

MOMI®

When Your System Demands Quick Attention...®

MOMI is a System Management tool for the Tandem (HP NonStop) computer systems using the Guardian operating system.

MOMI software, written by BlackWood Systems, Inc., provides an easy way to obtain useful System information without severely utilizing System resources.

MOMI is a Client/Server design (Requester/Server for us old-time Tandem folks). The Server portion runs on the HP NonStop System as a nonStop multi-threaded process with a passive backup. The Client runs on Windows XP, Windows Vista (see [quirk](#)) and is written in Borland's Delphi. TCP/IP sockets are used to communicate between the client and server.

The document reflects MOMI PC Client version 5.14 and MOMI Server version 5.11.

Quick start Links -

[Installation](#)

[Network Information / Troubleshooting](#)

[Security concerns](#)

[Start / Stop MOMI Server](#)

[Server configuration](#)

[Adjust System time via SNTP](#)

[Client Access](#)

[Alarms](#)

[Support](#)

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Minimum system requirements

MINIMUM SYSTEM REQUIREMENTS

PC Client

Pentium 4 - 3.0 GHz

1 GB memory for XP - 2 GB for Vista

1 GB free disk space

Windows XP, Windows Vista

Windows Server 2003

3 GB of virtual memory

1024 x 768 display with 24 bit color (minimum)

1280 x 1024 display with 32 bit color (recommended)

Sound card and speakers (if Alarm sound desired)

NonStop Server

Integrity NonStop Blade with J06.04 or later

Integrity NonStop with H06.09 or later

ServerNet 'S' System with G06.20 or later

TCP/IP connection from PC to NonStop Server

MEASURE installed and STARTED

100 MB disk space without History active or

1 GB initial default size (user selectable) with History active

Optional Features

Certain functions within MOMI are optional and require authorization in the MOMI password in order to function. This help document does not generally differentiate optional features.

If you have any questions about your level of optional features, please contact [us](#).

General Limitations

CAIL emulator

The CAIL Emulator is provided courtesy of [CAIL](#) and is not a component of any purchased MOMI product. The Emulator is a limited-function version of the CAIL CTT/Suite product. BlackWood Systems and CAIL reserves the right to discontinue, limit or alter the availability in future releases. Please see the CAIL Emulator help within the Emulator for additional information. To obtain a full featured emulator, please contact [CAIL](#).

Non-privileged operation

MOMI operates in a non-privileged mode and generally relies on information available via documented interfaces. This restriction means that certain information is not available. For example, viewing the screen [Processes / Process Detail](#) cannot show the last error that occurred on a file. The last error is not available via either a documented Guardian procedure call nor via MEASURE.

Processes in the future

In its default mode of operation, MOMI does not generally display processes that are created after the current system time. This unusual situation could arise if either 1) the system is being used to experiment with changes in the system time, or 2) by accident the system time was set ahead, some processes were started, and the system time was returned to normal.

A normal change in the system time, such as where the system time is gradually adjusting, is not what this issue is describing. If the system operator was to force the system time backward say a couple of hours, MOMI would not generally pick up processes created within that couple of hour period of time. Once the couple of hours has passed, then MOMI would begin reporting on the missing processes.

The CONFMOMI keyword [COLLECT-ALL-PROCESSES](#) is provided to change the default mode of operation.

Snapshot operation

CPU and Process overview is generally displayed as the difference between two points in time. A way to think about this is that MOMI is constantly taking a limited picture of the system and compares the difference between the previous picture and the current picture.

For example, viewing the screen [Main Overview](#) the top processes on the system are the result of taking a snapshot of the system and comparing the differences from another snapshot 10 seconds later (by default). If a process was running during the entire window of time, it will be picked up by the snapshot. If the process was not running the entire window of time, the process itself should not be captured but the CPU busy (or some other field of the CPU such as Overhead) would be captured. This does not mean it will be displayed, unless it was busy enough to make the Top Processes on the system, but the snapshot captures the process.

Some screens, such as the screen [Processes / Process Entity](#), that directly invoke MEASURE and read its result do capture all process activity.

The intention of these snapshots is not to try to capture every single process activity on the system, but capture process activity that occurs long enough that its activity could be noticed or acted on.

MEASURE can capture every process startup and shutdown. MOMI snapshots cannot. MOMI can display short duration processes on the screen [Processes / Process Entity](#) by starting this screen with a process name of \$* and by sorting ascending on the Measure Window Size (last column scrolling the screen all the way to the right).

Installation

Installation Sources

MOMI is distributed in the following formats: EXE, User created ZIP and MOMI CD.

The various formats all provide the same type of MOMI software. The different package formats are provided to suit various customer requirements.

EXE

The EXE is a self-extracting executable that is downloadable from our web site.

Executing the EXE file and using all the defaults will install the MOMI PC Client only. This is the easiest way to obtain MOMI PC Client software. By choosing the "Complete" installation option, the PC Client is installed, and the NonStop Server components are placed on your PC so they are available for transfer to the host.

User created ZIP

The EXE that is downloaded from our web site may be renamed to a .ZIP and extracted via standard PC utilities or the built-in capability of Windows XP.

Extracting and viewing the ZIP format file displays the various subdirectories of the MOMI software and documents available without the need to "install" MOMI software.

MOMI CD

MOMI software found on our CD is uncompressed and comprised of the individual files. This is similar to the user created ZIP described above.

MOMI software is available on CD by request.

Multiple platform server support

MOMI configuration files automatically support S-Series and Nonstop Integrity.

On the Nonstop system, in the subvolume where MOMI is installed, the following object files and their use are present:

```
BWMOMI   - 32-bit TNS/R native (S-Series)
BWMOMIi  - 32-bit TNS/E native (Integrity)
```

The file used to SQL/MP compile the MOMI object file (OBYCSQL) and the TACL obey file used to start MOMI (OBYMOMI) automatically select the NonStop platform type and use the appropriate object file type.

In the event that the automatic platform selection logic does not function, simply change the references of BWMOMI and BWMOMIi as needed.

First Installation / Update of an existing installation

If you are installing MOMI for the first time, or updating an existing installation of MOMI, this section will walk you through the installation details using a utility called MOMIFTP.EXE. This utility handles the details transferring MOMI files from the PC to the Tandem via FTP.

If the utility cannot be used, please refer to the ReadMe.txt file for manual installation instructions.

Note: The MOMI Software download EXE file may be altered to a ZIP file by renaming it and changing the extension from .EXE to .ZIP. Conventional utilities that recognize the ZIP format will see and process the file just like any other compressed format. This allows the ability to view the contents of the EXE prior to executing or treat the EXE as a ZIP.

1) If you need MOMI software, download the latest version of MOMI from our [web](#) site.

2a) If you downloaded an EXE from our web site:

a. double click on the downloaded file

2b) If you renamed the EXE to a ZIP:

a. expand the ZIP file to an empty subdirectory on your PC
b. double click on the file SETUP.EXE

2c) If you have a MOMI CD:

a. double click on the file SETUP.EXE

3) The EXE files self extract to a temporary location and launch a program which gives you the option display the ReadMe file or perform either a Normal Installation to the PC or a Server Install Only. Select Normal Installation. The setup on an expanded ZIP or CD will go directly to a Welcome screen. Click through the initial and Welcome screen. Please read and accept the license agreement.

4) Choose the location where the MOMI files on the PC are to be installed.

5) The next screen selects the Setup Type. Choose **Complete Installation**.

6) Choose the name of the program group for shortcut on the Start menu (typically use the default).

7) Click Next to begin the installation. The installation may take some time if all help formats are installed.

8) Check the box to Install Server Files and click finish.

9) The program [MomiFTP](#) is automatically started and will perform the FTP transfer of files from the PC to the Tandem.

- a. On the 1st Connect to Tandem page, fill in the Host Address (your Tandem IP address), User ID, password and initial Volume/Subvolume where the MOMI files are placed. The User ID specified owns the files once the transfer takes place. Press Connect. If the connection was successful, you will see a big green "Connected..." .
- b. Press Next to advance the screen.
- c. On the 2nd Select Vol/SubVol on Tandem screen shows a list of the files present in the selected location. Change the location if desired and press Change.
- d. Press Next to advance the screen.
- e. On the 3rd Select New Install or Update screen press Put Files on Tandem. The status boxes indicate the outcome of the transfer.
- f. Press the Exit button to disconnect and stop the program.

10) From a TACL terminal emulator, Logon with the User ID and password to operate \$MOMI. Volume to the location where the MOMI files were placed.

11) Edit the file OBYMOMI. This is a TACL obey file used to start MOMI and provide initial configuration information. Page down to the section "set values below here". This marked portion of the obey file is the place to change the initial startup values for MOMI.

Check the process names, CPU \$MOMI operates in, priority and home terminal. The default values are usually valid for most systems.

12) Edit the file [CONFMOMI](#) . This edit file is used to set various MOMI parameters after startup. Set the System-description and check the TCP/IP process name and port that MOMI will 'listen' on for PC Client connections.

- Mini-MOMI users, the above should be about the only item of concern.
- MOMI users, add your MOMI password. Also, define any history files desired. MOMI will automatically create the history files in the location specified.

13) [SQL/MP compile MOMI](#) (If you don't have SQL/MP, ignore this step):
From a TACL prompt: OBEY OBYCSQL

14) Create BWSSG or the Super Group helper process (see [Security Considerations](#) to determine if you need this step):

(these steps omit logons as different users that may be required in your environment)

```
Purge BWSSG2
Rename BWSSG1, BWSSG2
Rename BWSSG, BWSSG1
FUP DUP BWMOMI, BWSSG,sourcedate      (BWMOMli on TNS/E)
FUP Give BWSSG, <Super.Group>        (Super.Super on TNS/E)
FUP secure BWSSG,NGNG,PROGID
```

15) [Start MOMI:](#)

From a TACL prompt: OBEY OBYMOMI

(wait at least 2 minutes before proceeding to the next step)

16) On your PC, start the PC MOMI Client (Start / Programs / BlackWood Systems / MOMI / MOMI). The MOMI Client will detect an initial start on the PC and will prompt for the TCP/IP address of the Tandem and port. The port is defined in the CONFMOMI file and has a default of 2000.

Shortly (or awhile) after starting the MOMI server on the NonStop System, the following message, one per processor, may be logged to EMS:

```
07-08-19 09:47:46.200 \SYSTEM.$XMnn TANDEM.MEASURE.G09 4016 Measurement 0
$vol.subvol.DCPUS: write to datafile failed. File error 45.
```

These messages are not a problem and may be ignored. No action is required.

MOMI starts on the NonStop System a measurement (the DCPUS file) configured for a variety of entities (CPU, Process, TMF, etc...). This measurement does not specify an interval but is effectively used for LISTACTIVE purposes. However, MEASURE will write data to this file such as processes stopping. Once the file is full, an error 45 is logged once from each processor in the system.

Even after the DCPUS file fills, the MEASURE counter records accessed by MOMI are still available. MOMI continues to access the counters via LISTACTIVE (the DCPUS file is not really used, but it must be present for MEASURE).

Later releases of the Operating System provide a means within MEASURE to prevent this error. If available, this feature it is automatically enabled by MOMI.

MomiFTP


The MomiFTP utility is provided to aid in the transfer of MOMI files from the PC to the Tandem server. The tool uses FTP to transfer files from the PC to the Tandem. File codes and ASCII | Binary settings are automatically managed by the tool.

The utility is located in the "\Tandem Install" subdirectory where the PC Client was installed if the Complete or Custom option was selected. This subdirectory contains configuration files necessary to drive MomiFTP and a subdirectory of the Tandem server based files.

MomiFTP is comprised of three screens. The first screen determines the system and User ID used to transfer the files, the second screen determines the location on the system and the third screen performs the transfer.

On the first screen enter the Host Address (or name) of the Tandem server to receive the MOMI files. Enter a User ID and password along with (optionally) the location (\$vol.subvol). Press Next >> to advance to the next screen.

FTP MOMI Files to HP NonStop (version 1.65)



1st Connect to HP NonStop

Host Address Port

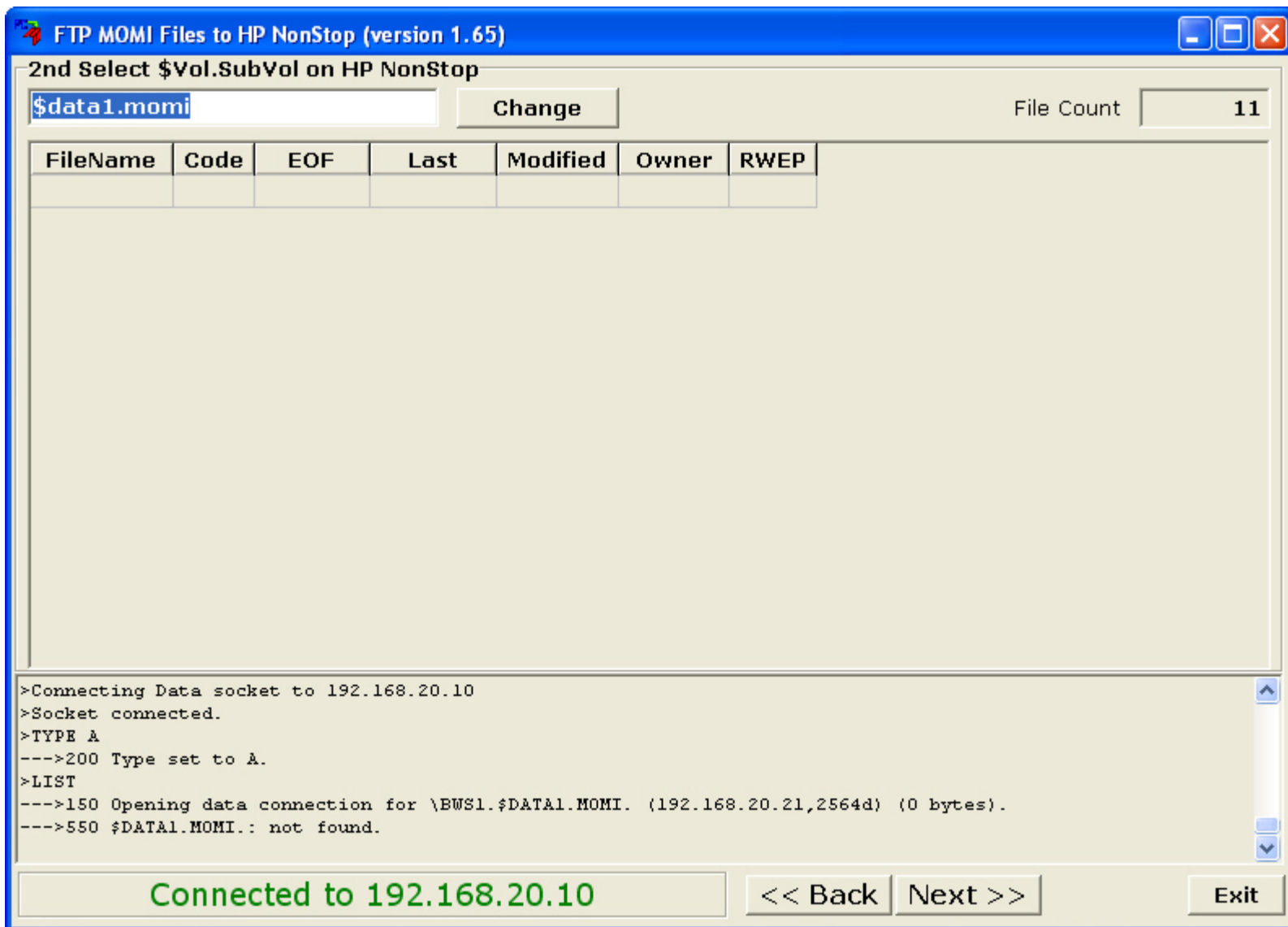
User ID

Password

Initial \$Vol.SubVol

```
>Connecting Data socket to 192.168.20.10
>Socket connected.
>TYPE A
--->200 Type set to A.
>LIST
--->150 Opening data connection for \BWS1.$DATA1.MOMI. (192.168.20.21,2492d) (0 bytes).
--->226 Transfer complete.
```

The second screen displays the current contents of the location and also provides the opportunity to change the location. Press Next >> to advance to the next screen.



The third screen displays the files to be transferred.

The "**Update Installation...**" option (the default) will rename existing files but will leave the configuration files alone. This is the normal method for transferring files on an active system. The update for an existing configuration file will have a 0 (zero) placed at the end of the name (indicating it is a new file). Existing files are renamed and a 1 (or 2) placed at the end of the name. Restarting MOMI with the OBYMOMI file will then cause the new file to be used.

The "**New Installation...**" option will rename any existing files (add a 1 to the end) so that any existing file is updated. This should only be performed with a new installation or major version upgrade. **Note: The OBY-MOMI file and CONFMOMI file need to be edited and settings confirmed for your environment.**

The X in the first column indicates which files are transferred (left/right click toggles the setting).

Press "Put Files on Tandem" to start the transfer process. During the transfer, a flashing indicator (...) is present in the Status column to signal the transfer progress .

3rd Select New Install or Update

Update Installation (Do NOT Update config files) New Installation (Update config files - if found)

4th Put Files on HP NonStop at \$data1.momi.*

| X | PC FileName | NonStop FileName | Type | FileCode | Config | Status | New FileName |
|---|-------------|------------------|------|----------|--------|--------|--------------|
| X | bwmomi | BWMOMI | B | 700 | NO | | |
| X | bwmomii | BWMOMII | B | 800 | NO | | |
| X | emsexpo | EMSEXPO | B | 845 | NO | | |
| X | confmomi | CONFMOMI | A | 101 | YES | | |
| X | obymomi | OBYMOMI | A | 101 | YES | | |
| X | obycsql | OBYCSQL | A | 101 | NO | | |
| X | fupevtcx | FUPEVTCX | A | 101 | NO | | |

Put Files on HP NonStop

```
>Connecting Data socket to 192.168.20.10
>Socket connected.
>TYPE A
--->200 Type set to A.
>LIST
--->150 Opening data connection for \BWS1.$DATA1.MOMI. (192.168.20.21,2867d) (0 bytes).
--->550 $DATA1.MOMI.: not found.
```

Connected to 192.168.20.10 << Back Next >> Exit

After the transfer, the Status column indicates the completion. Status counts are located in the lower left hand corner of the screen. The New FileName column indicates the name of any new configuration file.

FTP MOMI Files to HP NonStop (version 1.65)

3rd Select New Install or Update

Update Installation (Do NOT Update config files)
 New Installation (Update config files - if found)

4th Put Files on HP NonStop at \$data1.momi.*

| X | PC FileName | NonStop FileName | Type | FileCode | Config | Status | New FileName |
|---|-------------|------------------|------|----------|--------|-----------|--------------|
| X | bwmomi | BWMOMI | B | 700 | NO | Completed | |
| X | bwmomii | BWMOMII | B | 800 | NO | Completed | |
| X | emsexpo | EMSEXPO | B | 845 | NO | Completed | |
| X | confmomi | CONFMOMI | A | 101 | YES | Completed | |
| X | obymomi | OBYMOMI | A | 101 | YES | Completed | |
| X | obycsql | OBYCSQL | A | 101 | NO | Completed | |
| X | fupevtcx | FUPEVTCX | A | 101 | NO | Completed | |

Put Files on HP NonStop

```

* Successful
* Put Completed : 7
* Skipped File : 0
* Failure
* Put Failed : 0
* Missing File : 0
***** Completed *****
  
```

Connected to 192.168.20.10

<< Back Next >> Help Exit

Status

Successful

Good Put

Skipped

Failure

Put Failed

Missing

Press Exit to leave the program.

If any problems occur, scroll through the log window to help determine the reason.

... in the STRTMOMI file ...

```
Logon user.momi  
volume $vol.momi  
obey OBYMOMI
```

... continue system startup

...

In the system startup files, MOMI should be started after the MEASURE subsystem is started and near the end of the system startup sequence.

In the system shutdown files, MOMI should be stopped early in the shutdown sequence and before the MEASURE subsystem is stopped.

Duplicate an existing server environment

The following describes how to duplicate an existing MOMI environment making the changes necessary in order to support another instance of the MOMI server. Take note of the explanations following as avoiding some files may speed up the creation of the duplicate environment.

1. stop the existing MOMI process.
2. using FUP duplicate all of the files in the existing MOMI subvolume to another subvolume.
3. restart the existing MOMI process.
4. In the duplicate OBYMOMI file, assign a new process name to MOMI (each main MOMI must have a unique name).
5. In the duplicate CONFMOMI file, change the settings that must be unique for each environment:
 - for the keyword [TCPIP-INFO-n](#), assign a new port number (each MOMI server must listen on a unique port).
 - for the keyword [HSTnnDB](#), assign new vol/subvol locations (each MOMI server must have unique history files).
 - check the file for any other reference to vol/subvol used by the existing MOMI for storage or work purposes (the keywords previously listed are the most common but a few others exist).

The following are brief explanations of certain files within the MOMI subvolume. MOMI will automatically create on startup new one(s) if they are not duplicated into the new environment:

- The CNF01DB file is the MOMI configuration database. It stores configuration information entered online such as Alarm definitions. It does not generally store information found in the OBYMOMI or CONFMOMI files. To start the duplicate environment 'clean', simply delete this file.
- The LOG01DB file is the MOMI log file. It stores messages logged by MOMI. If you want to start the duplicate environment with an empty log file, simply delete this file.
- The HSTnnDB files are the MOMI history files. If you want to start the duplicate environment with empty history files, simply delete them. These files are usually large and may take some time to duplicate. It is usually faster to duplicate them from one disk volume to another (to avoid drive thrashing).

PC Client on a central server

see [Viewing Help across Network Share](#)

Larger shops may wish to install a single copy of the PC MOMI Client on a central server to simplify upgrades of the MOMI Client.

The PC MOMI Client executable (MOMI.EXE) has no special installation requirements. There are no registry, DLLs or OCXs directly associated with the MOMI Client itself (other than built-in Windows components).

To share the PC MOMI Client in a server environment, there are two methods:

a. Install the MOMI Client on a PC workstation and then copy all the files and subdirectories over to the desired server share.

or

b. Copy all of the files from the "\PC Manual setup" subdirectory from an .EXE renamed to a .ZIP (or MOMI CD) over to the desired server share.

Create a share (or use an existing) on the central server. The share must allow READ access to all desired PC workstations which are executing the PC Client software. Create a shortcut on each PC workstation to the MOMI.EXE on the shared server.

The first time a PC workstation executes the shared MOMI.EXE, a MOMI.INI file, along with a few others are created in the location:

Windows Vista -

C:\Users\<<UserID>\AppData\Roaming\BlackWood Systems\MOMI\

Other Windows versions -

C:\Documents and Settings\<<UserID>\Application Data\BlackWood Systems\MOMI\

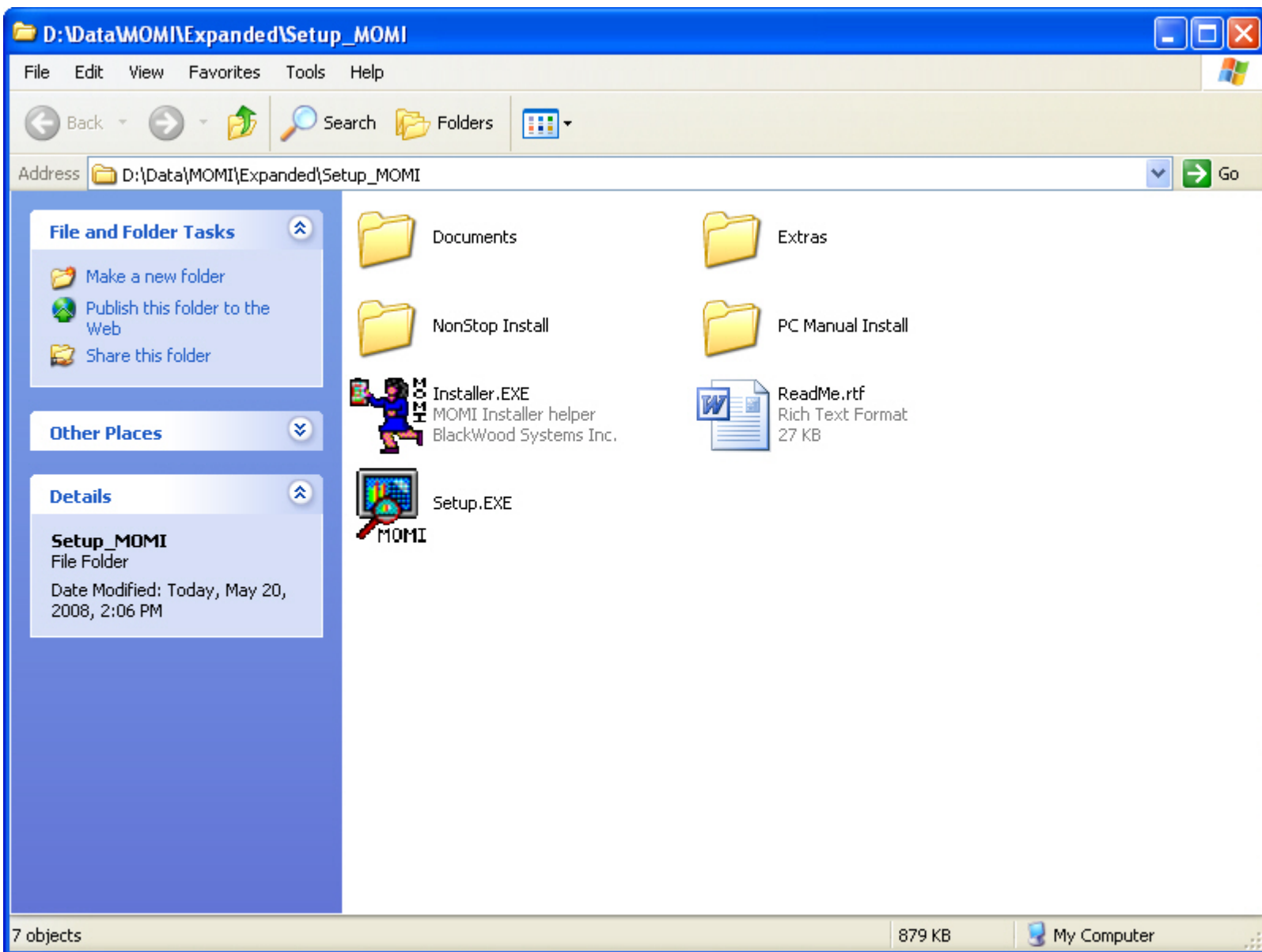
Where <UserID> is the name used at logon to Windows. You must enable the display of 'hidden' locations within Windows in order to see these locations.

See [Specifying run-time parameters](#) if an alternate location is desired.

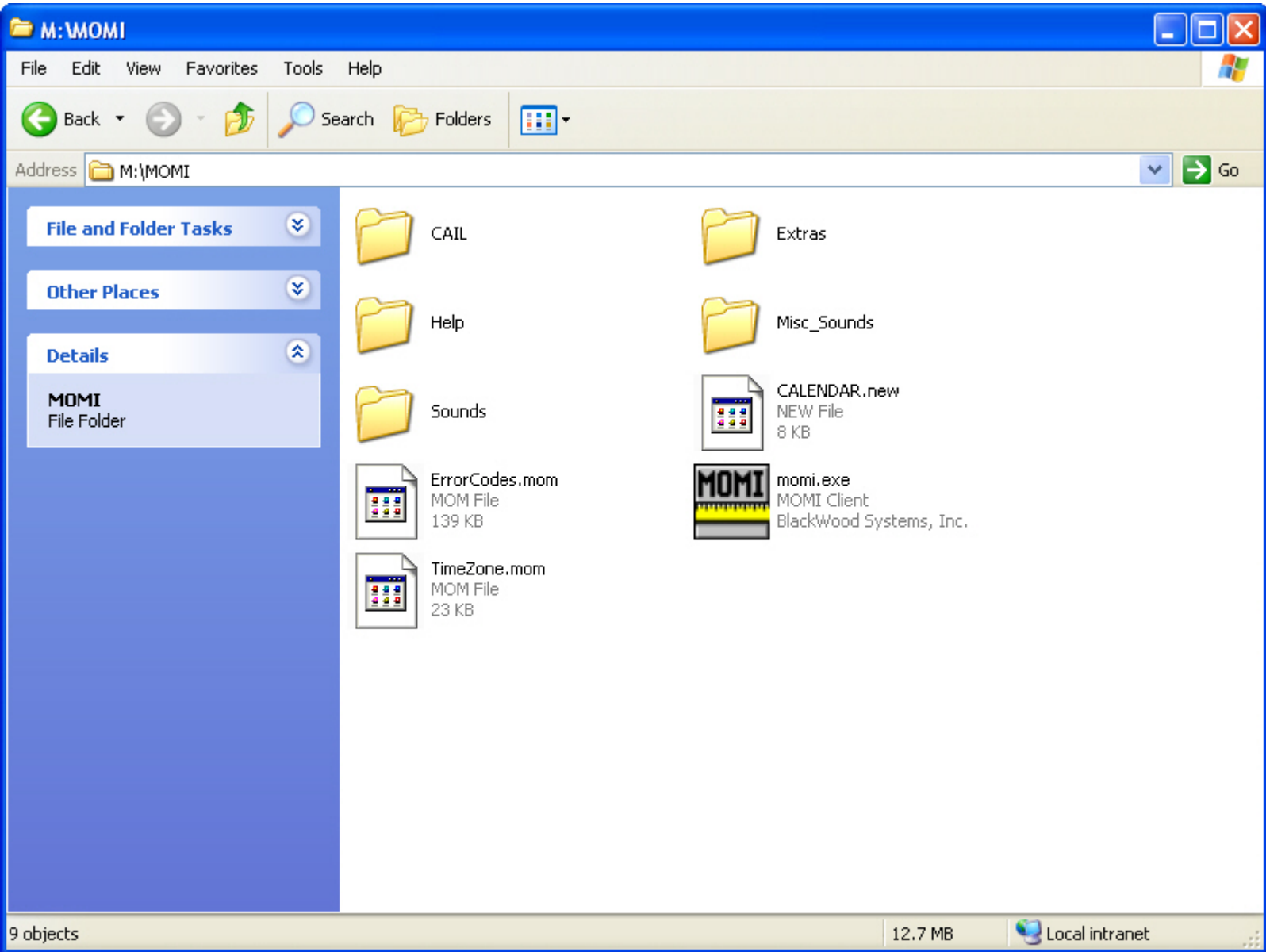
Example

This example shows how to setup the MOMI PC on a shared subdirectory. The MOMI source files are obtained by renaming the EXE to a ZIP and expanding it to a work area.

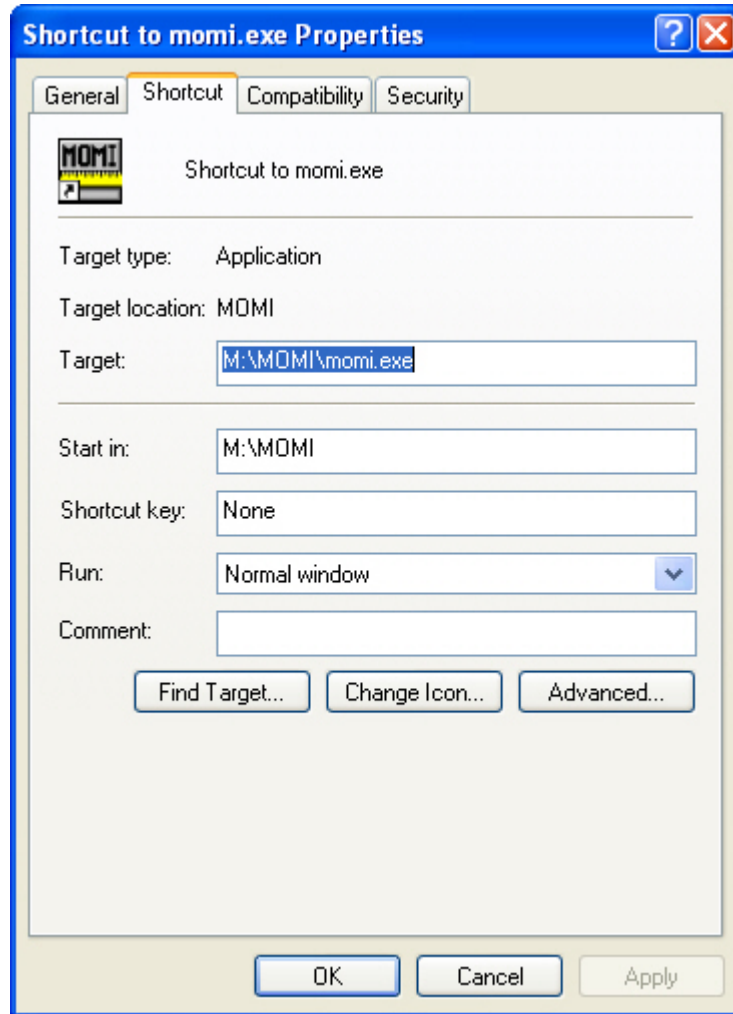
The subdirectory "\PC Manual Install" contains all the files a typical PC Client would need.



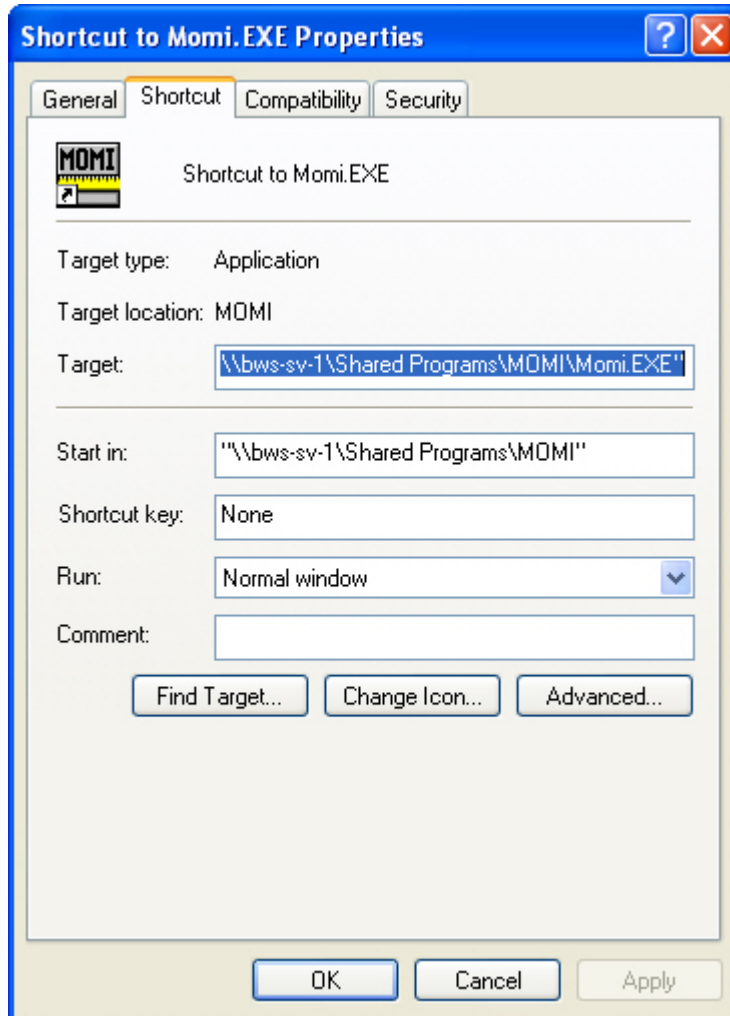
On a Shared drive, for example drive M:, the administrator creates a subdirectory called \MOMI and copies into it all the files from "\PC Manual Install". The files and subdirectories shows in this example may change from release to release.



On each PC workstation, create a shortcut to the MOMI.EXE located in shared drive M:\MOMI.



Alternately, a shortcut may be directly created to the shared location (i.e. not using a drive letter). In the following example, the server \\BWS-SV-1 has MOMI located under Shared Programs:



Configuration recommendations

Overview

Several configuration settings should be reviewed in your Windows environment to insure that MOMI and other programs can operate to the fullest.

24 bit color or better

The PC must be configured with at least 24 bit color for the client to operate fully. A warning message is displayed at client start up if a lower color depth is detected. While the client will generally function correctly, certain features are not available such as the a pop up window when the mouse is placed over the connector lines between systems on the SubSystems / Expand / Diagram page.

Sufficient Desktop Heap

Windows XP and Vista should increase the default size of their Desktop Heap. The desktop heap provides for "interactive" windows and contains user objects like hooks, menus, strings, and windows. Programs like MOMI and others such as Lotus Notes consume a great deal from the desktop heap.

Windows Vista in SP1, both 32-bit and 64-bit, has substantially increased the default size of the Desktop Heap. The registry change, while still valid, may not be needed or use a larger value.

A Windows PC that runs at or near the Desktop Heap limit may experience random application crashes and messages such as "Not enough storage is available to process this command". This message is somewhat misleading as it does not always refer to PC memory, but may also relate to the memory available within the Desktop Heap.

Increasing the size of the Desktop Heap allows Windows to support running concurrently more than one copy of the MOMI PC Client along with increasing capacity for other Windows programs.

Below is a modified excerpt from a Microsoft Knowledge Base Article that provides details on how to increase the Desktop Heap. This information is documented in the Knowledge Base Article ID 126962 (or search for "Out of Memory"). Additional details concerning the parameter values may be found in the Knowledge Base Article ID 184802.

Important: The information below requires modification of the Windows registry. Serious problems might occur if you modify the registry incorrectly. Make sure that you take care and change only the fields recommended. For added protection, back up the registry and/or key being modified before you implement this change.

1. Run Registry Editor (REGEDT32.EXE).

2. From the HKEY_LOCAL_MACHINE subtree, go to the following folder:

```
\System\CurrentControlSet\Control\Session Manager\SubSystems
```

3. On the right hand side of the screen double-click on the key:

```
Windows
```

4. On the pop-up window you will see a very long field selected. Move the cursor near the beginning of the string looking for this (*values may vary*):

```
SharedSection=1024,3072,512
```

5. SharedSection specifies the System and desktop heaps using the following format:

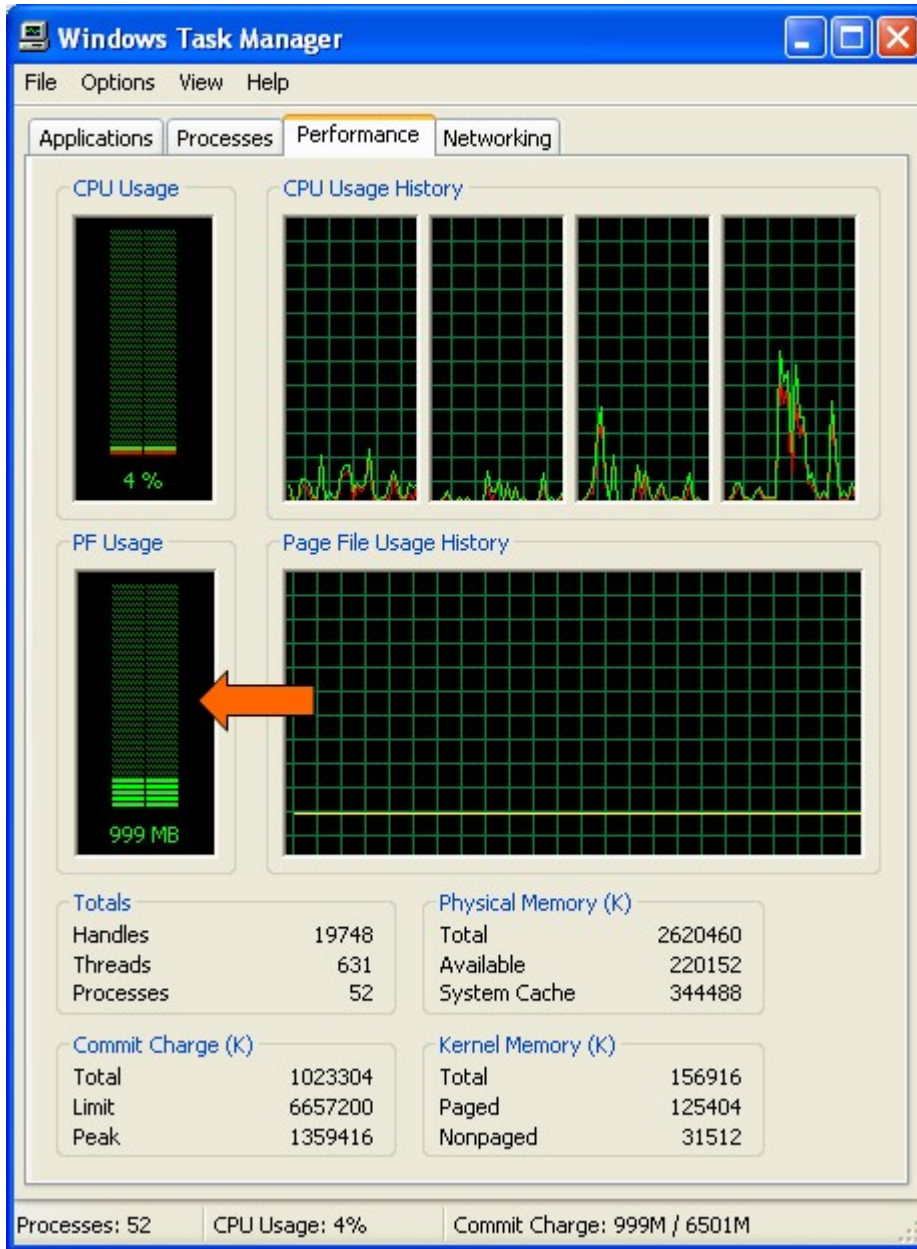
```
SharedSection=xxxx,yyyy,zzz
```

where xxxx defines the maximum size of the system-wide heap (in kilobytes), yyyy defines the size of the per desktop heap, and zzz defines the size of the desktop heap for a "noninteractive" window station.

6. Change **ONLY** the yyyy value to 8192 (or larger) and press OK.

7. Exit the Registry Editor and reboot the PC for the change to take effect.

This registry change allows for potentially more Windows programs to operate concurrently. It is also a good idea to check that Windows also has a sufficient amount of virtual memory (i.e. paging file). This can be checked by starting the Windows Task Manager (right-click on an empty portion of the task bar and select Task Manager) and selecting the Performance tab. In Windows 2000/XP check the PF Usage bar chart, in Windows Vista check the field labeled Page File which displays the current and maximum values.



Windows Task Manager

File Options View Help

Applications Processes Services Performance Networking Users

CPU Usage

CPU Usage History

Memory

Physical Memory Usage History

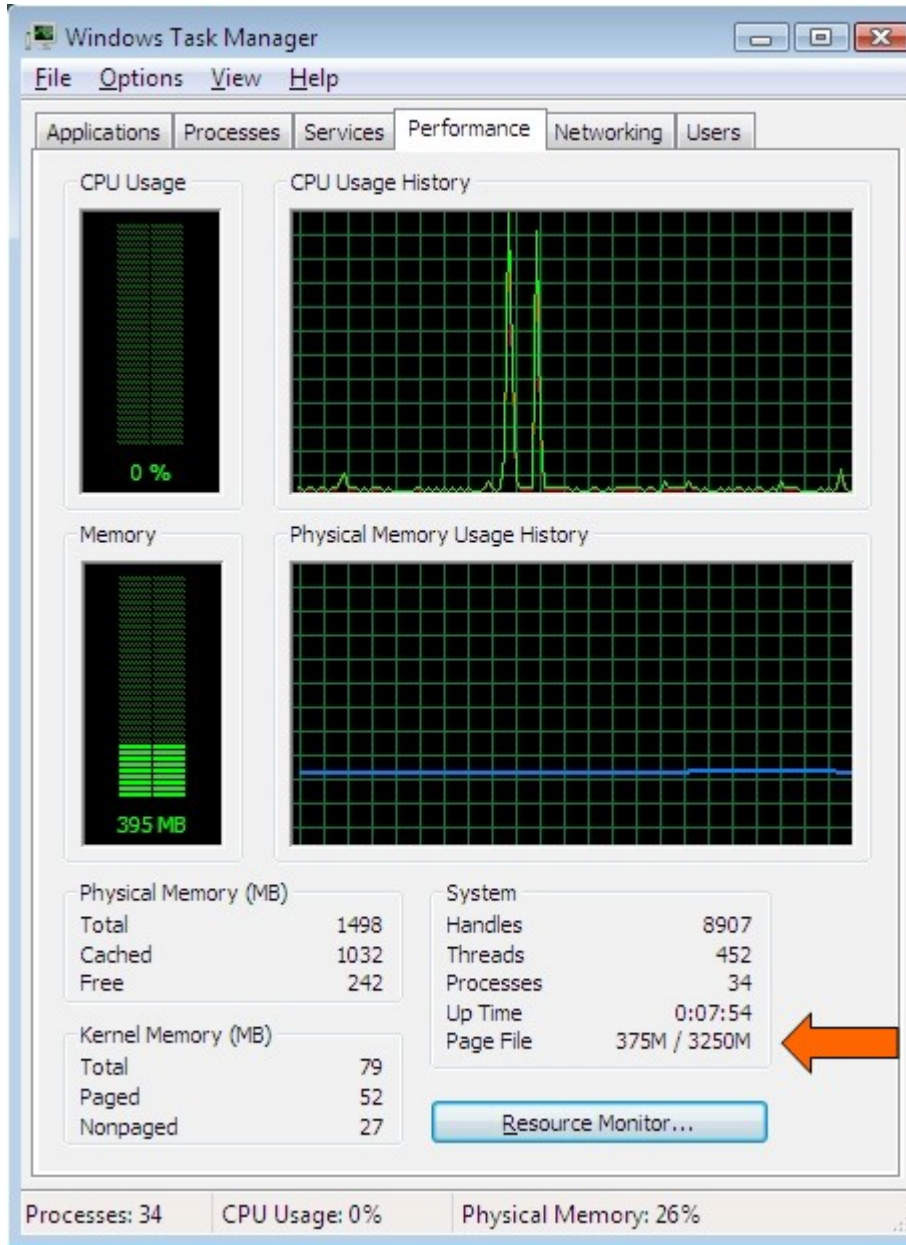
| Physical Memory (MB) | |
|----------------------|------|
| Total | 1498 |
| Cached | 1032 |
| Free | 242 |

| Kernel Memory (MB) | |
|--------------------|----|
| Total | 79 |
| Paged | 52 |
| Nonpaged | 27 |

| System | |
|-----------|--------------|
| Handles | 8907 |
| Threads | 452 |
| Processes | 34 |
| Up Time | 0:07:54 |
| Page File | 375M / 3250M |

Resource Monitor...

Processes: 34 CPU Usage: 0% Physical Memory: 26%

An orange arrow points to the 'Up Time' field in the System table, which displays '0:07:54'.

Network Information / Troubleshooting

Overview

Today's networks are increasingly complex and installing a new application may require interaction from several operational groups in order to insure success. This section describes how MOMI communicates between the PC Client and NonStop based MOMI server.

The MOMI PC Client uses native TCP/IP (i.e. no RSC or anything like that is used) and opens a TCP socket to the MOMI Server on the NonStop platform.

Common problem scenarios are described and discussed.

Basic Network Information

MOMI uses an address and port defined by the user. Communication originates from the MOMI PC based Windows client program and is destined to a NonStop Server based process. The TCP level socket provides two-way or bi-directional communication. Multiple sockets may be used, but all are originated from the MOMI PC Client.

MOMI uses 'plain Jane' TCP/IP native to Windows and the NonStop System. No other communication software is required.

If everything goes right

The MOMI server on the NonStop System must be started first. This allows the server to initialize and prepare to receive incoming connections.

On the NonStop server, in the subvolume where MOMI is installed the edit format file CONFMOMI contains at least one of the following lines:

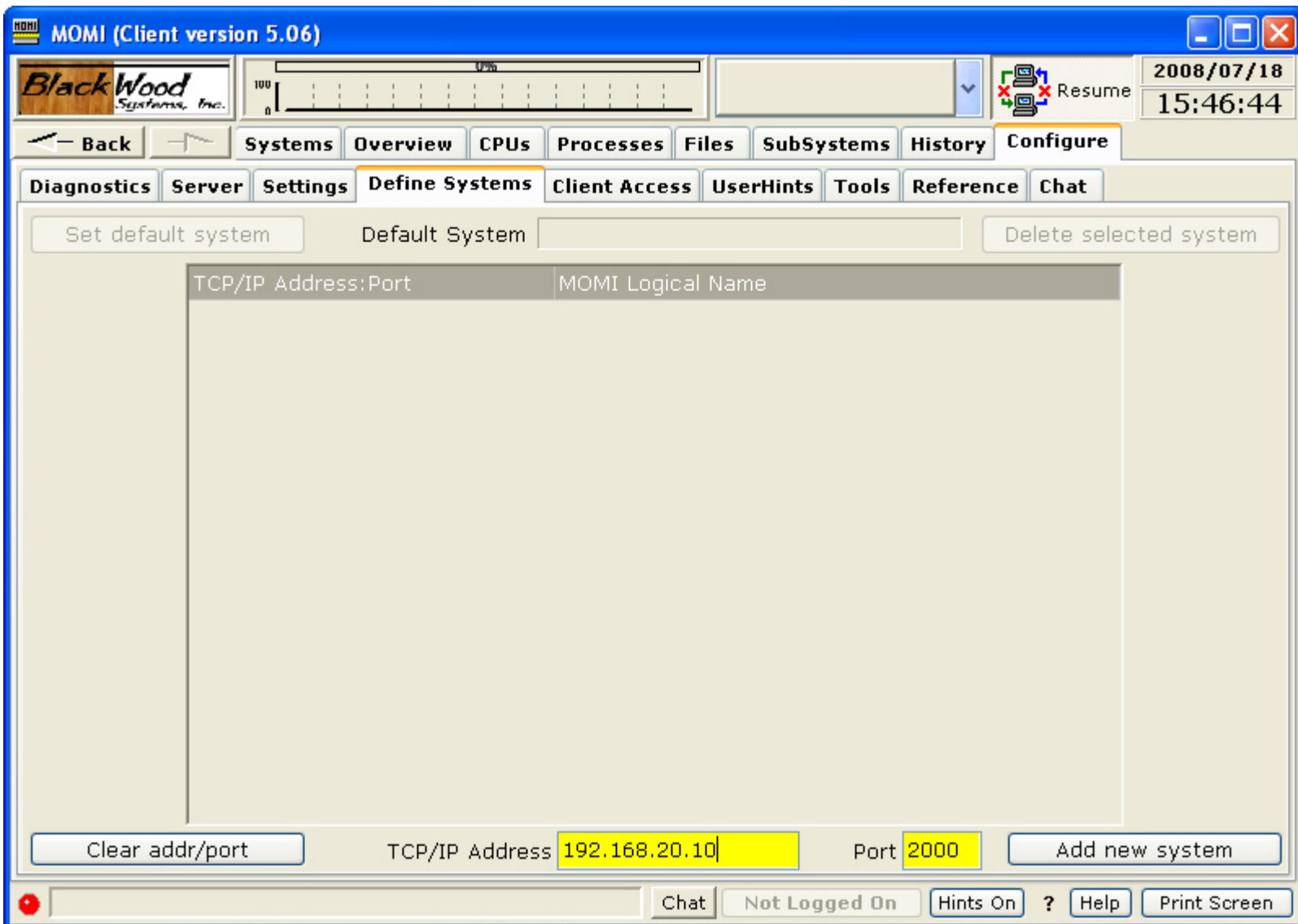
== TCP/IP process and port

== the MOMI server listens

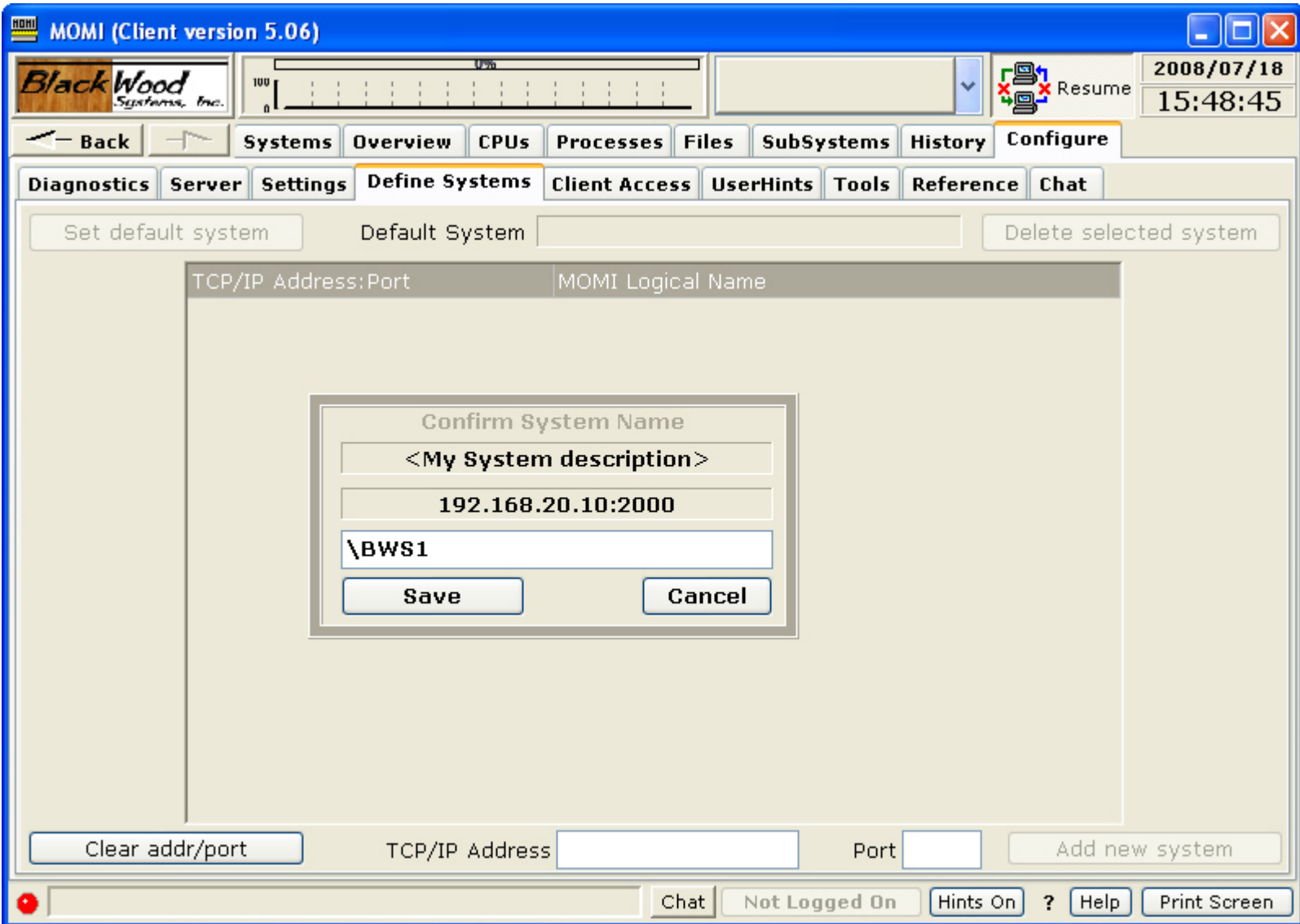
```
Tcpip-info-1 $ZTC0 2000
```

In this example, the line specifies that the MOMI server is listening on the TCP/IP process \$ZTC0 port 2000.

Once the MOMI Server is running, give it a couple of minutes after starting, in the MOMI PC Client, assuming that \$ZTC0 has a TCP/IP address of 192.168.20.10, you would enter the following information (color highlighted) on the screen [Configure / Define Systems](#):



If communication is successfully established, the following displays:



The pop-up window entitled "Confirm System Name" indicates communication was successfully established. If desired update the text field, showing the system name \BWS1 above, and then push Save to complete the operation of defining a system to MOMI.

The first system successfully defined becomes the default system displayed on subsequent startups of the MOMI PC Client. The default system displayed may be changed on this screen.

Now, what can go wrong (i.e. troubleshooting)

I pressed "Add new System" and nothing happed

It can take up to 30 seconds for a response if a timeout or retries occur. Normally, after pressing "Add new System", the response from the MOMI server is immediate.

I pressed "Add new System" and the MOMI PC Client locks up or terminates

This indicates that antivirus and/or firewall software is blocking the TCP socket connect from the client to the server.

Check with your PC and/or network support groups and see what authorization is required to enable a new PC application. MOMI uses a TCP level socket over the port number you specify. You may need 1) the MOMI PC Client itself authorized to operate, and 2) the TCP level socket and port authorized.

The TCP/IP process name is not valid

Shortly after starting MOMI, check the EMS log on the NonStop System. If MOMI encounters any error accessing the TCP/IP process, messages are logged to EMS.

To determine if the TCP/IP process named entered in the CONFMOMI file (\$ZTC0 used in our example) is correct, from a TACL prompt enter the following command:

```
STATUS $ZTC0
```

If the process is found, several lines of data appear listing either TCPIP or TCP6SAM as the object file name (usually located in \$SYSTEM.SYSnn). If the process name is not found, TACL returns "Process does not exist". Check with your NonStop System administrator to determine the correct TCP/IP stack process name. Note that multiple stacks may exist on the system (i.e. you need the correct one and not any one).

The TCP/IP port is already in use

Shortly after starting MOMI, check the EMS log on the NonStop System. If MOMI encounters any errors accessing the TCP/IP socket (i.e. port), messages are logged to EMS.

To determine if a TCP port is free, start a SCF from a TACL prompt and enter the following command:

```
SCF status process $ZTC0
```

Examine the output and find a port in the LPort column not used (greater than 1024

and less than 32767)

The TCP/IP address entered in the client is not correct

Check with the system and/or network administrator to confirm the address(es) for the TCP/IP stack.

It is possible that your network re-maps addresses. Literally, the NonStop System address may not be directly accessible, but an alternate mapped address is referenced.

The TCP/IP address and port are both correct and not already in use but I still can't connect

This may indicate a firewall and/or firewall software is in-between your MOMI PC Client and the NonStop Server. The firewall may be running on your PC and/or is a physical box on the network in-between your PC and the NonStop Server. You can try to PING from your PC to the NonStop Server by opening up a command prompt window and entering the following (using the example IP address above):

```
PING 192.168.20.10
```

Unfortunately, it is possible that the PING works but a MOMI connection fails. This would indicate that the ICMP (i.e. what a PING really is) function is allowed but MOMI data flow is not.

The best bet, assuming the required TCP/IP address and port information is valid and the MOMI server is started and successfully running on the NonStop System, is to speak with your network and/or PC administrators and determine what procedures are required to enable a new TCP/IP network application within your environment. It is very possible that both local PC and network authorization is required.

What things may stop MOMI data flow

Generally speaking, firewall and anti-virus port scanning software.

Network firewalls in-between corporate PC's and Servers are getting to be more common place. The extra level of security means that any new application must be enabled. Literally, firewalls prevent communication to non-approved network methods.

Anti-Virus port scanning software can be configured to examine all TCP/IP port traffic. The examination itself may interfere or the lack of understanding MOMI's

communication protocol by the AntiVirus software can prevent or stop communication by error-ing on the side of caution.

In both cases, environments running protections of this type would have a defined procedure available (i.e. forms to fill out) to establish a new software product. Since Introducing new software applications such as MOMI is probably not an everyday occurrence, don't be surprised if the required underlying tasks need to be dug out from a drawer and 'dusted off' :)

Security

General considerations (updated for server version 4.16 or later)

MOMI is initially launched via a TACL obey file to start the main \$MOMI process. This process starts other processes that support the MOMI environment.

When a user 'logs on' to a MOMI PC Client, a logon server process is launched that assumes given User ID. If it is necessary to perform a sensitive command, such as viewing a Spooler Job, a process is launched from the logon server to perform the sensitive commands under the users authority and not under the authority of the main \$MOMI process.

MOMI does NOT contain privileged code so it does NOT require to be licensed via FUP. However, certain Operating System functions require additional levels of authority. MOMI obtains this authority via the object file BWSSG (discussed below). BWSSG is manually created by the System Administrator during [installation](#).

There are three general User ID classifications. Super.Super (i.e. 255,255), Super.Group (i.e. 255,*) and all other "normal" User ID's. You should consider starting MOMI under a "normal" User ID, perhaps one specifically created for MOMI. However, the use of SAFEGUARD or SQL/MP may require that you operate MOMI under a higher level of authority.

Below are the security guidelines:

BWMOMI

The BWMOMI executable

Must be secured to allow Execute for all users. For example, a Guardian security string of "UUNU". Additionally, in order to allow the creation of SAVEABEND files (used in troubleshooting), READ access should also be considered for a resulting security string of "NUNU".

BWSSG

The BWMOMI executable Super Group helper

Performs TCP/IP "Ping" or the ICMP Echo command and adjustment of [System time](#) (if enabled)

Must be secured to allow Execute for all users and PROGID to a Super.Group user for TNS/R systems and Super.Super for TNS/E systems. For example, a Guardian security string of "UUNU". Additionally, in order to allow the creation of SAVE-ABEND files (used in troubleshooting), READ access should also be considered for

a resulting security string of "NUNU". This server is not used if MOMI is started under Super.Super.

Subvolume of BWMOMI

MOMI creates several work files in the subvolume where the object resides. The User ID MOMI runs under must have read/write/execute/purge/create access in this subvolume. It is suggested that SAFEGUARD is not used for this subvolume.

Subvolume of MOMI history files

MOMI must be given read/write/create access to the subvolume(s) [specified](#) for the history files.

\$SYSTEM.SYSnn.MEAS*

MEASURE support files

MOMI makes extensive use of MEASURE . These files must allow read/execute access.

\$SYSTEM.SYSnn.EMSDIST

EMS distributor program.

The file must allow execute access.

\$SYSTEM.SYSnn.INITDLL

ProcessH support file

MOMI uses this file in ProcessH "System" code report on Integrity and later systems.

The file must allow read access.

\$SYSTEM.SYSnn.MCPDLL

ProcessH support file

MOMI uses this file in ProcessH "System" code report on Integrity and later systems.

The file must allow read access.

\$SYSTEM.SYSnn.NSKCOM

Virtual memory access utility

MOMI uses this to report on virtual memory usage. The file must allow execute access.

\$SYSTEM.SYSnn.RLSEID

O/S release information (i.e. G06.29.02)
The file must allow read access.

\$SYSTEM.SYSnn.TSC

ProcessH support file - 16-bit code
MOMI uses this file in ProcessH "System" code report on S-Series systems. The file must allow read access.

\$SYSTEM.SYSnn.TSL

ProcessH support file
MOMI uses this file in ProcessH "System" code report. The file must allow read access.

\$SYSTEM.SYSnn.TSYSCLR

ProcessH support file
MOMI uses this file in ProcessH "System" code report on S-Series systems. The file must allow read access.

\$SYSTEM.SYSTEM.SQLCOMP

SQL/MP compilation utility
The display of SQL/MP information is the result of dynamic SQL statements. This file must allow read/execute access.

SQL/MP catalog subvolumes

MOMI provides SQL/MP information by reading this subsystem's catalogs. MOMI needs read access to all the catalogs on the system, particularly to the Catalog of the System, to provide information on the SQL/MP screens.

\$SYSTEM.SYSTEM.EVENTTX

EMS HTML cause/effect/recovery information
MOMI makes use of this file to display EMS cause/effect/recovery information. MOMI needs read access to this file.
(This file is not found on pre-S-series systems.)

`$SYSTEM.SYSTEM.EVENTCX` *(this file is optional)*

EMS user defined cause/effect/recovery information
MOMI makes use of this file to display EMS user defined cause/effect/recovery information. MOMI needs read access to this file. Additionally, a user may also logon and if they have proper security edit this file. The location of this file may be overridden with the CONFMOMI keyword [EVENTCX](#).

`$SYSTEM.ZLOGnn`

EMS log file subvolume
In order to display EMS messages from \$0, the EMS log files must allow read access. Use EMSCINFO \$0 to display the current EMS log file settings and EMSCCTRL \$0,-<command> to alter the settings within \$0. Existing EMS log files will need to have their file security altered via FUP.

Logon / Logoff

Operations within MOMI, such as viewing of performance information, listing volumes, files and Spooler collector status are considered non-sensitive commands. Commands of this type are executed in the context of the User ID that started \$MOMI.

Commands that perform an action, such as purging a file, viewing the contents of a file or viewing the contents of a Spooler job, are considered sensitive and must be executed under the context of a User ID and Password entered at the Client.

The Security Logon / Logoff screen allows the User to enter a Guardian Group.User or Safeguard alias format and password. The information is validated, and if accepted used to execute sensitive commands.



The screenshot shows a window titled "Security Logon / Logoff" with a close button (X) in the top right corner. The window has a pink background. It contains the following elements:

- User ID:** A text input field containing "fred".
- Password:** A text input field containing "*****".
- Change Password:** A button located to the right of the password field.
- Request Logon:** A button located below the User ID and Password fields.
- Logoff:** A button located to the right of the Request Logon button.
- Status Bar:** A small square icon followed by an empty text field at the bottom left.

After attempting to logon and the password is expired but has a grace period or if Change Password is pressed, additional fields are displayed to allow the user the ability to alter their password.



The screenshot shows a window titled "Security Logon / Logoff" with a close button (X) in the top right corner. The window has a pink background. It contains the following elements:

- User ID:** A text input field containing "fred".
- Password:** A text input field containing "****".
- Change Password:** A button located to the right of the password field.
- New Password:** A text input field located below the Password field.
- Confirm New Password:** A text input field located to the right of the New Password field.
- Request Logon:** A button located below the User ID and Password fields.
- Logoff:** A button located to the right of the Request Logon button.
- Status Bar:** A small square icon followed by the text "Password expired but grace period is in effect".

The MOMI server uses a password one time when the Request Logon button is pressed. A "logon server" process is created locked to an instance of the client. It is used to start additional MOMI server processes as needed to provide sensitive command processing for that instance of the client.

The MOMI server imposes the following to a logon:

- CMON pre-logon message is requested
- CMON logon message is requested
- numeric form of User ID is not allowed (example 255,100)

If [Client Access](#) is enabled, a logon may be denied by MOMI (which means the logon is not sent to the host).
Message generated by Client Access are preceded by:

Client Access DB -

The following messages may be returned by Client Access:

Client Access DB - User Record Not Found

Client Access DB - User Not Allowed to Logon To Tandem

Client Access

Overview

MOMI has the ability to limit the screens and features available to users of the PC Client. Virtually every screen (with some exceptions) may be turned on/off. Client Access configuration is optional but provided to allow system administrators to tailor MOMI more closely to their specific needs.

Users are identified to MOMI using the standard Guardian User Id or Safeguard Alias. Client Access relies on host to perform authentication (in other words MOMI does not maintain a database of User Id's and passwords).

Client Access is configured and enabled after MOMI is installed and operational. Configuration information is stored on the Tandem Server in the file [CNF01DB](#).

This section describes Client Access and gives examples of turning Client Access on and configuring.

What Client Access is not

Client Access is not the security granted to users accessing the Nonstop system. All sensitive commands, regardless of Client Access settings, require logon security as discussed in [Security Logon / Logoff](#).

Default Security User

The user that starts MOMI on the Nonstop server is considered the Default Security User. This user is allowed to activate Client Access, configure global Client Access settings, define new users and grant the Security User right to others.

Once additional users are defined on the system and at least one is configured as a Security User, it is generally no longer necessary to use the Default Security User. Some operations, such as disabling Client Access, may only be performed by the Default Security User.

The default may be overridden with the CONFMOMI keyword [DEFAULT-SECURITY-USER](#),

Initial operation of MOMI is Client Access turned off

When MOMI is started for the first time and creates its configuration file [CNF01DB](#), Client Access is turned off. All MOMI PC Client screens are displayed to any user that starts the MOMI PC Client. Some functions, such as Alarm configuration and operation may only be performed by the user that starts the MOMI server.

In this point, the user that starts the MOMI server is the only user with full control and full access over the MOMI environment.

Enable Client Access

The Default Security User [logs on](#) to the MOMI PC Client and navigates to the screen Configure / Client Access / Global Settings. Check the box to enable Client Access and then press the button "Change Global Client Access Settings".

Special predefined users

Two user are automatically created within Client Access and are used to determine available screens/function when 1) the client is not logged on and 2) the client has logged on their User Id is not defined within MOMI.

"NOT LOGGED ON" determines what screens/function the MOMI PC Client are available prior to a logon or when a Logoff is performed.

"USER NOT DEFINED" determines what screens/function the MOMI PC Client are available in the event that the User ID is not found in the Client Access database. This user provides the means to define the default operation for any user that can logon to the host.

Client Access order of precedence

When the MOMI PC Client is first started, the predefined user "NOT LOGGED ON" determines what screens/function are available. When a user logs on, the Client Access database is searched in the following order:

- 1) an exact match to the User ID
- 2) match User ID by wild card
- 3) use USER NOT DEFINED if enabled

An exact match to the User ID entered against a User ID defined in the Client Access database always takes precedence. Next, the Client Access database is searched again but logic is enable to allow the first match with an entry containing a wild card. Lastly, the predefined user "USER NOT DEFINED" is chosen if enabled.

Wild-card support, such as ADMIN.*, is available in the MOMI PC Client 4.05 and later.

Examples

The following examples (denoted by a ➔) describe the sequence of steps necessary to perform certain activities. With the exception of the first two examples, which assume an initial configuration, all other steps assume that Client Access is enabled.

- ➔ The MOMI server is initially started

Results

- All screens within MOMI are available to all users
- Only the Default Security User may add/delete/operate an Alarm
- Only the Default Security User may enable Client Access checking

- ➔ Enable Client Access checking

- Log on to Client as User that started the MOMI server on Tandem
- Go to the screen [Configure/Client Access/Global Settings](#)
- Check "Enable Client Access Checking on this System"
- Click the button "Change Global Client Access Settings"

Results

- Only the Default Security User may add/delete/operate an Alarm
- Only the Default Security User may disable Client Access checking
- The profile "NOT LOGGED ON" determines logged off access
- The profile "USER NOT DEFINED" determines logged on access

- ➔ Change profile for "NOT LOGGED ON"

- Log on to Client as User that started the MOMI server on Tandem
- Go to the screen [Configure/Client Access/Define](#)
- Select User ID (in the upper left hand corner of the screen)
- In the drop-down box pick "NOT LOGGED ON"
- Configure as desired
- Save settings by clicking button "Change User"

Results

- Users not logged on have settings as configured

- ➔ Change profile for "USER NOT DEFINED"

- Log on to Client as User that started the MOMI server on Tandem
- Go to the screen [Configure/Client Access/Define](#)
- Select User ID (in the upper left hand corner of the screen)

- In the drop-down box pick "USER NOT DEFINED"
- Configure as desired
- Save settings by clicking button "Change User"

Results

- Users logged on but not otherwise defined to MOMI have settings as configured

➡ Add an individual User ID

- Log on to Client as User that started the MOMI server on Tandem
- Go to the screen [Configure/Client Access/Define](#)
- Select User ID (in the upper left hand corner of the screen)
- Enter User ID and Description
- Don't enter or select a "Member of Group"
- Configure as desired
- Save settings by clicking button "Save New User"

Results

- User ID when logged on has settings as configured

➡ Add a Group ID

- Log on to Client as User that started the MOMI server on Tandem
- Go to the screen [Configure/Client Access/Define](#)
- Select Group ID (in the upper left hand corner of the screen)
- Enter Group ID and Description
- Configure as desired
- Save settings by clicking button "Save New Group"

Results

- A new Group ID is now available

➡ Add an User ID to a group

- Log on to Client as User that started the MOMI server on Tandem
- Go to the screen [Configure/Client Access/Define](#)
- Select User ID (in the upper left hand corner of the screen)
- Enter User ID and Description
- Select in the drop-down box "Member of Group"
- Save settings by clicking button "Save New User"

Results

- A new User ID that is a member of a group is now available

- ➔ Allow a user to add/delete/operate an Alarm (*assumes the user was already added*)
 - Log on to Client as User that started the MOMI server on Tandem
 - Go to the screen [Configure/Client Access/Define](#)
 - Select User ID (in the upper left hand corner of the screen)
 - Enable settings under History/Alarms to Create/Update Alarms
 - Save settings by clicking button "Change User"

Results

- User ID when logged on has Alarm Create/Update ability

- ➔ Limit AutoUpdate time
 - Log on to Client as User that started the MOMI server on Tandem
 - Go to the screen [Configure/Client Access/Global Settings](#)
 - Check box and "Set AutoUpdate Limit to" value
 - Save settings by clicking button "Change Global Client Access Settings"

Results

- AutoUpdate is limited by default for all users. (*This may be overridden on an individual or group basis*)

- ➔ Restore the default state of Client Access and Disable (use only if you really mess up)
 - Log on to Client as User that started the MOMI server on Tandem
 - Go to the screen [Configure/Client Access/Global Settings](#)
 - Press button "Delete All Client Access Records"
 - Press confirmation button

Results

- Client Access disabled. Default functionality restored.

- ➔ Disable Client Access Checking
 - Log on to Client as User that started the MOMI server on Tandem
 - Go to the screen [Configure/Client Access/Global Settings](#)
 - Uncheck box "Enable Client Access Checking on this System"
 - Save settings by clicking button "Change Global Client Access Settings"

Results

- Client Access disabled. Default functionality restored.
- User profiles are still present.

MOMI Server

Overview

MOMI obtains its information on the NonStop server platform by running a number of processes. Some process run continually and others are started on demand.

MOMI is initially started via the TACL obey file OBYMOMI. This obey file starts the main \$MOMI process which serves as the overseer for the MOMI subsystem. This main MOMI will:

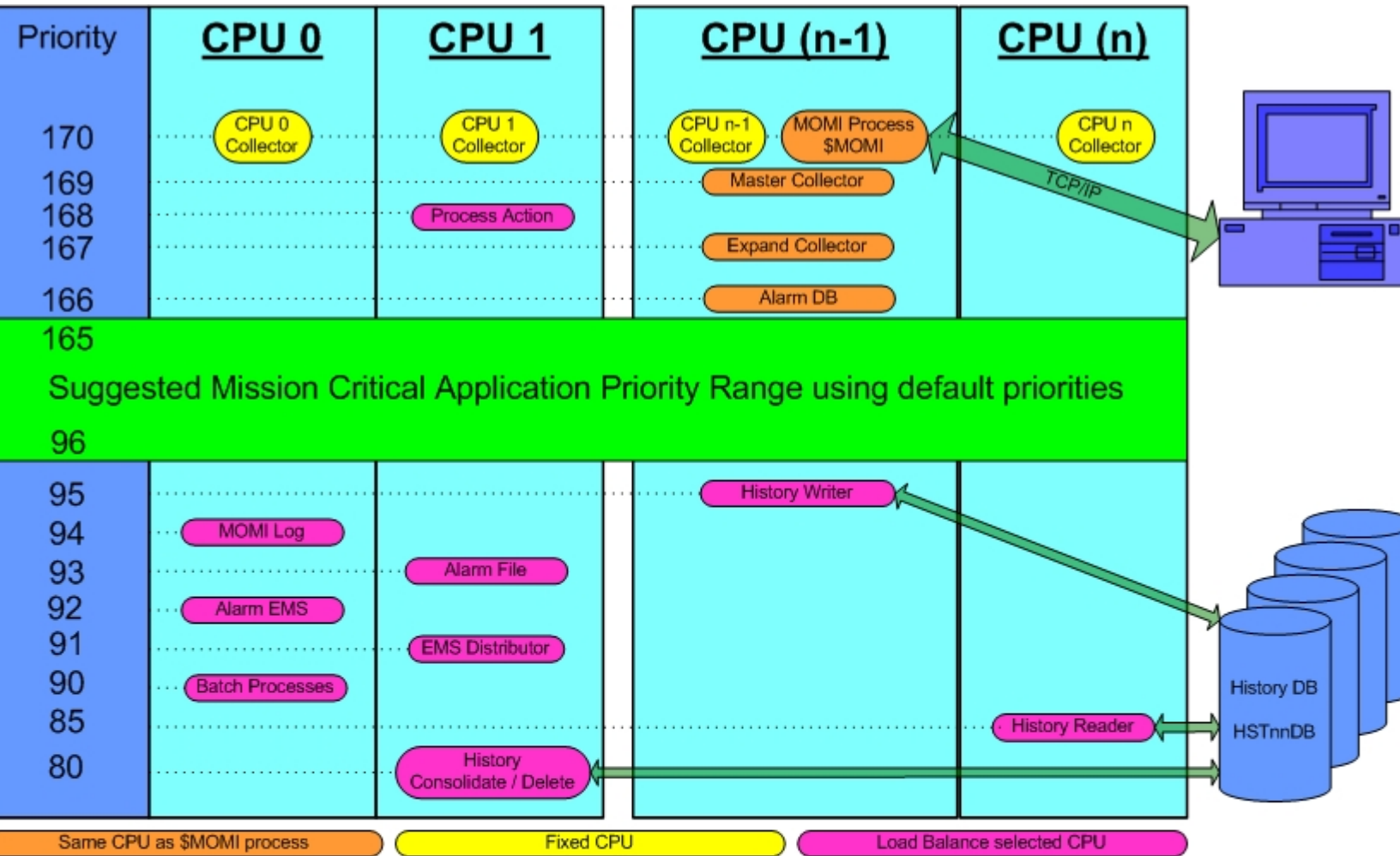
- start a master process that configures the main measurement in the MEASURE subsystem
- start an Expand collector process
- start a collector in each processor of the system
- start a process that writes [history](#) to the HST01db file
- start a process that performs the history consolidation and deletion
- start an NSKCOM process for obtaining virtual memory statistics
- post a 'listen' on the [assigned](#) TCP/IP process(es) and port(s)

The MOMI PC Client issues a TCP/IP connect to the address and port configured to establish communication with \$MOMI. \$MOMI either provides answers directly to Client queries or passes the request to a server started by \$MOMI. The response is returned to \$MOMI which is in turn is passed back to the PC Client.

Sensitive commands that require security are executed in the context of the User ID provided. When a user logs on, the server that executes the actual logon command assume the authority of that particular user. From that point on, any sensitive command is executed within a server started under the authority of that particular logon.

The BWMOMI server uses dynamic SQL/MP statements to obtain information from the system and user catalogs. The dynamic SQL/MP is used in support of the PC MOMI Client screens Files / SQL/MP / *. The TACL obey file OBYCSQL performs an SQL/MP compile of the BWMOMI object with the attribute of NOREGISTER ON (this means that the SQL/MP catalog does not reflect BWMOMI).

Process Priority



| Process | default priority | run-time parameter to alter priority |
|-------------------------------|------------------|--------------------------------------|
| Main \$MOMI and CPU collector | 170 | PRIORITY-MOMI or startup priority |
| Master Collector | \$MOMI - 1 | PRIORITY-COLLECTOR-MST |
| Process Action BWSSG | \$MOMI - 2 | PRIORITY-PA |
| Expand Collection | \$MOMI - 3 | PRIORITY-EXPAND |
| Alarm DB | \$MOMI - 4 | |
| History Writer | 95 | PRIORITY-DB-HST01DB |
| MOMI log | 94 | PRIORITY-DB-LOG01DB |
| Alarm File processor | 93 | PRIORITY-ALARM-FILE |
| Alarm EMS processor | 92 | PRIORITY-ALARM-EMS |
| EMS Distributor | 91 | PRIORITY-EMS |
| Batch | 90 | PRIORITY-BATCH |
| History Reader | 85 | PRIORITY-DB-HSTxxDB-R |
| History Consolidate / Delete | 80 | PRIORITY-DB-HSTxxDB-CON |

Approximate CPU Usage at idle on S7000

\$MOMI CPU 3%

Other CPUs 1%

In order for MOMI to collect information on a timely basis, it must run at a priority high enough so that the other programs on the system do not 'walk over' or interrupt operation.

The diagram above shows the relative process priorities of \$MOMI and its server programs.

MOMI, to divide its workload, starts several copies of itself. The main program \$MOMI, is the master traffic cop, data collector and data reporter. MOMI also starts a copy of itself in every CPU in order to collect information about that CPU. All information collected is reported back to \$MOMI. \$MOMI and the CPU collectors consume a fairly consistent portion of CPU resources, with \$MOMI varying the most, based on incoming requests from the PC Clients.

By default, \$MOMI and the collectors in each CPU run at a rather high priority of 170. This priority is set in the OBYMOMI file.

MOMI also starts other processes based on needs of the PC Client and generally run at default priorities in the 80 to 95 range. These priorities can be adjusted in the [CONFMOMI](#) file.

If you have concerns with the priority of the MOMI environment, you could run \$MOMI at a lower priority than your critical production programs. Please be aware that running \$MOMI at a lower priority could prevent the timely collection and reporting of data (usually showing up as random interruptions). In the [Main Overview](#) screen you may see MOMI CPU collectors reporting as HUNG or STOP. Once you have tested and are comfortable with the operation of MOMI on your system, MOMI should run at a rather high priority to help to insure consistent data collection and reporting.

Adjust System time via SNTP

(server version 4.17 or later)

Overview

MOMI has the capability to adjust the Nonstop System time via a Network time source.

This feature is not enabled by default.

A Network Time Protocol (NTP) server is specified to MOMI and this server queried periodically using the Simple Network Time Protocol (SNTP). SNTP is defined in RFC 2030 and MOMI specifies version 3 in the time request. This protocol provides a simplified means for obtaining time from a reliable source located either on the local network or via the Internet. NTP servers usually obtain their time from master sources such as atomic clocks or from over-the-air sources such as GPS.

How it works

MOMI queries or takes many samples from the NTP server over several minutes. The samples are processed to determine a network time. The network time is compared to the time on the Nonstop System to determine if an adjustment forward or backward is required. The Operating System call SET-SYSTEMCLOCK is used to perform the adjustment and is given 1) the amount to adjust and 2) a mode of 6 which directs a clock adjustment (not a clock set) regardless of the clock error.

The Nonstop Operating System provides two methods for manipulating the System time. The first method is to set the clock to a specific time, which could be an abrupt operation and is not generally performed with a 'live' System. The second method is to adjust the rate at which the clock operates without disturbing the live environment. MOMI uses the second method by default.

A way to think of the clock adjustment is "nudging" either forward or backward by slightly speeding up or slightly slowing down the System clock, but **not** jumping or forcing it to a specific time. Time nudging may be performed on an active system generally without concern. An actual set of the clock, especially going backwards in time, could have a really undesirable affect on certain subsystems such as TMF (i.e. you really don't want to do that).

A side effect of clock "nudging" is that if the System is off by more that a few minutes, particularly if the system is ahead of the network source, it may take some time (no pun intended) before an accurate system time is achieved. If the System time is really 'off', a manual operation should be considered during a maintenance window.

Should I use it?

The SNTP protocol and the MOMI implementation does not provide the highest level of accuracy theoretically possible, but can in most situations maintain the System time much better than manual input. The code implementation strives for an accuracy of .001 seconds, which is the smallest adjustment attempted, but a resulting accuracy of about 0.1 seconds is recommended for "should I use it" purposes. However, if any of the following are true:

- a. Operating System is less than G06.23 (a bug was fixed in T9050APH with SET-SYSTEMCLOCK), or
- b. higher level of accuracy is required, or
- c. minor fluctuations cannot be tolerated, or
- d. System time management is exceptionally critical

then this feature of MOMI should not be enabled.

Systems that are just plain "slow" and are constantly behind, may be closer to the network source as a result of MOMI requesting time adjustments, but may still remain behind.

What is the best time source?

Ideally, a local NTP server/device on your Network would provide the highest levels of accuracy. Hopefully, the local network has far less traffic and response time fluctuations than a remote device accessed via the Internet. However, the MOMI SNTP implementation does take network fluctuations (i.e. delays, lags) into account.

The local NTP server/device may be a dedicated NTP server, a Windows Server or a UNIX Server. A Windows Server must be a domain controller or otherwise have the NTP server function enabled.

A public time server (NTP) may be used by searching via an Internet search engine or from the following URL -

<http://www.pool.ntp.org/>

Network firewall information

SNTP uses a UDP socket over port 123. A MOMI server on the NonStop System opens the socket and sends a time request. The response is received over the same socket and port. It may be necessary to have your firewall (i.e. network environment) allow this outbound request.

How to activate

The System time management feature of MOMI may be placed in a 'preview' mode prior to full activation.

The preview mode allows confirmation of access to an NTP server and the time difference between Nonstop System and the NTP server are written to the [MOMI Log](#). The first three steps below place MOMI in the preview mode and the fourth step allows adjustment of the System clock:

1. determine the NTP server to use.
2. add the following keywords to the CONFMOMI file (restart MOMI to take effect):

```
== specify  
TCP/IP stack  
name  
== (not always  
needed)
```

```
SNTP-TCPIP-NAME <tcpip-process-name>
```

```
== NTP server
```

```
SNTP-SERVER-ADDR <DNS-name> | <IP-address>
```

3. view the [MOMI Log](#) to see the difference between the System time and the Network Source (the messages are logged once an hour by default).
4. if desired, direct MOMI to perform required adjustments to the System clock by adding the following keyword to the CONFMOMI file (restart MOMI to take effect):

```
== allow
```

MOMI to
adjust
== the
System
time

[SNTP-ALLOW-ADJUSTMENT](#)

Common questions

Can our operators still set the System time if MOMI is configured to make adjustments?

Yes, with a consideration. The operating system forces a set of the system clock under two situations. 1) a SETTIME is performed twice within two minutes, or 2) the SETTIME value specifies a time two minutes or more off from the current System time. If the operator only issues a single SETTIME within two minutes of the current System time and expects only an adjustment, a clock set may result if MOMI is also performing an adjustment.

Can this feature be activated even if the System time is off by more than several minutes?

Yes. It may take weeks or months to finally arrive at the correct time, particularly if the System time is ahead of the Network Source.

How long do time adjustments take?

Adjusting the clock forward two minutes takes about 33 hours. Adjusting the clock back two minutes takes about 14 days.
(information from the HP Knowledgebase)

Can an operator perform a SETTIME while MOMI is adjusting the System time?

Yes. Take note of the first question above. MOMI's time computation may be affected if the System time is externally set but the condition would self correct after a few automatic time updates.

Can I have another process (or method) also perform adjustments to the System time in addition to MOMI?

Not recommended. Only one process (or method) should be selected to maintain the System time.

Once the System time is correct and MOMI is performing adjustments, will the System time need to be manually set again?

Probably not. The System time should be checked periodically by an operator to insure proper operation. Messages are written to the [MOMI Log](#) and [EMS Msgs](#) log for normal and error conditions detected by MOMI (messages are described below).

After a maintenance window, particularly if the outage was extended or if any hardware was replaced, the System time should be checked after processors are loaded but before System is 'started'.

Will messages appear in my EMS log every hour (assuming MOMI is checking once an hour)?

Only if a time adjustment is required.

Initially, you will see messages logged to EMS every hour while your System time is brought into sync. Two messages are logged when a time adjustment occurs. The first message notifies that MOMI is going to perform an adjustment. The second message is from the Operating System indicating the time was adjusted (System ID: TANDEM.CLOCK, event number 107). Additionally, a message is also logged should the Operating System reject the attempt by MOMI to perform the time adjustment.

The System time does not seem to be as accurate as it should be and EMS event 104 (Error reading Service Processor clock, error code :nnn) is logged.

This may indicate a problem with the service processor (SP). Consider resetting the service processors in CPU 0 and 1.

MOMI logs the following messages

Normal messages

SNTP: System time n.nnnnnn seconds ahead of Network Source (<ip-address>)
SNTP: System time n.nnnnnn seconds behind Network Source (<ip-address>)
SNTP: System time 0.000000 seconds equal to Network Source (<ip-address>)

This message is written to the [MOMI Log](#) and reflects the difference between the NTP server and the Nonstop System.

SNTP: System time does not require adjustment by MOMI

This message is written to the [MOMI Log](#) and indicates that the required adjustment is below an internal threshold so MOMI does not perform any action to the System time.

SNTP: System time will be adjusted by MOMI forward n.nnnnnn seconds

SNTP: System time will be adjusted by MOMI backward n.nnnnnn seconds

This message is written to the [MOMI Log](#) and [EMS Msgs](#) log prior to performing the adjustment to the System Clock. The operating system will also generate an EMS message when MOMI issues the call to adjust the System Clock.

Error messages

SNTP: Unable to open socket - TCP/IP stack \$tcpip-name

This message is written to the [MOMI Log](#) and [EMS Msgs](#) log and indicates that the TCP/IP process specified in the CONFMOMI keyword [SNTP-TCPIP-NAME](#) was either invalid or not available.

SNTP: Unable to obtain TCP/IP address from <DNS-name> | <IP-address>

This message is written to the [MOMI Log](#) and [EMS Msgs](#) log and indicates that the NTP server specified in the CONFMOMI keyword [SNTP-SERVER-ADDR](#) was invalid or the DNS entry could not be converted to a binary address (like the Nonstop System did not have access to an DNS server).

SNTP: Unable to obtain reliable time from Network Source

This message is written to the [MOMI Log](#) and indicates that MOMI could not process the responses from the NTP server. This either indicates a temporary condition, such as an extremely poor communications link or problems at the NTP server. Occasional messages (particularly if the Internet connection is down) are expected.

SNTP: MOMI failed to adjust System time

This message is written to the [MOMI Log](#) and [EMS Msgs](#) log and indicates that the call to adjust the System Clock failed. MOMI requires the proper security for the MOMI helper program [BWSSG](#) to perform this activity.

CONFMOMI

Overview

The CONFMOMI file is used to configure/define settings and features for the MOMI environment during program startup. This file is read once, shortly after MOMI is started. CONFMOMI is a simple edit format file (code 101).

At a minimum, the [PASSWORD](#) and [TCPIP-INFO-n](#) are defined in this file.

After making any changes to the CONFMOMI file, in order for them to take effect, restart MOMI then check the EMS log. Any errors encountered in the CONFMOMI file will cause an EMS message and possibly an ABEND.

Two sections in this document describe the CONFMOMI, Keywords and Advanced Keywords. Keywords are general in nature and may apply to any configuration and usually have a default value. Advanced Keywords are not generally used except in special situations.

Below are some select categories and the keywords that apply. Not all keywords are needed to enable a particular function.

Alarming

[Overview](#)

[ALARM-DOMAIN-NAME](#)
[ALARM-EMAIL-ADDRESS-FROM](#)
[ALARM-EMAIL-SUBJECT](#)
[ALARM-SMTP-SERVER-ADDR](#)

History

[Overview](#)

[HSTnnDB](#)
[HSTnnDB-DELETE-TIME](#)
[HSTnnDB-HISTORY-DUMP](#)

MOMI Process Priorities

[Overview](#)

[PRIORITY-BATCH](#)
[PRIORITY-DB-HST01DB](#)
[PRIORITY-DB-HSTxxDB-CON](#)
[PRIORITY-DB-HSTxxDB-R](#)
[PRIORITY-EMS](#)
[PRIORITY-EXPAND](#)
[PRIORITY-MOMI](#)

[PRIORITY-PA](#)

SNTP

[Overview](#)

[SNTP-ALLOW-ADJUSTMENT](#)

[SNTP-SERVER-ADDR](#)

[SNTP-TCPIP-NAME](#)

[SNTP-UPDATE-INTERVAL](#)

General structure

The file has the following basic format of a keyword optionally followed by a space and a value:

```
keyword [<value>]
```

The [] symbols indicate an optional field. The < > symbols are not included, but are for documentation purposes.

Strings must be enclosed in quotes or tics if it contains an embedded space. For example:

```
System-description "Production System" == Description of system
```

Comments may be included in the file. Lines that begin with the following identifiers are considered comment lines:

```
!  
==  
comment
```

Generally, data is extracted from lines of the CONFMOMI file when a keyword is recognized. Characters past expected data are ignored. Comments are not supported within valid input lines (i.e. you can't embed a comment between a keyword and an expected value).

The following are some examples how comments are used:

```
comment *** this section documents something ***  
  
=====
```

```
== this is the MOMI configuration file ==  
=====
```

```
Hst01db $data1.momi.hst01db == MOMI history database
```

Keywords in the file are not case sensitive. Only one keyword is allowed per line. Use the sample CONFMOMI file, automatically placed in the same subvolume as MOMI object file during install, as a formatting template.

It is not necessary to use all the available keywords as most have default values. Many keywords are provided for limited or special purposes.

Some keywords, in order to make it unique, append a value, documented as -nn that represents a a number such as 01, 02, 03, etc... . xx is used to signify that the keyword applies in all cases. In other words, where you see nn, such as [HSTnnDB](#), replace it with 01, 02, 03, etc... Where you see xx, such as [PRIORITY-DB-HSTxxDB-CON](#) , use the keyword 'as is' as it applies in all instances.

Keywords

ALARM-DOMAIN-NAME

ALARM-DOMAIN-NAME <domain.name> (Default = none)

Defines the users domain name which MOMI uses in alarm email. Specifying this keyword activates in the SMTP (i.e. outbound email) the HELO protocol. Some SMTP servers require this protocol (perhaps in conjunction with SPAM detection).

The Domain Name specified here is usually the last portion of your email address (i.e. what is after the @ in your email address).

By default, MOMI does not use the HELO protocol.

Example:

```
== SMTP domain name
== My email address is
== fred@fredsco.com so
== my domain name is
== fredsco.com
```

```
ALARM-DOMAIN-NAME fredsco.com
```


ALARM-EMAIL-SUBJECT

ALARM-EMAIL-SUBJECT <"subject-line"> | <""> (Default = none)

Defines the email subject line which MOMI uses in alarm email.

There are three possibilities in using this keyword:

1. If this keyword is not present, the default subject reads: MOMI Alarm
2. Use this keyword and specify a particular subject line.
3. Use this keyword but specify an empty double quote (i.e. ""). This causes the first line of the alarm message to appear as the subject (in other words the "fixed subject" is eliminated). Some email systems, particularly call phones, limit the length of the subject line more so than the body of the email.

Examples:

```
ALARM-EMAIL-SUBJECT "Alarm from MOMI" == my alarm subject

ALARM-EMAIL-SUBJECT "" == no 'fixed' email subject, use
                        == first line of alarm text
```

ALARM-SMTP-SERVER-ADDR

(server version 4.03 or later)

ALARM-SMTP-SERVER-ADDR <DNS-name> | <IP-address> (Default = none)

Defines the name or IP address of the SMTP server which MOMI uses to send EMAIL. This is the server MOMI uses to send outbound email. Note that the Tandem system must have the resolver active if a DNS-Name is used.

As of server version 4.06 or later, a DNS entry that resolves to more than one IP address is interpreted as a primary and backup(s) SMTP servers. MOMI connects to the first IP address returned but if the connect fails, a connect is attempted on the second address and so on. Note that the criteria for using the additional IP addresses in a DNS name is a failure to connect, not a failure of the email.

This keyword is required in order to support Alarm email.

Example:

```
== alarm outbound SMTP
== server which resolves
== into 64.158.128.147
```

```
ALARM-SMTP-SERVER-ADDR smtp.fredsco.com
```

ALARM-SMTP-SERVER-TIMEOUT

(server version 4.05 or later)

ALARM-SMTP-SERVER-TIMEOUT <seconds> (default = 30)

Specifies the maximum amount of time (in seconds) that MOMI waits for a single I/O to complete on the SMTP server. The SMTP server is used for sending Email.

A server that does not respond within the specified time generates an error 40 (Timeout).

Multiple I/Os are required in order to converse with the SMTP server. A server responding slowly may take much longer than the value specified in order to complete an Email transmission. No error is generated as long as each I/O does not take longer than this value.

Example:

```
ALARM-SMTP-SERVER-TIMEOUT 60 == increase I/O timeout to SMTP
```

ALARM-SMTP-TCPIP-NAME

ALARM-SMTP-TCPIP-NAME <tcpip-process-name> (Default = first [TCPIP-INFO-n](#))

Defines the TCP/IP process name that MOMI uses to access the SMTP server which MOMI uses to send EMAIL. SMTP is outbound email.

By default, the first TCP/IP process defined to MOMI for establishing client connections is used.

This keyword would generally be used in the situation where the SMTP server is isolated or not accessible from the same subnet MOMI PC Clients connect.

Example:

```
==  
TCP/IP  
process  
used  
for  
==  
alarm  
output  
SMTP
```

==

email

ALARM-SMTP-TCPIP-NAME \$ZSAM1

ALARM-SUSPEND-DELAY

ALARM-SUSPEND-DELAY <minutes> (default = none)

Specifies the amount of time (in minutes) that MOMI should delay alarm processing when the subsystem is started. During this time, alarms are not checked.

The time specified is a minimum and may vary somewhat as at MOMI startup additional delays are imposed to help minimize system overhead at startup.

Alarm processing may also be suspended once MOMI is running, or this startup value altered, after the server is initialized and the client can connect on the screens a [Alarms / Active](#) and [Settings / Actions](#).

Example:

```
ALARM-SUSPEND-DELAY 30 == delay alarms 30 minutes
```

ALARMS-MAXIMUM-PER-DEFINITION

(server version 4.06 or later)

ALARMS-MAXIMUM-PER-DEFINITION <value16> (Default = 100)

Specifies the maximum number of Alarms that a single definition is allowed to generate.

This value is primarily a protection mechanism to prevent a single definition from generating an excessive number of Alarms. Once the limit is reached, a special 'really red' alarm is displayed and further alarms from the definition are prevented. Update the Alarm definition to 'reset' or clear the 'really red' alarm.

Example:

```
ALARMS-MAXIMUM-PER-DEFINITION 175 == Alarms maximum / DEF 175
```

CNF01DB

CNF01DB <file-name> (Default = subvolume of BWMOMI object)

Specifies the name of the MOMI configuration database. This database is used to store MOMI configuration information.

This keyword is not required. The file is automatically created if not found at the location (or default) specified. MOMI must have create/write/read security access to this file.

The I/O activity on this file is generally very low.

Example:

```
CNF01DB $data1.momi.cnf01db == MOMI configuration database
```


DEFAULT-SECURITY-USER

(server version 4.03 or later)

DEFAULT-SECURITY-USER <user-name> (Default = user that started MOMI)

Specifies the user name, i.e. Guardian or Safeguard, that is the Default Security User for MOMI.

See [Client Access](#) for additional information about the Default Security User.

If MOMI is started directly via a TACL process, this keyword would not normally be required. However, in the situation where a site uses a security manager or other front end process the current security context may not be totally accurate. In this situation this keyword allows the direct defining of the desired User ID for default security purposes.

The default value for this keyword is the User ID provided at logon time from the current security context.

Example:

```
DEFAULT-SECURITY-USER admin.fred == fred is default security user
```

DEFAULT-WORK-LOCATION

(server version 4.11 or later)

DEFAULT-WORK-LOCATION <\$vol.subvol> (Default = default vol/subvol when MOMI was started)

Specifies an alternate location for MOMI to place work files which typically are MEASURE data files.

The default value for this keyword is the default vol/subvol specified when MOMI was started which normally is the subvolume of the BWMOMI program.

The User ID MOMI runs under must have read/write/execute/purge/create access in this subvolume. It is suggested that SAFEGUARD is not used for this subvolume.

Example:

```
DEFAULT-WORK-LOCATION $data1.momiwork == $data1.momiwork for temp files
```

DISABLE-LOGON-COMMANDS

DISABLE-LOGON-COMMANDS TRUE | FALSE (Default = false)

Specifies if MOMI allows commands to function that require LOGON with a User ID and password.

Certain sensitive commands require the user to LOGON with a GUARDIAN and password. This setting can be used to disable LOGON commands and prevent such commands from being executed.

True causes all sensitive commands requiring LOGON to be disabled. False allows the user to enter a User ID and password and if authentication is accepted, execute sensitive commands.

Example:

```
DISABLE-LOGON-COMMANDS TRUE == disable LOGON
```

DISABLE-MEAS-OSSCPU

(server version 4.09 or later)

DISABLE-MEAS-OSSCPU TRUE | FALSE (Default = false)

Determines if MOMI is allowed to report on the OSS CPU entity via MEASURE.

True means this entity is not allowed to operate. False allows this entity to operate.

Certain versions of the operating system may have issues with this MEASURE entity so this keyword provides a disable capability.

Example:

```
DISABLE-MEAS-OSSCPU TRUE == disable OSS CPU
```

DISABLE-MEAS-OSSNS

(server version 4.09 or later)

DISABLE-MEAS-OSSNS TRUE | FALSE (Default = false)

Determines if MOMI is allowed to report on the OSS Name Server (NS) entity via MEASURE.

True means this entity is not allowed to operate. False allows this entity to operate.

Certain versions of the operating system may have issues with this MEASURE entity so this keyword provides a disable capability.

Example:

```
DISABLE-MEAS-OSSNS TRUE == disable OSS Name Server
```

DISABLE-MEAS-SQLPROC

(server version 4.12 or later)

DISABLE-MEAS-SQLPROC TRUE | FALSE (Default = true)

Determines if MOMI is allowed to report on the SQLPROC (SQL Process) entity via MEASURE.

True means this entity is not allowed to operate. False allows this entity to operate.

Certain versions of the operating system may have issues with this MEASURE entity. As a precaution, it is not enabled by default.

Example:

```
DISABLE-MEAS-SQLPROC FALSE == enable SQLPROC
```

DISABLE-MEAS-SQLSTMT

(default changed in server version 4.06 or later)

DISABLE-MEAS-SQLSTMT TRUE | FALSE (Default = true)

Determines if MOMI is allowed to operate an SQL Statement measurement.

True means this entity is not allowed to operate. False allows this entity to operate.

Certain versions of the operating system may have issues with this MEASURE entity. As a precaution, it is not enabled by default.

The MEASURE manual warns that this entity may consume more CPU in its data collection activities. Additionally, some O/S releases may encounter processor halts. Prior to enabling this ability, check your operating system version for any applicable software updates or alerts prior to activating this feature.

Example:

```
DISABLE-MEAS-SQLSTMT FALSE == enable SQL statement
```

ENCRYPTION-ALGORITHM

(server version 5.06 or later)

ENCRYPTION-ALGORITHM 0 .. 5 (Default = 0)

Specifies the type of data encryption used between the MOMI PC Client and the MOMI Server in the TCP/IP data flow.

Three settings are available:

0 - None

1 - FAS

2 - AES

3 - FAS No Port

4 - AES No Port

5 - FAS 2

0 - None, the default, means that normal MOMI traffic is not encrypted. This provides the highest level of performance with the lowest CPU cost.

1 - FAS uses a proprietary algorithm with a 256 bit key to provide a "Fast and Simple" encryption of the data. A fairly high level of performance is obtained a modest CPU cost.

2 - AES uses the Advance Encryption Standard with a 256 bit key and provides an industry standard for data encryption. The performance impact varies depending on the NonStop CPU. The System should be monitored after selecting this option to insure no adverse amount of processor is being consumed.

3 - FAS No Port uses a proprietary algorithm with a 256 bit key to provide a "Fast and Simple" encryption of the data. A fairly high level of performance is obtained a modest CPU cost. This algorithm may be is automatically selected if the TCP/IP dynamic port varies between the MOMI PC Client and MOMI Server.

4 - AES No Port uses the Advance Encryption Standard with a 256 bit key and provides an industry standard for data encryption. The performance impact varies depending on the NonStop CPU. The System should be monitored after selecting this option to insure no adverse amount of processor is being consumed. This algorithm may be is automatically selected if the TCP/IP dynamic port varies between the MOMI PC Client and MOMI Server.

5 - FAS 2 uses a proprietary algorithm with a 256 bit key to provide a "Fast and Simple" encryption of the data. A fairly high level of performance is obtained a modest CPU cost. This implementation is improved over the original 1 - FAS algorithm.

Regardless of the chosen setting, even the default of None, note the following:

- Logon to the MOMI PC Client always (and always has been) encrypted.
- Header and control information in the data flow may not be encrypted.
- Certain message types, usually where only values or statistics are present, may not be encrypted for performance and data control reasons.
- MOMI Clients version 5.06 and earlier can still communicate with a MOMI server even if encryption is enabled. The older clients simply do not have their data encrypted. The requirements for encryption were changed at MOMI Server version 5.06. If encryption is required for all MOMI PC Clients, version 5.07 or later of the client must be installed.

Generally speaking, MOMI takes advantage of the multiple processing running within its environment and pushes encryption processing down-to the level where a request is actually serviced. This push helps to limit the amount of encryption overhead that occurs in the higher priority processes of a MOMI subsystem. See [Process Priority](#) for additional information on how MOMI divides its workload.

Example:

```
ENCIPHERMENT-ALGORITHM 1                               == Encrypt type FAS
```

EVENTCX

(server version 4.10 or later)

EVENTCX <file-name> (Default = \$SYSTEM.SYSTEM.EVENTCX)

Specifies an alternate location for the EMS user defined cause and recommended action file. Usage of the keyword effectively limits the file for the exclusive use of MOMI.

This optional file, defined by HP for the Viewpt subsystem, provides a means of user defined verbiage for an EMS event. If the file is 1) present and 2) if a record is found with the same owner, subsystem and event number for a given EMS event then the content of the record is displayed.

On a system that does not have an EVENTCX file, the FUP obey file FUPEVTCX (located in the subvolume where MOMI is installed) is provided to allow its creation. The following command would be used to create the file:

```
FUP / in FUPEVTCX /
```

See [EMS EVENTCX](#) for additional information.

Example:

```
EVENTCX $data1.momi.eventcx
```

== alternate location of EVENTCX

EXPAND-IO-DELAY

EXPAND-IO-DELAY <.01 seconds> (Default = 5)

Specifies the amount of time, in an implied .01 seconds, of delay in-between individual I/Os used to gather information about Expand objects.

This delay reduces the CPU in gathering information by spreading the I/Os out over a longer period of time.

Example:

EXPAND-IO-DELAY 200 == delay 2 seconds between

EXPAND-NETWORK-NAME

EXPAND-NETWORK-NAME <name> (Default = spaces)

Specifies a unique name on an Expand network that MOMI uses to group systems for reporting purposes.

The name may be up to eight characters.

It is possible that a MOMI Client could be connected to more than one Expand network. For network diagram or other reporting purposes, MOMI needs to know how to group this information. This parameter provides that grouping.

All MOMI servers in this 'network' must use the same name in order for the client to properly establish network node relationships.

Example:

```
EXPAND-NETWORK-NAME USA == network name USA
```

EXPAND-UPDATE-INTERVAL

`EXPAND-UPDATE-INTERVAL <seconds>` (Default = 60)

Specifies the frequency in seconds in which Expand objects are updated. The higher the value, the longer in-between updates.

Lower values result in more frequent updates, but result in higher CPU usage.

The time spent gathering data also lengthens the update frequency.

Example:

```
EXPAND-UPDATE-INTERVAL 30 == update every 30 seconds
```

EXPAND-UPDATE-INTERVAL-ERR

EXPAND-UPDATE-INTERVAL-ERR <seconds> (Default = 30)

Specifies the frequency in seconds in which Expand objects are updated after an error condition has been detected.

By default, MOMI uses a faster update interval during error conditions such as when a line or path down are present. This allows MOMI to report updates more quickly. After the error condition is corrected and detected by MOMI, the normal update interval is used.

See the parameter [EXPAND-UPDATE-INTERVAL](#) for additional considerations.

Example:

```
EXPAND-UPDATE-INTERVAL-ERR 15 == update every 15 seconds
```

FNAME-SPOOLER-n

FNAME-SPOOLER-n <object-file-name-pattern>

(Default = \$SYSTEM.SYSTEM.SPOOL)

Specifies the standard SPOOLER supervisor object file name. MOMI identifies SPOOLER subsystems by object file name.

Usage of this parameter will override the default value. If the default is required along with other entries, it must be included.

Multiple file names may be specified when more than one object file is in use, such as during a version upgrade. A file name pattern may also be specified.

The n in the parameter name provides a means to create unique parameter names. Up to 9 object file names may be specified.

Examples:

```
FNAME-SPOOLER-1 $SYSTEM.SYSTEM.SPOOL  
FNAME-SPOOLER-2 $*.*.SPOOL
```

FNAME-SPOOLER-PLUS-n

FNAME-SPOOLER-PLUS-n <object-file-name-pattern> (Default = none)

Specifies the SPOOLER 'plus' supervisor object file name. MOMI identifies SPOOLER subsystems by object file name.

Use of this parameter is required to identify a SPOOLER 'plus' subsystem. SPOOLER 'plus' is an optional product that requires certain changes in the access method versus the standard SPOOLER.

Multiple file names may be specified when more than one object file is in use, such as during a version upgrade. A file name pattern may also be specified.

The n in the parameter name provides a means to create unique parameter names. Up to 9 object file names may be specified.

Examples:

```
FNAME-SPOOLER-PLUS-1 $SYSTEM.SPLUS.SPOOL
```

```
FNAME-SPOOLER-PLUS-2 $*.*.SPOOL
```


HSTnnDB

HST01DB <file-name> (optional but first)
HST02DB <file-name> (optional but second)
HST03DB <file-name> (optional but third)
HST04DB <file-name> (optional but fourth)

Specifies the name of the MOMI history database(s). These database are used to maintain various history statistics.

The file is automatically created if not found at the location specified. MOMI must have create/write/read security access to the files and the subvolume location.

The HST01DB file is used by MOMI to dump the initial history statistics. If history is enabled, the HST01DB file must be specified first, followed optionally by HST02DB as second and so on.

It is recommended that the history file NOT be placed on \$SYSTEM nor any other extremely active disk volume.

Examples:

```
HST01DB $data1.momi.hst01db  
HST02DB $data1.momi.hst02db  
HST03DB $data1.momi.hst03db  
HST04DB $data1.momi.hst04db
```

HSTnnDB-DELETE-TIME

HST01DB-DELETE-TIME <days> (default = 14)
HST02DB-DELETE-TIME <days> (default = 28)
HST03DB-DELETE-TIME <days> (default = 60)
HST04DB-DELETE-TIME <days> (default = 800)

Specifies how long (in days) data is retained before it is deleted from the history database. Another way to think about it is this value determines how far back history is allowed to accumulate.

If a history file reaches capacity, either maximum number extents or no more disk space is available, MOMI automatically deletes the oldest data in the file regardless of this setting. MOMI does not generate any out of disk space or file full messages.

It is not required to specify this keyword. However, for best overall operation if this the value is specified it should be short enough to keep the file from filling to 100% (i.e. file is not completely full).

If the value of zero is specified, 1) data is not deleted from the file, however 2) data is no longer written to the file. This setting is generally only used internally to examine a saved history file.

Examples:

```
hst01db-delete-time 7           == keep HST01DB history 7 days  
hst02db-delete-time 30        == keep HST02DB history 30 days
```

HSTnnDB-HISTORY-DUMP

HST01DB-HISTORY-DUMP <seconds> (default = 120) 2 minutes
HST02DB-HISTORY-DUMP <seconds> (default = 600) 10 minutes
HST03DB-HISTORY-DUMP <seconds> (default = 3600) 1 hour
HST04DB-HISTORY-DUMP <seconds> (default = 86400) 1 day

Specifies the amount of time (in seconds) that history data is dumped to disk. This value determines the 'window' of time that the history statistics represent.

Depending on the system capacity, the default values are rather conservative.

A value of zero turns history dumping off.

The value entered here will effectively still be a multiple of the raw data collection time, which defaults to 10 seconds.

Examples:

```
hst01db-history-dump 30 == dump HST01 every 30 seconds
hst02db-history-dump 120 == dump HST02 every 2 minutes
```

IIT-NORMAL-INTERVAL-INCREMENT

IIT-NORMAL-INTERVAL-INCREMENT <seconds> (Default = 10, minimum 10)

Specifies the number of seconds that a normal Measure interval is to increase. An attempt to set the value below the minimum is forced to the minimum.

Measurements started on demand run for an initial period of time, stop, report data, restart the measurement but increase the time interval by an increment value. The computed time interval is capped at a maximum amount. This keyword determines the amount a measurement interval is increased.

A normal Measure are the time periods associated with measurements such as Disk Entity, DiskFile Entity and File Entity. It is not associated with time periods for details such as Process Detail.

Example:

```
IIT-NORMAL-INTERVAL-INCREMENT 20 == increase by 20 seconds
```

IIT-NORMAL-MAXIMUM

IIT-NORMAL-MAXIMUM <seconds> (Default = 240, minimum 30)

Specifies the maximum number of seconds of a normal measurement interval. An attempt to set the value below the minimum is forced to the minimum.

Measurements started on demand run for an initial period of time, stop, report data, restart the measurement but increase the time interval by an increment value. The computed time interval is capped at a maximum amount. This keyword determines the maximum amount of a measurement interval.

A normal Measure are the time periods associated with measurements such as Disk Entity, DiskFile Entity and File Entity. It is not associated with time periods for details such as Process Detail.

Example:

```
IIT-NORMAL-MAXIMUM 100
```

```
== increase stops at 100 seconds
```

IIT-NORMAL-STARTING

IIT-NORMAL-STARTING <seconds>

(Default = 30, minimum 10)

Specifies the initial number of seconds for a normal measurement interval. An attempt to set the value below the minimum is forced to the minimum.

Measurements started on demand run for an initial period of time, stop, report data, restart the measurement but increase the time interval by an increment value. The computed time interval is capped at a maximum amount. This keyword determines the first measurement interval.

A normal Measure are the time periods associated with measurements such as Disk Entity, DiskFile Entity and File Entity. It is not associated with time periods for details such as Process Detail.

Example:

```
IIT-NORMAL-STARTING 20
```

```
== first interval is 20 seconds
```

INTERVAL

INTERVAL <seconds> (default = 10)

Specifies the amount of time (in seconds) in-between each gathering of the main body of information collected by MOMI. This main body of information is primarily the status of each CPU, process, OSS CPU and OSS Name Server on the system.

The value has a range of 5 to 180 seconds.

Internally, MOMI will generally round this value. The accepted values are 5, 10, 20, etc...

The default value is recommended.

Example:

```
INTERVAL 20
```

```
== stats every 20 seconds
```

IO-STUCK-EXCLUDE-n

(server version 4.06 or later)

IO-STUCK-EXCLUDE-n <object-file-name-pattern> (Default = none)

Specifies object file names to exclude from the determination if a process is 'stuck' in an I/O.

Processes with object files located in \$SYSTEM.SYSTEM and \$SYSTEM.SYSnn are excluded automatically.

A process which remains in a wait state of %004, and is not consuming any processor time (i.e. no CPU busy time), may possibly be caught in some sort of I/O which is not completing. This may or may not indicate a problem.

Multiple file names may be specified when more than one object file is in use, such as during a version upgrade. A file name pattern may also be specified.

The n in the parameter name provides a means to create unique parameter names. Up to 9 object file names may be specified.

Examples:

```
IO-STUCK-EXCLUDE-1 $DATA1.DEVEL.FREDOBJ == exclude fredobj
```

```
IO-STUCK-EXCLUDE-2 $*.*.PRODCATB == exclude prodcatb
```

IO-STUCK-INTERVAL

IO-STUCK-INTERVAL <seconds> (default = 30)

Specifies the amount of time (in seconds) that a process must be in a wait state of %004 before it is declared as possibly 'stuck' in an I/O.

The value has a lower range of twice the [INTERVAL](#), which defaults to 10 seconds.

A process which remains in a wait state of %004, and is not consuming any processor time (i.e. no CPU busy time), may possibly be caught in some sort of I/O which is not completing. This may or may not indicate a problem.

See [IO-STUCK-EXCLUDE-n](#) for additional information.

Example:

```
IO-STUCK-INTERVAL 60 == define 'stuck' as 60 seconds
```


LOG01DB

LOG01DB <file-name> (Default = subvolume of BWMOMI object)

Specifies the name of the MOMI log file. This file stores events generated by MOMI.

This keyword is not required. The file is automatically created if not found at the location (or default) specified. MOMI must have create/write/read security access to this file.

The I/O activity on this file can be high if logging is enabled on high activity alerts.

Data is retained until the file is full. When a full file is detected, the oldest data is deleted to make room for a new record. To increase the maximum file storage, increase the maximum number of extents for the file.

Example:

```
LOG01DB $data1.momi.log01db == MOMI log file location
```

PASSWORD

PASSWORD <string> (REQUIRED for full operation)

The keyword specifies a password string used to control the operation of MOMI. The password either allows MOMI to operate on a specific NonStop System, or on any NonStop system for a limited period of time. Optional features and other program capabilities can also be controlled by the password.

Password should be entered EXACTLY as supplied. The entire password is on one single line. There is a single space after the keyword PASSWORD and no quotes around <string>.

Once the Server is started and the Client connected, the status of the password may be viewed on the [Diagnositics](#) page within the PC Client.

Example:

```
== MOMI password  
PASSWORD 2932938045092384...420394852093845848
```

PATHWAY-TCP

PATHWAY-TCP <pathtcp2-object-file-name> (Default = none)

Defines an additional object file location for a Pathway TCP.

By default, MOMI only considers \$SYSTEM.SYSTEM.PATHTCP2 as the only object file for Pathway TCP process.

In order for MOMI to identify a Pathway TCP process, the object file name is examined. This keyword supports the situation where an additional or perhaps customer modified copy of the original Pathway TCP object is maintained. MOMI considers the standard location and this location, if specified, as Pathway TCP object files.

Example:

```
== Location of our copy  
== of PATHTCP2
```

```
PATHWAY-TCP $data1.alttcp.pathtcp2
```

PRIORITY-ALARM-EMS

(server version 4.06 or later)

PRIORITY-ALARM-EMS <value-1-199> (Default = 92)

Specifies the process priority of a MOMI server for Alarm operations relating to EMS messages.

This server generally reads the EMS log and scans for events defined to trigger and clear Alarms.

Example:

```
PRIORITY-ALARM-EMS 101 == Alarm EMS priority at 101
```

PRIORITY-ALARM-FILE

(server version 4.06 or later)

PRIORITY-ALARM-FILE <value-1-199> (Default = 93)

Specifies the process priority of a MOMI server for Alarm operations relating to Disk and File.

This server generally issues commands to obtain disk volume and file information to trigger and clear defined Alarms.

Example:

```
PRIORITY-ALARM-FILE 102 == Alarm File priority at 102
```

PRIORITY-BATCH

PRIORITY-BATCH <value-1-199>

(Default = 90)

Specifies the process priority of a MOMI server for 'batch' type operations within MOMI. Batch operations are operations where a server MOMI is started for demand type of operations such as measuring files, processes, ProcessH, etc...

Example:

PRIORITY-BATCH 89

== batch at priority 89

PRIORITY-DB-HST01DB

PRIORITY-DB-HST01DB <value-1-199> (Default = 95)

Specifies the process priority of a MOMI server for database operations relating to the HST01DB file. This file is used as the initial location for storing performance information.

Specifically, this keyword controls the priority for writing new data to the file and reading the most current data. It is suggested that the priority specified here be the highest of the 'MOMI' servers to insure data is written timely to disk.

Example:

```
PRIORITY-DB-HST01DB 94 == hst01db priority at 94
```

PRIORITY-DB-HSTxxDB-CON

PRIORITY-DB-HSTxxDB-CON <value-1-199> (Default = 80)

Specifies the process priority of a MOMI server for database operations relating to the data consolidation of the HSTxxDB files. These files are used for storing performance information.

Specifically, this keyword controls the priority for consolidating history from one file into another and deleting old data. This is an ongoing but fairly consistent operation and should occur at a fairly low priority.

Example:

```
PRIORITY-DB-HSTXXDB-CON 75 == history consolidation at 75
```


PRIORITY-DB-HSTxxDB-DEL

PRIORITY-DB-HSTxxDB-DEL <value-1-199> (Default = 80)

NOTE: This parameter is not currently used, but is kept for compatibility. See [PRIORITY-DB-HSTxxDB-CON](#).

Specifies the process priority of a MOMI server for database operations relating to the HSTxxDB files. These files are used for storing performance information.

Specifically, this keyword controls the priority for deleting old data or cleanup of the files and as such, this is an ongoing but fairly consistent operation and should occur at a fairly low priority.

PRIORITY-DB-HSTxxDB-R

PRIORITY-DB-HSTxxDB-R <value-1-199> (Default = 85)

Specifies the process priority of a MOMI server for database operations relating to the HSTxxDB files. These files are used for storing performance information.

Specifically, this keyword controls the priority for initial, or possibly long running, read operations against the files. It is suggested that this priority be rather low.

Example:

```
PRIORITY-DB-HSTXXDB-R 87
```

```
== history read at 87
```

PRIORITY-DB-LOG01DB

(server version 4.06 or later)

PRIORITY-DB-LOG01DB <value-1-199> (Default = 94)

Specifies the process priority of a MOMI server for database operations (write and delete of old data) relating to the LOG01DB file.

This file stores events generated by MOMI.

Example:

```
PRIORITY-DB-LOG01DB 100 == log01db priority at 100
```

PRIORITY-EMS

PRIORITY-EMS <value-1-199> (Default = 91)

Specifies the process priority of a MOMI server for EMS message retrieval within MOMI. EMS distributors and a MOMI server are started for obtaining this data.

Example:

```
PRIORITY-EMS 50 == EMS at priority 50
```

PRIORITY-EXPAND

PRIORITY-EXPAND <value-1-199>

(Default = Main MOMI - 3)

Specifies the process priority for the Expand Server/Collector. This process collects Expand information and services Client requests.

The default value is recommended.

Example:

```
PRIORITY-EXPAND 167
```

```
== expand at priority 167
```

PRIORITY-MOMI

PRIORITY-MOMI <value-1-199> (Default = as started)

Specifies the priority for \$MOMI.

While the process priority of \$MOMI is set when the process is started, sometimes \$CMON can alter or prevent the priority given at run-time. This keyword causes the program to alter its own priority directly via a GUARDIAN procedure.

This keyword will override the value specified when the program was started.

Example:

```
PRIORITY-MOMI 168 == MOMI at priority 168
```

PRIORITY-PA

PRIORITY-PA <value-1-199> (Default = Main MOMI - 2)

Specifies the process priority for Process Actions.

Process Actions are the following general activities:

- logon
- process stop / abend / altpri / etc...
- BWSSG

This grouping of Process Actions helps to insure that these commands are processed in a timely manner and are not hindered by low-priority intense batch type of activity in a CPU.

Example:

PRIORITY-PA 168 == Process Actions at priority 168

SELECTION-DEFAULT-VHS

(server version 4.11 or later)

SELECTION-DEFAULT-VHS <\$vol.subvol> (Default = none)

Specifies the default location the file selector displays when selecting a VHS log file to display. VHS, or the Virtual Hometerm Subsystem, provides a stable location for processes to log message usually related to a problem or status update.

Usage of this parameter may aid users in selecting the proper log file as the File Locator on the screen [VHS Log](#) as it will automatically drill-down to the location specified.

Examples:

```
SELECTION-DEFAULT-VHS $DATA1.VHSLOG
```


SNTP-ALLOW-ADJUSTMENT

(server version 4.16 or later)

SNTP-ALLOW-ADJUSTMENT (Default = no adjustment)

Allows MOMI to adjust the time on the Nonstop System.

This keyword is provided as an 'extra' step to insure that it is desired for MOMI to make adjustments to the System time.

MOMI adjusts the System time, it does not set the time. Adjusting the System time means that MOMI compares the current time at the Network time source to the Nonstop System and based on that result "nudges" the System clock either forward or backward. "Nudges" is effectively slightly speeding up or slowing down the system clock, but not forcing it to a specific time. This action may be performed on an active system without concern for setting the clock backward, which certain systems such as TMF could not tolerate.

By default, MOMI will not alter the System time.

Example:

```
SNTP-ALLOW-ADJUSTMENT
```

```
== Allow MOMI to adjust  
== the system time
```

SNTP-SERVER-ADDR

(server version 4.16 or later)

SNTP-SERVER-ADDR <DNS-name> | <IP-address> (Default = none)

Defines the name or IP address of the NTP server. The NTP server provides a network time source and MOMI uses this to determine if the System time should be adjusted. Note that the Tandem system must have the resolver active if a DNS-Name is used.

MOMI uses the SNTP protocol to access the network time source.

If a DNS entry resolves into more than one IP address, MOMI connects to the first IP address returned but if communication fails over a certain threshold, a connect is attempted on the second address and so on.

This keyword is required in order to have MOMI adjust the System time.

Example:

```
SNTP-SERVER-ADDR us.pool.ntp.org == NTP server
```

SNTP-STARTUP-CHECK

(server version 5.05 or later)

SNTP-STARTUP-CHECK TRUE | FALSE (Default = FALSE)

Allows MOMI during the initial query of the SNTP server to make any needed time adjustments if an adjustment is required and adjustments are allowed.

If SNTP processing is enabled, a query is made to the SNTP server shortly after MOMI is started to confirm that the configured SNTP server is accessible. This initial query is made regardless of the configured time interval. By default, the initial query does not make adjustments to the system time (i.e. it operates in preview mode). If this keyword and the keyword [SNTP-ALLOW-ADJUSTMENT](#) are both enabled, the initial access to the SNTP server may perform a system time adjustment.

By default, no adjustments are made to the system time by the initial SNTP query.

The purpose of this keyword is to allow MOMI to make any needed time adjustments shortly after startup. This is particularly handy if SNTP processing is enabled for the first time and a time adjustment is desired to confirm proper configuration and operation. This keyword should probably be removed after an initial use.

Example:

== Allow MOMI to adjust
== the system time
== during the initial
== check

SNTP-STARTUP-CHECK TRUE

SNTP-TCPIP-NAME

(server version 4.16 or later)

SNTP-TCPIP-NAME <tcpip-process-name> (Default = first [TCPIP-INFO-n](#))

Defines the TCP/IP process name that MOMI uses to access the NTP server. The NTP server provides a network time source and MOMI uses this to determine if the System time should be adjusted.

By default, the first TCP/IP process defined to MOMI for establishing client connections is used.

This keyword would generally be used in the situation where the NTP server is isolated or not accessible from the same subnet MOMI PC Clients connect.

Example:

```
SNTP-TCPIP-NAME $ZSAM1
```

```
== specify TCP/IP stack name  
== (not always needed)
```

SNTP-UPDATE-INTERVAL

(server version 4.16 or later)

SNTP-UPDATE-INTERVAL <hours> (Default = 1)

Specifies the frequency that MOMI accesses the NTP server to obtain a network time. The NTP server provides a network time source and MOMI uses this to determine if the System time should be adjusted.

The frequency of access has a minimum value of 1 hour and a maximum value of 744 hours (which is approximately 1 month). A value less than the minimum is set to the minimum. A value over the maximum is set to the maximum.

The time when MOMI begins the time update process is approximately an LCT multiple of the value specified here. What this means is if a value of 24 is specified, i.e. update every 24 hours, MOMI begins its processing of updating the system time at 12:00 am. If the value of 2 is specified, time update processing occurs at 12:00 am, 2:00 am, 4:00 am and so on. The time update processing may take several minutes so any adjustment will not be on the multiple, but usually the same number of few minutes after the multiple.

Example:

```
SNTP-UPDATE-INTERVAL 48 == check NTP server every 2 days
```

SPI-IO-TIMEOUT

(server version 4.06 or later)

SPI-IO-TIMEOUT <seconds> (default = 5)

Specifies the maximum amount of time (in seconds) that MOMI waits for a single SPI I/O to complete. SPI is a programmatic interface used to obtain information about various subsystems such as Expand, TMF, Tape, etc... .

A server that does not respond within the specified time generates an error 40 (Timeout).

It is not recommended to increase the value greatly as this could slow down other processing within MOMI.

Example:

```
SPI-IO-TIMEOUT 12 == set timeout to 12 seconds
```

SPOOLER-IO-DELAY

(server version 4.05 or later)

SPOOLER-IO-DELAY <.01 seconds> (Default = 5)

Specifies the amount of time, in an implied .01 seconds, of delay in-between individual I/Os used to gather information about Spooler objects

This delay reduces the CPU in gathering information by spreading the I/Os out over a longer period of time.

Example:

```
SPOOLER-IO-DELAY 200 == delay 2 seconds between
```

SPOOLER-UPDATE-INTERNAL

(server version 4.05 or later)

SPOOLER-UPDATE-INTERVAL <seconds> (Default = 60)

Specifies the frequency in seconds in which Spooler objects are updated. The higher the value, the longer in-between updates.

Lower values result in more frequent updates, but result in higher CPU usage.

The time spent gathering data also lengthens the update frequency.

Example:

```
SPOOLER-UPDATE-INTERVAL 30 == update every 30 seconds
```


SPOOLER-UPDATE-INTERVAL-ERR

(server version 4.05 or later)

SPOOLER-UPDATE-INTERVAL-ERR <seconds> (Default = 30)

Specifies the frequency in seconds in which Spooler objects are updated after an error condition has been detected.

By default, MOMI uses a faster update interval during error conditions such as when a line or path down are present. This allows MOMI to report updates more quickly. After the error condition is corrected and detected by MOMI, the normal update interval is used.

See the parameter [SPOOLER-UPDATE-INTERNAL](#) for additional considerations.

Example:

```
SPOOLER-UPDATE-INTERVAL-ERR 15 == update every 15 seconds
```

SYSTEM-DESCRIPTION

SYSTEM-DESCRIPTION <string> (Default = none)

An informational field that specifies the nature or characteristics of the NonStop System on which MOMI is running.

The <string> is limited in length to the first 30 bytes.

The string may be quoted to include an embedded space.

Examples:

```
SYSTEM-DESCRIPTION Production
SYSTEM-DESCRIPTION 'Communication Front End'
SYSTEM-DESCRIPTION "Production 1"
```

TCPIP-INFO-n

TCPIP-INFO-n <tcpip-process-name> <port> (At least 1 is REQUIRED)

Specifies the TCP/IP process name and TCP/IP port to place a 'listen' on. Up to 20 specifications may be made.

The 'n' is a value portion of the keyword is present to make the parameter name unique.

Examples:

```
TCPIP-INFO-1 $ZSAM1 2000      == TCP/IP $ZSAM1 port 2000
TCPIP-INFO-2 $ZTC1 3000      == TCP/IP $ZTC1 port 3000
TCPIP-INFO-3 $ZTCP0 2000     == TCP/IP $ZTCP0 port 2000
```

TCPIP-WRITE-BYTES-SEC

TCPIP-WRITE-BYTES-SEC <value64>

(Default = varies)

Specifies the maximum number of TCP/IP bytes that may be written per second from the MOMI server to all PC Clients. When data traffic exceeds the specified limit, I/Os are limited (i.e. throttled) to honor the limit.

The default value is determined based on the processor type which \$MOMI is running and may vary in MOMI releases.

This parameter has the indirect effect of limiting the amount of CPU usage consumed by \$MOMI in response to TCP/IP traffic. TCP/IP v6 and Parallel TCP/IP effectively perform the protocol overhead in the sending process. This causes an apparent increase in CPU cycles during high volumes of TCP/IP traffic. However, if you compare the overall cost of the previous method, an inter-process message to a TCP/IP stack process, TCP/IP v6 and Parallel TCP/IP is a more cost effective method.

A value of zero disables limitation.

The following table lists the default value:

| <u>Processor</u> | <u>Default</u> |
|-----------------------------|----------------|
| pre-S-Series | 300,000 |
| S7000, S70000, S7400, S7600 | 300,000 |
| S72000 | 500,000 |
| S7800[B] | 500,000 |
| S74000, S76000 | 600,000 |
| S86000, S86100 | 800,000 |
| S88000 | 900,000 |
| Later S-Series processors | 1,400,000 |
| NS5000T | 800,000 |
| NS1000, NS1200, NS3000AC | 900,000 |
| NS14000, NS14200 | 2,000,000 |
| NS16000, NS16200 | 3,000,000 |
| NB50000C | 4,000,000 |
| Later NS-Series processors | 1,000,000 |

Examples:

TCPIP-WRITE-BYTES-SEC 0

== remove limitation

TCPIP-WRITE-BYTES-SEC 350000

== limit to 350,000 bytes/sec

Advanced Keywords

ALARM-EMS-EVENT-NBR

(server version 5.00 or later)

ALARM-EMS-EVENT-NBR <value> (Default = zero)

Defines the EMS event number for messages logged by MOMI that are a result of an alarm.

Value has a recommended range of 20000 through 32767.

MOMI does generally create EMS messages in a 'formatted' manner, but logs its information as text with an event number of zero. However, to allow for any possible future enhancement in this area the recommended range of values should be followed.

Example:

```
== Set event number  
== for EMS alarm messages
```

```
ALARM-EMS-EVENT-NBR 22000
```

CLIENT-ACC

CLIENT-ACC TRUE | FALSE (Default = TRUE)

Determines if PC Client acceleration is activated. This optimization allows the server to construct multiple responses to a Client a request (i.e. block up responses into fewer transmissions).

By default, this optimization is turned on. The keyword is provided primarily for internal testing.

Example:

```
Client-acc false == acceleration off
```


COLLECT-ALL-PROCESSES

(server version 4.17 or later)

COLLECT-ALL-PROCESSES TRUE | FALSE (Default = FALSE)

Directs MOMI to collect all processes on the system regardless of its creation time.

By default, processes created in the future are not collected.

MOMI, in order to prevent possible process collection hangs, in its normal data collection [INTERVAL](#) does not monitor processes with a process creation time greater than the start of a particular collection interval. In the situation where numerous processes are continually being created (i.e. 100's or 1000's), trying to pick up newly created processes could hang a MOMI CPU collector. The default operation of MOMI, in order to work-around this possible situation, is to not pick-up processes created in the "future".

Systems used for test purposes that may adjust or play with (rather dramatically) the system time can use the keyword to alter the normal data collection operation. A side effect of using this keyword, is that HUNG or STOP may be seen on the [Main Overview](#) screen for CPUs if the situations described above occur.

Example:

```
COLLECT-ALL-PROCESSES true
```

```
== collect all processes  
== regardless of process  
== creation time
```

CPU-COLLECTOR-NOREPORT-TIMEOUT

(server version 4.06 or later)

CPU-COLLECTOR-NOREPORT-TIMEOUT <seconds> (default = (3 * [INTERVAL](#)))

Specifies the maximum amount of time (in seconds) that MOMI waits for a CPU collector process to report.

A CPU collector process that does not report in a timely manner is stopped and its data cleared. The client initially reports the CPU as HUNG (or STOP). The collector is automatically restarted about 1 minute later.

It is not recommended to increase this value as data reported by the client for that affected processor may be old and incorrect. However, certain system configurations may not be able to provide MOMI the CPU cycles needed to operate timely and this keyword allows for a greater timeout value.

The minimum value allowed is the default. Any value less than the default is set to the default. No maximum is imposed. .

This value is not 'exact' as the internal processing for to determine if a CPU collector is not reporting timely is only performed about once a minute. In other words, the effective value specified here will usually be somewhat higher.

Example:

```
CPU-COLLECTOR-NOREPORT-TIMEOUT 30 == set timeout to 30 seconds
```

CPU-LIMIT

CPU-LIMIT <percent-limit> (Default = no limit)

Percentage of CPU busy each MOMI process is allowed to consume.

This parameter sets a default. Usage of any other CPU-LIMIT-* parameter will override this value for that particular parameter. In other words, this parameter is a 'catch all', or starting point, for all MOMI programs including the main \$MOMI. However, all other CPU-limiting values take precedence (including their default values).

By default, no limitation is imposed. It is generally not advisable or required to use this parameter.

Example:

```
CPU-LIMIT 22 == limit CPU usage to 22%
```

CPU-LIMIT-ALARM-DETECT

CPU-LIMIT-ALARM-DETECT <percent-limit> (Default = 10)

Specifies the percentage of CPU busy a MOMI server is allowed to consume in alarm detection activity.

The value may range from 0 to 99. A value of 0 disables CPU limit.

Alarm detection is the processing in stand alarm servers associated determining if a threshold has been reached. For example, this could be scanning through disk files and obtaining attributes, requesting information from the SPOOLER, performing PING, etc...

Example:

```
CPU-LIMIT-ALARM-DETECT 15 == limit CPU usage to 15%
```

CPU-LIMIT-EMS

CPU-LIMIT-EMS <percent-limit> (Default = none)

Specifies the percentage of CPU busy a MOMI server is allowed to consume in reading from EMS.

The value may range from 0 to 99. A value of 0 disables CPU limit.

Reading from EMS is in response to a MOMI PC Client request to obtain information from either \$0, other collectors or an EMS log file. By limiting or slowing down the MOMI process requesting from EMSDIST, indirectly the CPU usage consumed by both may be reduced.

Example:

```
CPU-LIMIT-EMS 16 == limit CPU usage to 16%
```

CPU-LIMIT-HSTxxDB-CONSOL

CPU-LIMIT-HSTxxDB-CONSOL <percent-limit> (Default = 4)

Specifies the percentage of CPU busy the MOMI history consolidate and delete processing is allowed to consume.

The value may range from 0 to 99. A value of 0 disables CPU limit.

History consolidation is the process of moving data from one history file to another. This process takes data from many history periods and adds them together to a more consolidated or 'less detailed' view. Delete processing is removing old data from the history file after consolidation has completed.

Example:

```
CPU-LIMIT-HSTXXDB-CONSOL 8 == limit CPU usage to 8%
```

D47-OR-LATER

D47-OR-LATER TRUE | FALSE (Default = automatic)

This parameter is intended for internal use only.

Specifies if MOMI uses certain procedural values to obtain information available in the D47 or later version of the operating system.

'True' instructs MOMI that D47 features are available. 'False' instructs MOMI that D47 features are not available.

By default, MOMI will automatically determine the proper setting for this parameter. Fields not available are set to zero or spaces (as appropriate). Usage of this parameter will override the automatic determination.

D48-OR-LATER

D48-OR-LATER TRUE | FALSE (Default = automatic)

This parameter is intended for internal use only.

Specifies if MOMI uses certain procedural values to obtain information available in the D48 or later version of the operating system.

'True' instructs MOMI that D48 features are available. 'False' instructs MOMI that D48 features are not available.

By default, MOMI will automatically determine the proper setting for this parameter. Fields not available are set to zero or spaces (as appropriate). Usage of this parameter will override the automatic determination.

DEBUG1

DEBUG1

(Optional)

This parameter is intended for internal use only.

If present, activates special debug code used to determine if server is sending invalid data to Client. Will cause MOMI to ABEND if the condition is found.

DEBUG2

DEBUG2 (Optional)

This parameter is intended for internal use only.

If present, activates special debug code used to determine if MOMI is trying to terminate due to an unexpected error condition. Will cause MOMI to ABEND if the condition is found.

DEBUG3

DEBUG3 (Optional)

This parameter is intended for internal use only.

If present, activates special debug code used to confirm if data compression is working correctly. Data is compressed, decompressed and compared to the original. Will cause MOMI to ABEND if a mismatch is found.

DISABLE-LIST-LOCKS

(server version 5.03 or later)

DISABLE-LIST-LOCKS TRUE | FALSE (Default = false)

Determines if MOMI is allowed to obtain information about the presence and status of locks on files.

True means this entity is not allowed to operate. False allows this entity to operate, which is the default.

The keyword is not normally used but is provided in the event that the listing of locks is not recommended for the current release of the operating system.

Example:

```
DISABLE-LIST-LOCKS TRUE == prevent list locks
```

DISABLE-MEAS-COUNTER-WRITE

(server version 5.05 or later)

DISABLE-MEAS-COUNTER-WRITE TRUE | FALSE (Default = varies)

Determines if MOMI disables writing of MEASURE counters to any data file where counters are accessed online (i.e. via LISTACTIVE).

True means MEASURE counters are not written to disk. False means MEASURE counters are written to disk.

The default value for this keyword varies based on the operating system release. See the table below:

| Operating System release | Default value |
|--------------------------|---------------|
| G Series | False |
| H Series prior to H06.14 | False |
| H Series H06.14 or later | True |
| any other release | False |

A measurement is started shortly after MOMI startup that collects information for CPU's, Processes, TMF, Expand, etc... This measurement is left running the entire time MOMI operates. The measure has no collection interval as data is retrieved via the LISTACTIVE function. However, MEASURE will write records such as process start / stop to the file until it fills. At that time each processor in the CPU will log an error 45 to EMS. This error, however, does not impact MOMI's ability to access the data via the LISTACTIVE function. It simply means that data is no longer written to the MEASURE data file. This feature of MEASURE to disable recording of counter records to disk effectively prevents the error 45 situation.

Setting this value to True, when MEASURE support is not available, will cause the initial measurement started by MOMI to fail. This would be seen in the MOMI PC Client on the screen [Overview](#) as the error indication MEAS.

Example:

```
DISABLE-MEAS-COUNTER-WRITE FALSE == enable SQL statement
```

DISABLE-TMF-REPORT

(server version 4.20 or later)

DISABLE-TMF-REPORT TRUE | FALSE (Default = false)

Determines if MOMI is allowed to query TMF to obtain information such as the overall transactions per second and the state of TMF.

True means this entity is not allowed to operate. False allows this entity to operate.

The keyword would be used if TMF is not present or not normally in operation. By default, MOMI will query TMF on a regular basis to obtain status and would log errors in the event of a failure to communicate with TMF.

Example:

```
DISABLE-TMF-REPORT TRUE == prevent automatic TMF report-  
ing
```

DISK-COMPRESSION-TYPE

(server version 5.00 or later)

DISK-COMPRESSION-TYPE 0 | 2 | 3 (Default = 2)

Specifies or disables the compression algorithm used for storing data on disk, primarily history.

The following selections are available:

0 - None

2 - Type 2 (Default)

3 - Type 3

None is available in MOMI Server version 5.00 or later to activate and process. This selection must not be chosen if there is any possibility that MOMI data may be accessed with an older version of the server.

Type 2 is the default and is present in MOMI Server versions 3.xx, 4.xx and 5.xx. No keyword was previously provided to access this capability. This is the default and provides the highest levels of data compatibility.

Type 3 is available in MOMI server version 5.00 or later to activate and process. This type compresses longer strings of repeat data than Type 2 and generally provides a higher level of compression. This selection must not be chosen if there is any possibility that MOMI data may be accessed with an older version of the server.

A newer version of the MOMI server can read data created from an older server version. No data conversion is required. However, an older version of the MOMI server cannot read data created by a newer server version if the compression type is not known.

The default is highly recommended at this time.

Example:

```
DISK-COMPRESSION-TYPE 3 == use new disk compression
```

G0612-OR-LATER

G0612-OR-LATER TRUE | FALSE

(Default = automatic)

This parameter is intended for internal use only.

Specifies if MOMI uses certain procedural values to obtain information available in the G06.12 or later version of the operating system.

'True' instructs MOMI that G06.12 features are available. 'False' instructs MOMI that G06.12 features are not available.

By default, MOMI will automatically determine the proper setting for this parameter. Fields not available are set to zero or spaces (as appropriate). Usage of this parameter will override the automatic determination.

G0626-OR-LATER

G0626-OR-LATER TRUE | FALSE

(Default = automatic)

This parameter is intended for internal use only.

Specifies if MOMI uses certain procedural values to obtain information available in the G06.26 or later version of the operating system.

'True' instructs MOMI that G06.26 features are available. 'False' instructs MOMI that G06.26 features are not available.

By default, MOMI will automatically determine the proper setting for this parameter. Fields not available are set to zero or spaces (as appropriate). Usage of this parameter will override the automatic determination.

H0604-OR-LATER

(server version 4.07 or later)

H0604-OR-LATER TRUE | FALSE (Default = automatic)

This parameter is intended for internal use only.

Specifies if MOMI uses certain procedural values to obtain information available in the H06.04 or later version of the operating system.

'True' instructs MOMI that H06.04 features are available. 'False' instructs MOMI that H06.04 features are not available.

By default, MOMI will automatically determine the proper setting for this parameter. Fields not available are set to zero or spaces (as appropriate). Usage of this parameter will override the automatic determination.

H0614-OR-LATER

(server version 5.05 or later)

H0614-OR-LATER TRUE | FALSE (Default = automatic)

This parameter is intended for internal use only.

Specifies if MOMI uses certain procedural values to obtain information available in the H06.14 or later version of the operating system.

'True' instructs MOMI that H06.14 features are available. 'False' instructs MOMI that H06.14 features are not available.

By default, MOMI will automatically determine the proper setting for this parameter. Fields not available are set to zero or spaces (as appropriate). Usage of this parameter will override the automatic determination.

MAX-COUNT-CONTEXT-ALLOWED

(server version 5.05 or later)

MAX-COUNT-CONTEXT-ALLOWED <value32> (default = 100)

This parameter is intended for internal use only.

Specifies the maximum number of context control blocks a single client may request from a single MOMI server.

The server will not set a value lower than an internal minimum value.

The MOMI server usually creates context to service individual Client requests. As a protection, the maximum number client context control blocks are limited. This prevents, in a worse case situation, the appearance of a MOMI server looping or consuming a great deal of CPU resources when the client disconnects and internal clean up occurs.

Example:

```
MAX-COUNT-CONTEXT-ALLOWED 60 == limit context to 60
```

MEAS-SQLSTMT-WILD-CARD

MEAS-SQLSTMT-WILD-CARD <"character"> (Default = Space)

Defines the character used as a wild-card for the field run^unit on the MEASURE entity SQL Statements.

MOMI always retrieves all SQL Statements in a process when requested. However, at some point the MEASURE interface changed and an asterisk ("*") no longer functioned as a wild-card. Instead, a space was required.

This keyword allows the definition of the character used for this particular MEASURE entity field.

Examples:

```
MEAS-SQLSTMT-WILD-CARD "*" == set SQL Statements wild-card  
                          == to an asterisk
```

OSS01-API-VERSION

(server version 4.20 or later)

OSS01-API-VERSION 1 | 2 (Default = automatically determined)

Determines the API set used by MOMI when accessing OSS.

Version 1 uses 32-bit OSS file system calls. Version 2 uses 64-bit OSS file system calls.

Later versions of the Operating System provides for OSS files larger than 2 Gigabytes in size. However, this requires that an extended set of API calls be used that generally return 64-bit instead of 32-bit values. The 64-bit OSS file system calls may be used on 64 and 32-bit files. However, 32-bit OSS file system calls cannot be used on 64-bit files.

Usage of this keyword is NOT recommended as the default is automatically determined by MOMI based on the current operating system version. The keyword is provided primarily for internal testing.

Example:

```
OSS01-API-VERSION 2 == use 64-bit OSS file system calls
```

PRIORITY-COLLECTOR-MST

PRIORITY-COLLECTOR-MST <value-1-199> (Default = Main MOMI - 1)

Specifies the priority for the Collector Master. This process configures the master measurement used by all MOMI CPU collectors and performs other coordination activities.

The default value is recommended.

Example:

```
PRIORITY-COLLECTOR-MST 165 == master at priority 165
```

SNTP-SET-IF-BEHIND

(server version 5.00 or later)

SNTP-SET-IF-BEHIND TRUE | FALSE (Default = FALSE)

Directs MOMI to perform a SET of the system time if a correction is needed that would move the system time forward.

This setting provides a capability to 'force' an adjustment of the system time. Moving the system time forward is not considered 'dangerous', where moving the system time backward (on an active system) is not desirable, especially to TMF.

By default, MOMI will only adjust the system time.

Customers generally should NOT use this capability.

Example:

```
SNTP-SET-IF-BEHIND TRUE
```

```
== Allow MOMI to set  
== the system time  
== forward
```


SNTP-VERBOSE

(server version 4.16 or later)

SNTP-VERBOSE (Default = not verbose)

Directs MOMI to write additional information about SNTP operations into the [MOMI Log](#).

This information would be used to help diagnose a problem with SNTP processing.

By default, MOMI will not generate this additional information.

Example:

```
SNTP-VERBOSE == Generate additional  
              == information about  
              == SNTP processing
```

TCPIP-THREADS

TCPIP-THREADS <value16> (Default = 100)

Specifies the maximum number of TCP/IP threads or concurrent Client connections supported. The absolute maximum allowed is 250.

Resources are allocated dynamically for TCP/IP connections, so using this keyword will not generally 'save' anything nor is it generally required.

The number of connections current, high water and the maximum available may be viewed in the PC Client.

Example:

```
TCPIP-THREADS 150 == TCP/IP threads 150
```

TCPIP-TIMEOUT

(server version 4.19 or later)

TCPIP-TIMEOUT <seconds> (default = 600)

Specifies the maximum amount of time (in seconds) that MOMI waits for any data to arrive from the MOMI PC Client. This value acts as a "sanity check" to insure that a socket connection eventually is either used (i.e. valid) or closed and does not simply hang.

If a timeout occur, the socket is closed.

This value also indirectly determines the maximum amount of time that the MOMI PC Client may be globally paused (i.e. all activity suspended) before the TCP/IP socket is disconnected.

The minimum value of 60, or 1 minute. Any value less than the minimum is set to the minimum.

Example:

```
TCPIP-TIMEOUT 60 == set timeout to 1 minute
```

History

Enabling History

MOMI has the ability to store history. This feature is activated by enabling it in the CONFMOMI file. By defining a history file, MOMI will automatically create and begin recording predetermined history information.

Up to four history files may be created. These are referred to as HST01DB -> HST04DB. History is initially written to HST01DB and then consolidated into the other files at different intervals. This gives the User the ability to maintain high resolution history for a short period of time and lower resolution history for a longer period of time.

The line to define each history file name ([HSTnnDB](#)) is the only line required. Other history attributes all have default values.

History is configured on the NonStop as follows:

1. Determine the disk volume(s) where the history files are to reside.
2. Edit CONFMOMI and un-comment out or add the following lines:

```
HST01DB $vol.subvol.hst01db == MOMI history database
```

```
HST01DB-DELETE-TIME 8 == Keep history 8 days
```

```
HST01DB-HISTORY-DUMP 120 == Dump history every  
== 120 seconds
```

3. Repeat step two for HST02DB -> HST04DB.
4. Start (or restart) MOMI via the OBYMOMI file.

Resizing History Files

MOMI automatically creates history files when enabled. The initial size of these files are as follows:

| File | Primary Extent | Secondary Extents | Maximum Extents | Total Megabytes |
|---------|----------------|-------------------|-----------------|-----------------|
| HST01DB | 5000 | 5000 | 50 | 512 |
| HST02DB | 4000 | 4000 | 32 | 262 |
| HST03DB | 2500 | 2500 | 25 | 128 |
| HST04DB | 1200 | 1200 | 16 | 39 |

Two methods are available to resize the history file.

Alter maximum extents

The utility FUP may be used, while \$MOMI is running, to alter the maximum extents of the history files.

To increase the amount of history disk space allowed, raise the MAXEXTENTS of the history file(s).

To decrease the amount of history disk space allowed, reduce the MAXEXTENTS of the history file(s). The file system will not allow a reduction in the maximum extents below the End of File (EOF).

On systems with limited amounts of disk space, it is suggested to start MOMI, wait a few seconds to allow the files to be automatically created, and then stop MOMI. In FUP "set like" a history file, purge the old file, set the MAXEXTENTS and/or primary/secondary extent sizes, then create a new file. MOMI must be able to allocate at least one extents on a history file.

See the screen [Server / Server Info 5](#) for information on how to alter the history files MAXEXTENTS from within the MOMI PC Client.

Convert file from Format 1 to Format 2

Older versions of MOMI created the history file as format 1. This format is limited to a maximum size of approximately 2 Gigabytes. MOMI supports format 2 files, which are generally limited only by available disk space.

The procedure to convert a file is to create a new file **just like** the old file and change a) format 2, and b) primary and secondary extent sizes. Data is transferred from the old file to the new via the FUP LOAD command.

The following steps describe how to perform the conversion. The values in green are dependant on your configuration and needs. HST01DB is used in this sequence. Substitute HST01DB with the desired name on your system. Compute a primary and secondary extent size for your system:

1. Stop \$MOMI. Wait until the file is closed.
2. Start FUP and enter the following sequence of commands -

FUP

```
RENAME HST01DB,HST01DB1  
  
SET LIKE HST01DB1  
SET FORMAT 2  
SET EXT (70000,70000)  
SET MAXEXTENTS 16  
CREATE HST01DB  
  
LOAD HST01DB1,HST01DB,SORTED
```

3. After the load completes, exit FUP and restart MOMI. Check the EMS log to insure that the new file was accepted.

Considerations:

- a) absolutely, positively, and without a doubt insure that other applications will not be impacted and that sufficient free disk space is available. Use the DSAP utility to confirm the availability of the extent sizes chosen. Remember that free disk space does not indicate the availability of the extent size chosen.
- b) assuming you want a history file over 2 Gigabytes in size, consider a primary and secondary extent sizes of 70000. This will create a file just over 2 Gigabytes which you can then alter the maximum extents to gain additional disk space.
- c) depending on the file size and system performance, the LOAD command may take 15-20 minutes. One way to speed the process is to perform the LOAD from one disk volume to another then FUP DUP the file back (if necessary). This may be faster than a LOAD with both files on the same volume.

Leave all other attributes of a MOMI file 'as is'. MOMI will not use the file if an expected attribute is changed. Check the EMS log immediately after restarting MOMI to insure that the converted history

file is accepted (MOMI writes a message to the EMS log (i.e. \$0) if the history file is not accepted). Fall-back to the original file should the new file not be accepted.

History Considerations

The collection of history requires some consideration before activation.

The history files (HSTxxDB) are simple Enscribe keyed sequence files with a single primary key. No alternate keys are used and the files are not TMF audited. If necessary, the HSTxxDB file may be purged. Stop MOMI, purge the desired files (or purge data) and restart MOMI. MOMI automatically creates files if needed. No special recovery procedures are required.

The activation of history primarily 1) will consume disk space, and 2) increase the I/O load to the disk volume(s) where MOMI history files reside. Additionally, older processors prior to the S72000 may notice a slight increase in CPU utilization. However, disk space and I/O load is really the primary considerations.

MOMI history files consume disk space. The default files sizes are found in [Resizing History Files](#). Care should be given to not impact disk space required by other applications.

MOMI initially writes history to the HST01DB file. History is consolidated from HST01DB into HST02DB, from HST02DB into HST03DB and finally from HST03DB into HST04DB. The consolidation process generally a) reads all needed records from one file, b) writes all needed records into the second file and c) goes back and deletes oldest eligible data from the first file. Spreading MOMI history files out across multiple disk does not really 'help' to provide any performance improvements at least to MOMI, however it may help other applications also residing on the same volume if it is heavily loaded.

History is written to HST01DB every few minutes by default. All MOMI history is compressed and packaged up into writes approximately 4,000 bytes in size. Consolidation into the other files occur at their history dump interval (default history dump intervals are found in [HSTnnDB-HISTORY-DUMP](#)).

Older smaller powered processors, such as the S7000, may see an increase in CPU utilization. The increase may one or two percent of a CPU. Newer processors, such as the S72000 and beyond, would hardly report any difference.

History Questions and Answers

1. Where do I start with the history parameters?

We suggest using the defaults. Un-comment out or add the lines to the CONFMOMI file as referenced elsewhere in this document.

2. What if my file is not large enough? Will MOMI cause error 45 (file is full) messages?

If MOMI needs to write data to the history file and space is not available, some of the oldest data in the file is automatically deleted to make room for new. You will not get error 45 messages nor error 43 (no disk space).

3. Does dumping data more frequently cause MOMI to work harder?

Directly no, but indirectly yes. The information MOMI dumps to the history file has already been collected. Activation of history is the process of dumping this data to disk, allowing the PC Client to read the history data and maintain or delete old data from the history file. Therefore, no additional CPU cost is directly imposed in the collection process, just in what you do with the data after it is collected.

4. At what priority will the history be dumped to disk? Will it be high like MOMI (by default) is?

MOMI uses a server process, by default running at priority 95, to write data to disk. It does not write at the priority of \$MOMI. MOMI uses three different servers to manage the history file. One server to write data, a second server to read data for PC Client requests, and a third server to delete or cleanup old data. See the CONFMOMI keyword documentation for additional information. Three keywords used to control the priority for access to the history file:

[PRIORITY-DB-HST01DB](#) - priority write
[PRIORITY-DB-HSTxxDB-R](#) - priority read
[PRIORITY-DB-HSTxxDB-CON](#) - priority delete/cleanup

5. What will happen if the server process that MOMI uses to write data to disk is bogged down or otherwise not able to get its data written out to disk?

MOMI will initially queue the data waiting to be written to disk in memory. This queue will continue for a period of time, before new data is discarded. Overall, MOMI will try to protect itself and your System by using more memory and discarding history data if necessary. In order to insure that all history data

is collected, the MOMI server used to write data to disk should be given sufficient CPU so it will not normally be bogged down by batch or other long running programs.

6. I see a high CPU utilization of a MOMI process running at a low priority, and by using MOMI I tracked it down as performing large number of disk reads from a history file. What is going on?

Normally, that is normal. The PC Client has a great deal of flexibility in accessing the history data. The PC Client could be searching for a named process, reading data for display or perhaps performing a history export operation. MOMI protects your System by using a separate, configurable priority process to perform "bulk" history reads. If the default priority is too high for your System, lower the priority by using the keyword [PRIORITY-DB-HSTxxDB-R](#) .

7. I am unsure if history activation should be performed on my production System. What would you suggest?

Don't activate history on your production System if you are unsure! Before any change is made to your production environment, you must feel confident. Any program version change or activation of a new feature may only be performed when you are sure! We suggest testing and experimenting on your development System, or lacking a development System, using your production System during approved after hours or during a maintenance window time frame.

System Quirks

The following links describes various situations or "quirks" present on the NonStop System:

[CPU Up/Down determination](#)

[Expand throughput](#)

[LISTLOCKS](#)

[O/S version determination](#)

[SQL/MP - DiskFile Entity](#)

[SQL/MP errors](#)

[Undefined externals on K-Series systems](#)

[Virtual Memory changes via NSKCOM / Virtual memory statistics](#)

CPU Up/Down determination

S-Series systems are not configured with the number of processors expected in the system. From a system configuration perspective, the operating system is always ready to accept (software wise) a maximum of 16 processors.

MOMI, every time is it started, uses the numerically highest 'up' processor in the system as the number of processors for up/down determination. For example, if the numerically highest 'up' processor is 5, which indicates 6 CPUs numbered 0 through 5, and processor 4 crashes, processor 4 is reported as down.

Additional processors added to the system while MOMI is operating automatically increase the numerically highest 'up' processor determination. In the above example, if an additional two processors were added, processors 6 and 7, MOMI now assumes the system is 8 processors numbered 0 through 7.

If processors are removed from the system 'on-line', i.e. without a cold-load, restart MOMI to force a new up/down calculation.

Expand throughput

Byte rates for Expand lines are generally only available for Expand over TCP/IP . Byte rates for other types of lines such as Expand over X.25 are estimated by using the Frame rate times the average bytes per frame. Expand over Fox and Supercluster (Expand over ServerNet which is reported as a NAM connection) do not provide a byte rate.

LISTLOCKS

The MOMI PC Client screen Enscribe / Locks does not function on systems prior to G06.26 as a precaution to prevent a possible CPU halt when using the Guardian procedure FILE_GETLOCKINFO_.

O/S version determination

Operating Systems versions prior to G06.24 do not provide the exact Operating System version as known by Users (i.e. G06.21) via supported system calls. You can determine the major portion (i.e. G06), but not the minor portion (i.e. .21).

The documented System procedure call `PROCESSOR_GETINFOLIST_` has an item code defined to return the minor version number, but it always returns zero on systems prior to G06.24. To work around this limitation MOMI reads an undocumented file `$SYSTEM.SYSNN.RLSEID`. This file appears to be used by the utility `SYSINFO` and by `TACL` to obtain this information.

On Operating Systems G06.24 and later, the documented System procedure `PROCESSOR_GETINFOLIST_` correctly returns the minor version number. The undocumented file `$SYSTEM.SYSNN.RLSEID` is not accessed.

The TNS/E Integrity System must use the `RLSEID` file. Hopefully, this may be removed in a future O/S release.

SQL/MP - DiskFile Entity

Secondary partitions on SQL/MP files do not always show up under this measurement. This is due to MEASURE not providing data. Try the DiskOpen Entity in this situation.

SQL/MP errors

The SQL/MP screens may display various SQL error codes, with 4060 as the most common. The appearance of these codes may indicate a discrepancy in the SQL catalog itself. MOMI assumes that the catalog structure and data within the catalog has full integrity.

In the PC Client, on the [SQL/MP / Catalog](#) screen, the column Status Message shows an error code if a simple query of that catalog fails. Any Status Message displayed here indicates that MOMI will have problems with SQL/MP reporting. This is the first place to check and perhaps identify the catalog in question.

We suggest consulting with your DataBase Administrator (DBA) if you have any integrity issues with your SQL/MP catalogs.

Below are some additional steps you can perform to check your catalog integrity. From a TACL prompt:

1) SQLCI GET CATALOG OF SYSTEM;exit

2) Volume to this location.

3) SQLCI SELECT * FROM CATALOGS;exit

4) The first column (CATALOGNAME) in the output consists of all of the catalogs on your system registered to SQL. For each of those entries do a fileinfo of the \$vol.subvol.*

5) If a \$vol.subvol is listed in the CATALOGS table that does not exist, or does not contain SQL catalog objects, an inconsistency is present. Consult with your DBA and/or HP to resolve the problem.

If your SQL/MP catalogs do not show a problem, please send us an email with a screen shot and description of the SQL/MP error encountered.

Undefined externals on K-Series systems

Several undefined externals will appear on the home terminal when starting the BWMOMI object file for the first time on a K-Series system. This is normal. MOMI code avoids invoking these procedures on the older systems. As a side effect, the amount of information returned by MOMI on some screens is reduced.

Virtual Memory changes via NSKCOM / Virtual memory statistics

Virtual memory configuration and statistics are not available from either the Guardian Operating System procedures nor MEASURE. To work around this limitation, MOMI starts a copy of NSKCOM and periodically parses its text output to determine the amount of virtual memory available, the highest usage (i.e. high water mark), and the current usage.

Some users have reported that they were unable to alter the virtual memory on their system due to NSKCOM reporting:

"... ZSYSCFG is locked by another user..."

Note: The file in question is really \$SYSTEM.SYSTEM.KMSFLOCK

They corrected this problem by stopping MOMI, making changes via NSKCOM and then restarting MOMI.

MOMI does not make any changes to virtual memory but just uses NSKCOM for 'reading' virtual memory status. However, we believe this situation may occur if a delete of a swapfile is pending after a system cold-load and if the NSKCOM started by MOMI is the first instance of this utility after a cold-load of the system.

The suggested work-around is to start an NSKCOM, under a Super.Group User ID or better, rather early in your system startup files a) after all processors have been loaded, but b) before MOMI is started. The purpose of this NSKCOM is to cleanup any pending swapfile operations after a cold-load. It is possible that the pending operation may take some time if a great deal of cleanup is involved. The recommended command to consider in your system startup file is:

```
comment                == start NSKCOM, allow any
comment                == pending cleanup then exit
```

```
NSKCOM EXIT
```

Update ➡ As of MOMI Server version 5.00 and later the NSKCOM used by MOMI is restarted after the initial request of swapfile information. This restart should prevent, or at least automatically correct, a locked configuration file. Note that pending changes to the swapfile may keep the initial instance of NSKCOM 'busy' for a while. This may delay the initial report swapfile information within MOMI. If your site changes the swapfile often, placing an NSKCOM EXIT in your startup files, as described above, is still recommended.

MOMI PC Client

Overview

The MOMI PC Client provides the presentation/access interface to MOMI. It is a standard Windows 32-bit program that uses TCP/IP (i.e. Winsock) to communicate with the MOMI server on the Tandem . No extra communication software such as RSC is required.

The Client is written in Borland Delphi . Delphi provides high speed, and a stand-alone executable that does not require 'registration' within the Windows environment in order to function. The Client makes extensive use of Windows graphics and other resources. As such, a professional version of the Windows operating system such as Windows XP (or Windows 2000) is required.

The MOMI PC Client *technically* does not require any Windows installation or setup. You can run the PC Client by double-clicking on the MOMI.EXE executable. This stand-alone executable feature helps support various deployment options. The MOMI PC Client activates additional features when expected sub-directories are present in the location where the executable is present. For example, if the subdirectory \Help\WebHelp is present, local HTML help may be invoked when pressing the Help button.

When a Client is started for the first time, it creates the MOMI.INI file. This file contains the configuration information for the program. We chose to use an INI file versus registry entries because a User can easily look at or relocate an INI file. Registry entries are a little more involved.

The default location where MOMI stores its INI and other working files:

Windows Vista -

C:\Users\<<UserID>\AppData\Roaming\BlackWood Systems\MOMI\

Other Windows versions -

C:\Documents and Settings\<<UserID>\Application Data\BlackWood Systems\MOMI\

Where <UserID> is the name used at logon to Windows. You must enable the display of 'hidden' locations within Windows in order to see these locations.

After the Client creates the MOMI.INI file, it will prompt the User for a TCP/IP address and port. This is an address and port the MOMI server on the Tandem is 'listening' on. After entering this information the Client will establish a socket connection and begin exchanging data with the MOMI Server. Additional Tandem Systems may be defined in the Client. Each TCP/IP address and port is defined on this same screen.

After the initial connection, the User is taken to the [Main Overview](#) screen. This main screen of MOMI provides an overview of the general System health.

The available screens are organized by functional groups. Select the Tab or button of the group to navigate to the desired screen. The mouse will change to a pointing hand when over a jump point. The letters L and/or R will appear to indicate what mouse keys (Left / Right) are available.

Tool Tips or pop-up windows are used extensively throughout the MOMI PC Client to describe fields and actions. Move the mouse over any field or column heading to obtain additional information.

Security is imposed when access to the data or information requires user specific authorization. For example, to view the contents of a file requires security but to view the names of files in a directory does not. Additionally, commands that perform an action such as purging a SPOOLER job or renaming a file require security. The User obtains security by logging on. This is obtained by pressing the [LOGON](#) button in the lower right hand corner of the screen. A Guardian User ID or Safeguard Alias and password is entered.

[Client Access](#) provides a means to restrict access to particular screens within the MOMI PC Client. Client Access does not replace Guardian/Safeguard security, but is a separate subsystem specific to MOMI.

During the course of accessing various screens and requesting information, additional MOMI servers on the Tandem are started. This action allows MOMI to [prioritize](#) and multi-thread operations. After a period of time (3-4 minutes) unused servers are stopped. Additionally, when the MOMI PC Client is stopped or disconnects from the System, unused servers are also stopped.

Common screen items



The mouse pointer displays an indication when a jump point or 'hot spot' is available. It will change to a hand with a L and/or R indicating when a Left and/or Right mouse click is available. Left clicks generally perform the default action and a right click brings up a context sensitive menu with the default action in **bold**. A mouse click in this document refers to the left mouse button.

Tool tips, or Hints, are yellow text windows that automatically display when the mouse is moved over certain fields. Tool tips are present throughout the PC MOMI Client. They provide information such as field descriptions, column descriptions and navigational assistance. Tool tips may be disabled or the amount of time before they appear are adjusted on the screen [Settings / System Wide](#). Below are some sample tool tips:

The screenshot shows two tool tips. The first is over a table with columns: 'Full Percent gauge', 'Fragments', and 'Largest Frag'. The second is over a system metrics panel with fields: 'Busy %', 'CPU que', 'Pressure', and 'Disk i/o'.

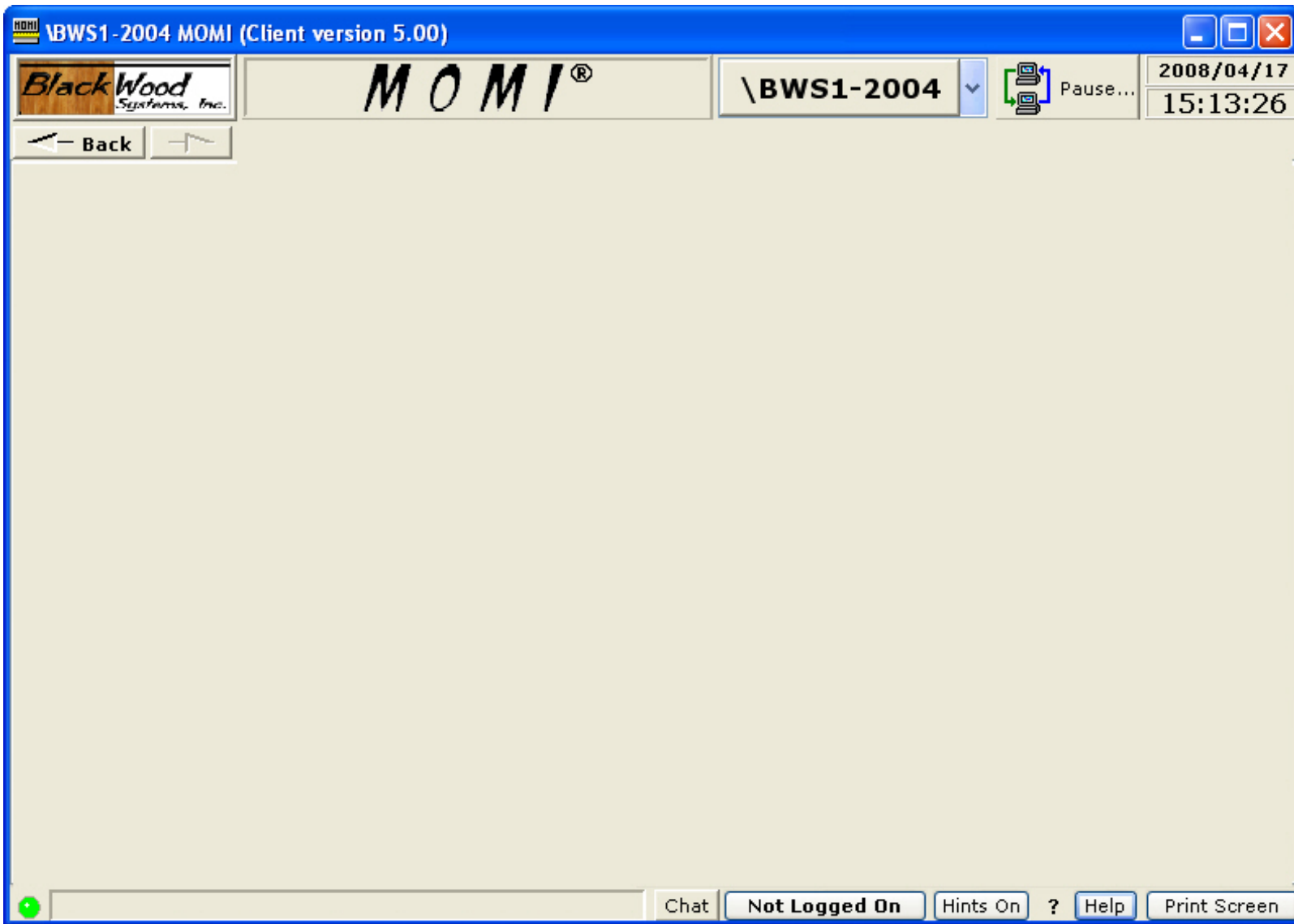
| Full Percent gauge | Fragments | Largest Frag |
|--------------------|-----------|--------------|
| 19 | 15 | 3,262 |
| 57 | 140 | 2,436 |
| 54 | 69 | 1,202 |

System Metrics:
Busy %: 9
CPU que: 0
Pressure: 0
Disk i/o: 9

Tool tips are also available to display the entire message in notification areas located at the bottom of most screens. In the example below, the text not visible on screen is shown in the tool tip.


The screenshot shows a notification area with a tool tip. The tool tip contains the text: 'Export finished to C:\Documents and Settings\dwood\Desktop\MOMI Process History.TXT'. The notification area contains a 'Clear' button, an 'Export Data ...' button, and a text field containing the same text. Below the notification area are buttons for 'Not Logged On', 'Help', and 'Print Screen'.

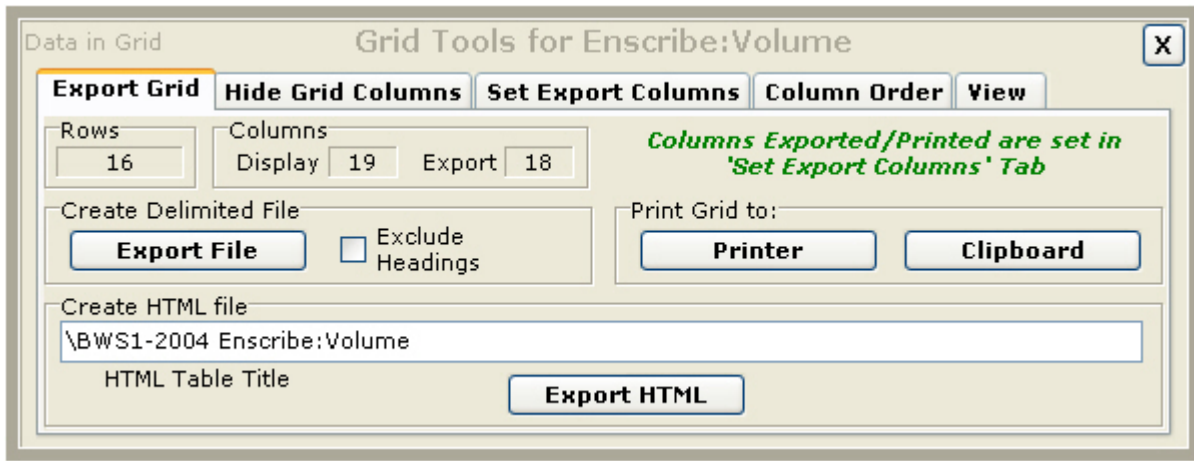
All MOMI screens have common items at the top and bottom of the screen. Place your mouse over items below and click for descriptions of these common items.



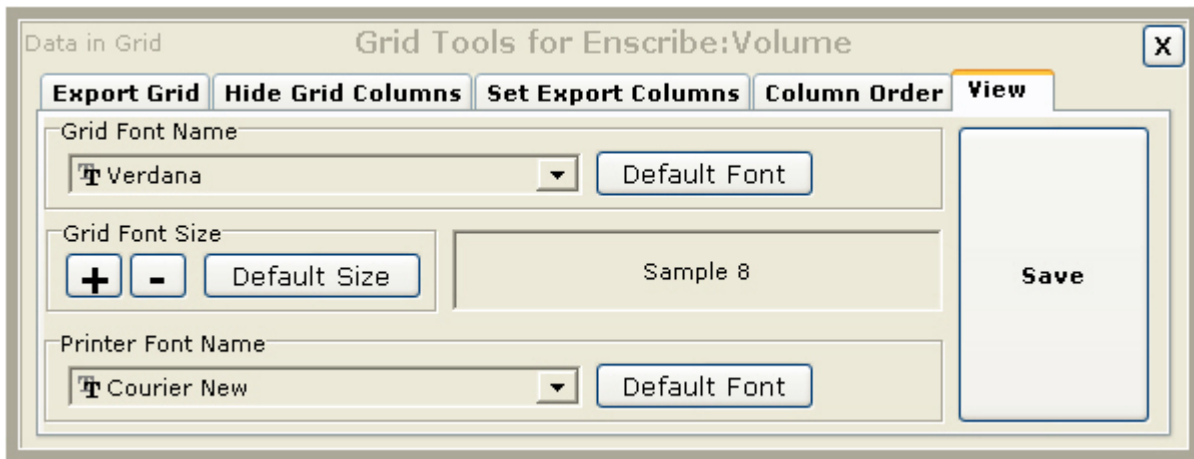
Rated Values

The Rated Values option allows the selection of either values on a per-second basis, or raw values for the measurement window. The measurement window is usually displayed in the status area or on the end of the data line.

 The Tool button in the lower left hand corner of most grids presents a pop-up window of options for exporting and printing grid data, hiding grid columns, setting the columns to export, and saving or restoring the column order.



The View tab of the Grid Tools window changes the font for viewing data within the grid and font used for printing data from the grid. The font size for viewing may also be increased or decreased in size by pushing the +/- keys. Push Save to store the settings. Settings within the Grid Tools window affect only the current screen.



Columns in display grids usually have a sort/filter function available. A pop-up window allows the column to be sorted ascending or descending and control filtering. Columns of string data have a single filter item. The entered filter string is exactly matched unless wild card characters * or ? are used. Columns of numeric data provide a minimum and maximum display value. Additionally, the sum of each row in the column is visible but this value is not always useful. Date ranges may be selected and columns with a single character may be selected/deselected.

Sort Volume

Filter Volume
Filter String
 Include Filter string
 Excludes Filter String

Cancel

Sort LDEV

Filter LDEV
Minimum display value
Maximum display value
Column Total

Cancel

Sort Modification Date

Filter Modification Date
Set Times
 Start
 Stop

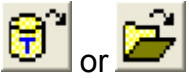
or Set Age
 Age over
 Age under

Cancel

Sort D

Filter D
 Include only D (Disk is Demountable)
 Exclude if D (Disk is Demountable)

Cancel



or This screen graphic button represents a \$volume, subvolume and/or file selector option. It can represent an open of a PC file or of a Tandem based file. Pressing this button for a Tandem based file brings up a tree view window that allows the user to expand the Volume, Subvolume and down to the file level (where appropriate).

SubVol/File Locator

X

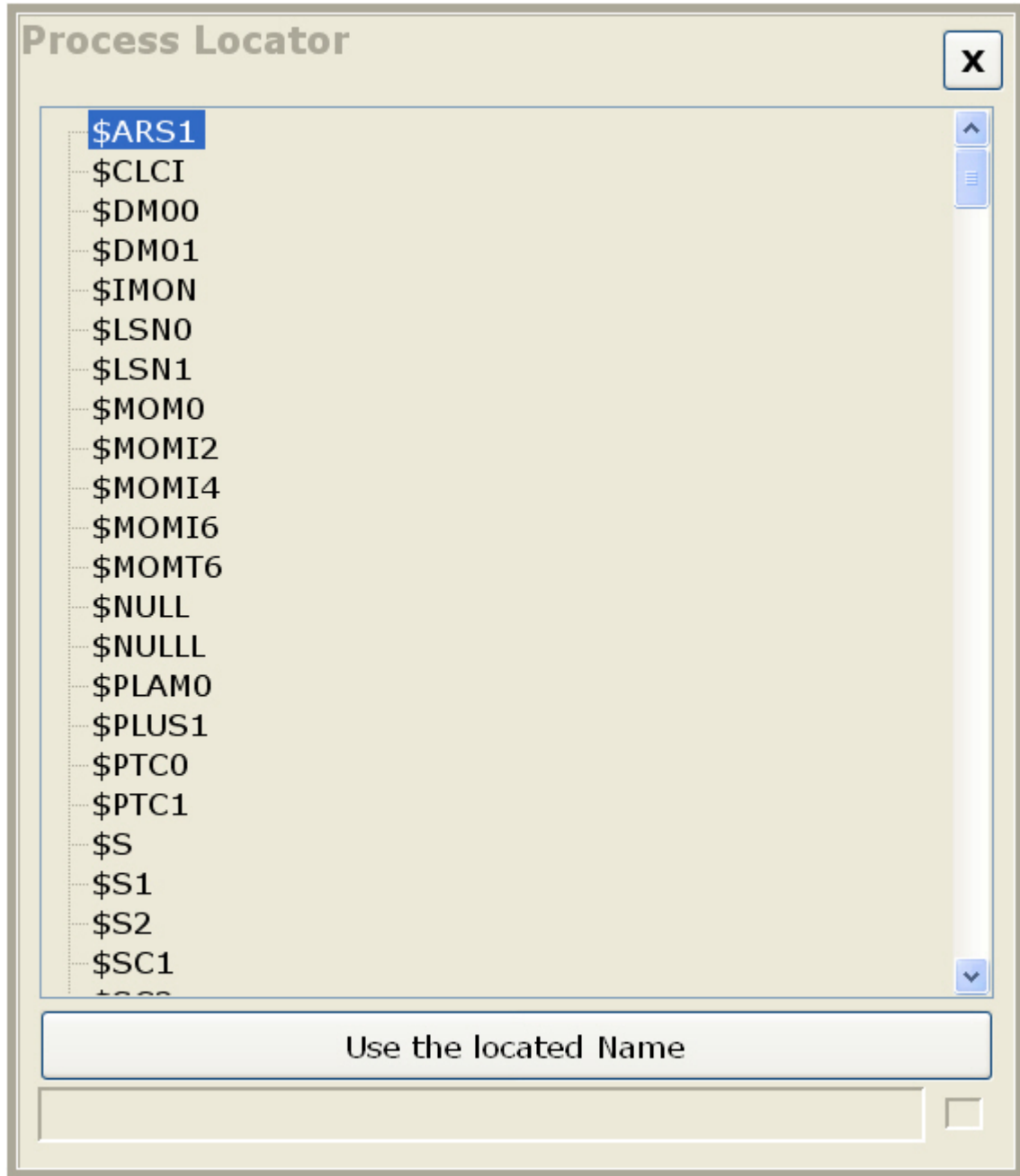
- \$AUDIT
- \$DATA1
- \$DSMSCM
- \$MOMI01
- \$PCS1
- [-] \$SWAP1
 - [-] \$SWAP1.IPMS
 - \$SWAP1.IPMS.R8374ABD**
 - \$SWAP1.JUNK
 - \$SWAP1.MOMI2002
 - \$SWAP1.MOMI2006
 - \$SWAP1.MOMI2010
 - \$SWAP1.PLUS1
 - \$SWAP1.R8374ABD
 - \$SWAP1.SAFE
 - \$SWAP1.SPLS
 - \$SWAP1.SWAPFILE
 - \$SWAP1.TESTCAT
- \$SYSTEM
- \$TEMP1
- \$TEMP2
- \$VDP1

| Code | Size | Creation Date |
|----------|-----------|---------------------|
| 991 | 1,159,512 | 2005/05/05 14:52:42 |
| Security | Owner | Modification Date |
| CCCC | 100,2 | 2005/05/05 14:52:44 |

Use the located File



This screen graphic button opens a tree view window that allows the user select a process name. The types of processes presented are usually limited to the type applicable for the given situation within the MOMI PC Client (for example a listing of all Tape processes).



Alarm Overview

MOMI Alarms are the ability to set thresholds and trigger notifications.

An Alarm definition is unique for each threshold monitored but the Alarm also references a reusable monitor time and action record. By default, an Alarm is monitored continuously and displays in red on the [Alarms / Active](#) screen.

Creation of an Alarm generally follows the sequence of entering a unique name, description, selection of an Entity Type and Sub-type, setting thresholds, entering entity name(s), selecting the Times to monitor and Action to take. If a desired Times or Action record does not already exist, the View button may be pressed to jump to the appropriate Define screen to create the record and then push Back to continue with the Alarm Definition.

Alarm processing may be delayed at MOMI start by using the CONFMOMI keyword [ALARM-SUSPEND-DELAY](#).

Alarm Security

By default, only the user that started the MOMI server is allowed to configure an Alarm. Additional users may be granted this authority by activating [Client Access](#).

CONFMOMI keywords

One of the available Actions to an Alarm is the generation of Email.

Email requires an external SMTP server (i.e. outgoing email) and the return Email address. The following must be defined in the CONFMOMI file to enable Email:

[ALARM-SMTP-SERVER-ADDR](#)
[ALARM-EMAIL-ADDRESS-FROM](#)

To override the default, this keyword determines the TCP/IP process used to communicate with the SMTP server:

[ALARM-SMTP-TCPIP-NAME](#)

Some SMTP servers require the HELO sequence:

[ALARM-DOMAIN-NAME](#)

The default subject line of a MOMI Alarm generate is altered by:

[ALARM-EMAIL-SUBJECT](#)

Common screen items

Definition screens usually have several common commands:



Display causes the selected record to appear.

Save New creates a record. If a record with the same name is already present, an error is displayed.

Change updates an existing record. If a record with the same name does not exist, an error is displayed.

Delete removes an existing record.

International Issues

Dates

All Dates in the Client, where the value is output, are in the format of yyyy/mm/dd (year/month/day) except where the date is contained within a text message. An example of this exception is EMS messages.

In certain regional language selections, the Calendar display for Dates displays some invalid characters, although the calendar still works. On the Config screen the User may select a roll up/down style instead of a calendar to prevent this display irregularity.

Export data

Data exported contains a leading HardSpace (ASCII value 160) for fields that contain numeric information intended to be treated as a string field. An example is the CPU,PIN field. The default character may have adverse implications when using a multi-byte character set. The leading character used for these fields may be altered on the [Settings / System Wide](#) page.

Specifying run-time parameters

Various parameters may be given to the MOMI PC Client at startup. These parameters control certain aspects of the program operation. Multiple parameters are separated by spaces and may be specified in any order.

Syntax may enclose descriptions in the characters < >, however these characters are not used. For example, this description:

INIPATH="<location>"

is used as follows:

```
MOMI.EXE inipath="d:\data\fred\momi"
```

Examples:

```
MOMI.EXE script=ProcessScript           executes script ProcessScript
MOMI.EXE nocail                          don't load the CAIL emulator
MOMI.EXE inipath=d:\data\fred\momi      sets INI to d:\data\fred\momi,
                                         execute script ProcessScript
MOMI.EXE inipath=d:\data\fred\momi  script=ProcessScript
```

Run-Time Parameters

INIPATH

INIPATH="<location>" (default = user profile area)

The parameter directs the MOMI PC Client to store its configuration information at the location specified.

Note there are no spaces between the keyword, equal sign and the location.

The Client configuration information is stored in a simple text file using standard INI format. By default, this file is located in the user's profile area. This location is typically:

Windows Vista -

C:\Users\<UserID>\AppData\Roaming\BlackWood Systems\MOMI\

Other Windows versions -

C:\Documents and Settings\<UserID>\Application Data\BlackWood Systems\MOMI\

Where <UserID> is the name used at logon to Windows. You must enable the display of 'hidden' locations within Windows in order to see these locations.

MOMI also stores the files Calendar.mom and CustErrors.mom file in this location.

The default location provides user specific storage for MOMI settings and usually has no security implications. However, using the parameter to define a fixed location may be desirable if more than one User accesses the PC and common settings are needed.

The User could have different INI files to store different configurations for multiple Systems. Each System could have its own filters, color-coded EMS messages, thresholds, etc... Specific a different location for each MOMI shortcut.

Example:

```
MOMI.EXE inipath="d:\data\fred\momi" redirects INI to d:\data\fred\momi
```

LOG

Log

Causes the MOMI PC Client to create a trace log file used for special customer problem situations. The file MOMI-Actions.log is created on the users desktop and a red "Logging" is visible in the top left portion of the MOMI screen.

Usage of this parameter would be by request of BlackWood support.

The syntax is as follows:

MOMI.EXE log

Example:

```
MOMI.EXE log                activate special logging
                             activate special logging
MOMI.EXE log user          MOMI.INI in user profile area
```

NOCAIL

Nocail

Directs the client to NOT load the CAIL terminal emulator.

The option is provided if the CAIL terminal emulator is not desired or cannot be loaded.

The syntax is as follows:

```
MOMI.EXE nocail
```

Examples:

```
MOMI.EXE nocail
```

```
don't load the CAIL emulator
```

NOSPEECH

(client version 4.07 or later)

Nospeech

Directs the client to NOT attempt speech activity.

The option is provided if the normal detection mechanism used by the MOMI PC Client fails on speech detection.

The syntax is as follows:

```
MOMI.EXE nospeech
```

Examples:

```
MOMI.EXE nospeech
```

```
don't enable speech
```

SAME

Same

The MOMI.INI file is placed in the same location as the MOMI.EXE.

The syntax is as follows:

MOMI.EXE same

Examples:

MOMI.EXE same

redirects INI to same location as EXE

MOMI.EXE same script=fred

*redirects INI to same location
as EXE, run script FRED*

SCRIPT

Script="<script-name>"

A script is a means to launch the MOMI PC Client directing it to perform a "pre-saved" sequence of commands. The MOMI PC Client stops at the completion of processing this parameter.

Only one script may be specified per launch of the MOMI PC Client.

This script provides a means to export information from the MOMI history files. See [History / Export Data](#) for information on defining the script.

Note there are no spaces between the script keyword, equal sign and the script name. The script-name must be enclosed in quotes if it contains a space.

This parameter is replaced by [SCRIPT-HISTORY](#).

The syntax is as follows:

```
MOMI.EXE script=<script-name>
```

Examples:

```
MOMI.EXE script=ProcessScript           executes script ProcessScript

MOMI.EXE inipath=d:\data\fred\momi      sets INI to d:\data\fred\momi, execute
                                         script ProcessScript
MOMI.EXE inipath=d:\data\fred\momi  script=ProcessScript
```

SCRIPT-HISTORY

(client version 4.20 or later)

Script-History="<script-name>"

A script is a means to launch the MOMI PC Client directing it to perform a "pre-saved" sequence of commands. The MOMI PC Client stops at the completion of processing this parameter.

Only one script may be specified per launch of the MOMI PC Client.

This script provides a means to export information from the MOMI history files. See [History / Export Data](#) for information on defining the script.

Note there are no spaces between the script-history keyword, equal sign and the name of the script. The script-name must be enclosed in quotes if it contains a space.

This parameter supercedes the older parameter [SCRIPT](#) (however but perform the same function).

The syntax is as follows:

```
MOMI.EXE script-history=<script-name>
```

Examples:

```
MOMI.EXE script-history=ProcessScript executes script ProcessScript
```

```
MOMI.EXE inipath=d:\data\fred\momi script-history=ProcessScript sets INI to d:\data\fred\momi, execute script ProcessScript
```

SCRIPT-LOG

(client version 4.20 or later)

Script-Log="<script-name>"

A script is a means to launch the MOMI PC Client directing it to perform a "pre-saved" sequence of commands. The MOMI PC Client stops at the completion of processing this parameter.

Only one script may be specified per launch of the MOMI PC Client.

This script provides a means to export information from the MOMI log file. See [MOMI Log](#) for information on defining the script.

Note there are no spaces between the script-log keyword, equal sign and the name of the script. The script-name must be enclosed in quotes if it contains a space.

The syntax is as follows:

```
MOMI.EXE script-log=<script-name>
```

Examples:

```
MOMI.EXE script-log=LogScript                                executes script ProcessScript
```

```
MOMI.EXE inipath=d:\data\fred\momi script-log=LogScript    sets INI to d:\data\fred\momi, execute  
script LogScript
```

Screens

Systems

Systems / Basic

MOMI (Client version 4.19)

BlackWood Systems, Inc.

100% CPU usage graph

\BWS1-2004

2006/12/27 13:20:39

Back *Systems Overview CPUs Processes Files SubSystems History Alarms Configure

*Basic Detail FTP PING TraceRoute Emulators

| | System Name | System Address:Port | System Description | Last Update | Busy% | System Busy | Vers. | Alarms |
|-------------------------------------|-------------------|---------------------|--------------------|----------------|-------|------------------------|-------|--------|
| <input checked="" type="checkbox"/> | \BWS1-2000 | 192.168.20.10:2000 | | | | Unable to reach System | | - |
| <input type="checkbox"/> | \BWS1-2002 | 192.168.20.10:2002 | | | | | | - |
| <input checked="" type="checkbox"/> | \BWS1-2006 | 192.168.20.10:2006 | BlackWood S72000 | 12/27 13:20:26 | 6.4 | | 4.16 | YES |
| <input type="checkbox"/> | \BWS1 Fast - 2002 | 192.168.20.11:2002 | | | | | | - |
| <input type="checkbox"/> | \BWS2-2000 | 192.168.20.12:2000 | | | | | | - |
| <input type="checkbox"/> | \BWS1 Fast - 2006 | 192.168.20.11:2006 | | | | | | - |
| <input type="checkbox"/> | \BWS2-2002 | 192.168.20.12:2002 | | | | | | - |
| <input checked="" type="checkbox"/> | \BWS1-2004 | 192.168.20.11:2004 | BlackWood S72000 | 12/27 13:20:31 | 6.4 | | 4.16 | YES |
| <input checked="" type="checkbox"/> | \BWS1-2010 | 192.168.20.11:2010 | BlackWood S72000 | 12/27 13:20:36 | 4.8 | | 4.15 | YES |
| <input type="checkbox"/> | \PAT | 80.127.78.71:2000 | | | | | | - |
| <input type="checkbox"/> | \BWS1-2004-Old IP | 192.168.20.10:2004 | | | | | | - |
| <input type="checkbox"/> | \NSKIT06-3000 | 204.160.19.31:3000 | | | | | | - |
| <input type="checkbox"/> | \ATNSK03-2000 | 204.160.19.38:2000 | | | | | | - |
| <input type="checkbox"/> | \BWS1-bws1-2004 | bws1:2004 | | | | | | - |

Pause

When 'X'ed will Probe remote systems

When checked will Display separate Probe window

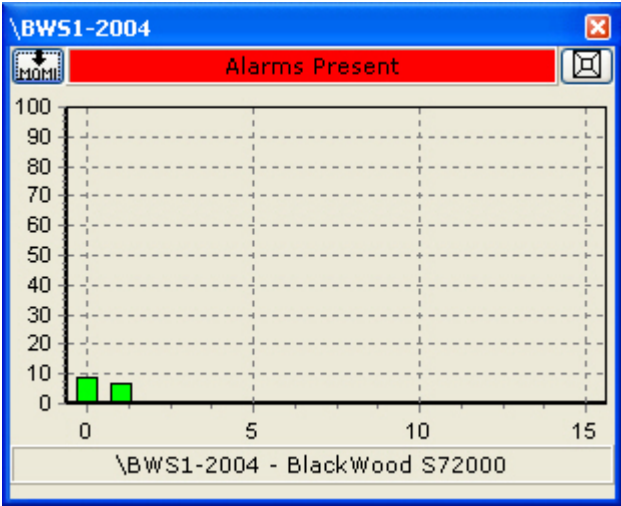
Not Logged On Hints On ? Help Print Screen

The Systems / Basic screen provides a method to configure the MOMI PC Client to monitor high level details on more than one system. The systems available on this screen were initially configured to MOMI on the [Define Systems](#) screen. Additionally, a floating independent window is available

By default, MOMI only communicates with each System selected in the main drop-down box at the top of the screen. Systems selected on this page are also contacted to provide additional information to a limited extent. This additional information is displayed on the screen [Systems / Detail](#) and under the Subsystem / Expand screens.

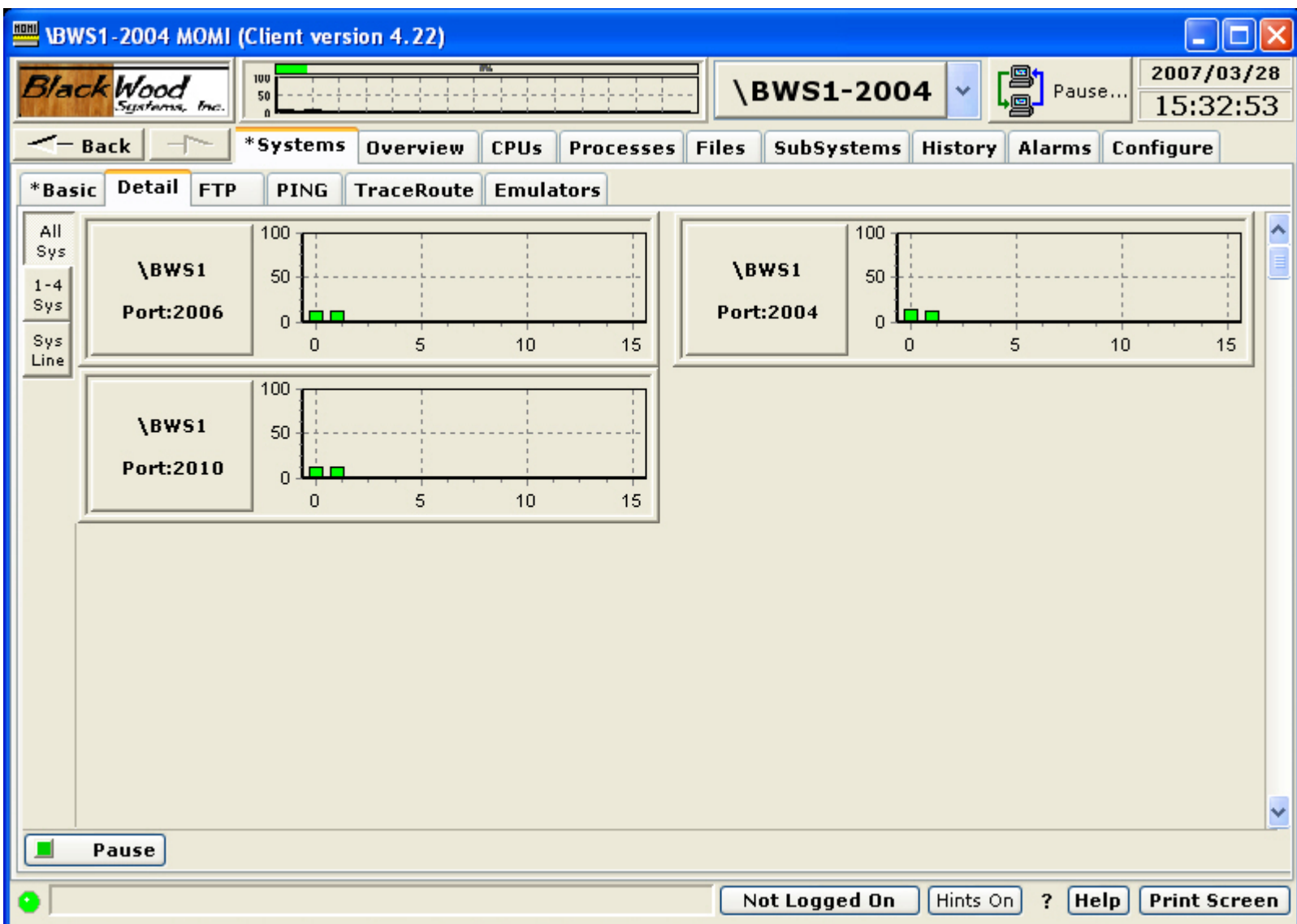
The column "Alarms" provides a general indication of any Alarms present on a system being probed. This column is not displayed by default. It is enabled on the screen [Settings / Single Screen](#).

The floating independent window provides basic information about a system. This resizable (grab the window edge and drag) window may be positioned anywhere on the desktop. Clicking on the cpu busy graph bar displays the top few processes busy in that processor. Clicking on the MOMI arrow button will select the main MOMI screen to that system.



| CPU,PIN | Process | Object | Priority | Busy% |
|----------|----------|---------|----------|-------|
| 00,00420 | \$MOMI4 | BWMOMI | 160 | 0.84 |
| 00,00257 | \$SYSTEM | OSIMAGE | 220 | 0.53 |
| 00,00426 | \$Z1197 | BWMOMI | 160 | 0.49 |
| 00,00291 | \$MOMI01 | TSYSDP2 | 220 | 0.48 |
| 00,00015 | \$ZNET | SCP | 175 | 0.47 |
| 00,00342 | \$ZPTM0 | TCP6MON | 201 | 0.35 |

Systems / Detail



The Systems / Detail screen provides a high level view for a number of Systems. The Systems available to these screens are enabled screen [Systems / Basic](#).

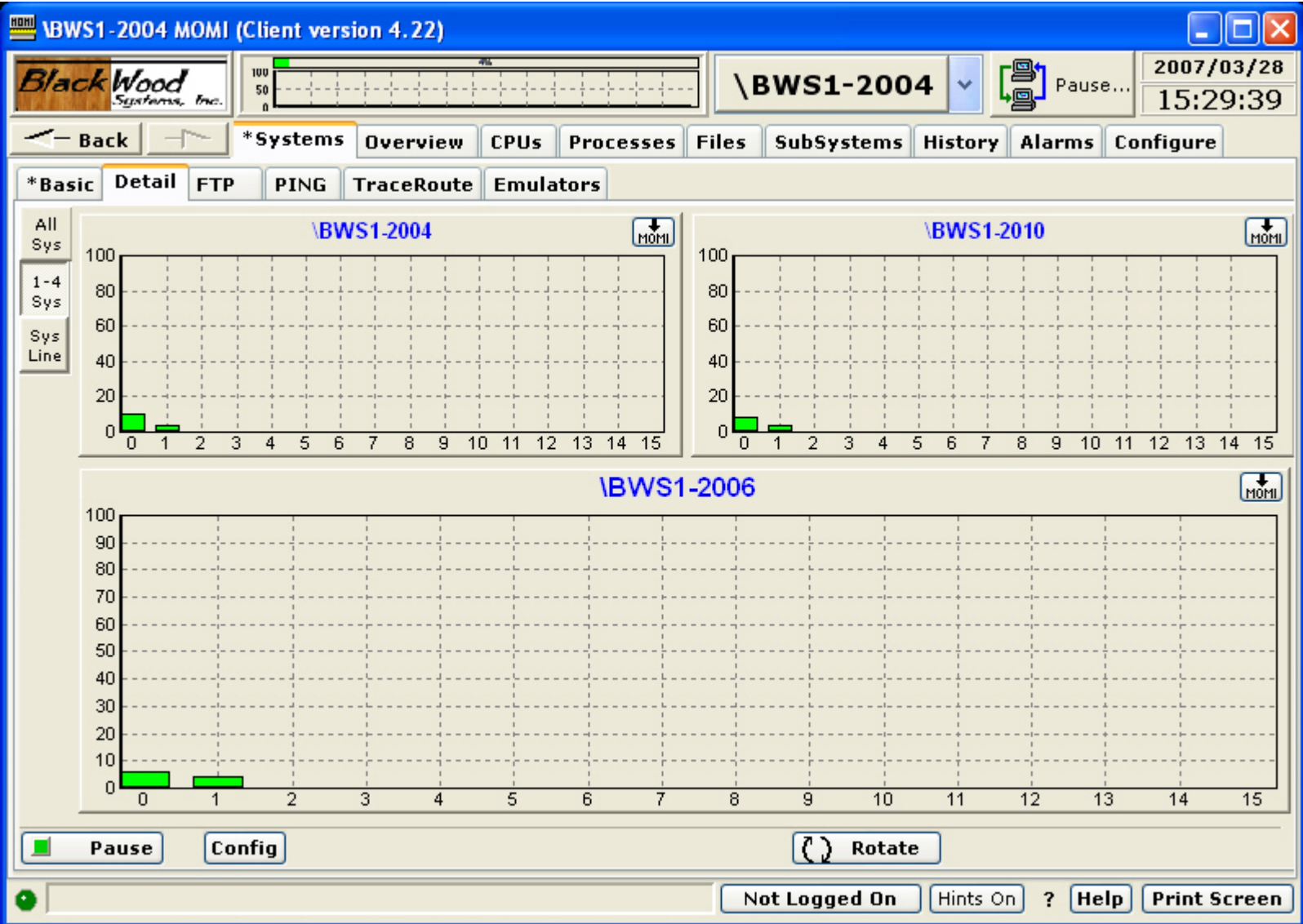
The CPU busy percent is displayed for each processor of the System. Pressing the button with the \System and port information will cause the PC Client to select that System and jump to the Main Overview screen.

Clicking on a CPU bar graph displays a pop-up window listing the top busiest processes in that processor.

\BWS1-2010 CPU 0 reports 8% busy

| CPU,PIN | Process | Object | Priority | Busy% |
|----------|-----------|---------|----------|-------|
| 00,01745 | \$MOMI4 | BWMOMI | 160 | 0.59 |
| 00,01751 | \$Z1523 | BWMOMI | 160 | 0.45 |
| 00,00015 | \$ZNET | SCP | 175 | 0.42 |
| 00,00000 | \$MONITOR | OSIMAGE | 201 | 0.38 |
| 00,00257 | \$SYSTEM | OSIMAGE | 220 | 0.36 |
| 00,00049 | \$XCAT | TMFCTLG | 149 | 0.35 |

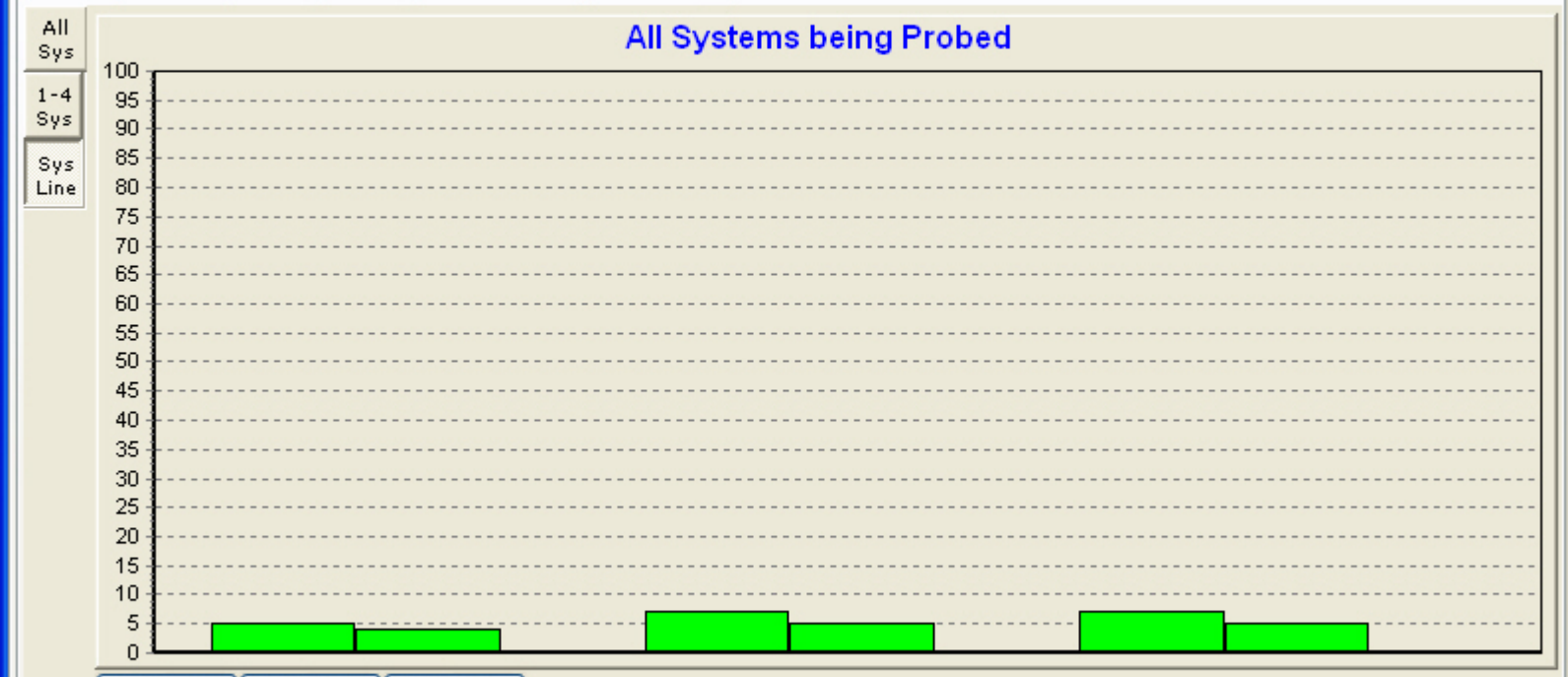
Additional formats of presentation are available by pressing the buttons on the left hand side of the screen. Push the Config button to select the screens displayed.



All Systems are displayed on this screen.

Black Wood Systems, Inc. \BWS1-2004

← Back



Systems / FTP

MOMI - Multi-system Online Measure Interface (Client version 4.19)

Black Wood Systems, Inc.

2006/11/13 14:52:32

\BWS1-2004

Pause...

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Basic Detail **FTP** Emulators

Remote System Connection

Host Name/Address: bws1 Port: 21 User ID: net.ftp Password: Password PASV: Connect Connected Quit

Local PC

| FileName | Size | Modified |
|---------------|------|---------------------|
| Data | | 2006/09/27 13:48:34 |
| MSOCache | | 2005/11/28 15:26:06 |
| Program Files | | 2006/06/07 16:39:50 |
| Share | | 2006/10/04 13:08:18 |

Remote Host

NSK OSS Windows

\BWS1.\$DATA1.FTP

| FileName | O | Code | Size | Date | Time |
|-----------|---|------|-------|-----------|----------|
| FUPCSTM | | 101 | 62 | 8-Oct-03 | 17:29:26 |
| README | | 101 | 72 | 18-Feb-01 | 22:41:32 |
| TACLCTSTM | | 101 | 2,048 | 8-Oct-03 | 17:25:20 |

No Filter Displayed 4 of 4

No Filter Displayed 3 of 3

All Errors

```
>LIST \BWS1.$DATA1.FTP
--->150 Opening data connection for \BWS1.$DATA1.FTP. (192.168.20.21,4570d) (0 bytes).
--->226 Transfer complete.
```

Not Logged On Hints On ? Help Print Screen

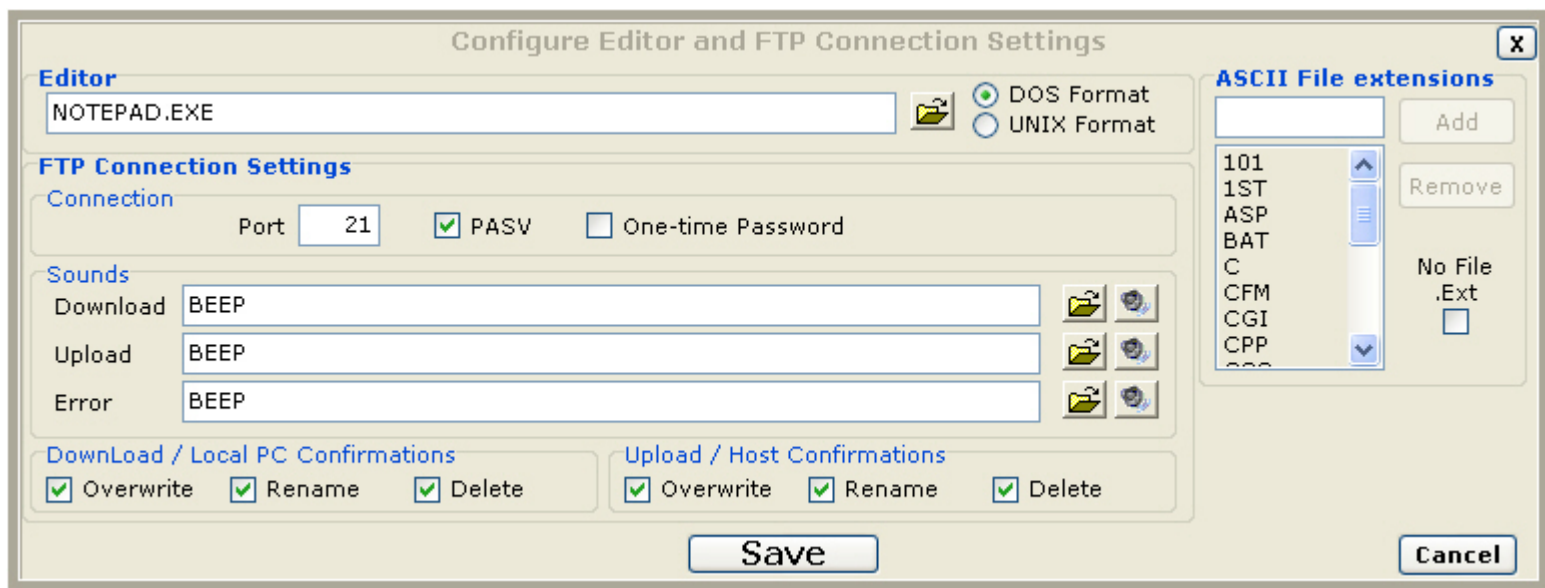
The Systems / FTP screen provides an FTP client knowledgeable of Guardian file formats to allow the display of file codes, size, date/time, Guardian security string, etc...

Files transferred from the PC to the Tandem with an extension of TXT are automatically loaded into and Edit file. Like wise, and Edit file is automatically transferred as ASCII to the PC. Additional PC file extensions may be defined as text. Right click on a column heading to activate standard sort/filter capabilities.

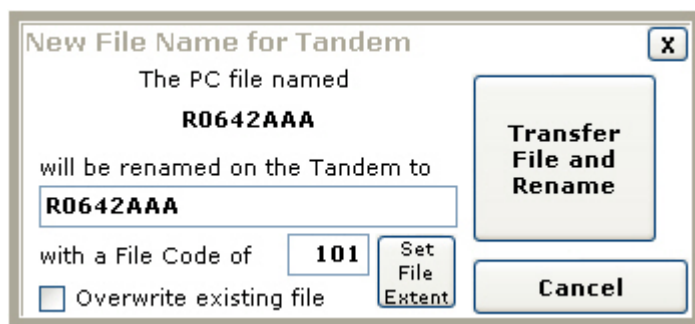
The user first enters the Host Name/Address, User ID and Password. Press Connect to establish a session with the FTP server on the Tandem. Press the Open Folder icon to navigate within the PC subdirectories or Tandem volumes/subvolumes.

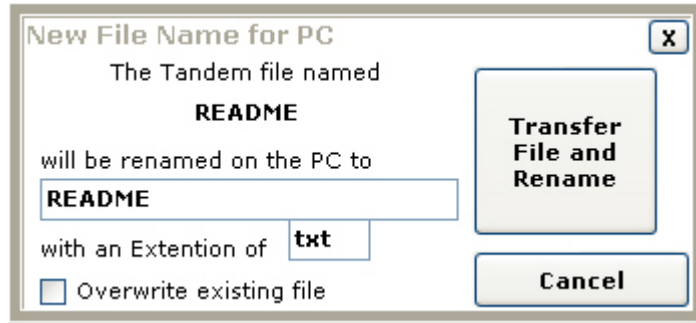
The PASV option enables a Passive FTP connection. A Passive FTP connection is where the FTP client initiates the control and data channels. PASV is usually required in order to access an FTP server behind a firewall (but does not seem to matter for local LAN connections).

The Config button displays a window to set various attributes of the FTP Client such as the editor used for PC file operations, file extensions to treat as ASCII (which result in Edit files on the Tandem), sounds to play after specific operations and turning confirmations off. Press Save to store selections.

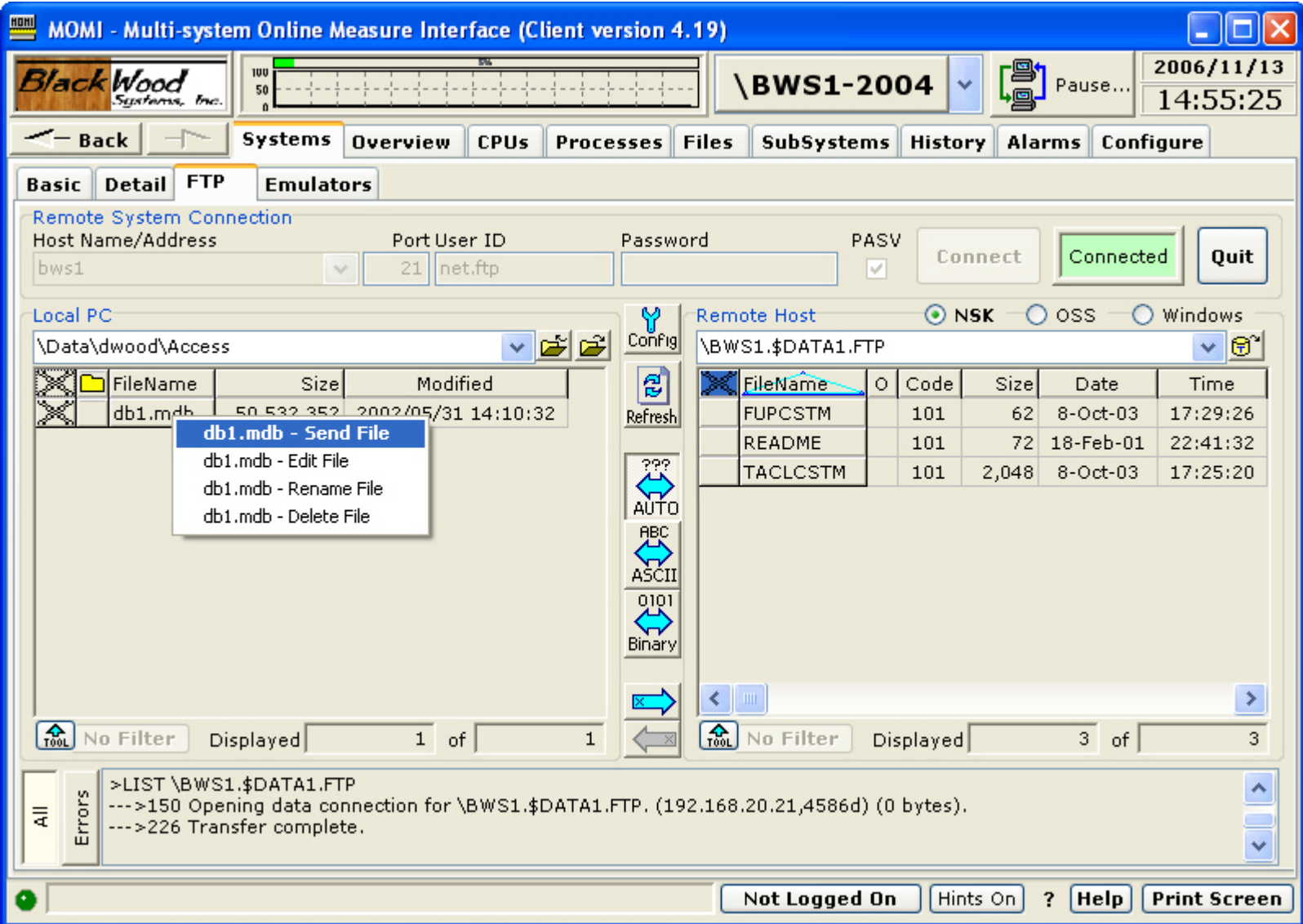


By default, a "New File Name..." window appears when transferring a file. This window displays the action about to take place and allows the user to make alterations.

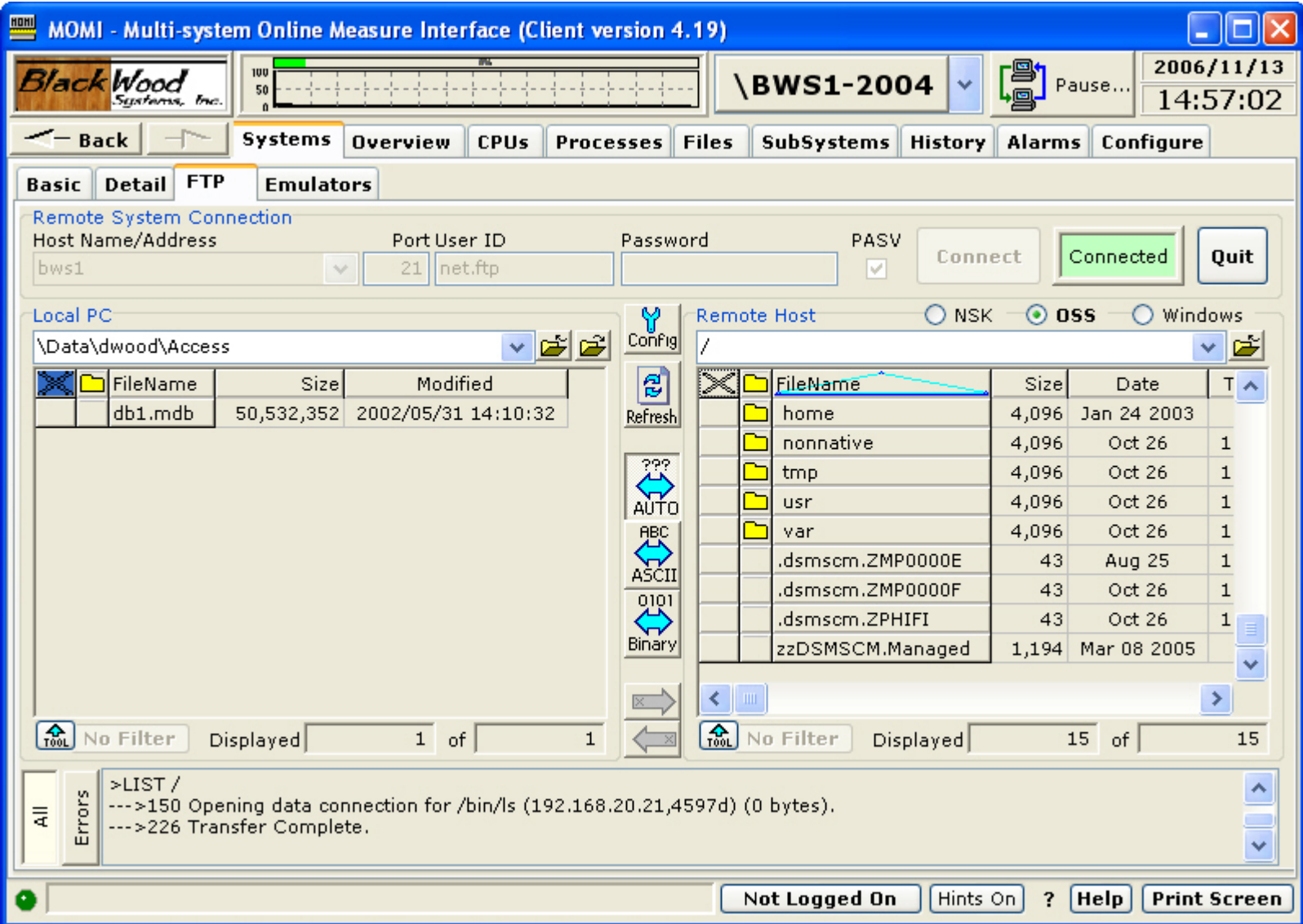




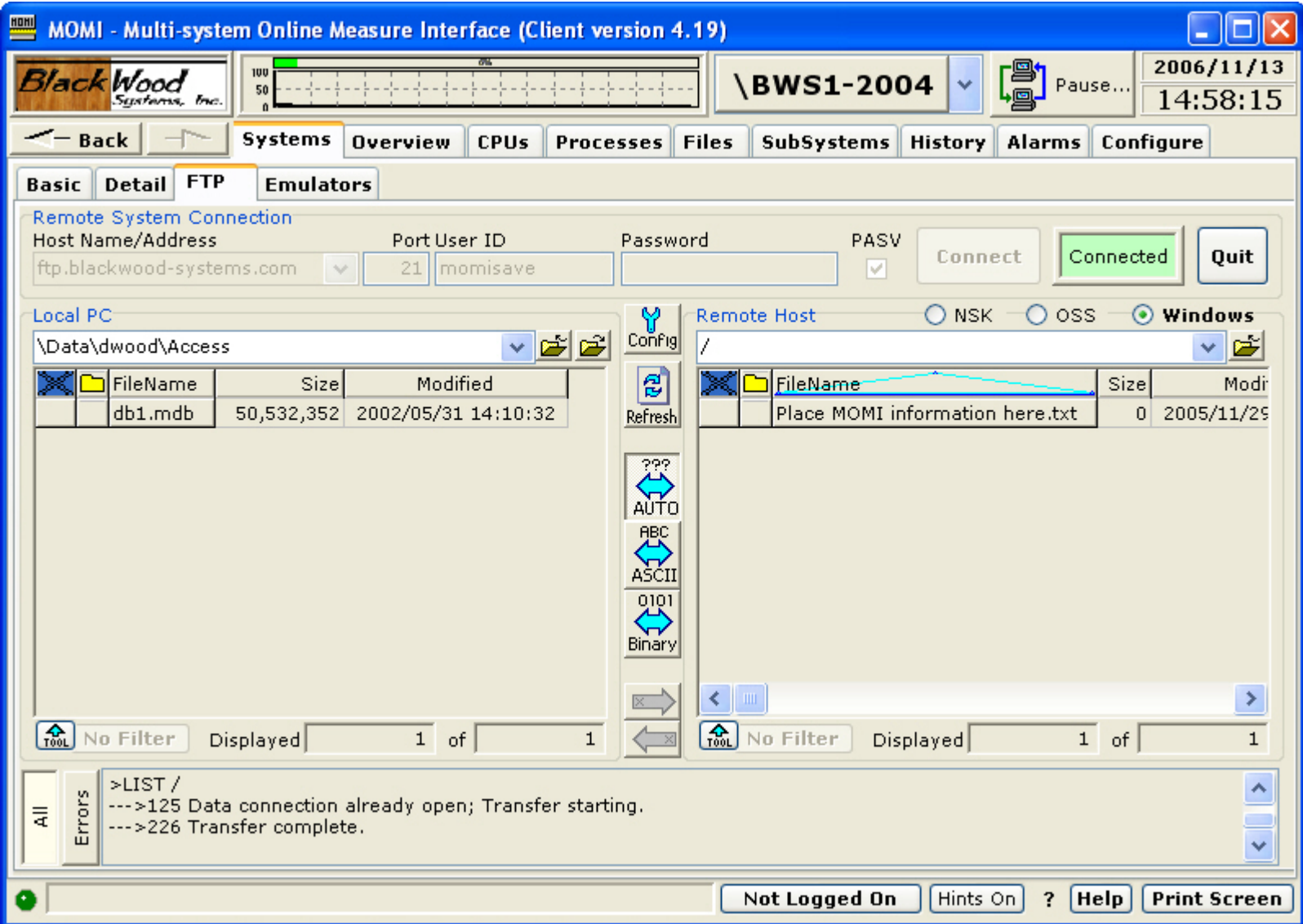
Placing the mouse over a file name, either PC or Tandem, and right-clicking brings up a menu to transfer, edit, rename or delete. Editing a file will launch an editor selected in Config.



Click on the circle next to the OSS label to enable the UNIX like personality in the FTP interface. Folders are displayed for subdirectories (the field is blank for files). Click on a folder to display its contents. Click on the folder with the up arrow (to the right of the current path field) to navigate up one level.



Click on the circle next to the Windows label to enable the conventional PC personality in the FTP interface. Folders are displayed for subdirectories (the field is blank for files). Click on a folder to display its contents. Click on the folder with the up arrow (to the right of the current path field) to navigate up one level.



Press Quit to drop the session with the Tandem FTP server.

Certain FTP activities may temporarily freeze or lock-up other MOMI PC Client screens.

Systems / PING

MOMI (Client version 4.19)

Black Wood Systems, Inc.

\BWS1-2004

2006/12/27 13:33:16

Back *Systems Overview CPUs Processes Files SubSystems History Alarms Configure

*Basic Detail FTP **PING** TraceRoute Emulators

From HOST Name/Address to Ping Count Delay Timeout TCP/IP Stack **PING**

From PC www.google.com 10 1.0 1 \$ZTC0

| Ping | Time | Response Times |
|------|----------|----------------|
| 1 | 13:31:23 | 40.6850 msec |
| 2 | 13:31:24 | 39.5280 msec |
| 3 | 13:31:25 | 41.9960 msec |
| 4 | 13:31:26 | 41.2460 msec |
| 5 | 13:31:27 | 40.9580 msec |
| 6 | 13:31:28 | 40.3100 msec |
| 7 | 13:31:29 | 40.4250 msec |
| 8 | 13:31:30 | 38.6050 msec |
| 9 | 13:31:31 | 41.5410 msec |
| 10 | 13:31:32 | 41.3610 msec |

Finished Clear/Reset

Statistics

Resolved Address 66.102.7.104

Minimum Response 38.6050 msec Sent 10

Maximum Response 41.9960 msec Success 10

Average Response 40.6655 msec Failure 0

Not Logged On Hints On ? Help Print Screen

The Systems / PING screen provides the ability to PING another host or device on the TCP/IP network and determine where the PING is originated either from the currently connected HOST or from the local PC.

PING is the generic name used to describe a diagnostic to test if communication is possible between the source (i.e. HOST or PC) to the destination.

A PING consists of an ICMP echo message that most TCP/IP stacks with acknowledge by simply echoing the original request. Note that some networks disable the ability for devices to respond to the PING.

When a PING is "From HOST" it is generated on the Nonstop system where the BWMOMI server is running using the selected TCP/IP Stack. When "From PC" is selected the PING is generated on the PC running the MOMI PC Client.

The screen is used by selecting either "From Host" or "From PC", entering a destination as an DNS name or IP address and pressing the PING button. Optionally, the number of PING attempts (Count), the time delay in seconds between each attempt, the amount of time to wait for a PING to respond and the TCP/IP Stack to issue the PING through. The center of the screen displays the amount of time each response took and a graphical presentation of the response time. General statistics about the number of attempts, successful and failed pings are also displayed.

The ability to PING from the HOST requires the setup of an additional MOMI server to perform the function. See [General considerations](#) for additional information.

Systems / TraceRoute

MOMI (Client version 4.19)

Black Wood Systems, Inc.

\\BWS1-2004

2006/12/27 13:59:29

Back *Systems Overview CPUs Processes Files SubSystems History Alarms Configure

*Basic Detail FTP PING TraceRoute Emulators

From HOST From PC

Name/Address to Trace: www.google.com

Max Hops: 30 Tries: 4 Timeout: 1 TCP/IP Stack: \$ZTC0

TraceRoute

| Hop | IP Address | Time | Result | Host Name |
|-----|----------------|--------------|----------|------------------------------------|
| 2 | 64.158.131.173 | 16.1870 msec | next | unknown.rni.net |
| 3 | 64.158.131.1 | 20.1100 msec | next | unknown.rni.net |
| 4 | 67.72.69.253 | 19.6800 msec | next | 67.72.69.253.rni.net |
| 5 | 209.0.5.73 | 21.9890 msec | next | 209.0.5.73.rni.net |
| 6 | 209.0.5.81 | 19.3320 msec | next | 209.0.5.81.rni.net |
| 7 | 64.154.128.73 | 22.9090 msec | next | se-3-0-10.hsa1.Phoenix1.Level3.net |
| 8 | 4.68.98.33 | 22.8280 msec | next | ae-2-52.mp2.Phoenix1.Level3.net |
| 9 | 209.247.9.114 | 38.2250 msec | next | as-1-0.bbr1.SanJose1.Level3.net |
| 10 | 4.68.123.176 | 40.9050 msec | next | ae-22-56.car2.SanJose1.Level3.net |
| 11 | 4.79.216.58 | 40.0880 msec | next | *Unknown* |
| 12 | 72.14.233.129 | 39.9660 msec | next | *Unknown* |
| 13 | 216.239.49.54 | 43.0330 msec | next | *Unknown* |
| 14 | 66.102.7.147 | 41.0380 msec | complete | mc-in-f147.google.com |

Finished Clear/Reset

Statistics

Resolved Address: 66.102.7.147

Hops Required: 14

Hop

Not Logged On Hints On ? Help Print Screen

The Systems / TraceRoute screen provides the ability to PING all devices in-between another host or device on the TCP/IP network and determine where the PING is originated either from the currently connected HOST or from the local PC.

PING is the generic name used to describe a diagnostic to test if communication is possible between the source (i.e. HOST or PC) to the destination. A TraceRoute uses a form of PING where the TTL (Time-To-Live) count starts at 1 and is incremented (to an absolute maximum of 255) allowing the display of each intervening device (usually a router) until the destination is reached. The resultant trace of information is an indi-

cation of the number of hops through the devices required to achieve a communications connection end-to-end.

When the TraceRoute is "From HOST" it is generated on the Nonstop system where the BWMOMI server is running using the selected TCP/IP Stack. When "From PC" is selected the TraceRoute is generated on the PC running the MOMI PC Client.

The screen is used by selecting either "From Host" or "From PC", entering a destination as an DNS name or IP address and pressing the TraceRoute button. Optionally, the maximum number of Hops, the retries per device, the amount of time to wait for a response and the TCP/IP Stack to issue the PING through. The center of the screen displays a trace of each device (IP address and DNS name if available) and the amount of time each response took. The graphic displays the response time.

The ability to PING from the HOST requires the setup of an additional MOMI server to perform the function. See [General considerations](#) for additional information.

Systems / Emulators

Special Note: The CAIL Emulator is provided courtesy of [CAIL](#) and is not a component of any purchased MOMI product. The Emulator is a limited-function version of the CAIL CTT/Suite product. BlackWood Systems and CAIL reserves the right to discontinue, limit or alter the availability in future releases. Please see the CAIL Emulator help within the Emulator for additional information. To obtain a full featured emulator, please contact CAIL.

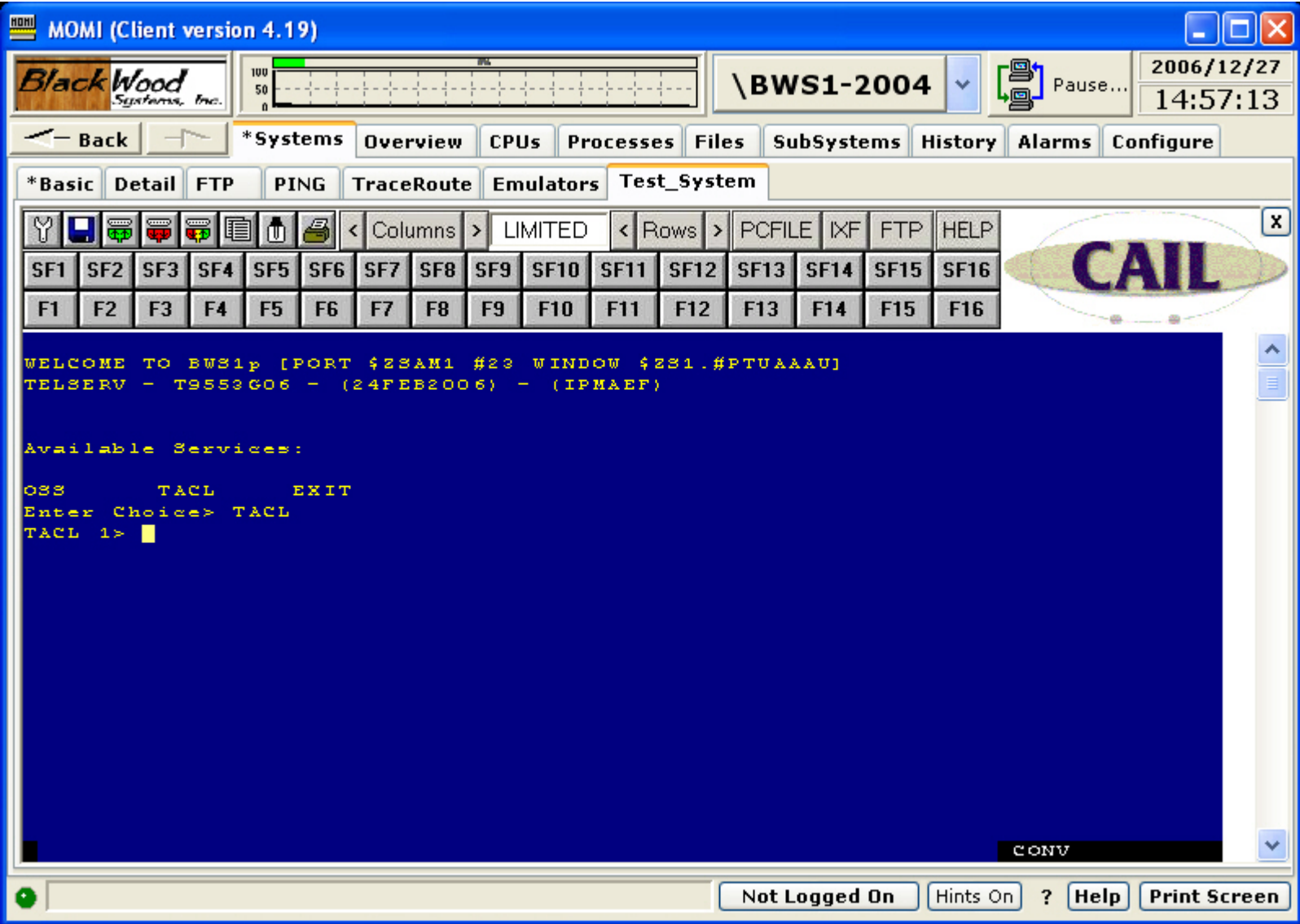
The screenshot displays the MOMI (Client version 4.19) interface. The title bar shows the BlackWood Systems, Inc. logo and a progress indicator. The main menu includes: Back, *Systems (selected), Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. Below this, a sub-menu shows: *Basic, Detail, FTP, PING, TraceRoute, and Emulators (selected). The Emulators section contains a 'Create New Emulator' button and a list of emulators. One emulator is visible: '6530 Test_System INTERNAL system used for test' with the CAIL logo. The status bar at the bottom includes: Not Logged On, Hints On, ? Help, and Print Screen. The system clock in the top right corner shows 2006/12/27 14:25:13.

The Systems / Emulators screen provides the ability to define and launch the CAIL 6530 terminal emulator. This provides command line and full screen access to Nonstop applications.

An emulator is defined by pushing the Create New Emulator button. In the pop-up window enter the Host-Name/IP Address, port (usually the default of 23 for Telserv), Service (by default a selection is displayed once a connection is established), a name for the emulator and a description the press Create. The new button created may then be pressed to launch an emulator. Right-click on the created emulator button to delete.

| HostName/IP Address | Port | Service |
|---------------------|------|---------|
| 192.168.20.10 | 23 | TACL |

An Internal emulator (below) appears as a tab within the MOMI process. An external emulator is launched in a stand-alone window.




Alternately, instead of a the built-in emulator an external program may also be defined.

Create new Emulator X

Type

Internal CAIL External CAIL External Program

External Program to run

C:\Windows\System32\cmd.exe 

Name for this Emulator

command_line

Description

allow direct command

Create **Cancel**

Overview

Main Overview

see [System Quirks](#)

Alarms | **M O M I**® | \NSKIT06-3000 | Pause... | 2008/12/04 14:35:48

← Back | **Systems** | Overview | CPUs | Processes | Files | SubSystems | History | Alarms | Configure

| System Name | Serial # | OS Version | TMF State | trans/sec |
|-------------|----------|------------|----------------------|-----------|
| \NSKIT06 | 054864 | H06.15.00 | Started (MAT at 12%) | 0.10 |

CPU Busy 81%

| CPU, PIN | Process | Pri | PFR | Object | Busy% |
|----------|-----------|-----|-----|----------|-------|
| 02,01188 | | 1 | R | CCOMBE | 94.42 |
| 03,01141 | \$PIG3 | 1 | R | PIG01OT | 77.07 |
| 01,00946 | \$PIG1 | 1 | R | PIG01OT | 69.08 |
| 00,00945 | \$PIG0 | 1 | | PIG01OT | 58.88 |
| 00,00000 | \$MONITOR | 201 | P R | NMONTOR | 1.55 |
| 00,00501 | \$XM00 | 199 | P | MEASCTL | 0.84 |
| 00,00421 | \$ZPTM0 | 201 | P | TCP6MON | 0.71 |
| 01,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.69 |
| 02,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.63 |
| 01,00508 | \$XM01 | 199 | P | MEASCTL | 0.59 |
| 02,00553 | \$XM02 | 199 | P | MEASCTL | 0.58 |
| 00,00691 | \$Z2RC | 100 | R | STDC | 0.56 |
| 00,00318 | \$OSS | 220 | P | TSYSDP2 | 0.52 |
| 00,00265 | | 255 | P | TSMMSGIP | 0.51 |
| 03,00481 | \$XM03 | 199 | P | MEASCTL | 0.49 |
| 01,00297 | \$DATA03 | 220 | P | TSYSDP2 | 0.45 |
| 02,00546 | \$ZPNS | 199 | P | NS | 0.44 |
| 02,01122 | \$CTTC | 148 | | CTSERVE | 0.44 |
| 03,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.39 |

Legend: Interrupt (cyan), Send (blue), Overhead (pink), Busy (yellow)

| Busy % | CPU que | Pressure | Disk i/o |
|--------|---------|----------|----------|
| 69 | 1 | 0 | 99 |
| 75 | 0 | 0 | 215 |
| 100 | 1 | 0 | 0 |
| 81 | 0 | 0 | 0 |

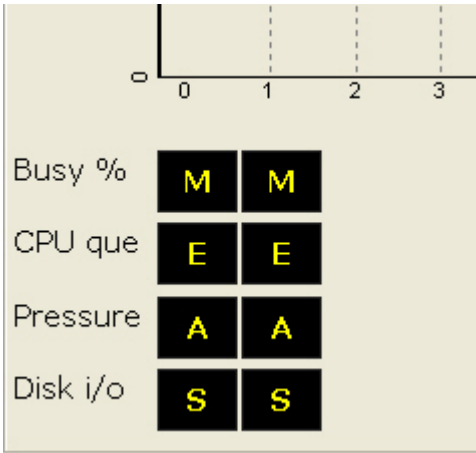
Chat | **Not Logged On** | Hints On | ? Help | Print Screen

The Main Overview screen provides the launch point for general information about the health of the System.

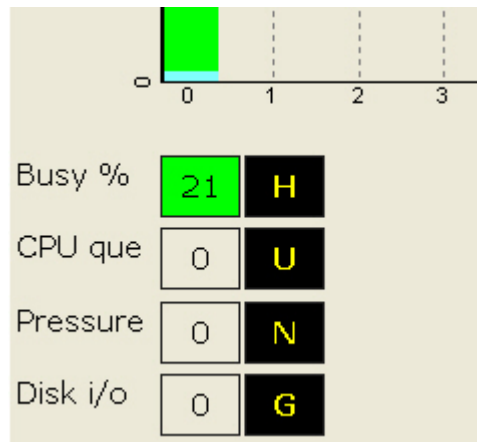
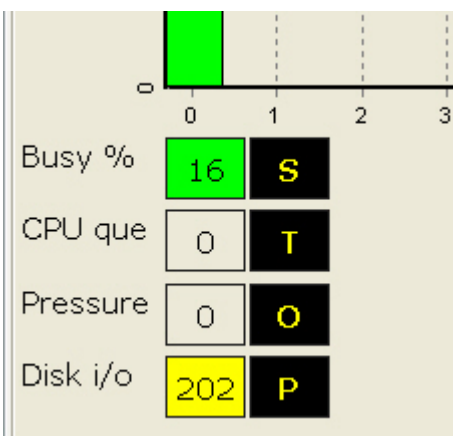
The top left side of the screen contains the System name, System serial number and operating system version. The next two fields provide the state of TMF and the current transactions per second. The TMF State displays the percent utilization of the audit trail (largest value is displayed if TMF is configured with auxiliary audit trails).

The fields in the lower left handle corner Busy %, CPU que, Pressure and Disk i/o display the Overall CPU busy, average CPU queue depth, memory pressure (a value from 0 to 7 where 7 is the highest) and physical disk I/Os per second respectively. Additionally, these fields are used to relate special information as described below.

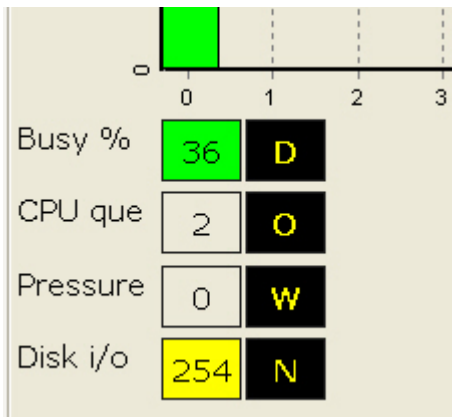
If MEASURE is not started, **MEAS** is reported in each affected processor. Use MEASCOM to start the MEASURE subsystem (for the system or a particular processor):



If a MOMI CPU collector process does not report in a timely manner, typically after 30 seconds, **STOP** is reported. MOMI then issues a Guardian stop on the collector process and the process is automatically restarted by MOMI (the automatic restart occurs approximately 1 minute after the **STOP** is displayed). Technically, the processor is marked as **HUNG** but this is usually not visible if the CPU collector process stops as directed:

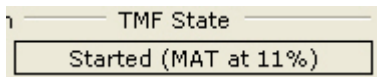


In the event a CPU fails, **DOWN** is reported for the affected CPU. MOMI will automatically restart its collector process for that processor approximately 1 minute after the CPU is reloaded:

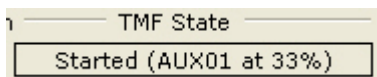


TMF State reports the general status of TMF (Started, Stopped, etc...) along with overflow and other error indicators. The percentage full (i.e. in use) of the largest of the Master (MAT) or Auxiliary (AUXnn) audit trails is also reported in parentheses for most states. Generally speaking, the "worst" state or condition is selected for display.

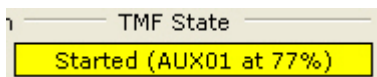
Below are some sample TMF States:



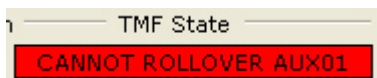
Master audit trail at 11% full



Auxiliary audit trail 1 at 33% full



Auxiliary audit trail 1 at 77% full



Auxiliary audit trail 1 cannot rollover (out of space and no overflow available)



Auxiliary audit trail 1 using overflow



Begin transactions disabled within TMF

| CPU,PIN | Process | Pri | PFR | Object | Busy% |
|----------|-----------|-----|-----|---------|-------|
| 00,00650 | \$Y01F | 150 | | IRGFSRV | 0.55 |
| 00,00757 | \$Y01Q | 100 | R | STDC | 0.51 |
| 01,01403 | \$CTTC | 148 | | CTSERVE | 0.42 |
| 00,00433 | \$ZPTM0 | 201 | P | TCP6MON | 0.41 |
| 00,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.32 |
| 00,00867 | \$Z2HJ | 180 | | STCPUR | 0.31 |

The right side of the screen shows the busiest or top processes on the entire System. The fields listed are the CPU + PIN , process name (blank if unnamed), current priority, PFR fields,

object file name and percent busy.

The Busy% field is the percentage of total CPU busy for the process during the last monitored interval (by default MOMI scans the CPUs every 10 seconds).

The Pri field is the current process priority field. The surrounding box is yellow if the operating system has reduced the process priority and the process is a disk. A red color is used for any other process with a reduced priority. Disk processes will assume the priority of the requesting process while waiting for executing time. It is normal to see a disk process running at different priorities. User processes have their priority lowered by the System if they are determined to be CPU bound (i.e. taking a great deal of CPU resources).

The PFR fields indicate with single letter descriptors if the process is P - Privileged , F - page Faulting or R - on the Ready list. A process is Privileged if it has been granted authority to run without security limitations (many System processes are Privileged). A process needing memory space is page Faulting during the time it takes to free or swap needed memory pages. A process is on the Ready list when it is waiting for CPU execution. Additionally, a process can be on the Ready list while waiting on a page Fault.

Placing the mouse over the CPU,PIN field displays a pop-up window presenting additional information for that process. Below is a sample image:

The image shows a 'Process Detail' pop-up window with the following fields and values:

| Process Detail | | | |
|-------------------|-------------------------------------|------------|--------------------------|
| Process | \$ZPTM0 | Busy% | 0.40% |
| Cpu,Pin | 00,00433 | PFR | P |
| Memory | 2.7 MB | Wait state | %015 |
| State | Runnable | | |
| Process Access ID | 255,255 | | |
| Login Name | SUPER.SUPER | | |
| Process Type | Guardian | | |
| File Name | \$SYSTEM.SYS00.TCP6MON | | |
| Ancestor | \$ZTCP | | |
| Hometerm | \$ZHOME | | |
| GMOM | \$ZM00 | JobID | |
| Created | 2007/07/31 05:58:06 | | 64 07:18:28 |
| Primary | <input checked="" type="checkbox"/> | Backup | <input type="checkbox"/> |
| IPri | 201 | CPri | 201 |

A right click on the CPU,PIN or Process field will bring up a menu allowing the User to select a variety of jumps or actions using the selected process (the actions available vary depending on the process):

| History Alarms Configure | | | | | |
|--------------------------|---------------------|-----|-----|---------|--|
| CPU,PIN | Process | Pri | PFR | Object | |
| 00,00015 | \$ZNET | 175 | P | SCP | |
| 00,00049 | \$ZNET - (00,00015) | | P | TMFCTLG | |
| 00,00041 | | | P | OZEXP | |
| 01,00405 | | | | BWMOMI | |
| 01,00273 | | | P | TSYSDP2 | |
| 01,00295 | | | P | TSYSDP2 | |
| 01,00204 | \$OM01 | 185 | | OMI82OT | |

The Overview screen may also be configured, on the page [Settings / Single Screen](#) to an alternate format that displays EMS information.



MOMI®

\NSBLDE4-3000

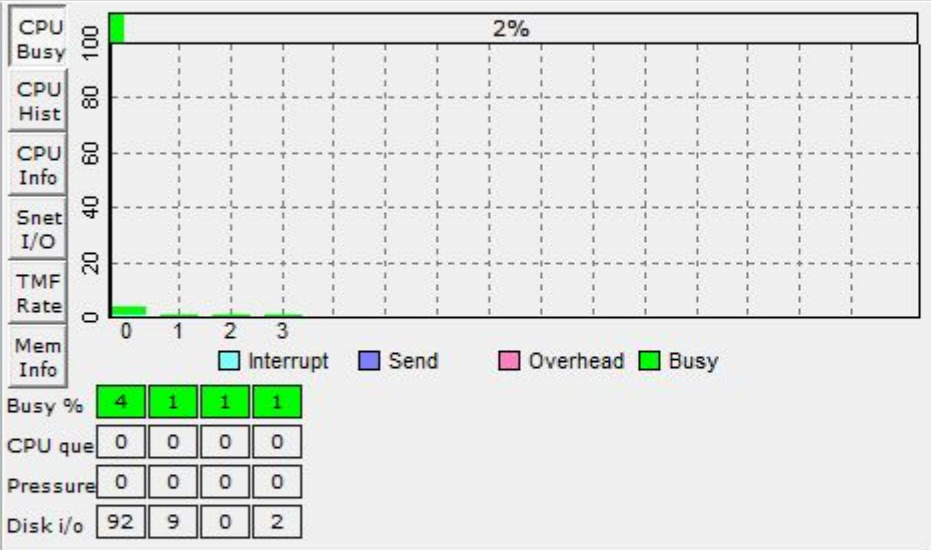


Pause...

2009/01/21
09:11:04

- Back
- Systems
- Overview
- CPU
- Processes
- Files
- SubSystems
- History
- Alarms
- Configure

| System Name | Serial # | OS Version | TMF State | trans/sec |
|-------------|----------|------------|----------------------|-----------|
| \NSBLDE4 | 066666 | 306.05.00 | Started (MAT at 13%) | 0.00 |

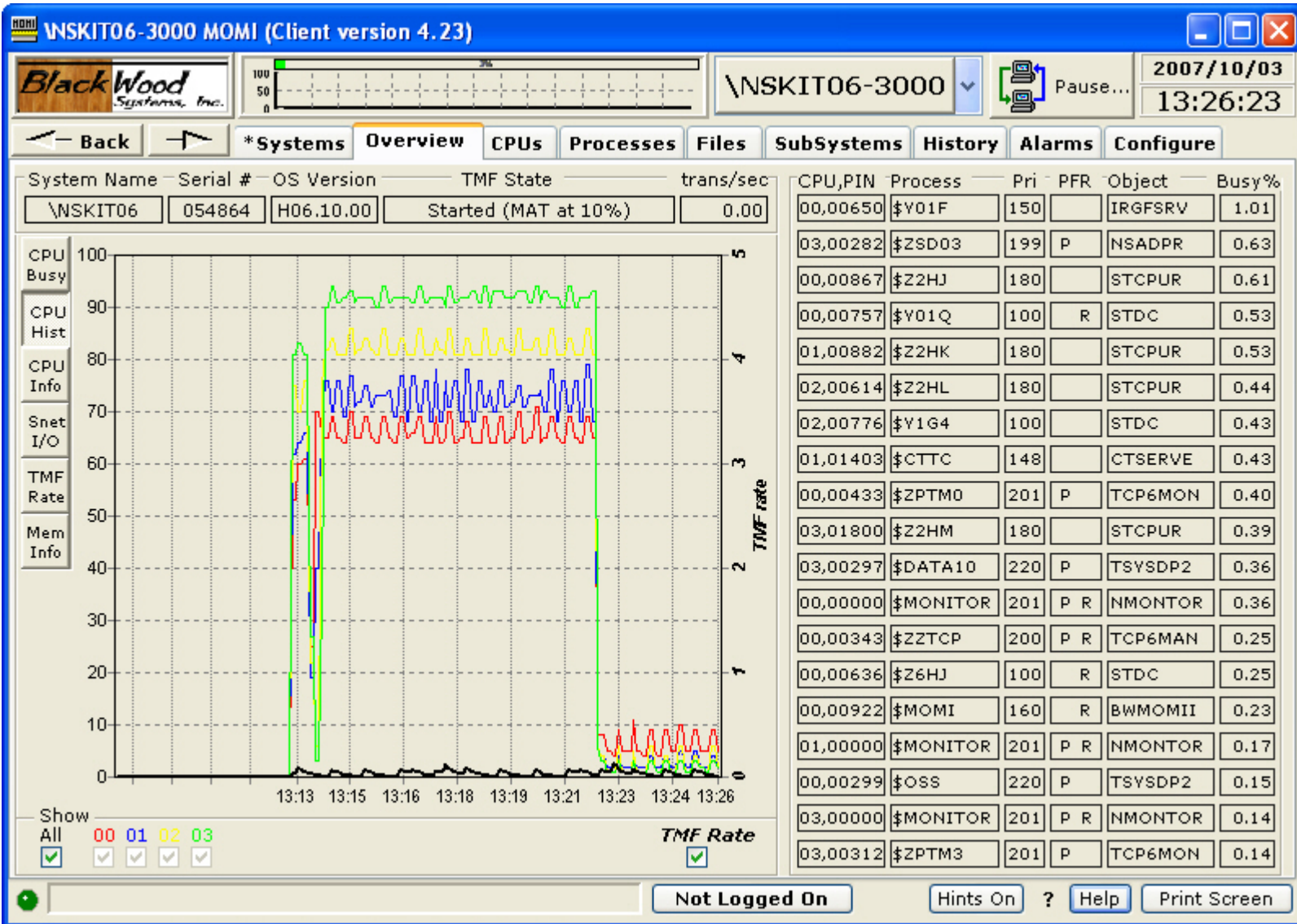


| CPU,PIN | Process | Pri | PFR | Object | Busy% |
|----------|-----------|-----|-----|---------|-------|
| 00,00417 | \$ZTN0 | 148 | R | TELSERV | 1.92 |
| 00,00310 | \$BLITZ | 199 | P | LHOBJ | 1.13 |
| 00,00322 | \$SAS00 | 146 | P R | TSYSDP2 | 0.67 |
| 00,00123 | | 101 | P R | FUP | 0.62 |
| 00,00265 | | 255 | P | TSMSGIP | 0.53 |
| 00,00446 | \$XM00 | 199 | P | MEASCTL | 0.53 |
| 01,00446 | \$XM01 | 199 | P | MEASCTL | 0.48 |
| 02,00393 | \$XM02 | 199 | P | MEASCTL | 0.35 |
| 01,00137 | | 102 | P | FUP | 0.35 |
| 03,00385 | \$XM03 | 199 | P | MEASCTL | 0.33 |
| 00,00266 | | 255 | P | TSCOMIP | 0.30 |
| 03,00264 | | 255 | P | TSMSGIP | 0.28 |
| 00,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.25 |
| 03,00147 | | 100 | P | FUP | 0.23 |

EMS Messages

| ? | Date/Time | PName | System ID | Event | Messages | Collector=" \$0 - EMS LOG" | Filter="NONE" |
|---|----------------|--------|----------------|-------|--|----------------------------|---------------|
| | 01-21 09:10:45 | \$ZNET | TANDEM.SCP.G05 | 37 | \NSBLDE4.\$ZNET: Device \NSBLDE4.\$X3VS.#ZSPI had File Sys Err | | |
| | 01-21 09:09:45 | \$ZNET | TANDEM.SCP.G05 | 37 | \NSBLDE4.\$ZNET: Device \NSBLDE4.\$X3VS.#ZSPI had File Sys Err | | |
| | 01-21 09:08:45 | \$ZNET | TANDEM.SCP.G05 | 37 | \NSBLDE4.\$ZNET: Device \NSBLDE4.\$X3VS.#ZSPI had File Sys Err | | |
| | 01-21 09:07:45 | \$ZNET | TANDEM.SCP.G05 | 37 | \NSBLDE4.\$ZNET: Device \NSBLDE4.\$X3VS.#ZSPI had File Sys Err | | |

Overview CPU History



The Overview CPU History screen charts the busy history of the CPU's on the System with the TMF transaction rate. The last 200 values are retained.

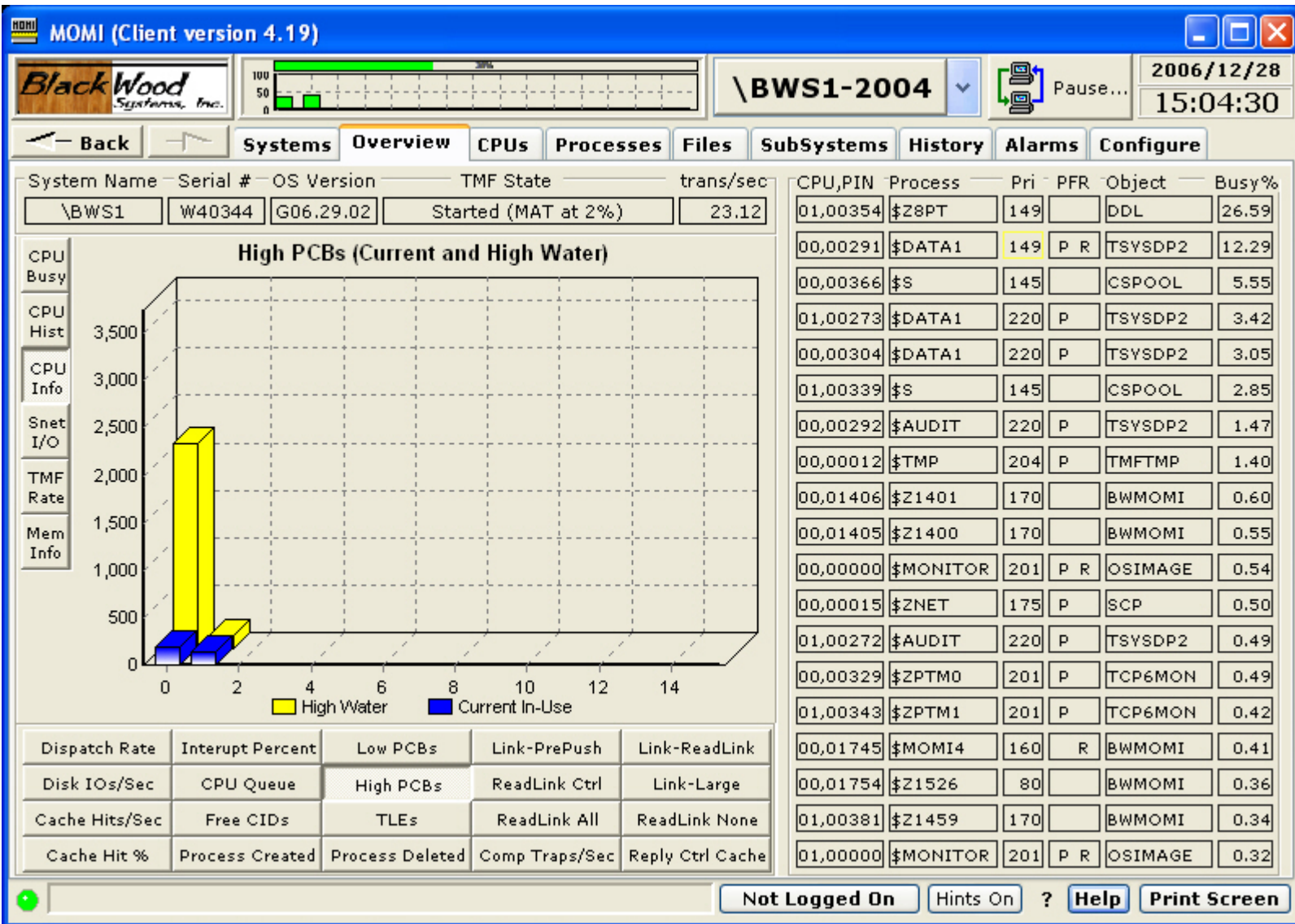
Data for this chart is captured every time the MOMI Client receives an update from the MOMI Server. This chart resets every time the Client connects or reconnects. However, from Client version 3.85 onward, this screen is retained if the system is marked on the screen [Systems / Basic](#).

Selection boxes near the bottom of the screen may be unchecked to removed CPUs or the TMF Rate from the display.

Placing your mouse over a chart line and clicking will display the top few processes at that point in time.

| CPU 01 at 13:25:20 reported 2% busy | | | | |
|-------------------------------------|-----------|----------|----------|-------|
| CPU,PIN | Process | Object | Priority | Busy% |
| 01,00882 | \$Z2HK | STCPUR | 180 | 0.54 |
| 01,01403 | \$CTTC | CTSERVE | 148 | 0.44 |
| 01,00000 | \$MONITOR | NMONTOR | 201 | 0.17 |
| 01,00649 | \$Z1V5 | STCOMM | 150 | 0.11 |
| 01,01474 | \$Y1FT | STCOMM | 150 | 0.11 |
| 01,00265 | | TSMMSGIP | 255 | 0.08 |

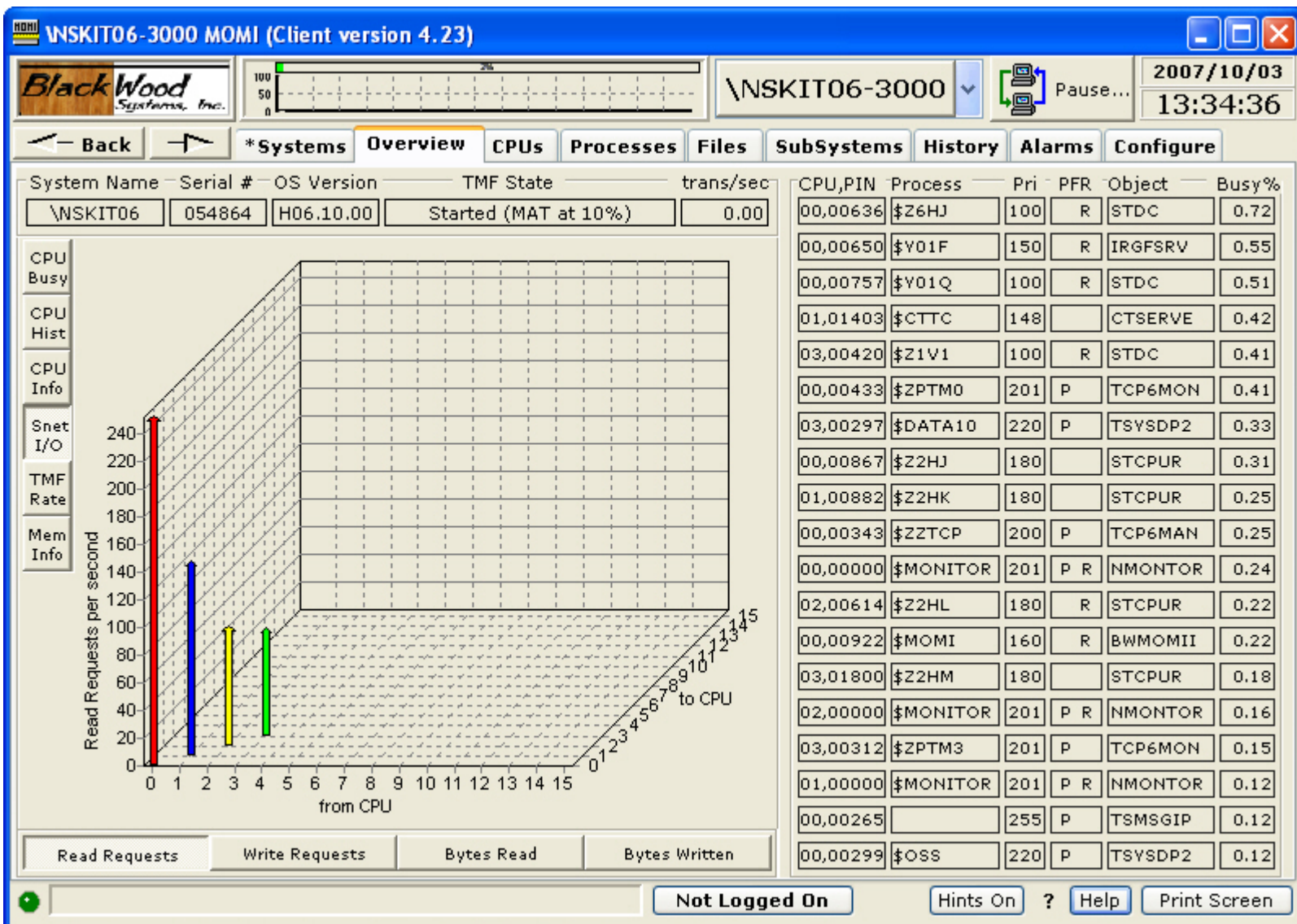
Overview CPU Info



The Overview CPU Info charts various values pertaining to a CPU.

Place the mouse over the Bar to see the actual value. Several bars have mouse clicks available to cause a jump to obtain more detailed information about a particular value. For example, pressing the Comp Traps button and clicking on a bar will jump to the Processes / Process Entity screen and configure a process entity measurement to display the highest generators of Comp Traps (Computational Traps) in the particular CPU.

Overview Snet I/O

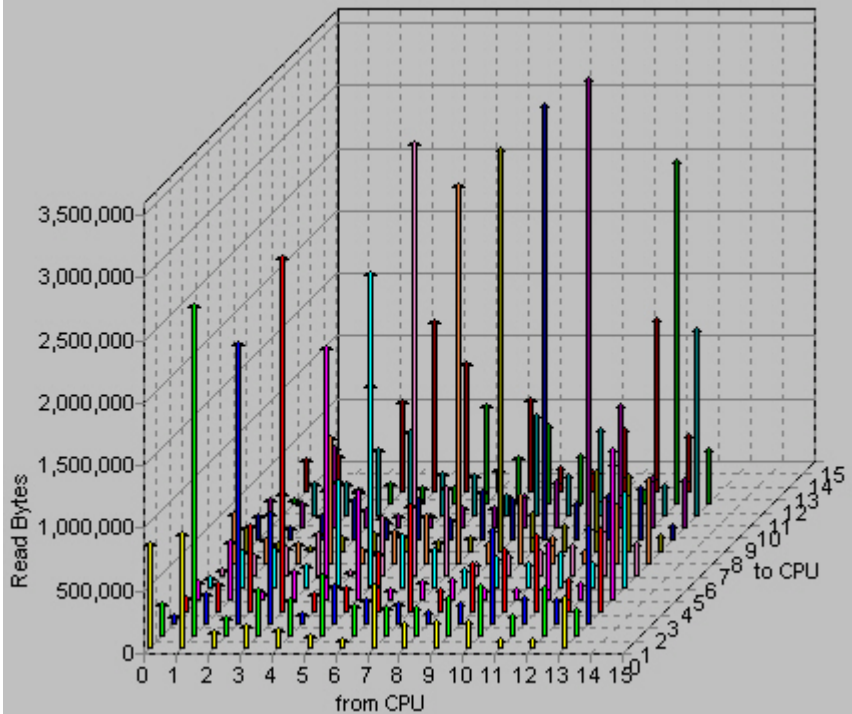


The Overview Snet I/O screen displays the traffic in and out of the ServerNet interconnects at the CPU level. Certain traffic is counted twice, so the chart is just a general idea of the traffic rate and distribution.

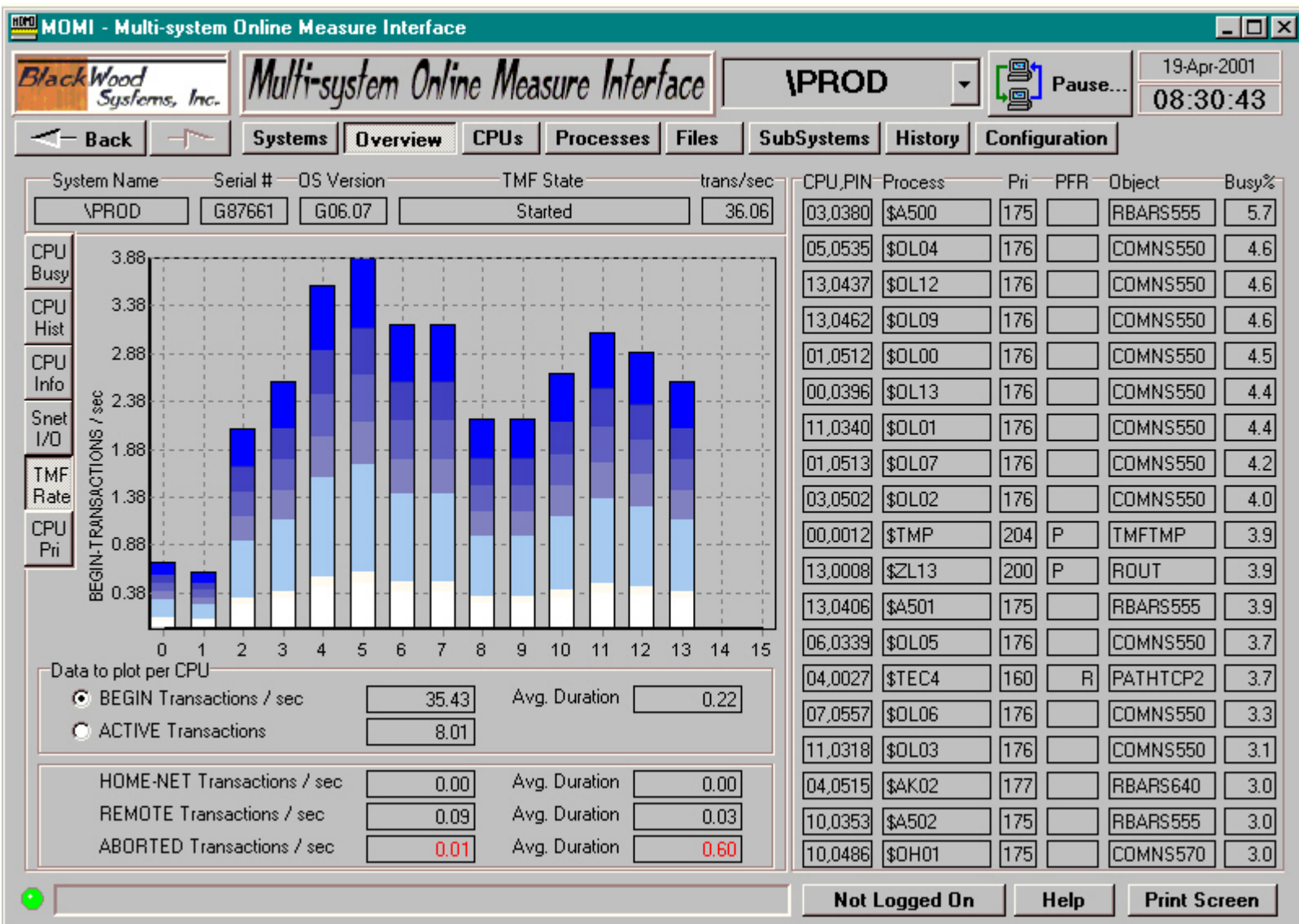
The chart is 3-dimensional and presents data transfers from all CPUs to all CPUs. On older ServerNet systems the chart appears more 3-dimensional than on newer systems. Newer systems display a 3-dimensional effect under heavy load.

The chart presents the Read and Write Requests and the Read and Write Byte rates.

Below is a portion of the same screen from an older system showing the 3-dimensional affect.



Overview TMF Rate



The Overview TMF rate chart presents the TMF transaction rate at a per CPU level.

Two options are available. Plotting data at BEGIN shows the count of transactions that were started. Plotting data at ACTIVE shows the number of transactions that were started but not yet completed. ACTIVE transactions are an approximation, based on available information from MEASURE.

Overview Mem Info

see [System Quirks](#)

The screenshot displays the 'Overview Mem Info' screen for the NSKIT06-3000 MOMI (Client version 4.23). The interface includes a top navigation bar with tabs for *Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The 'Overview' tab is selected.

System information at the top shows: System Name: \NSKIT06, Serial #: 054864, OS Version: H06.10.00, TMF State: Started (MAT at 10%), and trans/sec: 0.00. The date and time are 2007/10/03 13:36:30.

The main area features a 'Virtual Memory' bar chart. The Y-axis represents 'Memory in MegaBytes' from 0 to 6,500. The X-axis represents CPU units from 0 to 15. The chart shows four bars for CPUs 0, 1, 2, and 3. Each bar is divided into three segments: green (Reserved (In-use)), yellow (Reserved Peak (High Water)), and red (Allocated (Configured)). Blue diamonds indicate 'Available (Free)' memory. A legend at the bottom of the chart includes:

- Allocated (Configured)
- Reserved Peak (High Water)
- Reserved (In-use)
- Available (Free)

Below the chart are tabs for Virtual Memory, Physical Memory, Locked Memory, and Misc. Memory. The 'Virtual Memory' tab is active.

On the right side, a table lists running processes with columns for CPU,PIN, Process, Pri, PFR, Object, and Busy%.

| CPU,PIN | Process | Pri | PFR | Object | Busy% |
|----------|-----------|-----|-----|----------|-------|
| 00,00650 | \$Y01F | 150 | | IRGFsrv | 0.90 |
| 00,00757 | \$Y01Q | 100 | R | STDC | 0.72 |
| 03,00282 | \$ZSD03 | 199 | P | NSADPR | 0.62 |
| 00,00867 | \$Z2HJ | 180 | | STCPUR | 0.62 |
| 01,00882 | \$Z2HK | 180 | | STCPUR | 0.54 |
| 01,01403 | \$CTTC | 148 | | CTSERVE | 0.44 |
| 02,00614 | \$Z2HL | 180 | | STCPUR | 0.43 |
| 00,00433 | \$ZPTM0 | 201 | P | TCP6MON | 0.41 |
| 00,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.40 |
| 03,01800 | \$Z2HM | 180 | | STCPUR | 0.38 |
| 00,00343 | \$ZZTCP | 200 | P | TCP6MAN | 0.25 |
| 01,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.21 |
| 00,00922 | \$MOMI | 160 | R | BWMOMII | 0.21 |
| 00,00265 | | 255 | P | TSMMSGIP | 0.15 |
| 00,00299 | \$OSS | 220 | P | TSYSDP2 | 0.15 |
| 03,00312 | \$ZPTM3 | 201 | P | TCP6MON | 0.14 |
| 03,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.13 |
| 02,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.13 |
| 03,00420 | \$Z1V1 | 100 | | STDC | 0.11 |

At the bottom of the screen, there are buttons for 'Not Logged On', 'Hints On', 'Help', and 'Print Screen'.

The Overview Mem Info screen presents the status of various aspects of virtual memory.

Each process running in a CPU consumes both physical and virtual memory. Virtual memory is the underlying disk space made available via NSKCOM to each CPU. Typically, a CPU has allocated twice the amount of virtual memory than physical memory.

Physical memory is the memory actually present in the CPU. For example, you have a 2 Gigabyte processor.

Not all memory is available for virtual use. When memory is locked, it is not allowed to swap to disk. A certain amount of memory is always locked by the operating system at startup. This amount varies as processes start and stop.

Misc. Memory is a 'catch area' for other useful memory counters.

- Un-sponsored memory is memory that is temporarily not owned by any process but must remain allocated.
- Memory pressure is a value from 0 to 7 where 0 is low. It is an indicator of the demand for memory. Systems with plenty of memory have a pressure of 0.
- A page fault is the situation where a memory page is needed but not present. This occurs when a process is first started and continues until all needed memory is accessed at least once. Additionally, a page fault can occur when memory that was previously accessed is no longer present, perhaps due to another process needing memory.
- Memory Queue is an indication of the number of processes waiting for memory. Newer systems do not seem to have a general memory queue. The servicing of page faults is now handled within the context of a user process (via system code in the background). On older machines, a memory queue was a second ready list because a process must first have memory accessible before it can wait to execute.

Overview EMS Msgs

System Name: \NSKIT06 | Serial #: 054864 | OS Version: H06.15.00 | TMF State: Started (MAT at 12%) | trans/sec: 0.00

Collector: \$0 - EMS LOG | Filter: NONE

| ? | Date/Time | PName | System ID | Event | Message |
|---|----------------|---------|---------------------|-------|---------|
| E | 12-04 14:36:16 | \$ZTN5 | TANDEM.TELSERV.H01 | 8 | Soc |
| | 12-04 14:33:02 | \$ZBAT | TANDEM.NETBATCH.D30 | 202 | \NS |
| | 12-04 14:33:01 | \$ZBAT | TANDEM.NETBATCH.D30 | 102 | \NS |
| | 12-04 14:31:57 | \$V5DBR | ESQ.1001.G06 | 3861 | <DE |
| E | 12-04 14:31:16 | \$ZTN0 | TANDEM.TELSERV.H01 | 8 | Soc |
| E | 12-04 14:26:15 | \$ZTN5 | TANDEM.TELSERV.H01 | 8 | Soc |
| E | 12-04 14:23:24 | \$ZPTM0 | TANDEM.ZTC6.H06 | 19 | 0.T4 |
| E | 12-04 14:23:09 | \$ZPTM0 | TANDEM.ZTC6.H06 | 19 | 0.T4 |
| | 12-04 14:21:57 | \$V5DBR | ESQ.1001.G06 | 3861 | <DE |
| E | 12-04 14:21:15 | \$ZTN0 | TANDEM.TELSERV.H01 | 8 | Soc |
| | 12-04 14:19:06 | \$OVM01 | TANDEM.OVMON.H01 | 2103 | OVM |
| E | 12-04 14:18:06 | \$OVM01 | TANDEM.OVMON.H01 | 2133 | OVM |
| E | 12-04 14:16:15 | \$ZTN5 | TANDEM.TELSERV.H01 | 8 | Soc |
| | 12-04 14:11:56 | \$V5DBR | ESQ.1001.G06 | 3861 | <DE |
| E | 12-04 14:11:15 | \$ZTN0 | TANDEM.TELSERV.H01 | 8 | Soc |
| | 12-04 14:06:56 | \$Z085 | DATADSGN.2.D20 | 10 | COM |
| | 12-04 14:06:54 | \$Z085 | DATADSGN.2.D20 | 16 | COM |
| | 12-04 14:06:52 | \$Z085 | DATADSGN.2.D20 | 10 | COM |
| | 12-04 14:06:50 | \$Z085 | DATADSGN.2.D20 | 16 | COM |
| | 12-04 14:06:48 | \$Z085 | DATADSGN.2.D20 | 10 | COM |
| | 12-04 14:06:47 | \$Z085 | DATADSGN.2.D20 | 16 | COM |

| CPU,PIN | Process | Pri | PFR | Object | Busy% |
|----------|-----------|-----|-----|----------|-------|
| 02,01188 | | 1 | R | CCOMBE | 94.12 |
| 03,01141 | \$PIG3 | 1 | R | PIG01OT | 76.88 |
| 01,00946 | \$PIG1 | 1 | R | PIG01OT | 69.41 |
| 00,00945 | \$PIG0 | 1 | R | PIG01OT | 59.83 |
| 00,00000 | \$MONITOR | 201 | P R | NMONTOR | 1.58 |
| 00,00501 | \$XM00 | 199 | P | MEASCTL | 0.80 |
| 00,00421 | \$ZPTM0 | 201 | P | TCP6MON | 0.71 |
| 01,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.69 |
| 02,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.64 |
| 02,00553 | \$XM02 | 199 | P | MEASCTL | 0.59 |
| 01,00508 | \$XM01 | 199 | P | MEASCTL | 0.55 |
| 03,00481 | \$XM03 | 199 | P | MEASCTL | 0.49 |
| 00,00265 | | 255 | P | TSMMSGIP | 0.47 |
| 02,00546 | \$ZPNS | 199 | P | NS | 0.45 |
| 00,00318 | \$OSS | 220 | P | TSYSDP2 | 0.45 |
| 02,01122 | \$CTTC | 148 | | CTSERVE | 0.44 |
| 03,00000 | \$MONITOR | 201 | P R | NMONTOR | 0.41 |
| 00,00583 | \$X8F6 | 180 | | STCPUR | 0.41 |
| 00,01029 | \$X2MH | 180 | | STCPUR | 0.41 |

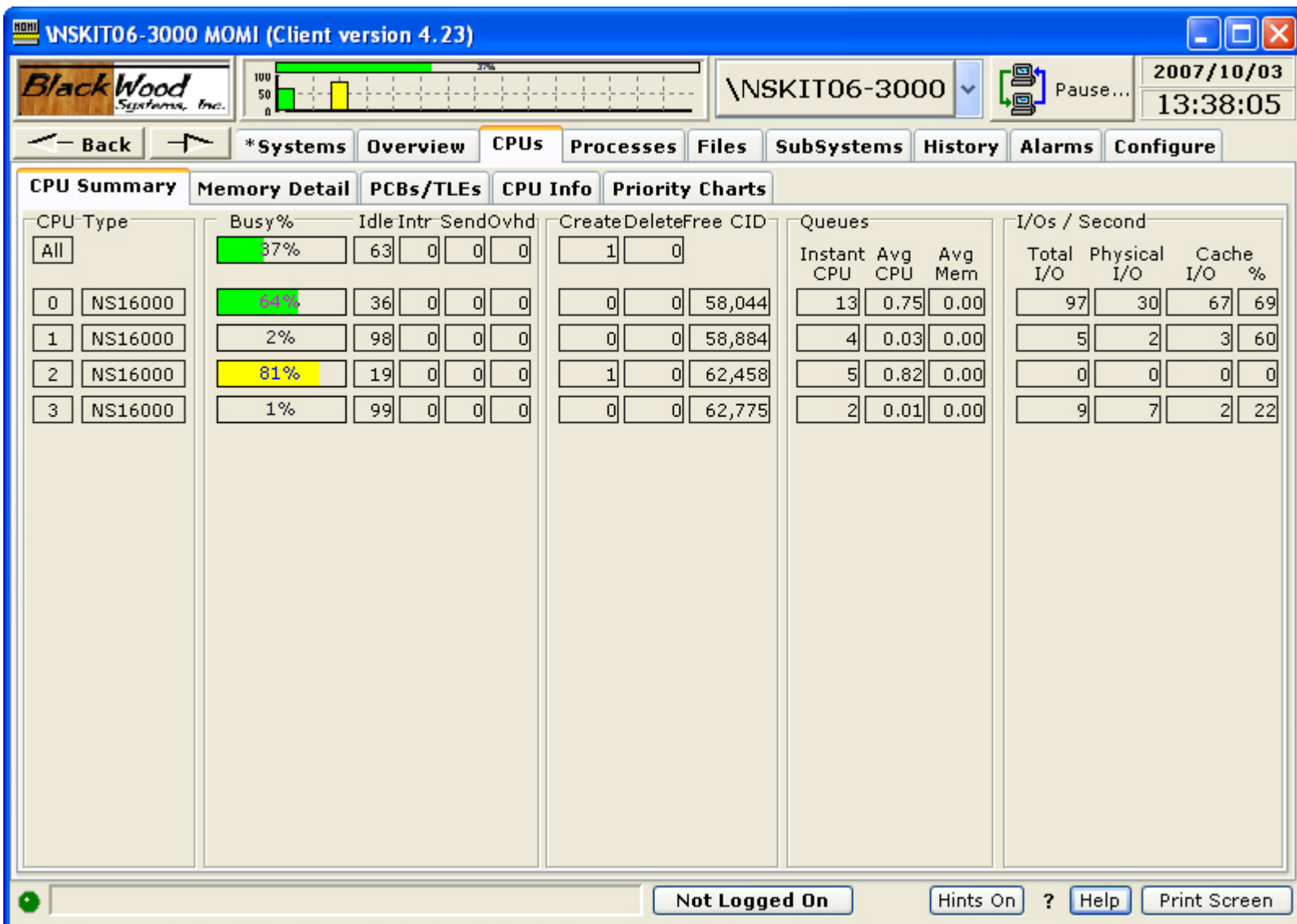
Chat | Not Logged On | Hints On | ? | Help | Print Screen

The Overview EMS Msgs screen presents EMS log messages from the system log \$0.

Place the mouse over an EMS line and a pop-up window displays the rest of the message.

CPUs

CPUs / CPU Summary



The CPUs / CPU Summary screen provides high level detail on the activity of each processor in the System.

Busy % breaks down the total CPU busy value into Interrupts, Send and Overhead. Send busy time is not found on newer ServerNet processors, only on older platforms.

Processes created and deleted give an indication as to the level of process turnover on the System. Typical Guardian-based processes usually start and stay started. A high process turnover may indicate a problem. OSS-type processes usually have a much higher turnover due to the nature of the UNIX-like environment.

CIDs are a MEASURE resource used to contain counters for measurements. Free CIDs must be available to support current and additional measurements.

The CPU queue is reported as Instant, or what is in the queue right now, and Average, which is the queue over the Interval period. The Instant queue is a whole number of processes while the Average is a decimal value. The Average memory queue is only available (i.e. have a non-zero value) on older platforms.

I/Os per second indicate the gross total disk I/O activity at the CPU level. The physical I/Os plus the I/Os satisfied from cache equal the total I/Os. The percent of cache hits indicates the overall effectiveness of the disk cache. High levels of I/Os with a low cache hit percentage may indicate insufficient cache allocated to disk.

CPUs / Memory Detail

The screenshot shows the MOMI interface with the following details:

- Window Title:** MOMI - Multi-system Online Measure Interface (Client version 3.76)
- System:** \BWS1 Fast - 2002
- Date/Time:** 2004/06/18 15:23:51
- Navigation:** Back, Systems, Overview, CPUs (selected), *Processes, Files, *SubSystems, History, Configure
- Sub-Menu:** CPU Summary, Memory Detail (selected), PCBs/TLEs, CPU Info, Priority Charts
- Table Data:**

| CPU | Memory in Megabytes | | | | Max | | Page Faults | CME Events | UCME Events | Memory Pressure | Memory Q-Len |
|-----|---------------------|------|------|--------|--------|----------|-------------|------------|-------------|-----------------|--------------|
| | Physical | Swap | Free | Locked | Locked | Lockable | | | | | |
| 0 | 512 | 508 | 38 | 176 | 189 | 444 | 0 | 1 | 0 | 0 | 0 |
| 1 | 512 | 508 | 15 | 191 | 192 | 444 | 0 | 0 | 0 | 0 | 0 |
- Footer:** Not Logged On, Help, Print Screen

The CPUs / Memory Detail screen provides the detail of the physical memory of each processor.

Physical memory refers to what was installed in the CPU, such as a 2 GigaByte processor. Swappable is the memory available for virtual memory usage. Memory that is locked is forced to remain in the processor and may not be swapped out to disk (i.e. virtual memory). System processes, control blocks and I/O buffers are examples of memory that is usually locked.

Page faults occur when a process needs to access memory but it is not present. The System must either read the memory from disk or create a new page.

CME (Correctable Memory Errors) is the situation where hardware checking logic indicates a memory bit was in error (as determined by a checksum algorithm) but the System could recover from the event. CMEs are usually transient in nature.

UCME (Uncorrectable Memory Errors) is the situation where the hardware checking logic indicates a memory bit(s) was in error (as determined by a checksum algorithm) but the System could NOT recover from the event. A UCME located in an unused area of memory is 'locked out' from further usage. A UCME in a User process may cause the process to be abended by the operating system. A UCME in a system process or system data area may cause the operating system to halt the CPU.

Memory pressure is an indication of the need for memory. This value ranges from 0 to 7, with 0 being no pressure and 7 being extreme pressure. Observation of this value indicates it is an average over time that increases rather rapidly but decreases rather slowly.

Memory queue length is the number of processes waiting for memory. Newer platforms do not see a value in this field because memory service occurs within the context of the process itself.

CPUs / PCBs/TLEs

The screenshot shows the MOMI interface with the following components:

- Header:** MOMI - Multi-system Online Measure Interface (Client version 3.76)
- Logo:** Black Wood Systems, Inc.
- System:** \BWS1 Fast - 2002
- Date/Time:** 2004/06/18 15:24:46
- Navigation:** Back, Systems, Overview, CPUs (selected), *Processes, Files, *SubSystems, History, Configure
- Sub-Menu:** CPU Summary, Memory Detail, PCBs/TLEs (selected), CPU Info, Priority Charts
- Summary:**
 - Low PCB's: 95
 - High PCB's: 302
 - TLE's: 164
- Table:**

| CPU | PCB's | Low PCB's | | | | High PCB's | | | | TLE's | | | |
|-----|-------|-----------|---------|------|--------|------------|---------|-------|--------|---------|---------|--------|--------|
| | | Current | Highest | Free | Failed | Current | Highest | Free | Failed | Current | Highest | Config | Failed |
| 0 | 193 | 45 | 46 | 210 | 0 | 148 | 159 | 3,596 | 0 | 92 | 112 | 3,600 | 0 |
| 1 | 204 | 50 | 53 | 205 | 0 | 154 | 170 | 3,590 | 0 | 72 | 101 | 3,600 | 0 |
- Status Bar:** Not Logged On, Help, Print Screen

The CPUS / PCBs/TLEs screen provides details on the availability of Process Control Blocks (PCB) and Time List Elements (TLE).

Each running process on the system requires one PCB. Additionally, a process may require a TLE, if it has requested notification of an elapsed amount of time.

Any failure to allocate one of these resources shows in **RED**.

CPUs / CPU Info

The screenshot shows the 'CPU Info' screen in the NSKIT06-3000 MOMI software. The interface includes a navigation menu at the top with options like 'Back', '*Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. Below this, there are sub-tabs for 'CPU Summary', 'Memory Detail', 'PCBs/TLEs', 'CPU Info', and 'Priority Charts'. The 'CPU Info' tab is active, displaying a table of CPU information and several system configuration fields.

| CPU | Name | CPU Type | CPU Model | Mem Page Size | System Loads | Time since Load | Busy since Load | Idle since Load | Ir |
|-----|-------|----------|-----------|---------------|--------------|-----------------|-----------------|-----------------|----|
| 0 | NSE-A | 10 | 1 | 16,384 | 0 | 65 05:36:40 | 1 04:01:51 | 63 23:15:57 | |
| 1 | NSE-A | 10 | 1 | 16,384 | 0 | 64 07:09:22 | 0 20:37:06 | 63 08:53:07 | |
| 2 | NSE-A | 10 | 1 | 16,384 | 0 | 64 01:02:32 | 0 20:42:56 | 63 02:53:50 | |
| 3 | NSE-A | 10 | 1 | 16,384 | 0 | 64 01:01:55 | 0 16:48:15 | 63 06:54:25 | |

System Information Fields:

- System: SysNN Volume Local Time Offset: SysGen Time:
- Expand System Number: ColdLoad Time:

At the bottom of the window, there are buttons for 'Not Logged On', 'Hints On', 'Help', and 'Print Screen'.

The CPUs / CPU Info screen presents an assortment of miscellaneous System and processor information.

The Local Time Offset is a system value used to determine LCT (Local Civil Time) and LST (Local Standard Time). The NonStop System technically maintain internal time as GMT (Greenwich Mean Time) and use the Local Time Offset to present LCT. Internally using GMT provides an easy and safe value for systems networked throughout the world to exchange.

The SysGen Time is when the Operating System was generated (via DSM/SCM).

The Cold Load time is when the system was loaded with the Operating System. The System Generation time is when the operating system was constructed. The Expand system number is a unique numeric identifier from 0 to 254 that identifies a System linked on a network.

Other fields of interest are the System Loads. This indicates the number of times the operating system was started or loaded from \$SYSTEM. Breakpoints are the number of stops or holds placed in an executing process by the system debugger Inspect. Older platforms had to configure the maximum number of breakpoints allowed in a CPU.

CPUs / Priority Charts / Charts

MOMI - Multi-system Online Measure Interface (Client version 3.76)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/06/18 15:26:55

Back Systems Overview **CPUs** *Processes Files *SubSystems History Configure

CPU Summary Memory Detail PCBs/TLEs CPU Info **Priority Charts**

Charts 1 Charts 2

CPU Percent Busy Per Priority

56%

| Process Priority | Percent of CPU |
|------------------|----------------|
| 255 | ~1 |
| 235 | ~1 |
| 215 | ~1 |
| 195 | ~1 |
| 175 | ~1 |
| 155 | ~1 |
| 135 | ~1 |
| 115 | ~1 |
| 95 | ~1 |
| 75 | ~1 |
| 55 | ~1 |
| 35 | ~1 |
| 15 | ~1 |

Scale 0-100 Scale 0-MAX

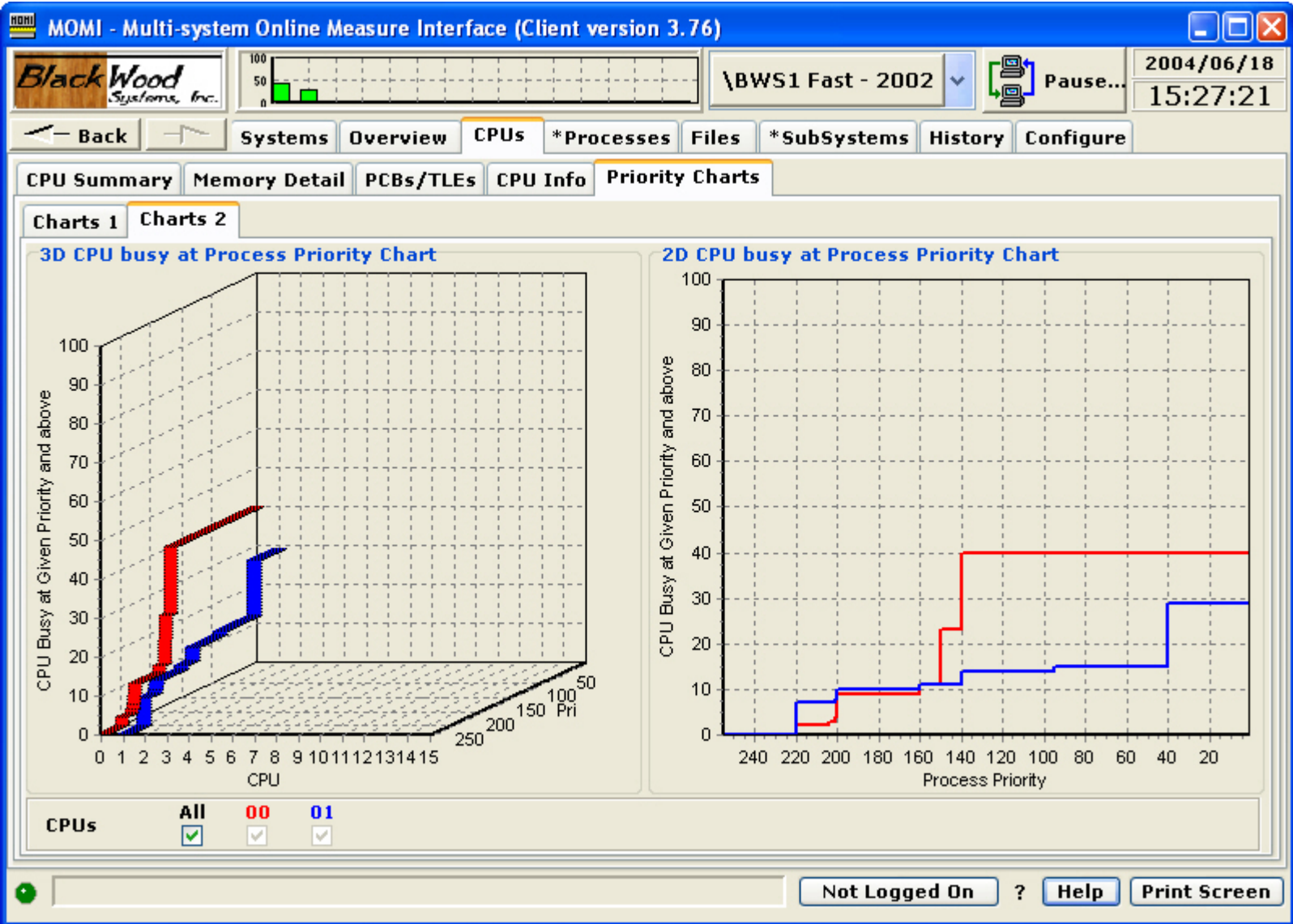
CPU 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

CPU Busy with Processes Priority 150 and above

| Process Priority | CPU Busy |
|------------------|----------|
| 0 | ~55 |
| 1 | ~35 |

Process Priority 150

Not Logged On ? Help Print Screen



The CPUs / Priority Charts / Charts screens display the relative CPU busy as related to priority.

These screens give several visualizations to the CPU usage. While a CPU could be 100% busy, if 90% was being used at priority 10, the overall CPU health may be good but the processor is currently performing a batch type of operation.

The Process Priority up/down indicator allows the setting of a threshold in which the lighter color represents a level below the threshold and the darker color of the bar represents the level above the threshold. For example, if the System runs production processes at priority 170 and above, and the indicator is set to 170, the dark portion of the bar presents the CPU usage at and above 170. The lighter color represents the CPU usage below that level. The total bar height still indicates the complete CPU usage.

Processes

Processes / Top Processes

Black Wood Systems, Inc.

2007/10/03 13:45:39

NSKIT06-3000

Pause...

Back

*Systems Overview CPUs **Processes** Files SubSystems History Alarms Configure

Top Processes Last Start/Stop All Processes Process Detail ProcessH Entity Process Entity PgmRay

| Cpu,Pin | Process | UserID | B | IPri | CPri | PT | P | F | R | I | SI | Mem | Object | Busy% | Busy Histogram |
|----------|-----------|---------|-----|------|------|----|---|---|---|---|----|------|----------------------------|-------|----------------|
| 02,01092 | \$Y1LX | 93,1 | | 1 | 1 | G | | | R | | | 0.4 | \$DATA01.UTILS.PIG01OT | 79.84 | |
| 00,01021 | \$Y1LW | 93,1 | | 1 | 1 | G | | | R | | | 0.4 | \$DATA01.UTILS.PIG01OT | 60.30 | |
| 00,00650 | \$Y01F | 255,255 | 150 | 150 | G | | | | | | | 12.2 | \$DATA03.R912.IRGFSRV | 0.55 | |
| 00,00757 | \$Y01Q | 255,255 | 100 | 100 | G | | | | R | | | 10.9 | \$DATA03.R912.STDC | 0.48 | |
| 01,01403 | \$CTTC | 18,1 | | 148 | 148 | G | | | | | | 2.3 | \$VD0603.NCITTOOLS.CTSERVE | 0.43 | |
| 00,00433 | \$ZPTM0 | 255,255 | 201 | 201 | G | P | | | | | | 2.7 | \$SYSTEM.SYS00.TCP6MON | 0.40 | |
| 00,00867 | \$Z2HJ | 11,10 | | 180 | 180 | G | | | | | | 10.0 | \$DATA03.R911.STCPUR | 0.31 | |
| 01,00882 | \$Z2HK | 11,10 | | 180 | 180 | G | | | | | | 12.3 | \$DATA03.R911.STCPUR | 0.27 | |
| 00,00343 | \$ZZTCP | 255,255 | 200 | 200 | G | P | | | | | | 1.0 | \$SYSTEM.SYS00.TCP6MAN | 0.25 | |
| 00,00922 | \$MOMI | 93,1 | | 160 | 160 | G | | | R | | | 62.0 | \$DATA01.MOMI.BWMOMII | 0.24 | |
| 00,00000 | \$MONITOR | 255,255 | 201 | 201 | G | P | | | R | | | 4.2 | \$SYSTEM.SYS00.NMONTOR | 0.22 | |
| 02,00614 | \$Z2HL | 11,10 | | 180 | 180 | G | | | R | | | 10.0 | \$DATA03.R911.STCPUR | 0.22 | |
| 02,00000 | \$MONITOR | 255,255 | 201 | 201 | G | P | | | R | | | 2.9 | \$SYSTEM.SYS00.NMONTOR | 0.20 | |
| 00,00299 | \$OSS | 255,255 | 220 | 220 | G | P | | | | | | 43.2 | \$SYSTEM.SYS00.TSYS DP2 | 0.19 | |
| 03,01800 | \$Z2HM | 11,10 | | 180 | 180 | G | | | | | | 14.9 | \$DATA03.R911.STCPUR | 0.18 | |

Select Process Type to view

Everything
 NSK Processes
 NSK User Processes
 Disks
 Priority Changing
 Inspect
 Stuck on I/O

OSS Processes
 OSS User Processes
 Tapes
 Interrupt Processes
 Suspended

Select CPU to view

ALL
 Busiest
 0
 1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15

Not Logged On Hints On ? Help Print Screen

The Processes / Top Processes screen presents the top 'hitters' of various system resources.

The screen is configured by starting at the bottom and working your way up. Select the CPU to view, Process type and click one of the **highlighted** headings at the top of the page (Busy %, Mem, R, F).

The top information presented on this screen is always maintained by MOMI so that the internal computations are made only once per update interval.

For example, to view the top memory users in CPU 1 of user processes, click CPU to view 1, Process Type to view Process Only and then click the Mem heading.

In the section "Select Process Type to view":

| | |
|---------------------|--|
| Everything | Displays all processes |
| NSK Processes | all Guardian processes |
| NSK User Processes | all Guardian processes except system processes |
| OSS Processes | all OSS processes |
| OSS User Processes | all OSS processes except system processes |
| Disks | disk process |
| Tapes | tape process |
| Priority Changing | processes with priority lowered by system (priority 255) |
| Interrupt Processes | on TNS/E interrupt processes |
| Stuck on I/O | processes in wait state of %004 (see IO-STUCK-INTERVAL) |
| Inspect | any process in Debug / Inspect |
| Suspended | any process suspended |

Processes / Last Start/Stop

MOMI - Multi-system Online Measure Interface (Client version 3.80)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/10/28 13:41:32

Back Systems Overview CPUs **Processes** Files SubSystems *History Configure

Top Processes **Last Start/Stop** All Processes Process Detail ProcessH Entity Process Entity PgmRay

Last Processes STARTED

| Date/Time | Cpu,Pin | Process | B | Pri | PT | SI | Object | UserID | LoginName | Ancestor |
|---------------------|----------|---------|---|-----|----|----|-------------------------|---------|-------------|----------|
| 2004/10/28 13:39:35 | 00,00392 | \$DDL | | 31 | G | | \$SYSTEM.SYSTEM.DDL | 100,109 | NET.DW | \$Z2TG |
| 2004/10/28 13:35:15 | 00,00336 | \$Z2W3 | | 90 | G | | \$DATA1.MOMI2010.BWMOMI | 255,1 | SUPER.OPER | \$MOM0 |
| 2004/10/28 13:35:04 | 01,00387 | \$Z2W2 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 |
| 2004/10/28 13:31:53 | 00,00394 | \$Z2W1 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 |
| 2004/10/28 13:28:19 | 00,00114 | \$STUCK | | 149 | G | | \$DATA1.DALE.FUP | 100,109 | NET.DW | \$Z2TG |
| 2004/10/28 13:27:36 | 01,00401 | \$Z2W0 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 |
| 2004/10/28 13:26:17 | 01,00432 | \$Z2VZ | | 180 | G | | \$SYSTEM.SYS30.INSPECT | 100,109 | SUPER.SUPER | \$IMON |

Last Processes STOPPED

| Date/Time | Cpu,Pin | Process | B | Pri | PT | SI | Object | UserID | LoginName | Ancestor |
|---------------------|----------|---------|---|-----|----|----|-------------------------|---------|-------------|----------|
| 2004/10/28 13:39:30 | 00,00114 | \$STUCK | | 149 | G | SI | \$DATA1.DALE.FUP | 100,109 | NET.DW | \$Z2TG |
| 2004/10/28 13:35:40 | 00,00336 | \$Z2W3 | | 90 | G | | \$DATA1.MOMI2010.BWMOMI | 255,1 | SUPER.OPER | \$MOM0 |
| 2004/10/28 13:35:15 | 01,00387 | \$Z2W2 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 |
| 2004/10/28 13:32:20 | 00,00394 | \$Z2W1 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 |
| 2004/10/28 13:30:30 | 01,00432 | \$Z2VZ | | 180 | G | | \$SYSTEM.SYS30.INSPECT | 100,109 | SUPER.SUPER | \$IMON |
| 2004/10/28 13:28:30 | 01,00401 | \$Z2W0 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 |
| 2004/10/28 13:28:30 | 00,00034 | \$STUCK | | 149 | G | SI | \$DATA1.DALE.FUP | 100,109 | NET.DW | \$Z2TG |

Not Logged On ? Help Print Screen

The Processes / Last Start/Stop screen presents the last few processes that were created or terminated on the System.

This view of process turnover is as seen by MOMI. As such, short lived processes may not be reported on this screen.

During process creation, there is a short period of time where accurate information is not available. This very initial creation period is ignored by MOMI. A process is not considered stopped until it has been completely removed from the System or replaced by another process.

Processes started by MOMI, and any direct descendants, are not presented on this screen.

Processes / All Processes

NSKIT06-3000 MOMI (Client version 4.23)

Black Wood Systems, Inc.

41%

\NSKIT06-3000

2007/10/03 13:52:43

Back Forward *Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Top Processes Last Start/Stop All Processes Process Detail ProcessH Entity Process Entity PgmRay

| CPU,PIN | Process | LH | B | IPri | CPri | PT | QLen | P | F | R | I | FL | O | S | L | D | C | ? | N | SP | T | M | @ | * | Mem | MemBytes | Program |
|----------|---------|----|---|------|------|----|------|---|---|---|---|----|---|---|---|---|---|---|---|----|----|---|---|---|-------|-------------|----------|
| 00,00000 | | L | | 201 | 201 | G | 0 | P | | R | | | | | | | | | N | SP | | | | | 4.2 | 4,407,296 | \$SYSTEM |
| 00,00001 | | L | | 210 | 210 | G | 0 | P | | | | | | | | | | | N | SP | | | | | 344.6 | 361,381,888 | \$SYSTEM |
| 00,00002 | | L | | 210 | 210 | G | 0 | P | | | | | | | | | | | N | SP | | | | | 0.4 | 425,984 | \$SYSTEM |
| 00,00003 | \$0 | L | | 201 | 201 | G | 0 | P | | | | | | | | | | | ? | N | SP | | | | 1.5 | 1,622,016 | \$SYSTEM |
| 00,00004 | | L | | 211 | 211 | G | 0 | P | | | | | | | | | | | N | SP | | | | | 12.3 | 12,992,512 | \$SYSTEM |
| 00,00005 | \$YMIOP | L | | 205 | 205 | G | 0 | P | | | | | | | | | | | ? | N | SP | | | | 86.2 | 90,488,832 | \$SYSTEM |
| 00,00006 | \$ZNUP | L | | 200 | 200 | G | 0 | P | | | | | | | | | | | N | SP | | | | | 0.3 | 409,600 | \$SYSTEM |
| 00,00007 | \$Z0 | L | | 200 | 200 | G | 0 | P | | | | | | | | | | | N | SP | | | | | 0.4 | 491,520 | \$SYSTEM |
| 00,00008 | \$ZOPR | L | | 201 | 201 | G | 0 | P | | | | | | | | | | | N | SP | | | | | 0.6 | 720,896 | \$SYSTEM |
| 00,00009 | \$ZCNF | L | | 200 | 200 | G | 0 | P | | | | | | | | | | | N | SP | | | | | 2.8 | 2,998,272 | \$SYSTEM |
| 00,00011 | \$ZTM00 | L | | 200 | 200 | G | 0 | P | | | | FL | | | L | | | | N | | | | | | 2.1 | 2,277,376 | \$SYSTEM |
| 00,00012 | \$TMP | L | | 204 | 204 | G | 0 | P | | | | FL | | | L | | | | N | | | | | | 6.5 | 6,914,048 | \$SYSTEM |
| 00,00013 | \$ZT00 | L | | 200 | 200 | G | 0 | P | | | | | | | | D | | | N | | | | | | 2.9 | 3,080,192 | \$SYSTEM |
| 00,00014 | \$ZL00 | L | | 200 | 200 | G | 0 | P | | | | | | | | D | | | | SP | | | | | 2.1 | 2,293,760 | \$SYSTEM |
| 00,00015 | \$YPHI | L | | 167 | 167 | G | 0 | | | | | | | | | D | | | | | | | | | 11.0 | 11,632,640 | \$SYSTEM |
| 00,00016 | \$NCP | L | | 199 | 199 | G | 0 | P | | | | | | | | D | | | N | SP | | | | | 1.1 | 1,196,032 | \$SYSTEM |
| 00,00017 | \$Z04M | L | | 150 | 150 | G | 0 | | | | | FL | | | D | | | | N | | | | | | 0.7 | 802,816 | \$SYSTEM |

NSK/OSS All Processes No Filter Displayed 1,199 of 1,199

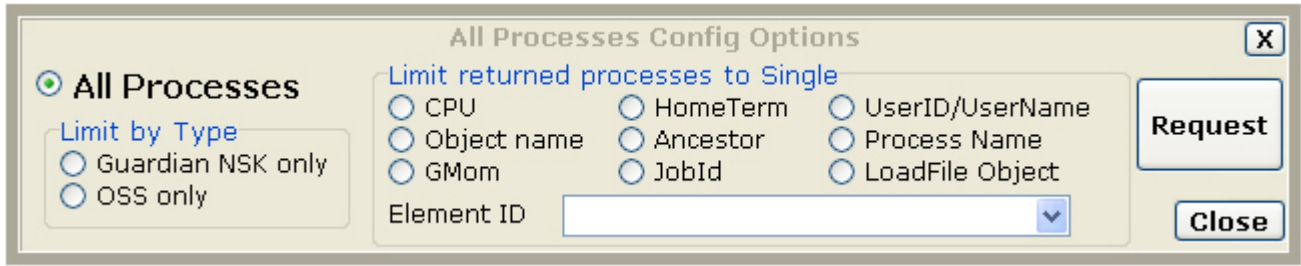
Clear Config Tree AutoUpdate Request data collected 2007/10/03 13:51:36

Not Logged On Hints On ? Help Print Screen

The Processes / All Processes screen presents a comprehensive detail of each process requested. The detail provided is generally everything you wanted to know but were afraid to ask! The information is obtained by Guardian procedure calls.

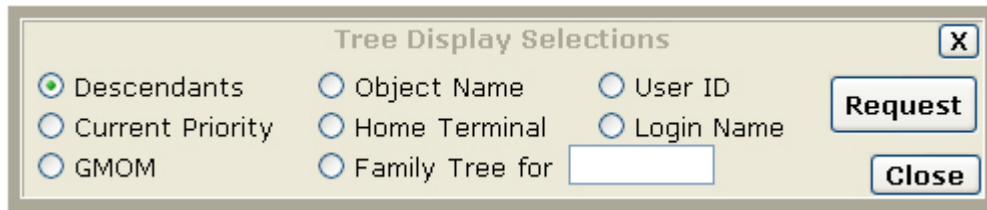
The AutoUpdate check box causes automatic request of new data.

By default, pressing the request button will gather and report all processes on the System. While the data can be filtered and sorted as needed, the Config button allows the User to partially qualify the desired data.

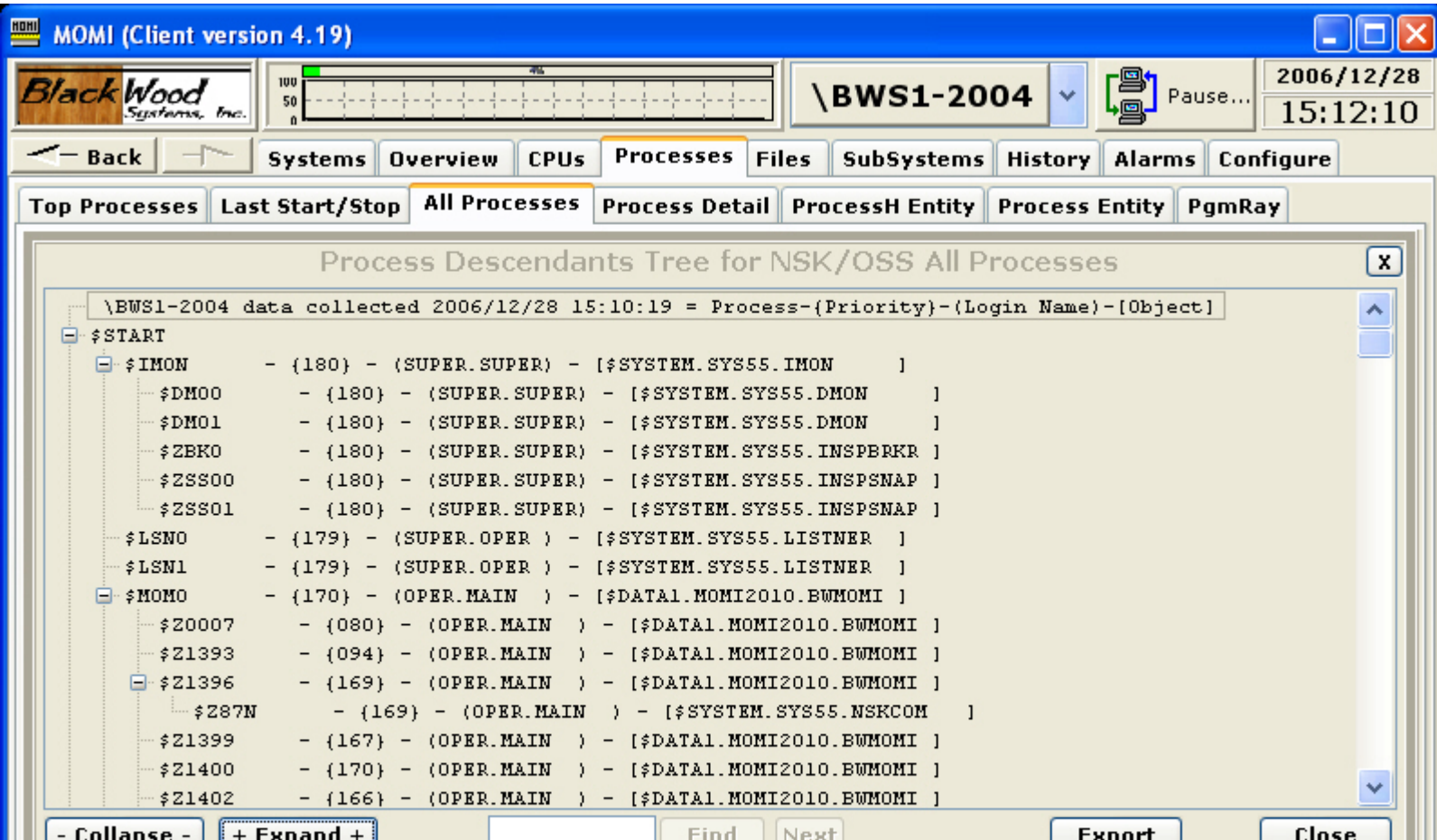


Limits entered on the Config Options pop-up require that the information return match the specified criteria. This reduces the information collected and speeds up the request.

Once data is retrieved, it may also be organized in a Tree View fashion. Pressing the Tree button displays the following:



The organization items allow relationships to be better viewed. For example, displaying data by Descendants presents a hierarchy of the order of process creation.



The Tree View is based on the information gathered from running processes. Processes referenced in a hierarchy that are no longer active may cause gaps in the Tree View (i.e. a process may refer to an ancestor no longer running).

The Find button allows searching for text within the Tree View. This can be useful on large systems with a great deal of data..

Processes / Process Detail

Process

Object: **\$ZNET**

\$SYSTEM.SYS67.SCP

| CPU,PIN | IPri | CPri | User ID | Backup |
|----------|------|------|---------|----------|
| 00,00015 | 175 | 175 | 255,255 | 01,00017 |

| Memory Used | PFS in-use | PFS Max-used |
|-------------|------------|--------------|
| 868,352 | 95,784 | 127,008 |

Wait: 011 P Code Type: TNS - 16-bit CISC Type: G

State: Runnable Stop: N

Start: 2007/08/27 15:45:12

Process Entity

| | | | | |
|-----|-----------------|--------|-----------------|----------|
| PE1 | CPU-Busy-Time | 0.35% | Ready-Time | 0.54% |
| PE1 | TNSR-Busy-Time | 0.13% | Page-Faults | 0.00 |
| PE2 | TNS-Busy-Time | 0.20% | Dispatches | 7.10 |
| PE3 | Accel-Busy-Time | 0.02% | Launches | 0.00 |
| SQL | Launch-WaitTime | 0.00% | Avg-Launch-Time | 0.000000 |
| SQL | Recv-Qtime | 0.00 | Recv-Qlen-Max | 3 |
| OSS | Msgs-Received | 1.70 | Msgs-Sent | 3.00 |
| OSS | Received-Bytes | 159.00 | Sent-Bytes | 420.00 |
| LF | Reply-Bytes | 585.20 | Returned-Bytes | 462.20 |
| LF | Checkpoints | 0.00 | Comp-Traps | 46.40 |

| File Name | File Busy Time | Avg Op Time | Opener File Nbr | File Type Description | Messages | Reads | Writes | Updates or Replies | Deletes or WriteReads |
|--------------|----------------|-------------|-----------------|-----------------------|----------|-------|--------|--------------------|-----------------------|
| \$ZEXP.#ZSPI | 0.27% | 0.000933 | 20 | unstructured | 3.03 | 0.00 | 0.00 | 0.00 | 3.03 |
| \$RECEIVE | 0.02% | 0.314022 | 0 | unstructured | 0.00 | 3.23 | 0.00 | 3.23 | 0.00 |

Process: \$ZNET

Buttons: Clear, Config, Rated Values, Stop

Bottom Bar: Not Logged On, Chat, Hints On, ? Help, Print Screen

The Processes / Process Detail screen presents a comprehensive look into a process.

Click on the areas in the image above display additional information.

The screen presents resources consumed, files opened by the process, files opened to the process, and SQL Statements activity. The SQL Statements section is not activated by default.

Information on this screen is obtained via Guardian procedure calls and the MEASURE entities of Process, File, DiskOpen, SQL Process and SQL Statement.

Values by default are rated in a "Per Second" mode such as 1.40 Comp-Traps. Uncheck the Rated box causes raw values to display. The window of time for the Process Entity is visible by pushing the Page 3 button. The window of time for the File, DiskOpen and SQL Statements entities are visible by scrolling all the way over to the right.

A Disk process displays similar information except the SQL Statements button is replaced by the [Disk Entity](#).

The screenshot shows the MOMI (Client version 4.23) interface. The main window title is "BWS1-2004 MOMI (Client version 4.23)". The interface includes a navigation bar with buttons for "Systems", "Overview", "CPUs", "*Processes", "Files", "SubSystems", "History", "Alarms", and "Configure". The "*Processes" button is selected, and the "*Process Detail" sub-tab is active.

The process details for "\$SWAP1" are shown. The process object is "\$SYSTEM.SYS67.TSYS2P2". The process is in a "Runnable" state, started on 2007/08/27 15:45:11. The process entity table shows various metrics:

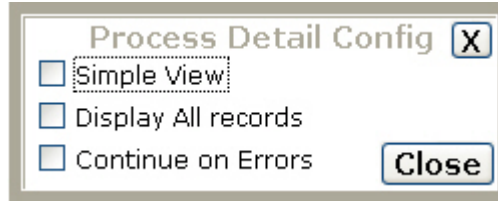
| Entity | Metric | Value | Metric | Value |
|--------|-----------------|----------|-----------------|----------|
| PE1 | CPU-Busy-Time | 0.14% | Ready-Time | 0.15% |
| | TNSR-Busy-Time | 0.14% | Page-Faults | 0.00 |
| | TNS-Busy-Time | 0.00% | Dispatches | 7.20 |
| PE2 | Accel-Busy-Time | 0.00% | Launches | 0.00 |
| | Launch-WaitTime | 0.00% | Avg-Launch-Time | 0.000000 |
| PE3 | Recv-Qtime | 0.00 | Recv-Qlen-Max | 3 |
| | Msgs-Received | 2.70 | Msgs-Sent | 0.00 |
| SQL | Received-Bytes | 9,014.00 | Sent-Bytes | 0.00 |
| | Reply-Bytes | 124.80 | Returned-Bytes | 0.00 |
| OSS | Checkpoints | 0.00 | Comp-Traps | 0.00 |

The "Disk Entity" table shows the following data for the "\$SWAP1" disk:

| Disk Name | Disk Rate | Request AST | Device AST | Disk Busy Time | Read QBusy Time | Write QBusy Time | Disk Reads | Disk Read Bytes | Disk Writes | Disk Write Bytes |
|-----------|-----------|-------------|------------|----------------|-----------------|------------------|------------|-----------------|-------------|------------------|
| \$SWAP1 | 4.60 | 0.005277 | 0.004819 | 2.16% | 0.00% | 2.16% | 0.00 | 0 | 4.60 | 18,841 |

The interface also includes a "Get Disk Entity" button, a "Volume View" checkbox, and a "Data Time" display showing "15:27:34 - Next 00:13". At the bottom, there are buttons for "Clear", "Config", "Rated Values", and "Stop". The status bar at the bottom indicates "Not Logged On", "Chat", "Hints On", "Help", and "Print Screen".

The operation of the screen may be altered by the Config button:



The **Simple View** will reduce or 'down size' the amount of information presented. By Default, records in the File, DiskOpen and SQL Statements do not display records with zero values (i.e. open but not active).

The **Display All records** option allows zero value records to be displayed.

The **Continue on Errors** option causes the screen to continue gathering data even when the process being measured has stopped (i.e. the display of data automatically picks back up again if the process is restarted). This is useful for transient processes or during debugging sessions.

Below is a sample screen for the Simple View selection:

BlackWood Systems, Inc. | **BWS1-2004** | 2007/10/01 15:28:07

Navigation: Back | Systems | Overview | CPUs | ***Processes** | Files | SubSystems | History | Alarms | Configure

Sub-navigation: Top Processes | Last Start/Stop | All Processes | ***Process Detail** | ProcessH Entity | Process Entity | PgmRay

Process: \$ZNET

Object: \$SYSTEM.SYS67.SCP

| | | | | |
|-------------|---------------------|-------------------|---------|----------|
| CPU,PIN | IPri | CPri | User ID | Backup |
| 00,00015 | 175 | 175 | 255,255 | 01,00017 |
| Memory Used | PFS in-use | PFS Max-used | | |
| 868,352 | 95,784 | 127,008 | | |
| Wait | PFR | Code Type | Type | |
| 011 | P | TNS - 16-bit CISC | G | |
| State | Runnable | | Stop | N |
| Start | 2007/08/27 15:45:12 | | | |

| | | | | |
|-----------------|----------|-----------------|----------|-----------------|
| CPU-Busy-Time | 0.45% | Ready-Time | 0.91% | Begin-Trans |
| TNSR-Busy-Time | 0.16% | Page-Faults | 0.00 | 0.00 |
| TNS-Busy-Time | 0.25% | Dispatches | 8.86 | Abort-Trans |
| Accel-Busy-Time | 0.03% | Launches | 0.00 | 0.00 |
| Launch-WaitTime | 0.00% | Avg-Launch-Time | 0.000000 | |
| Recv-Qtime | 0.00 | Recv-Qlen-Max | 3 | File-Open-Calls |
| Msgs-Received | 1.99 | Msgs-Sent | 3.96 | 0.00 |
| Received-Bytes | 210.07 | Sent-Bytes | 553.20 | File-Info-Calls |
| Reply-Bytes | 1,136.15 | Returned-Bytes | 973.78 | 0.00 |
| Checkpoints | 0.00 | Comp-Traps | 59.47 | |

| File Name | File Busy Time | Avg Op Time | Opener File Nbr | File Type Description | Messages | Reads | Writes | Updates or Replies | Deletes or WriteReads | Info Calls | Timeouts or Cancels |
|--------------|----------------|-------------|-----------------|-----------------------|----------|-------|--------|--------------------|-----------------------|------------|---------------------|
| \$ZEXP.#ZSPI | 0.21% | 0.000951 | 20 | unstructured | 2.24 | 0.00 | 0.00 | 0.00 | 2.24 | 0.00 | 0.00 |
| \$RECEIVE | 0.02% | 0.437433 | 0 | unstructured | 0.00 | 2.28 | 0.00 | 2.28 | 0.00 | 0.00 | 0.00 |

Process: \$ZNET | No Filter | Displayed 2 of 2

Buttons: Clear | Config | Rated Values | **Stop** | Data Time 15:28:03 - Next 00:29

Footer: Not Logged On | Chat | Hints On | ? | Help | Print Screen

Processes / ProcessH Entity

The screenshot shows the BlackWood Systems MOMI client interface. The title bar reads "BWS1-2004 MOMI (Client version 4.23)". The main window displays the "Processes" tab, with the "ProcessH Entity" sub-tab selected. The process being viewed is "\$ZNET".

Process Summary:

- Object: \$SYSTEM.SYS67.SCP
- CPU, PIN: 00,00015
- IPri: 175
- CPri: 175
- User ID: 255,255
- Backup: 01,00017
- Memory Used: 868,352
- PFS in-use: 95,784
- PFS Max-used: 127,008
- Wait: 011
- PFR: P
- Code Type: TNS - 16-bit CISC
- Type: G
- State: Runnable
- Stop: N
- Start: 2007/08/27 15:45:12

ProcessH Entity Table:

| Code Space ID | Code Range Name | CR Proc Busy Percent | CR Busy Samples | CR Busy Percent | Code Name |
|---------------|---------------------------------|----------------------|-----------------|-----------------|-----------|
| SCR | CODERANGE-0X80800000-0X81FBFFFF | 20.8 | 34 | 100.0 | \$SYST |
| SLr | CODERANGE-0X7C000000-0X7C5DBFFF | 14.7 | 24 | 100.0 | \$SYST |
| UC | APPL^PROCESSIONREQUEST | 6.7 | 11 | 12.3 | \$SYST |
| UC | KX^RECEIVEDONE | 4.2 | 7 | 7.8 | \$SYST |
| UC | KP^CYCLELOOP | 4.2 | 7 | 7.8 | \$SYST |
| UC | KP^FILENAMESTRING | 4.2 | 7 | 7.8 | \$SYST |
| UC | SCP^SERVERRECEIVE | 4.2 | 7 | 7.8 | \$SYST |
| UC | SCP^SERVERSEND | 4.2 | 7 | 7.8 | \$SYST |
| UC | KX^PREPAREDISPTRACE | 3.6 | 6 | 6.7 | \$SYST |
| UC | KP^GETMEMORYTAGGED | 3.6 | 6 | 6.7 | \$SYST |
| UC | SCP^PUTMEMORY | 3.6 | 6 | 6.7 | \$SYST |
| ULr | CODERANGE-0X7F800000-0X7F827FFF | 3.0 | 5 | 100.0 | \$SYST |
| SL | CODERANGE-0X7A000000-0X7A01FFFF | 3.0 | 5 | 100.0 | \$SYST |
| UC | KP^PUTMEMORY | 3.0 | 5 | 5.6 | \$SYST |
| UC | KP^TIMESTATSET | 1.8 | 3 | 3.3 | \$SYST |
| UC | APPL^AWAITIOX | 1.2 | 2 | 2.2 | \$SYST |
| UC | KP^PUSHBOTTOM | 1.2 | 2 | 2.2 | \$SYST |

Process Statistics:

- CPU Busy %: 0.41%
- Comp-Traps: 547 (54.70/sec)
- Process samples: 163
- Session Time: 0:08:32

Measurement Code Type: User System Both

Process: \$ZNET | No Filter | 29 of 29

Buttons: Clear, Print List, Stop, Data Time 16:19:50 - Next 01:40

Footer: net.dw, Chat, Hints On, Help, Print Screen

The Processes / ProcessH screen presents the locations within the process code where CPU time is spent. This information is obtained from the MEASURE ProcessH entity.

While a process has a busy time, the areas of code where it spends its execution time are of interest to developers and may reveal locations that are not performing efficiently. Generally, only a developer with access to the source code can interpret the meaning of the values given on this screen.

Three types of Measurements are available: **User**, **System**, or **Both**.

User code generally is the area of the program the developer has actually coded. This includes the main object file plus all loadfiles (i.e. SLRs and DLLs) not located in \$SYSTEM.SYSnn or \$SYSTEM.ZDLL.

System code is the area spent in the operating system supplied routines. System code is defined as loadfiles (i.e. SLRs and DLLs) located in \$SYSTEM.SYSnn or \$SYSTEM.ZDLL.

Both are a combination of **User** and **System**.

The image below shows some additional procedure information obtained when Both is selected.

BlackWood Systems, Inc. | **WBS1-2004 MOMI (Client version 4.23)** | **\BWS1-2004** | **2007/10/02 16:24:34**

Navigation: Back | **Systems** | Overview | CPUs | ***Processes** | Files | SubSystems | History | Alarms | Configure

Sub-Navigation: **Top Processes** | Last Start/Stop | All Processes | **Process Detail** | *ProcessH Entity | Process Entity | PgmRay

Process: \$ZNET

Object: \$SYSTEM.SYS67.SCP

| CPU,PIN | IPri | CPri | User ID | Backup |
|----------|------|------|---------|----------|
| 00,00015 | 175 | 175 | 255,255 | 01,00017 |

| Memory Used | PFS in-use | PFS Max-used |
|-------------|------------|--------------|
| 868,352 | 95,784 | 127,008 |

Wait: 011 | PFR: P | Code Type: TNS - 16-bit CISC | Type: G

State: Runnable | Stop: N

Start: 2007/08/27 15:45:12

| CPU Busy % | Comp-Traps | Process samples | Session Time |
|------------|-----------------|-----------------|--------------|
| 0.46% | 614 61.40/sec | 22 | 0:01:21 |

Measurement Code Type: User System Both

Process: \$ZNET | No Filter | 16 of 16

Stop | Data Time 16:24:11 - Next 01:19

net.dw | Chat | Hints On | ? | Help | Print Screen

Measuring the System code may be an interesting exercise, but will usually result in reporting locations that don't make much sense. This is due to the fact that documentation on internal operating system routines are not published. On occasion, the code area may have a name that directly relates to a system call initiated by the developer (such as FILE_SETKEY_ (position within an Enscribe file) or malloc (a C memory allocation routine)).

A Code Range with a name of CODERANGE (sample highlighted in yellow above) followed by hexadecimal numbers are locations where time was spent but a procedure (or function) name was not available. More recent releases of MEASURE seem to collect information on the entire process even if only the user area is selected. The Code Range may indicate system code, SRL's or DLL's.

A Code Range is an individual function or procedure within a program. Programs are typically comprised of many functions or procedures. Exceptions to this are COBOL and Java which is interpreted code not supported by this MEASURE entity.

A Code Space is a logical grouping of one or more Code Ranges. This typically could be thought of as all of the Code Ranges within program file comprise a Code Space. However, a process accesses many Code Spaces as each SRL or DLL and the Operating System itself are divided into Code Spaces.

The column CR Proc Busy Percent reports the percentage of the total process busy time the code range was active. This column is the best overall indicator to the activity of a Code Range.

This screen continually gathers data in increasing increments. The initial sample is of a short period of time increasing to longer periods of time. This allows a relatively quick display of initial samples while easing the system load if the measurement is left to run. Internally, MOMI combines data from each measurement and displays the seamless results. You can leave this measurement running for hours to gather data, which is sometimes required.

Security Note: The User ID that MOMI operates under must be able to READ the object file(s) of the process under measurement. MEASURE requires this information in order to obtain procedure/function names and code range locations.

Processes / Process Entity

MOMI - Multi-system Online Measure Interface (Client version 3.82)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/12/03 16:38:14

Back Systems Overview CPUs *Processes Files SubSystems History Configure

Top Processes Last Start/Stop All Processes Process Detail ProcessH Entity *Process Entity *PgmRay

| CPU, PIN | Process Name | Program File Name | Program Code Type | Init Pri | CPU Busy Time | Ready Time | TNS Busy Time | TNSR Busy Time |
|----------|--------------|------------------------|--------------------|----------|---------------|------------|---------------|----------------|
| 00,00000 | \$MONITOR | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 201 | 1.02% | 1.14% | 0.00% | 1.02% |
| 00,00001 | \$VIRTUAL | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 210 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00002 | \$MSENGER | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 210 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00004 | | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 211 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00005 | \$0 | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 201 | 0.02% | 0.02% | 0.00% | 0.02% |
| 00,00006 | \$ZNUP | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 200 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00007 | \$Z0 | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 200 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00008 | \$ZOPR | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 201 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00009 | \$ZRM00 | \$SYSTEM.SYS31.OSIMAGE | TNSR - Native RISC | 200 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00010 | \$ZTM00 | \$SYSTEM.SYS31.TMFMON2 | TNSR - Native RISC | 200 | 0.01% | 0.03% | 0.00% | 0.01% |
| 00,00011 | \$ZL00 | \$SYSTEM.SYS31.ROUT | Accelerated | 200 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00012 | \$TMP | \$SYSTEM.SYS31.TMFTMP | TNSR - Native RISC | 204 | 1.11% | 1.62% | 0.00% | 1.11% |
| 00,00013 | \$ZZLAN | \$SYSTEM.SYS31.LANMAN | TNSR - Native RISC | 180 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00014 | \$ZM00 | \$SYSTEM.SYS31.QIOMON | TNSR - Native RISC | 201 | 0.01% | 0.02% | 0.00% | 0.01% |
| 00,00015 | \$ZNET | \$SYSTEM.SYS31.SCP | TNS - 16-bit CISC | 175 | 0.00% | 0.00% | 0.00% | 0.00% |
| 00,00024 | \$ZSVR | \$SYSTEM.SYS31.ZSERVER | TNS - 16-bit CISC | 149 | 0.00% | 0.00% | 0.00% | 0.00% |

Process Name \$* No Filter Displayed Collecting of 10

Clear Config Rated Values Stop data collected 2004/12/03 16:38:09

Not Logged On ? Help Print Screen

The Processes / Process Entity screen presents the MEASURE Process Entity in tabular format for a number of processes.

This screen differs from the [Processes / All Processes](#) screen in that MEASURE is used to obtain the information rather than Guardian procedure calls.

The data retrieved may be limited to a single process or all processes in a CPU.

Values by default are rated in a "Per Second" mode such as 5.8 Messages Sent. Uncheck the Rated box will cause raw values to display. The window of time is visible by scrolling all the way over to the right.

Processes / PgmRay

MOMI - Multi-system Online Measure Interface (Client version 3.74)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

2004/05/26 09:54:27

Back Systems Overview CPUs ***Processes** Files *SubSystems History Configure

Top Processes Last Start/Stop All Processes Process Detail ProcessH Entity Process Entity ***PgmRay**

General stats

Process

\$MOMI2

Object

\$DATA1.DALEMOMI.BWMOMI

Busy % CPU,PIN

0.8% 00,00393

IPri CPri Memory (MB)

160 160 3.9

PFRI flags User ID

100,109

Ancestor Wait State

\$Z03K 005

Creation Date/Time

2004/05/21 17:40:07

Home Terminal

\$YMIOP.#CLCI

General stats

started connected HW

Ports 14 2 4 Last Task_tcpip error 4120

Write bytes per sec limit 0

TCP/IP I/O writes 60,101 Write bytes per second 402

TCP/IP I/O writes saved 11,769 Write limitations 0

Accelerated I/Os (1-4) 0 0 0 0

Pctrl requests failed 0

Process_getinfolist_Count 0 Unknown err 0 Detail 0

Collector subtype 30 error - Count 0

Error 0

Process \$MOMI2

Clear Config Stop

Page Line

User Pages

SF1 SF2 SF3 SF4 SF5 SF6 SF7 SF8 SF9 SF10 SF11 SF12 SF13 SF14

F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 F13 F14

System Pages

Not Logged On ? Help Print Screen

The Processes / PgmRay screen presents information using an internal interface into MOMI and other programs written by BlackWood Systems.

Various aspects of internal information such as memory usage, open files, message traffic and task status are available. The function keys F1 through F14 provide generally fixed information. The function keys SF1 through SF14 provide information specific to the program.

This screen is only for use in BlackWood Systems programs. Users should not attempt to use it on other processes because the attempt to open a process and query it for information may affect the operation of programs not expecting this message.

The screen is used internally by BlackWood Systems and may be required in troubleshooting certain end-user problems.

This screen is turned off by default and is enabled on the screen [Settings / Single Screen](#).

Files

Files / File Explorer

The screenshot shows the Black Wood Systems File Explorer interface. The title bar indicates the client version is 4.23. The main window displays a file explorer for the path `\BWS1-2004`. The left pane shows a tree view of disk volumes, with `$SWAP1` selected. The right pane displays a table of files under `$SWAP1.TAPECAT`.

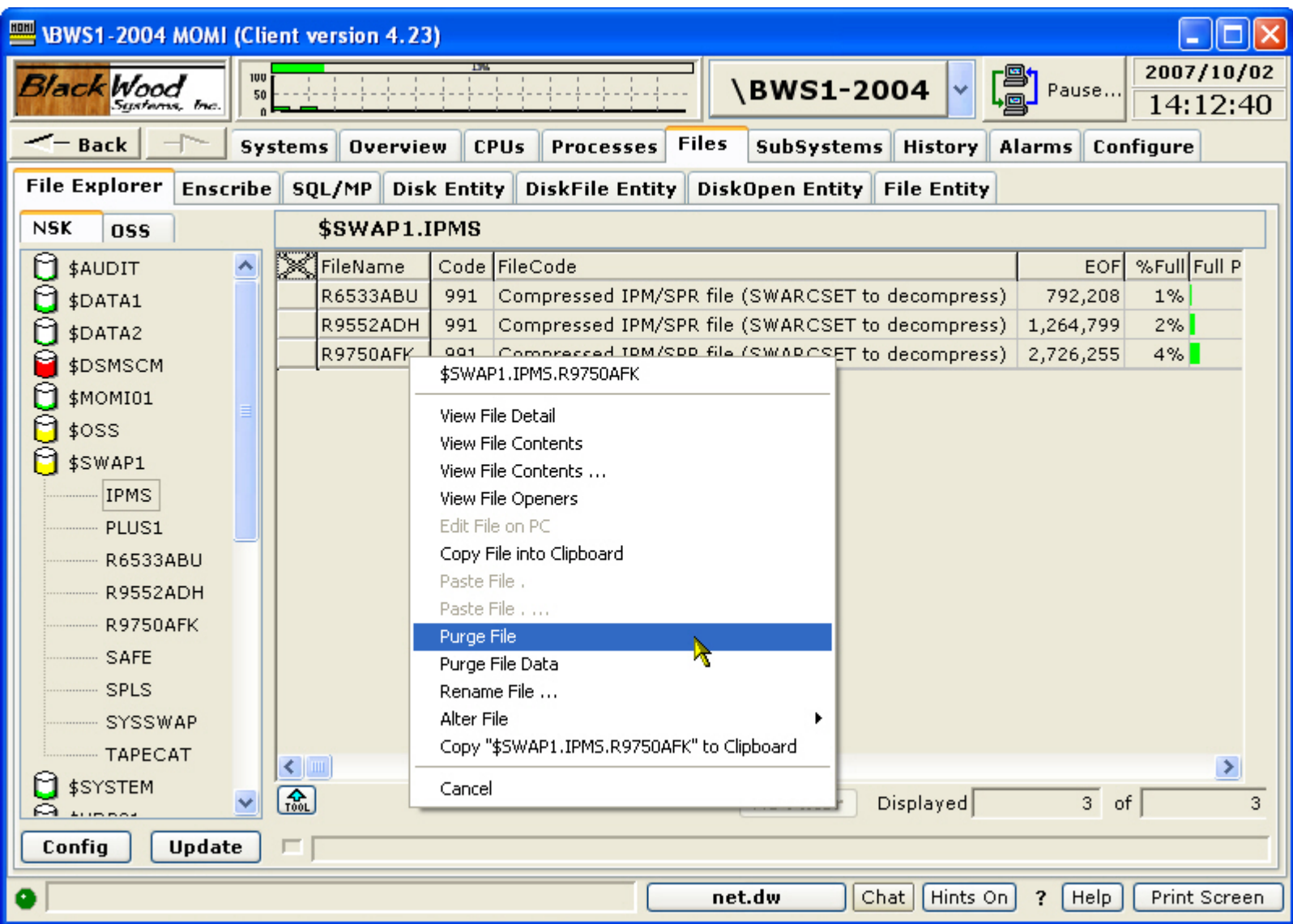
| FileName | Code | FileCode | EOF | %Full | Full Percent gauge | Mod |
|----------|------|---------------------------------|--------|-------|--------------------|------|
| BASETABS | 572 | NonStop SQL (base tables) file | 12,288 | 0% | | 200! |
| COLUMNS | 573 | NonStop SQL (columns) file | 65,536 | 0% | | 200! |
| COMMENTS | 574 | NonStop SQL (comments) file | 0 | 0% | | 200! |
| CONSTRNT | 575 | NonStop SQL (constraints) file | 0 | 0% | | 200! |
| CPRLSRCE | 587 | NonStop SQL (cprlsrce) file | 0 | 0% | | 200! |
| CPRULES | 586 | NonStop SQL (cprules) file | 0 | 0% | | 200! |
| FILES | 576 | NonStop SQL (files) file | 12,288 | 0% | | 200! |
| INDEXES | 577 | NonStop SQL (indexes) file | 12,288 | 0% | | 200! |
| IXINDE01 | 577 | NonStop SQL (indexes) file | 12,288 | 0% | | 200! |
| IXPART01 | 579 | NonStop SQL (partitions) file | 0 | 0% | | 200! |
| IXPROG01 | 580 | NonStop SQL (programs) file | 0 | 0% | | 200! |
| IXTABL01 | 581 | NonStop SQL (tables) file | 12,288 | 0% | | 200! |
| IXUSAG01 | 583 | NonStop SQL (dependancies) file | 12,288 | 0% | | 200! |
| KEYS | 578 | NonStop SQL (keys) file | 16,384 | 0% | | 200! |
| PARTNS | 579 | NonStop SQL (partitions) file | 0 | 0% | | 200! |
| POOL | 900 | DSM/TC tape catalog file | 0 | 0% | | 200! |

The interface includes a navigation pane on the left, a main display area with a table, and a status bar at the bottom showing "No Filter" and "Displayed 33 of 33".

The Files / File Explorer screen provides a powerful high level graphical navigator for NSK (i.e. Guardian) and OSS files. Operations such as drag-and-drop, copy-and-paste and other right-click functions are supported.

On the left side of the screen are listed disk volumes and clicking on a disk volume displays its subvolumes. Clicking on a subvolume displays on the right the files under that subvolume. The disk volume displays in color the approximate percentage full for the disk.

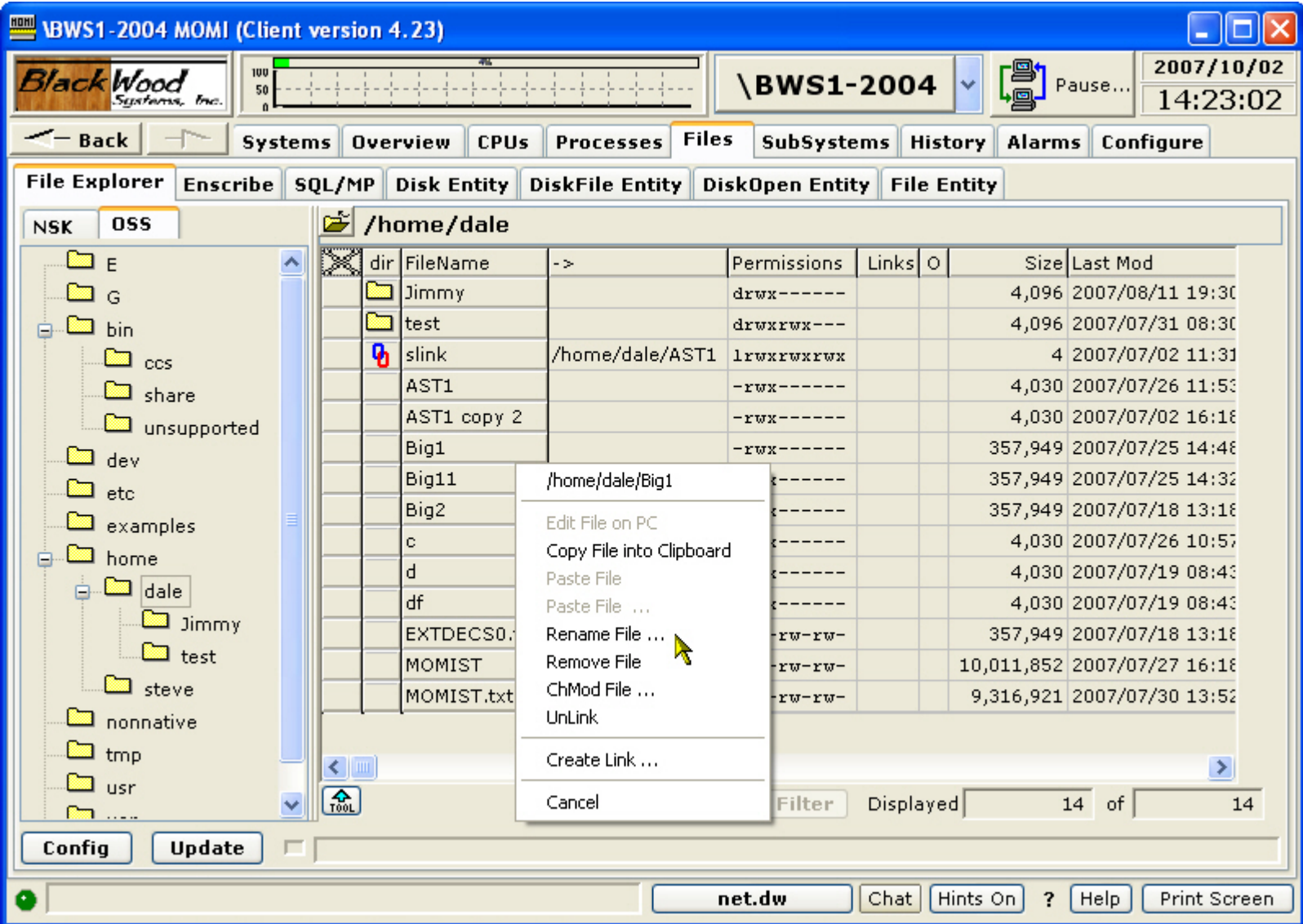
Actions that are available are displayed by right-clicking on a file name.



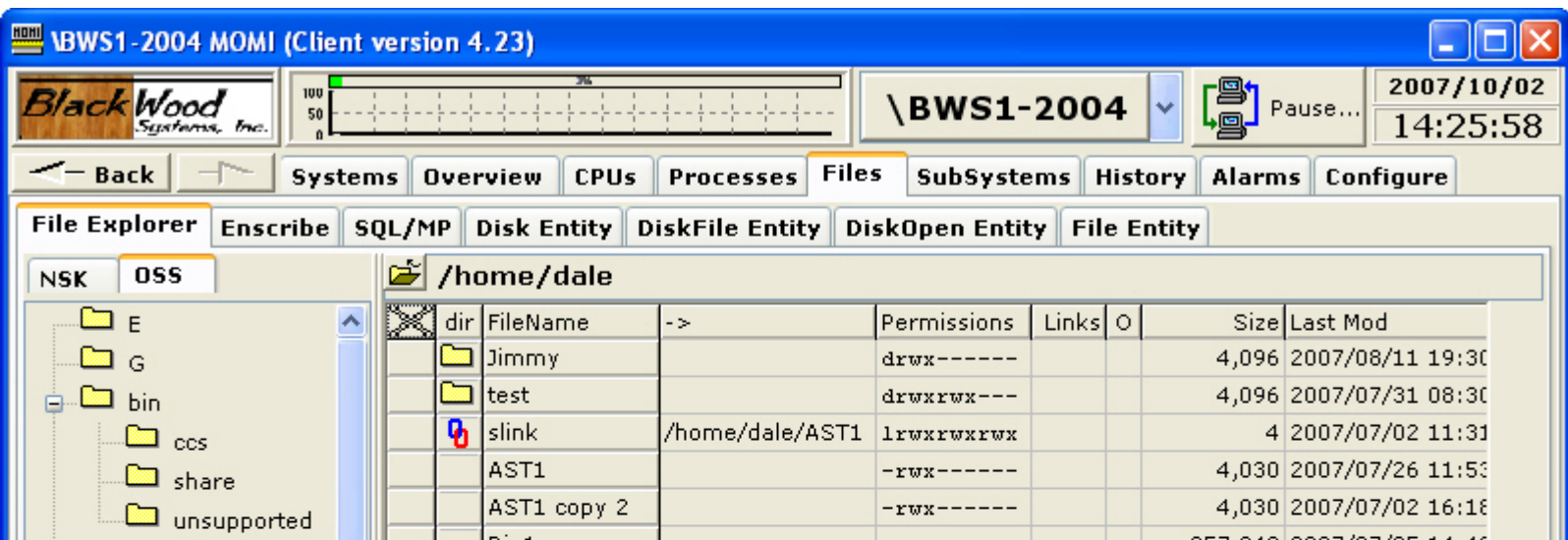
Selecting the OSS tab displays a tree view of the OSS file system on the left and files under the currently selected subdirectory. Subdirectories on the left continue to drill-down if selected.



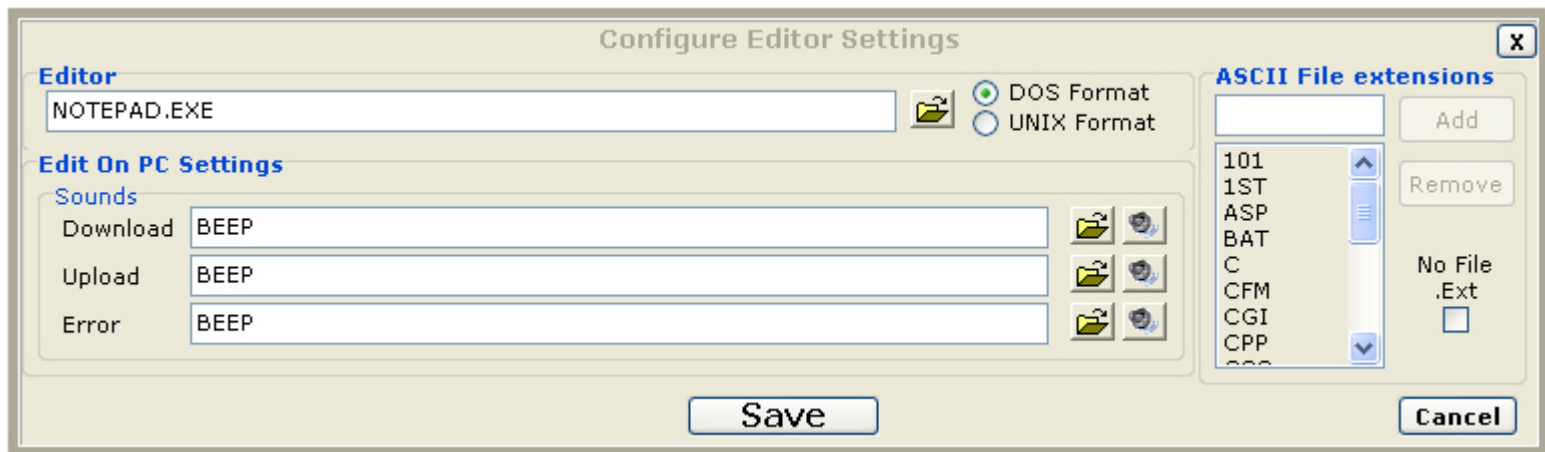
Actions that are available are displayed by right-clicking on a file name.



Additional pop-up information is displayed if the mouse is placed over the Permissions field. This pop-up provides a more friendly translation for the security screen field.



The Config button displays configuration settings for this screen such as the Windows editor to launch when editing a file and sounds played.



The **Editor** field defines the Windows program that is launched when editing a file. Editing a file involves the following steps: 1) the file is transferred from the NonStop System to the PC using an internal transfer method (FTP is not involved), 2) the Editor is launched and, 3) after exiting the Editor the file is transferred back to the NonStop System (if changed)

The **DOS** and **UNIX** format selection determines how line termination is formatted for ASCII files. The DOS Format uses a CR/LF and the UNIX Format uses a LF to terminate a line. This selection determines how the file is prepared for the Editor.

Edit On PC Settings selects various sounds played during file transfers and if an error occurs.

The **ASCII File extensions** determine when a file is considered ASCII, or a readable text file, and edit is allowed. Otherwise, the file is considered binary and is not editable.

Enscribe

Enscribe / Volume

MOMI - Multi-system Online Measure Interface (Client version 4.15)

Black Wood Systems, Inc.

\BWS1-2004

2006/09/06 16:19:15

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Enscribe SQL/MP Disk Entity DiskFile Entity DiskOpen Entity File Entity

Volume SubVolume File File Opener File Detail View File Cache Locks

| Volume | LDEV | Type | DiskPath(P) Primary | DiskPath(B) Backup | DiskPath(M) Mirror | DiskPath(MB) MirrorBackup | Capacity (MB) | Capacity (Pages) | FreeSpace (MB) | Free (MB) |
|----------|------|----------|------------------------|-----------------------|-----------------------|------------------------------|------------------|---------------------|-------------------|--------------|
| \$AUDIT | 160 | Magnetic | UP | *UP | UP | *UP | 8,837 | 4,315,357 | 7,887 | 3,8 |
| \$DATA1 | 158 | Magnetic | UP | *UP | UP | *UP | 8,837 | 4,315,357 | 3,260 | 1,5 |
| \$DSMSCM | 157 | Magnetic | UP | *UP | UP | *UP | 17,901 | 8,740,994 | 7,066 | 3,4 |
| \$MOMI01 | 151 | Magnetic | *UP | UP | *UP | UP | 17,901 | 8,740,994 | 6,065 | 2,9 |
| \$PCS1 | 150 | Magnetic | *UP | UP | *UP | UP | 8,837 | 4,315,357 | 1,543 | 7 |
| \$SWAP1 | 140 | Magnetic | *UP | UP | *UP | UP | 8,837 | 4,315,357 | 3,733 | 1,8 |
| \$SYSTEM | 6 | Magnetic | *UP | UP | *UP | UP | 36,099 | 17,626,876 | 25,421 | 12,4 |
| \$TEMP1 | 138 | Magnetic | *UP | UP | | | 8,837 | 4,315,357 | 2,674 | 1,3 |
| \$TEMP2 | 137 | Magnetic | *UP | UP | | | 8,837 | 4,315,357 | 8,713 | 4,2 |
| \$VDP1 | 133 | Virtual | *UP | | | | 17,675 | 8,630,714 | 11,387 | 5,5 |
| \$VDP2 | 132 | Virtual | *UP | | | | 17,675 | 8,630,714 | 11,387 | 5,5 |
| \$VDP3 | 131 | Virtual | *UP | | | | 17,675 | 8,630,714 | 11,387 | 5,5 |
| \$VDP4 | 130 | Virtual | *UP | | | | 17,675 | 8,630,714 | 11,387 | 5,5 |
| \$VDP5 | 129 | Virtual | *UP | | | | 17,675 | 8,630,714 | 11,387 | 5,5 |

Total Volume Capacity(MB) 248,648

Volume \$* No Filter Displayed 16 of 16

Clear Request data collected 2006/09/06 16:18:39

Not Logged On Hints On ? Help Print Screen

The Enscribe / Volume screen presents the disk present on the System. Virtual and Magnetic (real disk drives) are displayed.

Information displayed includes capacity, free space, fragments, if the volume may have TMF audited files, and drive product number. Mirrored volumes display additional information.

The screen supports drill down by right clicking on a drive to bring up a selection of jump options.

| Volume | SubVolume | File | File Opener | File Detail | View File | C |
|----------|-----------|----------|------------------------|-----------------------|-----------------------|---------------|
| Volume | LDEV | Type | DiskPath(P) Primary | DiskPath(B) Backup | DiskPath(M) Mirror | Disk Mirro |
| \$AUDIT | 168 | Magnetic | UP | *UP | UP | |
| \$DATA1 | | | | | UP | |
| \$DATA2 | | | | | *UP | |
| \$DSMSCM | | | | | UP | |
| \$MOMI01 | | | | | *UP | |
| \$OSS | 157 | Magnetic | UP | *UP | UP | |
| \$SWAP1 | 147 | Magnetic | *UP | UP | *UP | |
| \$SYSTEM | 6 | Magnetic | *UP | UP | *UP | |

\$AUDIT - View SubVolumes for this Volume

\$AUDIT - View Files for this Volume

\$AUDIT - View Openers for this Volume

Copy "\$AUDIT" to Clipboard

Enscribe / SubVolume

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.15) window. The title bar includes the Black Wood Systems, Inc. logo and a progress bar. The main window has a navigation menu with options: Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. Below this is a sub-menu with options: Enscribe, SQL/MP, Disk Entity, DiskFile Entity, DiskOpen Entity, and File Entity. The main content area displays a table of subvolumes with columns: Volume, SubVolume, File, File Opener, File Detail, View File, Cache, and Locks. The table lists subvolumes such as \$DSMSCM.JUNK, \$DSMSCM.NETBACK, \$DSMSCM.SAFE, \$DSMSCM.SQL, \$DSMSCM.SYS, \$DSMSCM.TESTCAT, \$DSMSCM.XBWS1, \$DSMSCM.XPHIHDB, \$DSMSCM.ZPHI0001, \$DSMSCM.ZPHI0003, \$DSMSCM.ZPHI0009, \$DSMSCM.ZPHI000B, \$DSMSCM.ZPHI000D, \$DSMSCM.ZPHI000G, \$DSMSCM.ZPHI000I, and \$DSMSCM.ZPHI000J. Below the table, there are controls for 'Vol.SubVol' (set to \$DSMSCM), 'Total SubVol Size' (10,482,189,024), 'No Filter', 'Displayed' (51 of 51), and a 'Request' button. At the bottom, there are buttons for 'Not Logged On', 'Hints On', 'Help', and 'Print Screen'.

| Volume | SubVolume | File | File Opener | File Detail | View File | Cache | Locks |
|--------|-------------------|---------------|-------------|-------------|-----------|-------|-------|
| | SubVolume | SubVol Size | Files | O | OCount | | |
| | \$DSMSCM.JUNK | 0 | 1 | | | | |
| | \$DSMSCM.NETBACK | 9,985,064 | 28 | | | | |
| | \$DSMSCM.SAFE | 0 | 1 | O | 1 | | |
| | \$DSMSCM.SQL | 292,352 | 28 | | | | |
| | \$DSMSCM.SYS | 10,322 | 4 | | | | |
| | \$DSMSCM.TESTCAT | 1,435,820 | 24 | | | | |
| | \$DSMSCM.XBWS1 | 61,175,166 | 118 | | | | |
| | \$DSMSCM.XPHIHDB | 132,384,502 | 211 | | | | |
| | \$DSMSCM.ZPHI0001 | 2,981,336,388 | 6,730 | | | | |
| | \$DSMSCM.ZPHI0003 | 57,558 | 1 | | | | |
| | \$DSMSCM.ZPHI0009 | 1,117,102,326 | 1,363 | | | | |
| | \$DSMSCM.ZPHI000B | 534 | 1 | | | | |
| | \$DSMSCM.ZPHI000D | 2,035,572 | 10 | | | | |
| | \$DSMSCM.ZPHI000G | 68,529,510 | 80 | | | | |
| | \$DSMSCM.ZPHI000I | 2,906 | 1 | | | | |
| | \$DSMSCM.ZPHI000J | 1,580,748 | 5 | | | | |

The Enscribe / SubVolume screen presents a list of subvolumes following the Guardian file naming convention.

The total number of bytes of the files comprising the subvolume, number of files present, if any files are open and the count of open files are displayed.

The option "No Details" directs that the above statistics are not gathered. This speeds the process of gathering data.

Temporary files on a disk are referenced as \$vol.#*. The search specification of \$*.* displays all volumes with temporary disk files.

Enscribe / File

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.15) window. The title bar includes the BlackWood Systems, Inc. logo and a progress bar. The main window has a navigation menu with tabs for Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The 'Files' tab is active, and the 'Enscribe' sub-tab is selected. Below this, there are sub-tabs for SQL/MP, Disk Entity, DiskFile Entity, DiskOpen Entity, and File Entity. The 'File Entity' sub-tab is active, showing a table of file information.

| Volume | SubVolume | File | File Opener | File Detail | View File | Cache | Locks |
|--------|-----------|--------------------------|-------------|--|-----------|-------|--------------------|
| | | FileName | Code | FileCode | EOF | %Full | Full Percent gauge |
| | | \$SYSTEM.SYSTEM.ACLH | 101 | EDIT-format file | 530 | 0% | |
| | | \$SYSTEM.SYSTEM.ADCSHELL | 101 | EDIT-format file | 82,156 | 0% | |
| | | \$SYSTEM.SYSTEM.AHEXOBJ | 100 | Object file (TNS) | 49,152 | 4% | |
| | | \$SYSTEM.SYSTEM.ALGORICC | 101 | EDIT-format file | 76,180 | 0% | |
| | | \$SYSTEM.SYSTEM.ALGORIT2 | 101 | EDIT-format file | 66,040 | 0% | |
| | | \$SYSTEM.SYSTEM.ALGORITM | 101 | EDIT-format file | 92,030 | 0% | |
| | | \$SYSTEM.SYSTEM.APCCDC | 100 | Object file (TNS) | 90,112 | 0% | |
| | | \$SYSTEM.SYSTEM.APCHEX | 100 | Object file (TNS) | 14,336 | 18% | |
| | | \$SYSTEM.SYSTEM.APCLMAP | 0 | | 134,244 | 1% | |
| | | \$SYSTEM.SYSTEM.APCMSGGS | 101 | EDIT-format file | 83,962 | 21% | |
| | | \$SYSTEM.SYSTEM.APCOBJ | 100 | Object file (TNS) | 1,722,368 | 1% | |
| | | \$SYSTEM.SYSTEM.APCPCOD | 301 | TPS (Pathway) TCL program code file | 60,416 | 2% | |
| | | \$SYSTEM.SYSTEM.APCPDIR | 300 | TPS (Pathway) TCL program directory file | 1,536 | 0% | |
| | | \$SYSTEM.SYSTEM.APCSEC | 100 | Object file (TNS) | 20,480 | 0% | |
| | | \$SYSTEM.SYSTEM.APCSTAB | 100 | Object file (TNS) | 274,132 | 0% | |

Below the table, there is a search filter section. The 'All Files' button is selected. The 'File Name' field contains '\$SYSTEM.SYSTEM'. The 'Total File Size(EOF)' is 523,934,442. The 'No Filter' button is selected. The 'Displayed' field shows 707 of 707 files. There are 'Clear' and 'Config' buttons. A 'Request' checkbox is checked, and the text 'data collected 2006/09/05 16:30:32' is displayed. At the bottom, there are buttons for 'Not Logged On', 'Hints On', 'Help', and 'Print Screen'.

The Enscribe / File screen presents information about disk files.

Files listed may also include OSS files. The path name is listed in a column further to the right on the scroll bar.

Actions available may be taken by right-clicking on the file name.

MOMI - Multi-system Online Measure Interface (Client version 4.15)

BlackWood Systems, Inc.

\BWS1-2004

2006/09/05 16:39:42

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Enscribe SQL/MP Disk Entity DiskFile Entity DiskOpen Entity File Entity

Volume SubVolume File File Opener File Detail View File Cache Locks

| FileName | Code | FileCode | EOF | %Full | Full Percent gauge |
|---------------------------|------|-----------------|-----------|-------|--------------------|
| \$SYSTEM.SYSTEM.ACLH | 404 | EOF format file | 530 | 0% | |
| \$SYSTEM.SYSTEM.ADCSHELL | | | 82,156 | 0% | |
| \$SYSTEM.SYSTEM.AHEXOBJ | | | 49,152 | 4% | |
| \$SYSTEM.SYSTEM.ALGORICO | | | 76,180 | 0% | |
| \$SYSTEM.SYSTEM.ALGORIT2 | | | 66,040 | 0% | |
| \$SYSTEM.SYSTEM.ALGORITHM | | | 92,030 | 0% | |
| \$SYSTEM.SYSTEM.APCCDC | | | 90,112 | 0% | |
| \$SYSTEM.SYSTEM.APCHEX | | | 14,336 | 18% | |
| \$SYSTEM.SYSTEM.APCLMAP | | | 134,244 | 1% | |
| \$SYSTEM.SYSTEM.APCMSG | | | 83,962 | 21% | |
| \$SYSTEM.SYSTEM.APCOBJ | | | 1,722,368 | 1% | |
| \$SYSTEM.SYSTEM.APCPCOD | | | 60,416 | 2% | |
| \$SYSTEM.SYSTEM.APCPDIR | | | 1,536 | 0% | |
| \$SYSTEM.SYSTEM.APCSEC | | | 20,480 | 0% | |
| \$SYSTEM.SYSTEM.APCTAB | | | 274,132 | 0% | |

\$SYSTEM.SYSTEM.ACLH - View File Detail

- \$SYSTEM.SYSTEM.ACLH - View File Contents
- \$SYSTEM.SYSTEM.ACLH - View File Contents ...
- \$SYSTEM.SYSTEM.ACLH - View File Openers
- \$SYSTEM.SYSTEM.ACLH - Purge File
- \$SYSTEM.SYSTEM.ACLH - Purge File Data
- \$SYSTEM.SYSTEM.ACLH - Rename File ...
- \$SYSTEM.SYSTEM.ACLH - Set File Security ...
- \$SYSTEM.SYSTEM.ACLH - Set File Owner ...
- \$SYSTEM.SYSTEM.ACLH - Set File Code ...
- \$SYSTEM.SYSTEM.ACLH - Set File Max Extents ...
- \$SYSTEM.SYSTEM.ACLH - Set File Audited
- \$SYSTEM.SYSTEM.ACLH - Set File License
- \$SYSTEM.SYSTEM.ACLH - Set File ProgId
- \$SYSTEM.SYSTEM.ACLH - Set File Audit Compress
- \$SYSTEM.SYSTEM.ACLH - Set File Buffered Writes
- \$SYSTEM.SYSTEM.ACLH - Set File Verify Writes
- \$SYSTEM.SYSTEM.ACLH - Set File Serial Writes
- \$SYSTEM.SYSTEM.ACLH - Set File Clear-On-Purge
- \$SYSTEM.SYSTEM.ACLH - Set File Refresh EOF
- \$SYSTEM.SYSTEM.ACLH - Reset Broken Flag
- \$SYSTEM.SYSTEM.ACLH - Allocate Extents ...
- \$SYSTEM.SYSTEM.ACLH - Deallocate Extents

Total File Size(EOF) 523,934,442

Displayed 707 of 707

Logged On Hints On ? Help Print Screen

To obtain a limited set of files, the Config button provides several options:

Set Limits to files returned

No Limits

Only if File Code is

Only if File is Audited

Only if File is Broken

Only if File is Corrupt

Only if File is CrashOpen

Only if Roll Forward needed

Only if File Full is over % full

Request

Close

Files retrieved with Config limitation imposed attempt to optimize file retrieval for the fastest access. Only those records matching the criteria are returned to the Client. The above example requests only files with the Corrupt attribute. If multiple selections are made, these are 'and'ed together (meaning everything checked must match).

OSS files displaying on this screen follow different processing rules. Columns such as "% full" and "maximum extents" may not apply or have strange information displayed.

Enscribe / File Opener

MOMI - Multi-system Online Measure Interface (Client version 4.15)

BlackWood Systems, Inc. | \BWS1-2004 | 2006/09/05 16:43:42

Back | Systems | Overview | CPUs | Processes | **Files** | SubSystems | History | Alarms | Configure

Enscribe | SQL/MP | Disk Entity | DiskFile Entity | DiskOpen Entity | **File Entity**

Volume | SubVolume | File | **File Opener** | File Detail | View File | Cache | Locks

| FileName | PName | Opener Program Name | Pri CPU,Pin | Access Mode | Exclusion Mode | SyncDep |
|---------------------------|---------|-------------------------|-------------|-------------|----------------|---------|
| \$AUDIT.SAFE.GUARD | \$ZS01 | \$SYSTEM.SYS52.OSMON | 01,00331 | read/write | shared | 1 |
| \$AUDIT.ZTMFAT.AA000178 | \$TMP | \$SYSTEM.SYS52.TMFTMP | 00,00012 | read/write | shared | 0 |
| \$AUDIT.ZTMFAT.AA000178 | \$TMP | \$SYSTEM.SYS52.TMFTMP | 01,00011 | read/write | shared | 0 |
| \$DATA1.#0002512 | \$Z19V | \$SYSTEM.SYS52.TACL | 00,00155 | read only | shared | 0 |
| \$DATA1.#0002512 | | \$SYSTEM.SYS52.OSIMAGE | 00,00000 | read/write | protected | 0 |
| \$DATA1.COMM.SNMPCTL | \$ZTMXA | \$SYSTEM.SYSTEM.SNMPAGT | 01,00353 | read/write | shared | 1 |
| \$DATA1.DALEMOMI.BWMOMI | | \$SYSTEM.SYS52.OSIMAGE | 01,00000 | read only | protected | 0 |
| \$DATA1.DALEMOMI.BWMOMI | | \$SYSTEM.SYS52.OSIMAGE | 00,00000 | read only | protected | 0 |
| \$DATA1.DALEMOMI.DCPUS | \$XMM | \$SYSTEM.SYS52.MEASMON | 01,00384 | read/write | shared | 0 |
| \$DATA1.DALEMOMI.DCPUS | \$XM00 | \$SYSTEM.SYS52.MEASCTL | 00,00385 | read/write | shared | 0 |
| \$DATA1.DALEMOMI.DCPUS | \$XM01 | \$SYSTEM.SYS52.MEASCTL | 01,00385 | read/write | shared | 0 |
| \$DATA1.MOMI2006.BWMOMI1 | | \$SYSTEM.SYS52.OSIMAGE | 01,00000 | read only | protected | 0 |
| \$DATA1.MOMI2006.BWMOMI1 | | \$SYSTEM.SYS52.OSIMAGE | 00,00000 | read only | protected | 0 |
| \$DATA1.MOMI2006.BWMTCPOT | | \$SYSTEM.SYS52.OSIMAGE | 01,00000 | read only | protected | 0 |
| \$DATA1.MOMI2006.BWMTCPOT | | \$SYSTEM.SYS52.OSIMAGE | 00,00000 | read only | protected | 0 |
| \$DATA1.MOMI2006.DCPUS | \$XMM | \$SYSTEM.SYS52.MEASMON | 01,00384 | read/write | shared | 0 |

File Name: \$* | No Filter | Displayed: 746 of 746

Disks Only Request | data collected 2006/09/05 16:43:29

The Enscribe / File Opener screen presents a list of 'opens' (the establishment of a communication path) from one entity to another. This is the equivalent of the FUP LISTOPENS command.

Generally, only system processes such as the disk process display opener information.

Enscribe / File Detail

MOMI - Multi-system Online Measure Interface (Client version 4.15)

BlackWood Systems, Inc.

Progress Gauge: 4%

System: \BWS1-2004

Date/Time: 2006/09/05 16:45:28

Navigation: Back, Systems, Overview, CPUs, Processes, **Files**, SubSystems, History, Alarms, Configure

Enscribe: SQL/MP, Disk Entity, DiskFile Entity, DiskOpen Entity, **File Entity**

File Entity: Volume, SubVolume, File, File Opener, **File Detail**, View File, Cache, Locks

File

| FileName | Code | FileCode | EOF | %Full | Full Percent gauge | Modification Date | Owner | Security | O | P |
|-------------------|------|----------|-----|-------|--------------------|---------------------|---------|----------|---|---|
| \$DATA1.JUNK.TEST | 0 | | 0 | 0% | | 2004/12/15 11:18:39 | 100,109 | CCCC | | |

Partitions

| Volume | Partition Key | PIdx | %Full | Full Percent gauge |
|----------|---------------|------|-------|--------------------|
| \$PCS1 | "aaaaa" | 1 | 0% | |
| \$SWAP1 | "bbbb",?0 | 2 | 0% | |
| \$MOMI01 | "cccc" 20 | 3 | 0% | |

Alternate Keys

| Key | KeyLen | KeyOff | FNum | NullV | N | U | - | I |
|------|--------|--------|------|-------|---|---|---|---|
| "OK" | 6 | 6 | 0 | | | | | |
| "dw" | 24 | 12 | 1 | | | | | |
| "sb" | 24 | 12 | 2 | | | | | |

Alternate Key Files

| FileName | FNum | %Full | Full Percent Guag |
|---------------------|------|-------|-------------------|
| \$DATA1.JUNK.TESTKA | 0 | 0% | |
| \$DATA1.JUNK.TESTKB | 1 | 0% | |
| \$DATA1.JUNK.TESTKC | 2 | 0% | |

Full FileName: \$DATA1.JUNK.TEST

Request data collected 2006/09/05 16:45:02

Not Logged On Hints On ? Help Print Screen

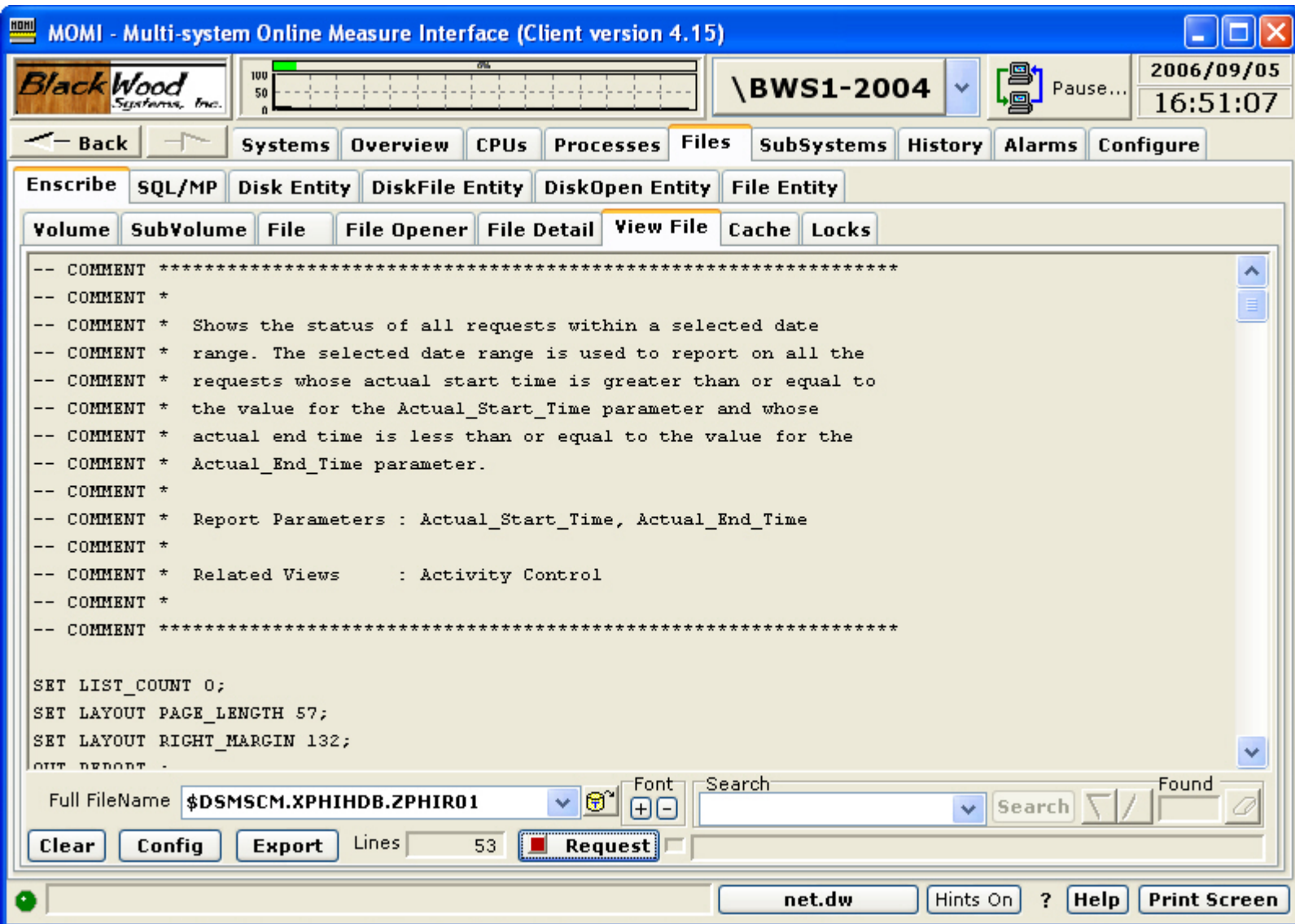
The Enscribe / File Detail screen presents details of the Partitions, Alternate Keys and Alternate Key Files associated with an Enscribe file.

File level detail is the same as presented on the Enscribe / Files screen.

Right clicks are available on the File, Partitions and Alternate Key files.

SQL files may not display correctly. The Guardian procedures do not always return correct information for SQL objects.

Enscribe / View File

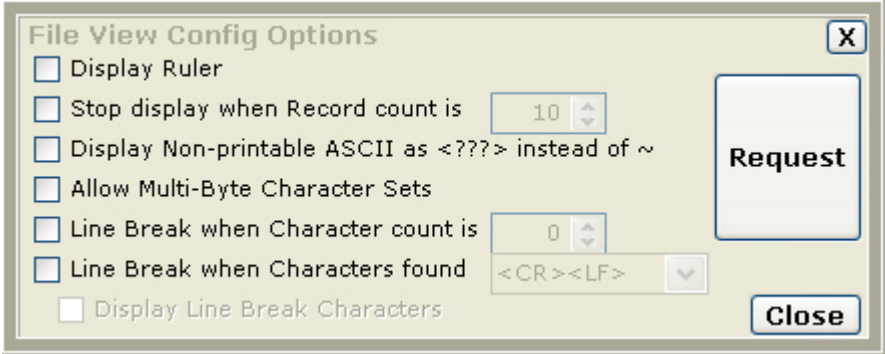


The Enscribe / View File screen allows display of the contents of a disk file. The User must Logon in order to perform action on this screen.

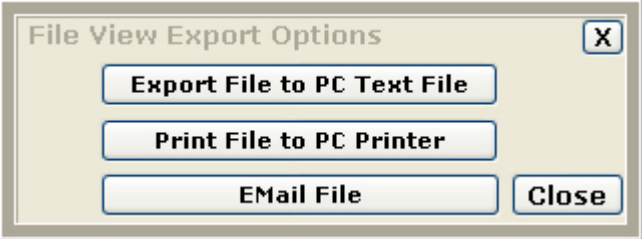
The file selected may either be an edit type or other type of file (such as an object file). By default, null characters are converted to ~ (tilde).

Object files, file codes 100, 700 and 800, have a fixed line length of 132 bytes. Edit files have variable length lines. All other files have a line length determined by the file record size.

The Config button display a pop-up window to alter screen defaults, such as not converting unprintable ASCII characters to ~ (tilde). Unstructured files with fixed length lines or lines terminated by particular characters (such as CR/LF) may also be processed.



The Export button is used to transfer the displayed information to a file, printer on the local PC or via an Email.



Enscribe / Cache

MOMI - Multi-system Online Measure Interface (Client version 4.15)

Black Wood Systems, Inc. | \BWS1-2004 | 2006/09/05 16:53:21

Back | Systems | Overview | CPUs | Processes | **Files** | SubSystems | History | Alarms | Configure

Enscribe | SQL/MP | Disk Entity | DiskFile Entity | DiskOpen Entity | **File Entity**

Volume | SubVolume | File | File Opener | File Detail | View File | **Cache** | Locks

| Volume | Current Stats Time | Reset Stats Time | Elapsed Stats Time | Total Cache KBytes | Writes per ControlPoint | 512 bytes Blocks Requested | 512 bytes Blocks Allocated | 512 bytes Blocks In Use |
|----------|---------------------|---------------------|--------------------|--------------------|-------------------------|----------------------------|----------------------------|-------------------------|
| \$AUDIT | 2006/09/05 16:53:13 | 2006/08/25 23:23:33 | 10 17:29:40 | 5,888 | 0.00 | | 512 | 0 |
| \$DATA1 | 2006/09/05 16:53:13 | 2006/08/25 23:23:33 | 10 17:29:40 | 67,328 | 0.00 | | 512 | 4 |
| \$DSMSCM | 2006/09/05 16:53:13 | 2006/08/25 23:23:33 | 10 17:29:40 | 25,792 | 0.00 | | 512 | 6 |
| \$MOMI01 | 2006/09/05 16:53:13 | 2006/08/25 23:24:12 | 10 17:29:01 | 29,792 | 0.00 | | 512 | 0 |
| \$PCS1 | 2006/09/05 16:53:13 | 2006/08/25 23:23:33 | 10 17:29:40 | 29,792 | 0.00 | | 512 | 0 |
| \$SWAP1 | 2006/09/05 16:53:13 | 2006/08/25 23:24:11 | 10 17:29:01 | 29,792 | 0.00 | | 512 | 2 |
| \$SYSTEM | 2006/09/05 16:53:13 | 2006/08/25 23:23:40 | 10 17:29:32 | 17,792 | 0.00 | | 512 | 14 |
| \$TEMP1 | 2006/09/05 16:53:13 | 2006/08/25 23:24:11 | 10 17:29:01 | 12,992 | 0.00 | | 512 | 16 |
| \$TEMP2 | 2006/09/05 16:53:13 | 2006/08/25 23:24:10 | 10 17:29:02 | 5,888 | 0.00 | | 512 | 2 |

Volume: \$* | No Filter | Displayed: 9 of 1

Clear | AutoUpdate | Request | data collected 2006/09/05 16:53:12

net.dw | Hints On | ? Help | Print Screen

The Enscribe / Cache screen presents the cache allocated and statistics about cache efficiency.

Disk cache is memory allocated in the disk process that is referenced prior to a physical access to disk. Data found in the cache reduces physical disk access and is inherently faster.

Disk cache is divided into 4 groups or block sizes. A block size is specified when a disk file is created. Cache blocks are allocated to each size. The sum of these blocks represents the Total Cache size.

A high percentage of "Cache Read Hits" and "Cache Write Dirties" are desired. Generally, additional cache blocks are allocated (via SCF) until percentages in the 90's are achieved. However, Users should also give attention to the Cache Faults counter. If a processor is running low on memory, the memory manager can take memory allocated to the disk cache. This counter indicates the frequency of this event. Consideration should be given to reducing the amount of disk cache or increasing memory in a processor when cache faults is constantly incrementing.

Clicking on a disk will bring up an SCF-like output containing detail for that volume:

| \$SYSTEM | | Disk Volume Cache Detail | | | | |
|------------------------------|--------------------------------|--------------------------|------|--------|-------|-----------|
| | | Cache Block Size | 512 | 1024 | 2048 | 4096 |
| Cache Bytes | 17,792.0 KB | Blocks Requested | | | 512 | 4,000 |
| Cache Bytes in Use | 16,223.0 KB | Blocks Allocated | 512 | 512 | 512 | 4,000 |
| Current Time | 2006/09/05 16:53:13 | Blocks in Use | 14 | 46 | 85 | 4,000 |
| Counter Reset Time | 2006/08/25 23:23:40 | Blocks Dirty | 0% | 0% | 0% | 0% |
| Elapsed Time | 10 17:29:32 | Cache Reads | 100% | 90% | 99% | 95% |
| Writes/Control Point | 0.00 | Cache Read Hits | 95% | 99% | 89% | 99% |
| Graphic Clipboard | | Cache Read Misses | 5% | 1% | 11% | 1% |
| | | Cache Writes | 0% | 10% | 1% | 5% |
| | | Cache Write Dirties | 0% | 30% | 0% | 62% |
| | | Cache Write Cleans | 0% | 68% | 100% | 37% |
| | | Cache Write Misses | 0% | 2% | 0% | 1% |
| | | Cache Calls | 312 | 14,322 | 5,378 | 8,076,915 |
| | | Cache Faults | 0 | 0 | 0 | 0 |
| | | Audit Forces | 0 | 0 | 0 | 0 |

Enscribe / Locks

see [System Quirks](#)

MOMI - Multi-system Online Measure Interface (Client version 4.15)

Black Wood Systems, Inc.

\BWS1-2004

2006/09/05 16:59:25

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Enscribe SQL/MP Disk Entity DiskFile Entity DiskOpen Entity File Entity

Volume SubVolume File File Opener File Detail View File Cache Locks

File Name

Lock Type (Len)-Key or RecNbr

Process Name Lock_Granted Lock_Intent TransId

\$DATA1.DMOMI4X.DICTODF

FILE-LOCK

DDL LOCK-GRANTED LOCK-INTENT \BWS1(1).0.9015047

RECORD-LOCK (004)-?0,?1,":1"

DDL LOCK-GRANTED \BWS1(1).0.9015048

\$DATA1.DMOMI4X.DICTALT

FILE-LOCK

DDL LOCK-GRANTED LOCK-INTENT \BWS1(1).0.9015047

RECORD-LOCK (012)-"SO",?0,?1,"lq",?0,?1,":2",?0,"5"

DDL LOCK-GRANTED \BWS1(1).0.9015047

RECORD-LOCK (012)-"SO",?0,?1,"lw",?0,?1,":2",?0,"6"

DDL LOCK-GRANTED \BWS1(1).0.9015047

RECORD-LOCK (012)-"SO",?0,?1,"ly",?0,?1,":2",?0,?19

DDL LOCK-GRANTED \BWS1(1).0.9015047

RECORD-LOCK (012)-"SO",?0,?1,"lu",?0,?1,":2",?0,?18

DDL LOCK-GRANTED \BWS1(1).0.9015047

FileName \$*

Clear Auto Expand **Request** data collected 2006/09/05 16:58:13

net.dw Hints On ? Help Print Screen

The Enscribe / Locks screen presents file and record lock information similar to the FUP LISTLOCKS command.

This screen only functions on systems running G06.26 or later.

The information is presented in a tree-view format. The first level is the file name, the second level a file level or record level type of lock and the third level the locking process.

The following are descriptions of the columns:

File_Name = File Name that has the Lock
 Lock_Type = Type of Lock (File or Record)

(Len)-Key = (length of Key)-Key Value for Key-Sequenced files or
RecNbr = Record Number for non-Key-Sequenced files
Process_Name = Name of Process that requested the Lock or
 process that initiated the TMF transaction
Lock_Granted = Lock is Granted
Lock_Intent = Lock Intent requested by DP2
TransId = Transaction ID (if TMF active on participant)

The underlying Guardian procedure to return locking information does not include the requesting process name if a Transaction ID is returned. MOMI queries TMF and requests the process name that initiates the TMF transaction. This is not necessarily the process performing I/O to the listed file.

If a lock cannot be granted, indicated by a space in the Lock_Granted column, then the request is placed in a queue until the lock is granted or the requesting process times out.

SQL/MP

SQL/MP / Catalog

see [System Quirks](#)

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 3.50) window. The title bar includes the BlackWood Systems, Inc. logo, a progress indicator, the system name '\BWS1 Fast - 2002', a 'Pause...' button, and the date '2003/10/06' and time '16:27:18'. The main navigation area includes buttons for 'Back', 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', '* SubSystems', 'History', and 'Configure'. The 'SQL/MP' menu is active, showing sub-options: 'Enscribe', 'SQL/MP', 'Disk Entity', 'DiskFile Entity', 'DiskOpen Entity', and 'File Entity'. The 'Catalog' sub-menu is selected, showing options: 'Catalog', 'Base Table', 'Table', 'File', 'Partition', 'Index', 'Table Detail', 'Program', 'Usage', and 'Statement'. The 'System Catalog' table is displayed with the following data:

| Catalog Name | SubSystem Name | Version | Version Upgrade | Status Message |
|--------------|----------------|---------|-----------------|----------------|
| \$DSMSCM.SQL | SQL | A345 | | |

The 'User Catalogs' table is also displayed with the following data:

| Catalog Name | SubSystem Name | Version | Version Upgrade | Status Message |
|------------------|----------------|---------|---------------------|----------------|
| \$DATA1.TESTCAT | SQL | A350 | 2002/09/25 16:34:49 | |
| \$DATA1.TESTCAT2 | SQL | A350 | | |
| \$DSMSCM.TESTCAT | SQL | A350 | | |
| \$DSMSCM.XBWS1 | SQL | A350 | | |
| \$DSMSCM.XPHIHDB | SQL | A350 | | |

At the bottom of the screen, there is a 'Clear' button, a 'System SQL Version' field with the value '350', a 'Request' button, and a status bar indicating 'data collected 2003/10/06 16:27:06'. The bottom right corner contains buttons for 'Not Logged On', 'Help', and 'Print Screen'.

The SQL/MP / Catalog screen presents the SQL/MP Catalog of the System and User Catalogs defined on the system.

The Tandem system itself has a version number for SQL/MP. This version is shown in the lower right hand corner of the display. The System and User Catalogs are usually at or below the version of SQL/MP of the system.

The column Status Message displays an error message if a simple query of the listed User Catalogs fails. An error in this column either indicates that MOMI does not have security access to the catalog or that the catalog is not present. Any error message in this column indicates that MOMI will encounter errors on other SQL/MP screens.

SQL/MP / Base Table

see [System Quirks](#)

MOMI - Multi-system Online Measure Interface (Client version 3.50)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

Pause...

2003/10/06 16:31:59

Back Systems Overview CPUs Processes Files * SubSystems History Configure

Enscribe SQL/MP Disk Entity DiskFile Entity DiskOpen Entity File Entity

Catalog Base Table Table File Partition Index Table Detail Program Usage Statement

| Catalog Name | Table Name | TC | TI | FileName | Stats Time | Row |
|-----------------|--------------------------|----|----|--------------------------|---------------------|-----|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.BASETABS | | TI | \$DATA1.TESTCAT.BASETABS | 2002/09/20 16:03:08 | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.COLUMNS | | TI | \$DATA1.TESTCAT.COLUMNS | 2002/09/23 10:02:33 | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.COMMENTS | | TI | \$DATA1.TESTCAT.COMMENTS | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CONSTRNT | | TI | \$DATA1.TESTCAT.CONSTRNT | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CPRLSRCE | | TI | \$DATA1.TESTCAT.CPRLSRCE | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CPRULES | | TI | \$DATA1.TESTCAT.CPRULES | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.FILES | | TI | \$DATA1.TESTCAT.FILES | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.INDEXES | | TI | \$DATA1.TESTCAT.INDEXES | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.KEYS | | TI | \$DATA1.TESTCAT.KEYS | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | | | \$DATA1.TESTCAT.ORDERS | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | | | \$DATA1.TESTCAT.ORDERS2 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.PARTNS | | TI | \$DATA1.TESTCAT.PARTNS | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.PROGRAMS | | TI | \$DATA1.TESTCAT.PROGRAMS | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.TABLES | | TI | \$DATA1.TESTCAT.TABLES | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.TRANSIDS | | TI | \$DATA1.TESTCAT.TRANSIDS | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.USAGES | | TI | \$DATA1.TESTCAT.USAGES | | |

Catalog \$*.* No Filter Displayed 207 of 207

Table \$*.*.*

Clear Request data collected 2003/10/06 16:31:56

Not Logged On ? Help Print Screen

The SQL/MP / Base Table screen presents information about base tables.

Base tables are physically present and are not a logical 'view' of the data. SQL tables are made up of rows and columns. A row can be thought of as a record, and a column is a field in a record.

SQL/MP / Table

see [System Quirks](#)

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 3.50) window. The title bar includes the BlackWood Systems, Inc. logo, a progress indicator, the system name '\BWS1 Fast - 2002', a 'Pause...' button, and the date/time '2003/10/06 16:43:46'. The main navigation area includes buttons for 'Back', 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', '* SubSystems', 'History', and 'Configure'. The 'Files' button is selected, and the 'SQL/MP' sub-tab is active. The 'Table' sub-tab is selected, displaying a table with the following columns: Catalog Name, Table Name, Type, Code, Cols, UserID, Create Time, and Invalid Time. The table lists various tables in the \$DATA1.TESTCAT catalog, including BASETABS, COLUMNS, COMMENTS, CONSTRNT, CPRLSRCE, CPRULES, FILES, INDEXES, KEYS, ORDERS, ORDERS2, PARTNS, PROGRAMS, TABLES, TRANSIDS, and USAGES. Below the table, there are filter controls for 'Catalog' (set to '\$*.*') and 'Table' (set to '\$*.*.*'). A 'Clear' button is present. A 'Request' button is also visible, along with a status bar indicating 'data collected 2003/10/06 16:39:17'. At the bottom of the window, there are buttons for 'Not Logged On', 'Help', and 'Print Screen'.

| Catalog Name | Table Name | Type | Code | Cols | UserID | Create Time | Invalid Time |
|-----------------|--------------------------|------|------|------|---------|---------------------|--------------------|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.BASETABS | TA | 572 | 9 | 255,255 | 2002/09/25 16:30:40 | 2002/09/25 16:30:3 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.COLUMNS | TA | 573 | 26 | 255,255 | 2002/09/25 16:30:40 | 2002/09/25 16:34:4 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.COMMENTS | TA | 574 | 5 | 255,255 | 2002/09/25 16:30:41 | 2002/09/25 16:30:3 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CONSTRNT | TA | 575 | 4 | 255,255 | 2002/09/25 16:30:42 | 2002/09/25 16:30:3 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CPRLSRCE | TA | 587 | 3 | 255,255 | 2002/09/25 16:34:54 | 2002/09/25 16:34:4 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CPRULES | TA | 586 | 6 | 255,255 | 2002/09/25 16:34:54 | 2002/09/25 16:34:4 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.FILES | TA | 576 | 26 | 255,255 | 2002/09/25 16:30:41 | 2002/09/25 16:34:4 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.INDEXES | TA | 577 | 15 | 255,255 | 2002/09/25 16:30:41 | 2002/09/25 16:34:4 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.KEYS | TA | 578 | 5 | 255,255 | 2002/09/25 16:30:41 | 2002/09/25 16:34:4 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | TA | 0 | 5 | 100,109 | 2002/09/24 09:37:56 | 2002/10/15 12:28:5 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | 0 | 5 | 100,109 | 2002/10/16 13:22:14 | 2002/10/16 13:22:3 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.PARTNS | TA | 579 | 5 | 255,255 | 2002/09/25 16:30:41 | 2002/09/25 16:30:3 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.PROGRAMS | TA | 580 | 19 | 255,255 | 2002/09/25 16:30:41 | 2002/09/25 16:34:4 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.TABLES | TA | 581 | 12 | 255,255 | 2002/09/25 16:30:41 | 2002/09/25 16:34:4 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.TRANSIDS | TA | 582 | 3 | 255,255 | 2002/09/25 16:30:42 | 2002/09/25 16:30:3 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.USAGES | TA | 583 | 7 | 255,255 | 2002/09/25 16:30:42 | 2002/09/25 16:30:3 |

The SQL/MP / Table screen presents information about tables.

A table is logical representation of data in a database.

SQL/MP / File

see [System Quirks](#)

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 3.50) window. The title bar includes the BlackWood Systems, Inc. logo and a progress gauge. The main window has a navigation menu with options: Back, Systems, Overview, CPUs, Processes, Files, * SubSystems, History, and Configure. The 'Files' menu is active, showing sub-options: Enscribe, SQL/MP, Disk Entity, DiskFile Entity, DiskOpen Entity, and File Entity. The 'File Entity' sub-option is selected, displaying a table of file entities.

| Catalog | Base Table | Table | File | Partition | Index | Table Detail | Program | Usage | Statement |
|-----------------|--------------------------|---------|-------|--------------------|-------|--------------|-----------|-------|-----------|
| Catalog Name | File Name | EOF | %Full | Full Percent gauge | FT | ActIndx | BlockSize | Pri | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.BASETABS | 12,288 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.COLUMNS | 49,152 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.COMMENTS | 0 | 0 | | K | | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CONSTRNT | 0 | 0 | | K | | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CPRLSRCE | 0 | 0 | | K | | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.CPRULES | 0 | 0 | | K | | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.FILES | 16,384 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.INDEXES | 16,384 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.IXINDE01 | 12,288 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.IXPART01 | 12,288 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.IXPROG01 | 0 | 0 | | K | | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.IXTABL01 | 12,288 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.IXUSAG01 | 221,184 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.KEYS | 20,480 | 0 | | K | 1 | 4,096 | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | 0 | 0 | | K | | 4,096 | | 1 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS? | 0 | 0 | | K | | 4,096 | | 1 |

Summary section at the bottom of the screen:

- Catalog: \$*.*
- File: \$*.*.*
- Total File Size: 81,527,808
- No Filter
- Displayed: 384 of 384
- Request: data collected 2003/10/06 17:02:08

Buttons at the bottom: Not Logged On, Help, Print Screen.

The SQL/MP / File screen presents information about files.

A file is the physical entity where data or descriptive information is stored.

The Actual Index (ActIdx) column displays the number of index levels in the file at the time of the screen display. This value does not come from the catalog. A high number of index levels can affect System performance. Sorting the screen by this column allows index levels to be quickly checked.

SQL/MP / Partition

see [System Quirks](#)

MOMI - Multi-system Online Measure Interface (Client version 3.50)

BlackWood Systems, Inc. | \BWS1 Fast - 2002 | 2003/10/06 17:09:17

Navigation: Back | Systems | Overview | CPUs | Processes | Files | * SubSystems | History | Configure

Sub-panels: Enscribe | **SQL/MP** | Disk Entity | DiskFile Entity | DiskOpen Entity | File Entity

Table Headers: Catalog | Base Table | Table | File | **Partition** | Index | Table Detail | Program | Usage | Statement

| Catalog Name | File Name | Primary | Partition Name | Catalog Part Name | First Key V |
|-----------------|-------------------------|---------|-------------------------|-------------------|-------------|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | Y | \$DATA1.TESTCAT.ORDERS | \$DATA1.TESTCAT | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | | \$PCS1.TESTCAT.ORDERS | \$DATA1.TESTCAT | 5000 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | | \$SWAP1.TESTCAT.ORDERS | \$DATA1.TESTCAT | 6000 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | Y | \$DATA1.TESTCAT.ORDERS2 | \$DATA1.TESTCAT | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | | \$PCS1.TESTCAT.ORDERS2 | \$DATA1.TESTCAT2 | (5000) |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | | \$SWAP1.TESTCAT.ORDERS2 | \$DATA1.TESTCAT | (6000) |
| \$DATA1.TESTCAT | \$PCS1.TESTCAT.ORDERS | Y | \$DATA1.TESTCAT.ORDERS | \$DATA1.TESTCAT | |
| \$DATA1.TESTCAT | \$PCS1.TESTCAT.ORDERS | | \$PCS1.TESTCAT.ORDERS | \$DATA1.TESTCAT | 5000 |
| \$DATA1.TESTCAT | \$PCS1.TESTCAT.ORDERS | | \$SWAP1.TESTCAT.ORDERS | \$DATA1.TESTCAT | 6000 |
| \$DATA1.TESTCAT | \$SWAP1.TESTCAT.ORDERS | Y | \$DATA1.TESTCAT.ORDERS | \$DATA1.TESTCAT | |
| \$DATA1.TESTCAT | \$SWAP1.TESTCAT.ORDERS | | \$PCS1.TESTCAT.ORDERS | \$DATA1.TESTCAT | 5000 |
| \$DATA1.TESTCAT | \$SWAP1.TESTCAT.ORDERS | | \$SWAP1.TESTCAT.ORDERS | \$DATA1.TESTCAT | 6000 |
| \$DATA1.TESTCAT | \$SWAP1.TESTCAT.ORDERS2 | Y | \$DATA1.TESTCAT.ORDERS2 | \$DATA1.TESTCAT | |
| \$DATA1.TESTCAT | \$SWAP1.TESTCAT.ORDERS2 | | \$PCS1.TESTCAT.ORDERS2 | \$DATA1.TESTCAT2 | (5000) |
| \$DATA1.TESTCAT | \$SWAP1.TESTCAT.ORDERS2 | | \$SWAP1.TESTCAT.ORDERS2 | \$DATA1.TESTCAT | (6000) |

Filter: Catalog \$*.* | No Filter | Displayed 24 of 24 | File \$*.*

Buttons: Clear | Request | data collected 2003/10/06 17:09:09 | Not Logged On | Help | Print Screen

The SQL/MP / Partition screen presents information about how large logical files are split across multiple smaller physical files.

As files grow in either physical size or number of accesses, partitions are used to spread the load across multiple disk drives. Multiple drives provide more physical space and/or better access time by overlapping I/O across more hardware.

SQL/MP / Index

see [System Quirks](#)

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 3.50) window. The title bar includes the BlackWood Systems, Inc. logo and the system name \BWS1 Fast - 2002. The date and time are 2003/10/06 17:16:01. The interface has a navigation menu with buttons for Back, Systems, Overview, CPUs, Processes, Files, * SubSystems, History, and Configure. The main area is divided into several tabs: Enscribe, SQL/MP, Disk Entity, DiskFile Entity, DiskOpen Entity, and File Entity. The SQL/MP tab is active, and the Index sub-tab is selected. A table displays index information with columns for Catalog Name, Table Name, Index Name, Code, Cols, Create Time, and Ke. Below the table are filter controls for Catalog and Table, both set to \$*.*. A 'Request' button is visible, and a status bar at the bottom indicates 'data collected 2003/10/06 17:15:52'. The bottom right corner has buttons for 'Not Logged On', 'Help', and 'Print Screen'.

| Catalog | Base Table | Table | File | Partition | Index | Table Detail | Program | Usage | Statement |
|------------------|------------------|----------|------|-----------|---------------------------|--------------|---------|-------|-----------|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | INDEXES | | | \$DATA1.TESTCAT.IXINDE01 | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | ORDERS2 | | | \$PCS1.TESTCAT.ORDERS2B | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | ORDERS2 | | | \$PCS1.TESTCAT.ORDERS2C | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | ORDERS2 | | | \$PCS1.TESTCAT.ORDERS2D | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | ORDERS2 | | | \$PCS1.TESTCAT.ORDERS2E | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | ORDERS2 | | | \$PCS1.TESTCAT.ORDERS2F | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | ORDERS2 | | | \$PCS1.TESTCAT.ORDERS2G | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | ORDERS2 | | | \$PCS1.TESTCAT.ORDERS2H | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | ORDERS2 | | | \$SWAP1.TESTCAT.ORDERS2A | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | PARTNS | | | \$DATA1.TESTCAT.IXPART01 | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | PROGRAMS | | | \$DATA1.TESTCAT.IXPROG01 | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | TABLES | | | \$DATA1.TESTCAT.IXTABL01 | | | | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT | USAGES | | | \$DATA1.TESTCAT.IXUSAG01 | | | | |
| \$DATA1.TESTCAT2 | \$DATA1.TESTCAT | ORDERS | | | \$DATA1.TESTCAT.IORDERS | | | | |
| \$DATA1.TESTCAT2 | \$DATA1.TESTCAT | ORDERS2 | | | \$PCS1.TESTCAT.ORDERS2A | | | | |
| \$DATA1.TESTCAT2 | \$DATA1.TESTCAT2 | INDEXES | | | \$DATA1.TESTCAT2.IXINDE01 | | | | |

The SQL/MP / Index screen presents information about files used to provide ordered access to data.

Indexes are comprised of data accessible in an ordered manner. As indexes physically grow in size, the number of levels within the index also increase, which can affect performance. Generally speaking, access

to a data record requires the number of index levels plus 1. As such, it is advisable to maintain index levels as low as possible. Note that disk cache generally favors indexes over data so the number of physical drive I/Os is usually reduced by adding cache.

The screen columns ActIndx and IndexL, as shown below, provide the Actual Index levels at the time of screen display and the Index levels recorded in the associated Catalog. Sorting by and/or comparing these values provides two pieces of information. First, it shows the number currently required. Second, if the Actual index levels and the Index level recorded in the Catalog vary greatly, SQL/MP compiles may not be choosing the most optimum access path.

The screenshot shows the MOMI interface with the following components:

- Header:** MOMI - Multi-system Online Measure Interface (Client version 3.50)
- Navigation:** Back, Systems, Overview, CPUs, Processes, Files, * SubSystems, History, Configure
- Entity Selection:** Enscribe, SQL/MP, Disk Entity, DiskFile Entity, DiskOpen Entity, File Entity
- Table Selection:** Catalog, Base Table, Table, File, Partition, Index, Table Detail, Program, Usage, Statement
- Table Data:**

| Catalog Name | Table Name | KeyTag | UV | VDef | VData | ActIndx | IndexL | RowSize | File Name |
|------------------|--------------------------|--------|----|------|-------|---------|--------|---------|----------------|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.INDEXES | 1 | UV | VDef | VData | 1 | | 104 | \$DATA1.TESTCA |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | 2 | | VDef | VData | | | 24 | \$PCS1.TESTCA |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | 3 | | VDef | VData | | | 28 | \$PCS1.TESTCA |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | 4 | | VDef | VData | | | 24 | \$PCS1.TESTCA |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | 5 | | VDef | VData | | | 24 | \$PCS1.TESTCA |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | 6 | | VDef | VData | | | 24 | \$PCS1.TESTCA |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | 7 | | VDef | VData | | | 24 | \$PCS1.TESTCA |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | 8 | | VDef | VData | | | 24 | \$PCS1.TESTCA |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | 1 | | VDef | VData | | | 24 | \$SWAP1.TESTC |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.PARTNS | 1 | | VDef | VData | 1 | | 105 | \$DATA1.TESTC |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.PROGRAMS | 1 | | VDef | VData | | | 40 | \$DATA1.TESTC |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.TABLES | 1 | | VDef | VData | 1 | | 40 | \$DATA1.TESTC |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.USAGES | 1 | | VDef | VData | 1 | | 112 | \$DATA1.TESTC |
| \$DATA1.TESTCAT2 | \$DATA1.TESTCAT.ORDERS | 1 | | VDef | VData | | | 13 | \$DATA1.TESTC |
| \$DATA1.TESTCAT2 | \$DATA1.TESTCAT.ORDERS2 | 1 | | VDef | VData | | | 24 | \$PCS1.TESTCA |
| \$DATA1.TESTCAT2 | \$DATA1.TESTCAT2.INDEXES | 1 | UV | VDef | VData | 1 | | 104 | \$DATA1.TESTC |
- Filters:** Catalog: \$*.*, Table: \$*.*
- Display Info:** No Filter, Displayed 177 of 177
- Buttons:** Clear, Request, data collected 2003/10/06 17:15:52
- Status:** Not Logged On, Help, Print Screen

SQL/MP / Table Detail

see [System Quirks](#)

MOMI - Multi-system Online Measure Interface (Client version 3.50)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

2003/10/07 18:02:36

Back Systems Overview CPUs Processes Files * SubSystems History Configure

Enscribe SQL/MP Disk Entity DiskFile Entity DiskOpen Entity File Entity

Catalog Base Table Table File Partition Index Table Detail Program Usage Statement

Base Table

| Catalog Name | Table Name | TC | TI | FileName | Stats Time | Row Count |
|-----------------|------------------------|----|----|------------------------|------------|-----------|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | | | \$DATA1.TESTCAT.ORDERS | | 1 |

Table

| Catalog Name | Table Name | Type | Code | Cols | UserID | Create Time | Invalid Time |
|-----------------|------------------------|------|------|------|---------|---------------------|---------------------|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | TA | 0 | 5 | 100,109 | 2002/09/24 09:37:56 | 2002/10/15 12:28:56 |

Partitions

| Catalog Name | File Name | Primary | Partition Name | Catalog Part Name | First Key Values |
|-----------------|------------------------|---------|------------------------|-------------------|------------------|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | Y | \$DATA1.TESTCAT.ORDERS | \$DATA1.TESTCAT | |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | | \$PCS1.TESTCAT.ORDERS | \$DATA1.TESTCAT | 5000 |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | | \$SWAP1.TESTCAT.ORDERS | \$DATA1.TESTCAT | 6000 |

Catalog: \$DATA1.TESTCAT

Full TableName: \$DATA1.TESTCAT.ORDERS

Request data collected 2003/10/07 18:02:23

Not Logged On ? Help Print Screen

The SQL/MP / Table Detail screen presents the details associated with a Base Table.

All link-able entries to a Base Table are displayed. These include table(s), partition(s), index(es) and program usage(s). A scroll bar is used to display off-screen data.

If a non-Base Table is selected, available information is displayed

SQL/MP / Program

see [System Quirks](#)

MOMI - Multi-system Online Measure Interface (Client version 3.50)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

2003/10/07 18:07:28

Back Systems Overview CPUs Processes **Files** * SubSystems History Configure

Enscribe **SQL/MP** Disk Entity DiskFile Entity DiskOpen Entity File Entity

Catalog Base Table Table File Partition Index Table Detail **Program** Usage Statement

| Catalog Name | Program Name | UserId | Security | Create Time | ReCompile Time | AC |
|------------------|--------------------------|---------|----------|---------------------|---------------------|----|
| \$DATA1.TESTCAT2 | \$DATA1.DALEMOMI.SQL02OC | 100,109 | CCCC | 2002/10/15 12:53:15 | 2002/10/15 12:53:15 | AC |
| \$DSMSCM.SQL | \$SYSTEM.SYSTEM.SQLCI2 | 255,255 | NUNU | 2002/09/26 11:08:29 | 2002/09/26 11:08:29 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T00C | 100,109 | CCCC | 2002/10/16 14:02:26 | 2002/10/16 14:02:26 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T100OC | 100,109 | CCCC | 2002/10/16 14:11:57 | 2002/10/16 14:11:57 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T101OC | 100,109 | CCCC | 2002/10/16 14:12:02 | 2002/10/16 14:12:02 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T102OC | 100,109 | CCCC | 2002/10/16 14:12:08 | 2002/10/16 14:12:08 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T103OC | 100,109 | CCCC | 2002/10/16 14:12:15 | 2002/10/16 14:12:15 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T104OC | 100,109 | CCCC | 2002/10/16 14:12:21 | 2002/10/16 14:12:21 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T105OC | 100,109 | CCCC | 2002/10/16 14:12:27 | 2002/10/16 14:12:27 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T106OC | 100,109 | CCCC | 2002/10/16 14:12:34 | 2002/10/16 14:12:34 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T107OC | 100,109 | CCCC | 2002/10/16 14:12:42 | 2002/10/16 14:12:42 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T108OC | 100,109 | CCCC | 2002/10/16 14:12:48 | 2002/10/16 14:12:48 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T109OC | 100,109 | CCCC | 2002/10/16 14:12:55 | 2002/10/16 14:12:55 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T100C | 100,109 | CCCC | 2002/10/16 14:03:36 | 2002/10/16 14:03:36 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T110OC | 100,109 | CCCC | 2002/10/16 14:13:02 | 2002/10/16 14:13:02 | AC |
| \$DSMSCM.TESTCAT | \$DATA1.JUNK3.T111OC | 100,109 | CCCC | 2002/10/16 14:13:08 | 2002/10/16 14:13:08 | AC |

Catalog \$*.*

Program \$*.*

Clear Request data collected 2003/10/07 18:07:22

Not Logged On ? Help Print Screen

The SQL/MP / Program screen presents programs registered in the SQL/MP catalog.

An SQL-compiled program is by default registered in the catalog. This allows for cross reference and gauging of possible impacts when table changes are made. Not all users of SQL/MP tables need to be registered in the catalog.

MOMI - Multi-system Online Measure Interface (Client version 3.50)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

2003/10/07 18:12:13

Back Systems Overview CPUs Processes Files * SubSystems History Configure

Enscribe SQL/MP Disk Entity DiskFile Entity DiskOpen Entity File Entity

Catalog Base Table Table File Partition Index Table Detail Program Usage Statement

| ▲ Catalog Name | Used Object Name | UType | RType | Using Object Name | DType | Used Catalog |
|-----------------|--------------------------|-------|-------|--------------------------|-------|--------------|
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | DP | \$PCS1.TESTCAT.ORDERS2H | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | DP | \$PCS1.TESTCAT.ORDERS2G | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | DP | \$PCS1.TESTCAT.ORDERS2F | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | DP | \$PCS1.TESTCAT.ORDERS2E | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | DP | \$PCS1.TESTCAT.ORDERS2D | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | DP | \$PCS1.TESTCAT.ORDERS2C | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | DP | \$PCS1.TESTCAT.ORDERS2B | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS2 | TA | DP | \$PCS1.TESTCAT.ORDERS2A | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.ORDERS | TA | DP | \$DATA1.DALEMOMI.SQL020C | PG | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.VIEWS | TA | DP | \$DATA1.TESTCAT.VIEWS | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.VERSIONS | TA | DP | \$DATA1.TESTCAT.VERSIONS | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.USAGES | TA | DP | \$DATA1.TESTCAT.USAGES | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.TRANSIDS | TA | DP | \$DATA1.TESTCAT.TRANSIDS | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.TABLES | TA | DP | \$DATA1.TESTCAT.TABLES | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.PROGRAMS | TA | DP | \$DATA1.TESTCAT.PROGRAMS | IN | \$DATA1.TES |
| \$DATA1.TESTCAT | \$DATA1.TESTCAT.PARTMS | TA | DP | \$DATA1.TESTCAT.PARTMS | IN | \$DATA1.TES |

\$*.*
 \$*.*.*
 Request data collected 2003/10/07 18:10:51

Displayed 4,632 of 4,632
 ?

The SQL/MP / Usage screen presents relationships within the SQL/MP environment.

Relationships recorded in the USAGES table:

- Program uses view, table, or index
- View uses view or table

- Index uses table
- Table, view, index, or program uses collation

SQL/MP / Statement

see [System Quirks](#)

MOMI - Multi-system Online Measure Interface (Client version 3.50)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

2003/10/07 18:30:53

Systems Overview CPUs Processes **Files** * SubSystems History Configure

Enscribe **SQL/MP** Disk Entity DiskFile Entity DiskOpen Entity File Entity

Catalog Base Table Table File Partition **Index** Table Detail Program Usage **Statement**

| Process Name | Run Unit | Index | Calls | BusyTime | Time/Call | Recs Used | Recs Access | Disk Reads |
|--------------|--------------------------------|-------|-------|----------|-----------|-----------|-------------|------------|
| 01,00179 | __SQLRTDU_00752581536145553379 | 1 | 62.38 | 33.77 | 0.006321 | 165.53 | 206.92 | 0.00 |
| 01,00179 | __SQLRTDU_00752581540628546612 | 0 | 2.88 | 0.42 | 0.001736 | 0.96 | 0.96 | 0.00 |
| 01,00179 | __SQLRTDU_00752581540628546612 | 1 | 1.26 | 0.15 | 0.001445 | 0.42 | 0.42 | 0.00 |
| 01,00179 | __SQLRTDU_00752581542030140151 | 0 | 0.34 | 0.04 | 0.001673 | 0.11 | 1.38 | 0.00 |
| 01,00179 | __SQLRTDU_00752581542030140151 | 2 | 2.19 | 0.33 | 0.001806 | 0.73 | 8.76 | 0.00 |
| 01,00179 | __SQLRTDU_00752581541900713156 | 0 | 0.36 | 0.05 | 0.001987 | 0.12 | 3.12 | 0.00 |
| 01,00179 | __SQLRTDU_00752581541900713156 | 4 | 0.16 | 0.02 | 0.002010 | 0.04 | 1.04 | 0.00 |
| 01,00179 | __SQLRTDU_00752581525665445811 | 0 | 0.16 | 0.01 | 0.001437 | 0.04 | 0.08 | 0.00 |
| 01,00179 | __SQLRTDU_00752581525665445811 | 4 | 0.32 | 0.04 | 0.001760 | 0.08 | 0.08 | 0.00 |
| 01,00179 | __SQLRTDU_00752581550005246418 | 3 | 0.25 | 0.02 | 0.002081 | 0.08 | 0.08 | 0.00 |
| 01,00179 | __SQLRTDU_00752581550005246418 | 8 | 0.33 | 0.03 | 0.002450 | 0.08 | 0.41 | 0.00 |
| 01,00179 | __SQLRTDU_00752581541617056117 | 5 | 1.08 | 0.18 | 0.004252 | 0.83 | 0.83 | 0.00 |
| 01,00179 | __SQLRTDU_00752591916499255466 | 1 | 0.25 | 0.01 | 0.001244 | 0.00 | 0.00 | 0.00 |
| 01,00179 | __SQLRTDU_00752581531391312014 | 1 | 0.25 | 0.51 | 0.052080 | 0.00 | 213.91 | 2.33 |

Process Name: 01,00179

Rated Values: Request:

data collected 2003/10/07 18:30:51

Not Logged On ? Help Print Screen

The SQL/MP / Statement screen provides a way to drill-down further within a process that uses SQL to see the level of activity performed by individual SQL statements. This information is obtained from MEASURE via the SQLSTMT entity.

The SQL Statement entity describes the cost in terms of time and I/O associated with individual SQL statements in a process. The statements are identified by an Index (0,1,2,3, etc...) obtained from a listing during SQL compilation (specify the SQLMAP option to SQLCOMP).

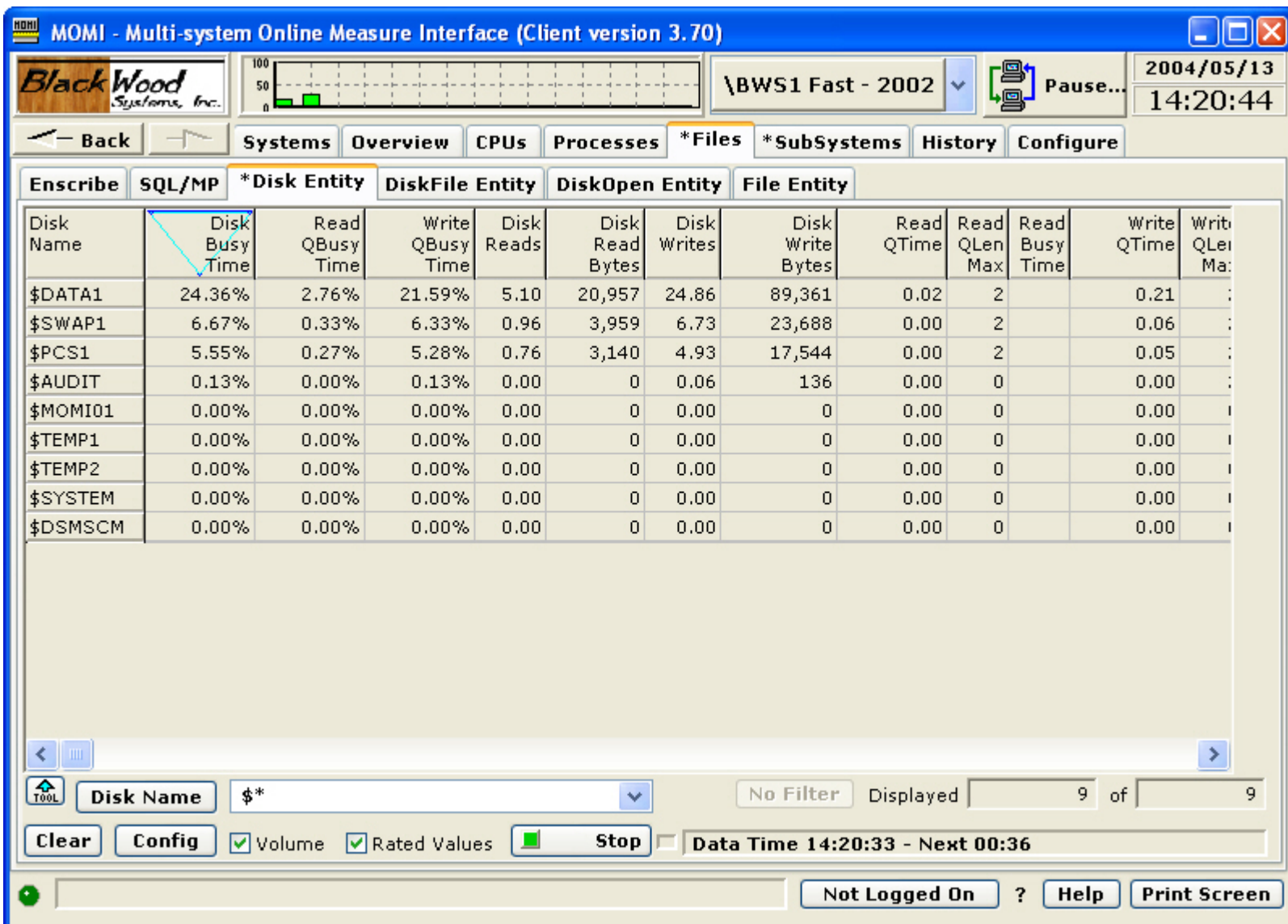
To use this screen, find a busy SQL application process on your system, perhaps from the Overview screen. Enter the process name (or CPU,PIN) in the Process Name field and push request. After 30 seconds or so, if the process is active and using SQL/MP statements, the results are displayed. The screen continues to update with progressively longer update intervals.

Generally, in order to interpret the output for this screen, you need to work with your DBA and/or application developer as the SQL Statement index is obtained during program compilation. Even with the statement index, usually only the application developer and/or DBA could determine if the SQL statement is executing as intended (knowledge of the data layout, meaning of the data and accesses available into the data really help).

If you are dealing with SQL/MX, things get a little strange as SQL/MX has the requirement that an SQL Statement measurement must be in place prior to starting the program. This is really backward (and does not make much sense to us) but in theory allows reduced measurement overhead. SQL/MX really did things differently from a historical NonStop perspective. Unfortunately, it may be better to a) run MEASURE manually to collect the data OR b) manually start an external measurement and then go into this screen within MOMI. In the latter case, the measurement that MOMI launches is internally "latching into" an existing measurement which allows data to be obtained.

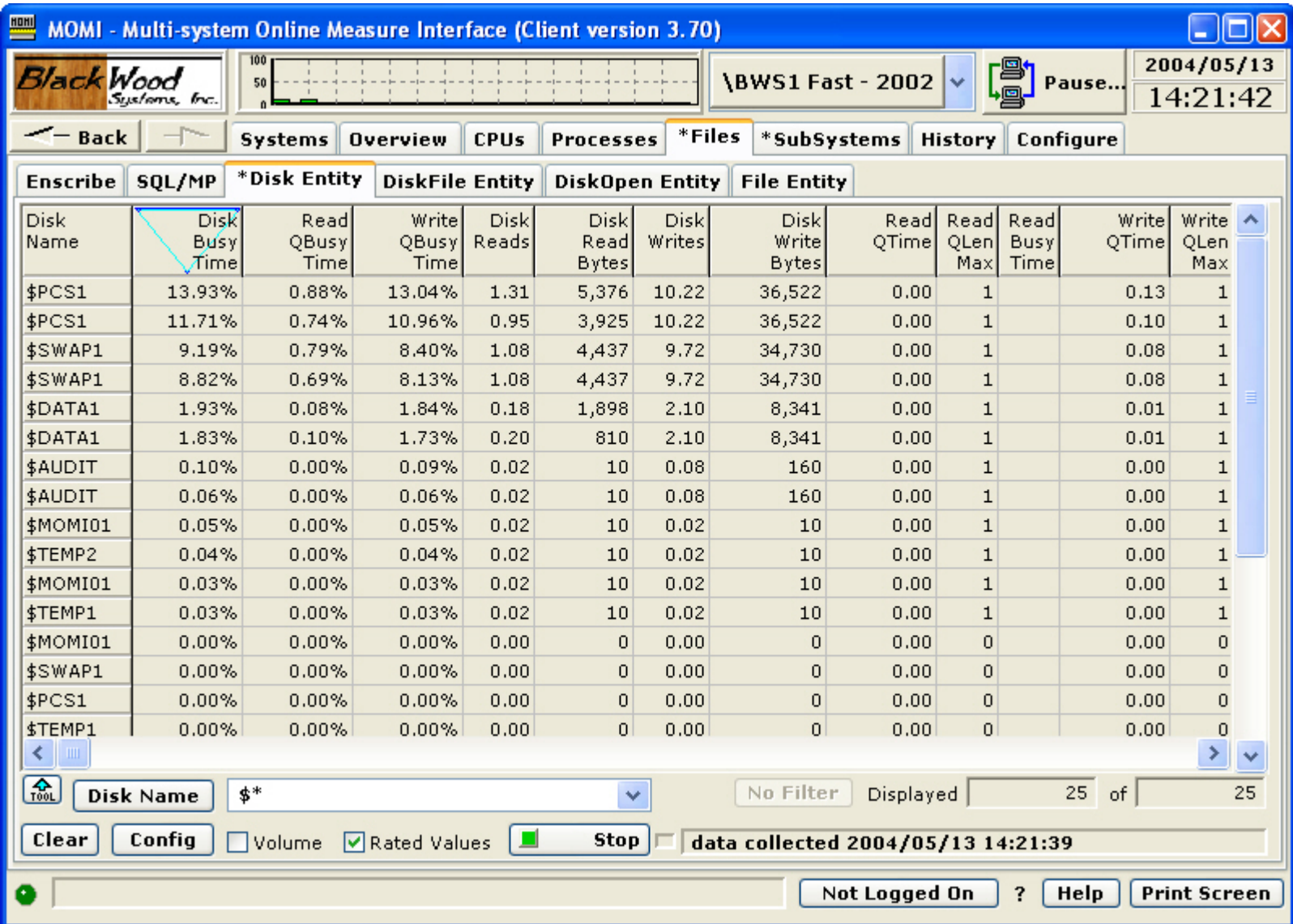
This screen is disabled by default. See the CONFMOMI keyword [DISABLE-MEAS-SQLSTMT](#) for additional information.

Files / Disk Entity



The Files / Disk Entity screen presents the MEASURE Disk Entity which reports statistics at a physical disk volume level.

The Disk Entity provides information on all four possible disk paths (primary, primary backup, mirror and mirror backup) for both the primary and mirror drive. By default, MOMI consolidates this information into a single line of performance information. The combining of this information can result in percentages of usually up to 200% when mirrored drives are present. For example, if the Write-QBusy-Time is 145%, this effectively means that 72.5% of the time of each disk (145 / 2) is being consumed. Uncheck the **Volume** selection to display information in the original or native format as seen below:



In the non-Volume view, the ServerNet Location (Group:Module:Slot) on newer platforms can be used to distinguish between primary and mirror drives.

Detailed disk cache information for a particular entry may be presented in a consolidated window by right-clicking on a disk name and selecting **View Disk Entity Detail** as seen below. MEASURE does not provide the same level of detail concerning cache as SCF (hence a few screen differences) and not all disk paths return cache information.

MOMI - Multi-system Online Measure Interface (Client version 3.70)

Black Wood Systems, Inc. \BWS1 Fast - 2002 2004/05/13 14:22:26

Back Systems Overview CPUs Processes ***Files** *SubSystems History Configure

Enscribe SQL/MP ***Disk Entity** DiskFile Entity DiskOpen Entity File Entity

Disk Name \$SWAP1 Disk - 8GB (4608/4609) Disk Entity Detail X

Disk Busy Time 18.02% Cache KBytes Allocated 34,560

| | Cache Block Size | 512 | 1024 | 2048 | 4096 |
|---------------------|------------------|-----|------|------|-------|
| Blocks Allocated | | 512 | 512 | 512 | 8,192 |
| Blocks in Use | | 0 | 4 | 0 | 8,192 |
| Blocks Dirty | | 0% | 0% | 0% | 2% |
| Cache Calls | | 0 | 0 | 0 | 29 |
| Cache Hits | | 0% | 0% | 0% | 96% |
| Cache Misses | | 0% | 0% | 0% | 3% |
| Cache Write Dirties | | 0% | 0% | 0% | 16% |
| Cache Write Cleans | | 0% | 100% | 0% | 71% |
| Cache Write Misses | | 0% | 0% | 0% | 12% |
| Cache Faults | | 0 | 0 | 0 | 0 |
| Audit Forces | | 0 | 0 | 0 | 0 |
| Block Splits | | 0 | 0 | 0 | 0 |

Clipboard

Disk Name \$* No Filter Displayed 9 of 9

Clear Config Volume Rated Values Stop data collected 2004/05/13 14:22:20

Not Logged On ? Help Print Screen

This is an approach to consider when diagnosing disk drive performance issues:

- Drill down starting at the volume level, working down sequentially through the DiskFile, DiskOpen and finally to the process level.
- Starting from the Disk Entity screen, click on a volume and select [DiskFile Entity](#) to see all of the active files on the disk.
- On an entry on the DiskFile Entity screen, click to select [DiskOpen Entity](#) which displays all of the processes accessing the file.

- On an entry on the DiskOpen screen, click on the Opener Process Name to view [Process Detail](#) of the opener process of that file. (you can also click on the File Name to view the [File Entity](#) which provides different I/O counters).

Files / DiskFile Entity

see [System Quirks](#)

The screenshot shows the 'Alarms' monitoring software interface. The title bar reads 'BWS1-2004 MOMI (Client version 5.06)'. The main window has a navigation menu with tabs: Back, Systems, Overview, CPUs, Processes, *Files, SubSystems, History, Alarms, and Configure. The 'Files' tab is active, and the 'DiskFile Entity' sub-tab is selected. A table displays the following data:

| File Name | File Size (EOF) | File Type Description | File Code | Requests | Driver Input Calls | Driver Output Calls | Cache Read Hits | Cache Write Hits | Cache Write Cleans | Block Split |
|----------------------------|-----------------|-----------------------|-----------|----------|--------------------|---------------------|-----------------|------------------|--------------------|-------------|
| \$SYSTEM.SYS72.OSIMAGE | 63,954,944 | unstructured | 0 | 0.07 | 0.14 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 |
| \$SYSTEM.SYSTEM.USERID | 7,168 | key-sequenced | 540 | 0.03 | 0.07 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 |
| \$SYSTEM.SAFE.OTHER | 12,288 | key-sequenced | 542 | 0.29 | 0.59 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 |
| \$SYSTEM.SAFE.GUARD | 0 | key-sequenced | 542 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| \$SYSTEM.ZLOG72.ZZEV0002 | 98,304 | entry-sequenced | 843 | 0.22 | 0.22 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 |
| \$SYSTEM.SYS72.TMFDR | 1,814,528 | unstructured | 100 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| \$SYSTEM.ZSERVICE.ZZSV0045 | 598,016 | entry-sequenced | 843 | 0.22 | 0.22 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 |
| \$SYSTEM.SYS72.MEASFH | 739,328 | unstructured | 100 | 0.77 | 2.51 | 0.00 | 2.51 | 0.00 | 0.00 | 0.00 |

At the bottom of the interface, there is a filter section with 'File Name' set to '\$SYSTEM', 'No Filter' selected, and 'Displayed 8 of 8' items. A 'Data Time' indicator shows '14:01:32 - Next 00:13'. Other controls include 'Clear', 'Config', 'Rated Values' (checked), 'Stop', 'Chat', 'Not Logged On', 'Hints On', 'Help', and 'Print Screen'.

The Files / DiskFile Entity screen presents information about the MEASURE DiskFile entity.

The MEASURE DiskFile entity displays one record for each open (or active) file on a disk volume. This can be considered the next level down from the Disk Entity.

This is an approach to consider when diagnosing disk drive performance issues:

- Drill down starting at the volume level, working down sequentially through the DiskFile, DiskOpen and finally to the process level.
- Starting from the Disk Entity screen, click on a volume and select [DiskFile Entity](#) to see all of the active files on the disk.
- On an entry on the DiskFile Entity screen, click to select [DiskOpen Entity](#) which displays all of the processes accessing the file.
- On an entry on the DiskOpen screen, click on the Opener Process Name to view [Process Detail](#) of the opener process of that file. (you can also click on the File Name to view the [File Entity](#) which provides different I/O counters).

Files / DiskOpen Entity

MOMI - Multi-system Online Measure Interface (Client version 3.50)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

2003/10/07 19:13:54

Systems Overview CPUs Processes * Files * SubSystems History Configure

Enscribe SQL/MP * Disk Entity * DiskFile Entity * DiskOpen Entity * File Entity

| File Name | Opener Process Name | Opener CPU,Pin | File Type Description | Requests | SQL Operation Time | Driver Total Calls | Driver Input Calls | Driver Output Calls | Cache Read Hits | Cache Write Hits |
|----------------------------|---------------------|----------------|-----------------------|----------|--------------------|--------------------|--------------------|---------------------|-----------------|------------------|
| \$SYSTEM.SYS16.OSIMAGE | 00,00000 | 00,00000 | unstructured | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| \$SYSTEM.ZSERVICE.ZZSV0019 | \$Z01V | 00,00040 | entry-sequenced | 0.10 | 0.00 | 0.10 | 0.10 | 0.00 | 0.10 | 0 |
| \$SYSTEM.ZLOG16.ZZEV0000 | \$Z01S | 00,00039 | entry-sequenced | 0.10 | 0.00 | 0.10 | 0.10 | 0.00 | 0.10 | 0 |
| \$SYSTEM.SAFE.GUARD | \$ZS00 | 00,00333 | key-sequenced | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| \$SYSTEM.SYSTEM.USERID | \$ZS01 | 01,00329 | key-sequenced | 0.10 | 0.00 | 0.20 | 0.20 | 0.00 | 0.20 | 0 |
| \$SYSTEM.SAFE.GUARD | \$ZS00 | 00,00333 | key-sequenced | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| \$SYSTEM.SAFE.OTHER | \$ZS01 | 01,00329 | key-sequenced | 0.06 | 0.00 | 0.13 | 0.13 | 0.00 | 0.13 | 0 |
| \$SYSTEM.SAFE.OTHER | \$ZS00 | 00,00333 | key-sequenced | 0.46 | 0.00 | 0.93 | 0.93 | 0.00 | 0.93 | 0 |

File Name: \$SYSTEM

No Filter Displayed 8 of 8

Clear Config Rated Values Pause Data Time 19:13:47 - Next 00:37

Not Logged On ? Help Print Screen

The Files / DiskOpen Entity screen presents the MEASURE DiskOpen entity.

The MEASURE DiskOpen entity is I/O activity on a file from an opener process perspective. One entry is present for every open to a file.

The MEASURE DiskOpen entity does not store the Opener Process Name, only the Opener CPU and Opener PIN . The Opener Process Name column is derived by looking up the current process name at the CPU & PIN currently running at that location.

This is an approach to consider when diagnosing disk drive performance issues:

- Drill down starting at the volume level, working down sequentially through the DiskFile, DiskOpen and finally to the process level.
- Starting from the Disk Entity screen, click on a volume and select [DiskFile Entity](#) to see all of the active files on the disk.
- On an entry on the DiskFile Entity screen, click to select [DiskOpen Entity](#) which displays all of the processes accessing the file.
- On an entry on the DiskOpen screen, click on the Opener Process Name to view [Process Detail](#) of the opener process of that file. (you can also click on the File Name to view the [File Entity](#) which provides different I/O counters).

Files / File Entity

MOMI - Multi-system Online Measure Interface (Client version 3.50)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

2003/10/07 19:29:39

Back Systems Overview CPUs Processes * Files * SubSystems History Configure

Enscribe SQL/MP Disk Entity DiskFile Entity DiskOpen Entity * File Entity

| File Name | Opener Process Name | Opener CPU,Pin | Opener Program Name | File Busy Time | Avg Op Time | Opener File Nbr | File Type Description |
|--------------------------|---------------------|----------------|---------------------------|----------------|-------------|-----------------|-----------------------|
| \$RECEIVE | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 0.73% | 0.056545 | 0 | unstructured |
| \$DSMSCM.XPHIHDB.PHIH13B | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 0.85% | 0.001028 | 10 | key-sequence |
| \$DSMSCM.XPHIHDB.PHIH19B | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 0.04% | 0.016492 | 11 | key-sequence |
| \$DSMSCM.XPHIHDB.PHIH29B | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 0.00% | 0.001362 | 12 | key-sequence |
| \$DSMSCM.XPHIHDB.PHIH11B | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 88.12% | 0.000878 | 13 | key-sequence |
| \$DSMSCM.XPHIHDB.PHIH24B | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 0.00% | 0.000646 | 14 | key-sequence |
| \$DSMSCM.XPHIHDB.PHIH33B | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 0.62% | 0.001673 | 15 | key-sequence |
| \$DSMSCM.XPHIHDB.PHIH18B | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 0.03% | 0.001271 | 16 | key-sequence |
| \$SYSTEM.SYSTEM.SQLMSG | | 01,00179 | \$DSMSCM.XPHIHDB.PHIHDBMG | 6.86% | 0.019218 | 18 | key-sequence |

File Name: 01,00179 No Filter Displayed 9 of 9

Clear Config Rated Values Pause Data Time 19:29:28 - Next 01:19

Not Logged On ? Help Print Screen

The Files / File Entity screen presents the MEASURE File Entity.

The MEASURE File entity is I/O activity on a file. A file is a communication path from one process to another and is **not** necessarily to a disk file. This entity is unique with its ability to track and report on all sorts of different I/O activity from inter-process, TCP/IP, OSS and process to disk.

The File entity is measured from the perspective of the opener. A process on a remote system opening a local file cannot be measured on the local system using this entity.

A local process opening a remote file can be measured locally. For example, if you are on system \BWS1 and want to see the file level activity across Expand, you would enter in the File Name field \BWS2.\$*.*.* .

SubSystems

Logs

EMS Msgs

Alarms

2008/07/09 13:00:45

Back *Systems Overview CPUs Processes Files *SubSystems History Alarms Configure

*Logs Spooler TCP/IP OSS Expand User Defined

*EMS Msgs VHS Log MOMI Log EMS EVENTCX

| #0 | Date/Time | Process | System ID | Event Nbr | Message (81 of possible 600) |
|----|----------------|----------|------------------|-----------|--|
| | 07-08 14:03:04 | 21574 | TANDEM.CLOCK.F40 | 102 | System time reset |
| | 07-08 14:03:04 | 21574 | BWS.0.0 | 0 | BWSSC -> SNTP: System time will be SET by MOMI |
| | 07-08 13:56:45 | 21570 | BWS.0.0 | 200 | BWMOMI -> Spooler \$S Collector - Percent full at |
| | 07-08 13:56:19 | 21570 | BWS.0.0 | 200 | BWMOMI -> Expand \$EP2BWS2 is DOWN |
| | 07-08 13:55:45 | MOMI4 | BWS.0.0 | 200 | BWMOMI -> Alarm processing resumed - time |
| | 07-08 13:55:13 | 21570 | BWS.0.0 | 200 | BWMOMI -> Spooler \$S: All Alarms suspended |
| | 07-08 13:55:13 | 21570 | BWS.0.0 | 200 | BWMOMI -> Expand \$EP2BWS2: All Alarms |
| | 07-08 13:55:13 | MOMI4 | BWS.0.0 | 200 | BWMOMI -> Alarm processing suspended - until 2008/07/08 13:55:45 |
| E | 07-08 13:10:01 | 00,00000 | TANDEM.CLOCK.F40 | 104 | Error reading Service Processor clock, error code: |
| | 07-08 13:03:04 | 21574 | TANDEM.CLOCK.F40 | 102 | System time reset |
| | 07-08 13:03:03 | 21574 | BWS.0.0 | 0 | BWSSC -> SNTP: System time will be SET by MOMI forward |

Single Line - Scroll Speed +
Compress

Filters Filter NO Filter PreFilter Define

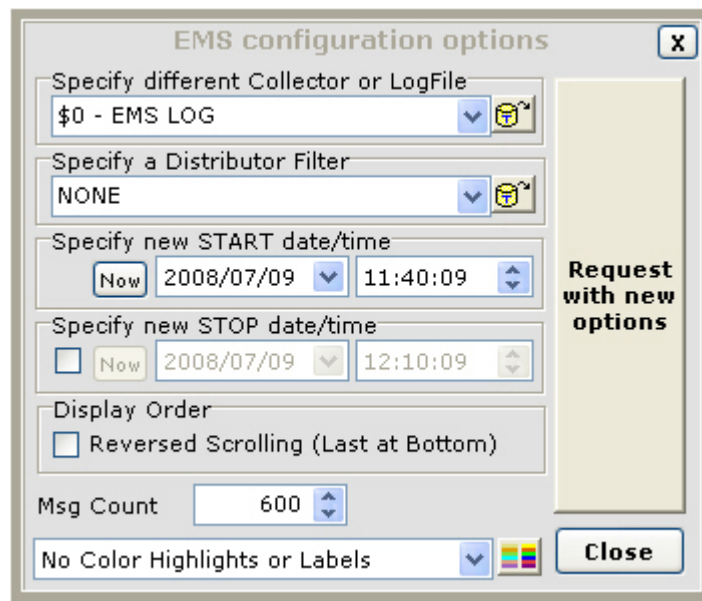
Clear Config Export Mini-Reports Pause Reading record at 2008-07-09 12:51:48

Chat Not Logged On Hints On ? Help Print Screen

The EMS Msgs screen presents information logged to an EMS collector or from an EMS log file.

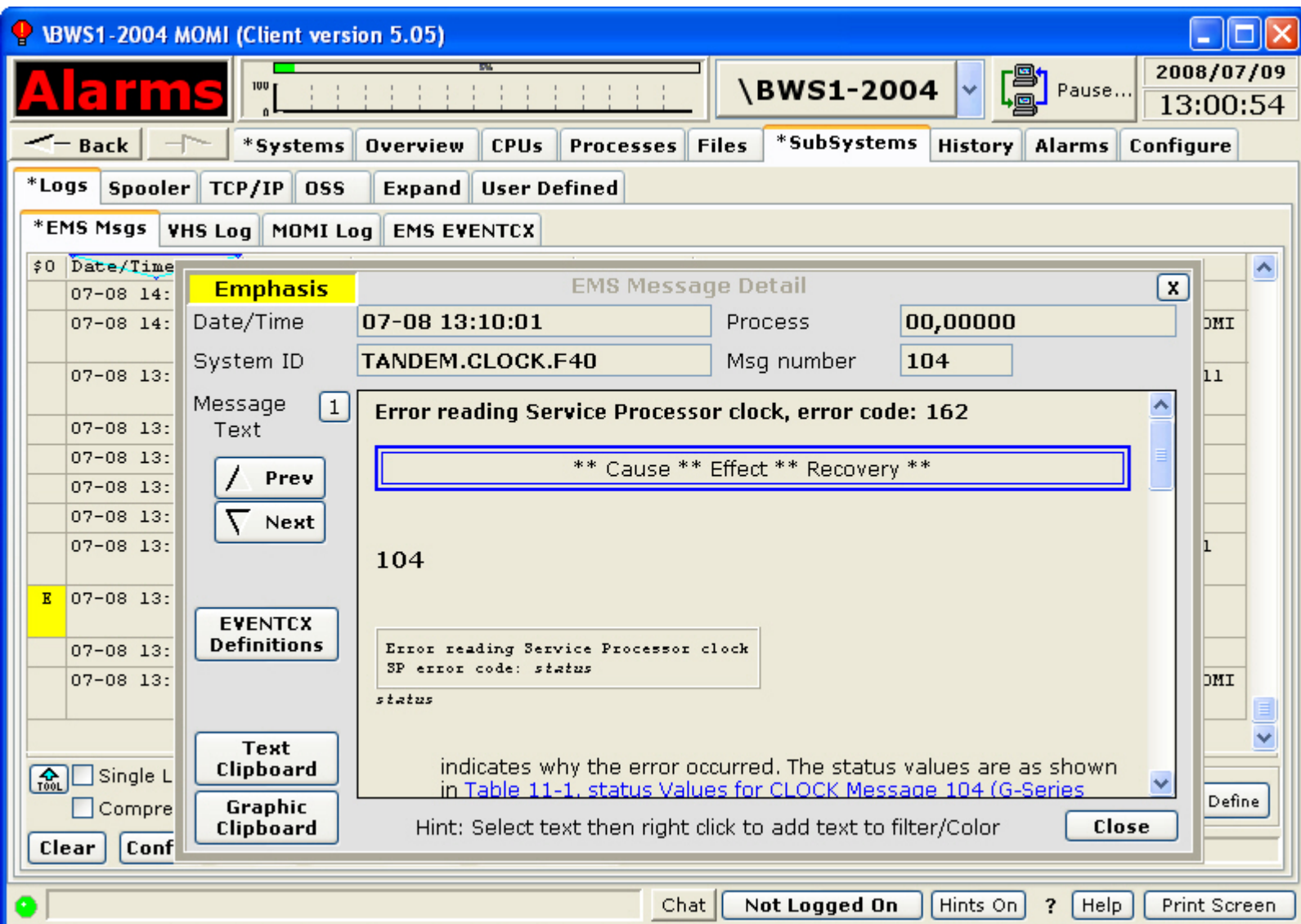
EMS messages provide a means for system and user programs to communicate to system operators and record significant events.

Selection of the EMS log is made by pressing the Config button. Specifying the EMS log and the START time are usually the required entries. Optionally, the User can browse for EMS log files, specify an EMS filter and specify a time to STOP scanning the log.

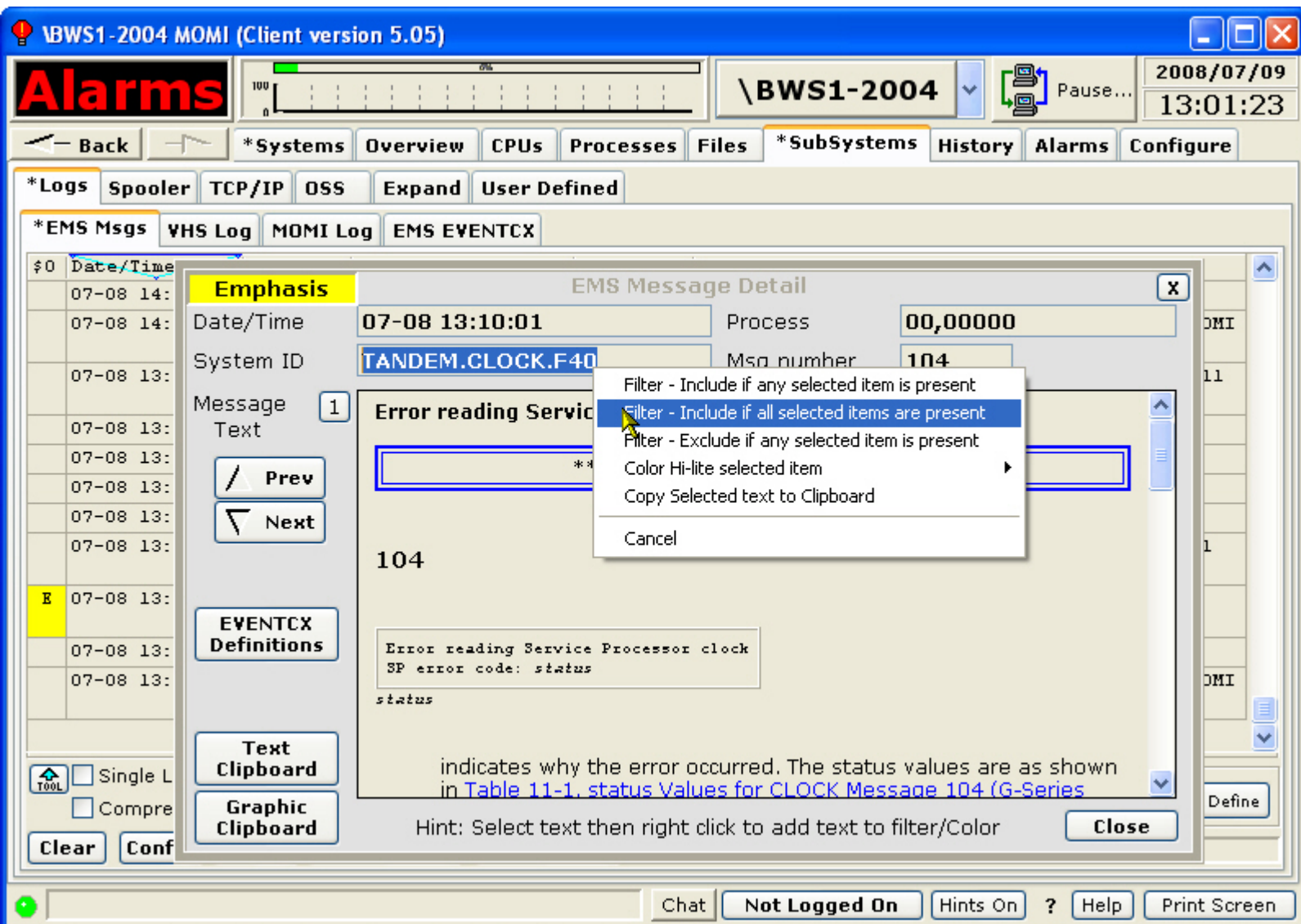


The field **Specify a Distributor Filter** allows the use of a pre-compiled EMS filter. A pre-compiled filter is a very efficient means to limit information reported, based on the filter criteria, as this functions as a pre-filter and only provides to MOMI records with matching criteria.

The entire EMS message and other details are displayed in a pop-up window when the left-clicking on a message. This display contains the entire EMS message, various attributes and any Cause - Effect - Recovery information available. Also, any information available in the [EVENTCX](#) file is added to the output.



Another way to filter data is to perform the filtering within the MOMI Client. This is accomplished 'on-the-fly' with a two-step operation. First freeze the screen (if moving) and click on a line of text to bring up a pop-up detail of that line (sample below). Highlight the text and right click over it. A menu selection will allow filtering to include the item or exclude it. *Note: This is one of the few situations when the mouse cursor will not change to a hand where a MOMI mouse click option is available.*



Messages may be color highlighted based on their content. This feature may be enabled in the Config window.

Alarms | \BWS1-2004 | 2008/07/09 13:03:38

Back | *Systems | Overview | CPUs | Processes | Files | SubSystems | History | Alarms | Configure

Logs | Spooler | TCP/IP | OSS | Expand | User Defined

EMS Msgs | VHS Log | MOMI Log | EMS EVENTCX

| φ0 | Date/Time | Process | System ID | Event Nbr | Message (81 of possible 600) |
|----|----------------|---------|--------------------|-----------|---|
| | 07-09 12:51:48 | φZZST0 | TANDEM.STORAGE.G06 | 1007 | SCF CONTROL DISK φSWAP1, REFRESH executed at terminal \BWS1.φZS1.#PTZP33D by user 255,255. |
| | 07-09 12:51:48 | φDATA2 | TANDEM.DISK.G07 | 5066 | LDEV 0163 DP2 REFRESH cache flush initiated, performance loss is possible. |
| | 07-09 12:51:48 | φZZST0 | TANDEM.STORAGE.G06 | 1007 | SCF CONTROL DISK φDATA2, REFRESH executed at terminal \BWS1.φZS1.#PTZP33D by user 255,255. |
| | 07-09 12:51:44 | φSYSTEM | TANDEM.DISK.G07 | 5066 | LDEV 0006 DP2 REFRESH cache flush initiated, performance loss is possible. |
| | 07-09 12:51:44 | φZZST0 | TANDEM.STORAGE.G06 | 1007 | SCF CONTROL DISK φSYSTEM, REFRESH executed at terminal \BWS1.φZS1.#PTZP33D by user 255,255. |
| | 07-09 12:03:09 | φZ1609 | TANDEM.CLOCK.F40 | 102 | System time reset |
| | 07-09 12:03:09 | φZ1609 | BWS.0.0 | 0 | BWSSG -> Sntp: System time will be SET by MOMI |
| | 07-09 11:03:03 | φZ1609 | TANDEM.CLOCK.F40 | 102 | System time reset |
| | 07-09 11:03:03 | φZ1609 | BWS.0.0 | 0 | BWSSG -> Sntp: System time will be SET by MOMI |

clock | TSM | OSS | Measure | TANDEM.TAPE | TMF

Single Line | Compress | Scroll Speed | Filters

Clear | Config | Export | Mini-Reports | Resume

Display/Change Color Selections ...
 Filter to show only this Color
 Filter to hide this Color
 Clear Color Filter
 Cancel

Prints On | Help | Print Screen

To configure what messages are highlighted, right click on the color guides near the bottom of the window and select **Display/Change Color Sections...** Enter the label text and message content text that should cause that color to be displayed. By default, the entered text is considered "one string" for comparison purposes. Multiple strings may be entered by separating them with a | (i.e. vertical bar) character. Enclose the entered text in quotes (i.e. " ") to retain leading and/or trailing spaces. Press Save when complete.

Alarms



\BWS1-2004 Pause...

Back
*Systems
Overview
CPU's
Processes
Files
SubSystems
History
Alarms
Configure

Logs
Spooler
TCP/IP
OSS
Expand
User Defined

EMS Msgs
VHS Log
MOMI Log
EMS EVENTCX

| φ0 | Date/Time | Process | System ID | Event Nbr | Message (81 of possible 600) |
|----|----------------|---------|--------------------|-----------|---|
| | 07-09 12:51:48 | φZ2ST0 | TANDEM.STORAGE.G06 | 1007 | SCF CONTROL DISK φSWAP1, REFRESH executed at terminal \BWS1 φ261 φRT2D2D by user φEE φ55. |

| Label identifier | Message contents | Label identifier | Message contents |
|------------------|------------------|------------------|------------------|
| clock | clock | clock | clock |
| TSM | TSM | TSM | TSM |
| OSS | OSS | OSS | OSS |
| Measure | tandem.measure | Measure | tandem.measure |
| TANDEM.TAPE | TANDEM.TAPE | TANDEM.TAPE | TANDEM.TAPE |
| TMF | TMF | TMF | TMF |

Save
Close

| | | | | | |
|-------|-----|-----|---------|-------------|-----|
| clock | TSM | OSS | Measure | TANDEM.TAPE | TMF |
|-------|-----|-----|---------|-------------|-----|

Single Line - Scroll Speed + Filters

Compress Filter NO Filter PreFilter Define

Clear
Config
Export
Mini-Reports
Resume

Chat
Not Logged On
Hints On
?
Help
Print Screen

VHS Log

MOMI - Multi-system Online Measure Interface (Client version 4.07)

BlackWood Systems, Inc.

\BWS1-2004

2006/02/10 20:31:59

Back Systems Overview CPUs Processes Files *SubSystems History Alarms Configure

*Logs Spool TCP/IP OSS Expand

EMS Msgs *VHS Log MOMI Log

| Msg Date/Time | PName | Cpu.Pin | Text |
|---------------------|--------|----------|--|
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? VOLUME \$DATA1.DALE |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? VOLUME \$DATA1.DALE |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? SYSTYPE GUARDIAN |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? SYSTEM |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? SOURCE SYSTEM |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? SCOPE TDS_USER_MAIN(0) |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? PROGRAM \$HOG1 |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? LOG (Logging turned off) |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? LANGUAGE TAL |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? DIRECTORY /G/DATA1/DALE |
| 2005/11/17 18:31:12 | \$HOG1 | 01,01300 | ?? 001,1,1300-HIGH;ENV |
| 2005/11/17 18:31:11 | \$X895 | 01,01293 | ?? -\$HOG1-INSPECT ONCE FILE \$SYSTEM.SYSTEM.INSPECT;HIGH;SET PROMPT P P,L |
| 2005/11/17 18:31:11 | \$X895 | 01,01293 | ?? Executing command file \$DATA1.DALE.INSPCSTM |
| 2005/11/17 18:31:11 | \$X895 | 01,01293 | ?? 001,01,01300 \$HOG1 #TDS_USER_MAIN.#66.502(HOG01ST) + %1I |
| 2005/11/17 18:31:11 | \$X895 | 01,01293 | ?? INSPECT CALL |

Filters: [] Filter NO Filter Define

Clear Config Export Pause

Waiting for new records after 2005/11/17 18:31:12

net.dw Hints On ? Help Print Screen

The VHS Log screen presents information collected by a VHS process.

VHS, or the Virtual Hometerm Subsystem, provides a stable location for processes to log message usually related to a problem or status update. Messages received by VHS are logged to a file which may be viewed on this screen. If the screen is going forward in time and reaches the end of file, new messages are automatically displayed shortly after they are written. However, if VHS switches to a new log file, the screen will stop displaying new messages. The user must manually select a new log file in order to continue viewing new messages.

The log file used by VHS does not have a unique file code assigned by default, so It is necessary to logon to MOMI and have the necessary security to view a VHS Log.

To start viewing VHS Log files, press the Config button and Specify a log file. To aid in selecting a log file, press the locator button to display the File Locator pop-up window. Unfortunately, MOMI cannot automatically determine the active LogFile as VHS does not provide such a mechanism. However, using the File Locator, usually the file with the highest sequence number, or LOG0001 in the image below, is the current file.

The screenshot shows the MOMI interface with the following components:

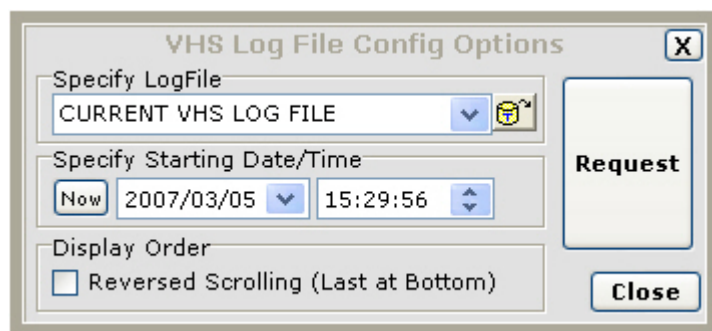
- Header:** MOMI - Multi-system Online Measure Interface (Client version 4.07). Includes a BlackWood Systems, Inc. logo, a progress bar, and system information: \BWS1-2004, 2006/02/07, 17:19:46.
- Navigation:** Back, Systems, Overview, CPUs, Processes, Files, *SubSystems, History, Alarms, Configure.
- Log Selection:** *Logs, Spool, TCP/IP, OSS, Expand. Sub-tabs: EMS Msgs, *VHS Log, MOMI Log.
- VHS Log File Config Options (Pop-up):**
 - Specify LogFile: \$DATA1.VHSLOG.LOG0000
 - Specify Starting Date/Time: Now, 2006/02/07, 17:12:20
 - Display Order: Reversed Scrolling (Last at Bottom)
 - Buttons: Request, Close
- File Locator (VHS Logs only) (Pop-up):**
 - Tree view showing file structure: \$DATA1.TIE, \$DATA1.UTILDC, \$DATA1.UTILDD, \$DATA1.UTILDT, \$DATA1.UTILS, \$DATA1.VHS, \$DATA1.VHSLOG (expanded), \$DATA1.VHSLOG.LOG0000 (selected), \$DATA1.VHSLOG.LOG0001, \$DATA1.VHSSTART, \$DATA1.VIEWPT, \$DATA1.ZSPIDEF, \$DATA1.ZZJUNK, \$DSMSCM, \$MOMI01, \$PCS1, \$SWAP1.
 - Table below the tree:

| Code | Size | Creation Date |
|----------|-----------|---------------------|
| 0 | 3,276,800 | 2005/11/17 13:00:56 |
| Security | Owner | Modification Date |
| NUUU | 100,109 | 2005/11/17 18:31:12 |
 - Buttons: Use the located File
- Main Log Table:**

| Msg | Date/Time | PName | Cpu.Pin | Text |
|------------|-----------|--------|----------|----------------------|
| 2005/11/17 | 18:31:12 | \$HOG1 | 01,01300 | ?? VOLUME \$DATA1.DA |
| 2005/11/17 | 18:31:12 | \$HOG1 | 01,01300 | ?? VOLUME \$DATA1.DA |
| 2005/11/17 | 18:31:12 | \$HOG1 | 01,01300 | ?? SYSTYPE GUARDIAN |
| 2005/11/17 | 18:31:12 | \$HOG1 | 01,01300 | ?? SYSTEM |
| 2005/11/17 | 18:31:12 | \$HOG1 | 01,01300 | ?? SOURCE SYSTEM |
| 2005/11/17 | 18:31:12 | \$HOG1 | 01,01300 | ?? SCOPE TDS_USER_ |
| 2005/11/17 | 18:31:12 | \$HOG1 | 01,01300 | ?? PROGRAM \$HOG1 |
- Footer:** net.dw, Hints On, ? Help, Print Screen.

A default location where the File Locator drills-down to may be set with the CONFMOMI keyword [SELECTION-DEFAULT-VHS](#). This keyword provides two functions. First, the File Locator automatically drills down

to the subvolume specified (the File Locator may display files other than VHS log files). Second, the special name of "CURRENT VHS LOG FILE" appears and will automatically select the current VHS Log file based on modification date. The automatic selection only occurs when Request is pressed.



After selecting the log file, press Request. Use the scroll bar to move forward and backward in time through the file.

MOMI Log

MOMI - Multi-system Online Measure Interface (Client version 4.07)

BlackWood Systems, Inc.

100% 50% 0%

\BWS1-2004

2006/02/07 17:54:21

Back Systems Overview CPUs Processes Files *SubSystems History Alarms Configure

*Logs Spool TCP/IP OSS Expand

EMS Msgs *VHS Log *MOMI Log

| S | Msg Date/Time | Text | Object Name | Object Type | Alarm Date/Time | User | RecType |
|---|---------------------|---|----------------------------------|-------------|---------------------|--------|--------------|
| | 2006/02/07 15:16:22 | Spooler \$S Collector - Percent full at 2% (under threshold of 5%) | SPOOLER - COLLECTOR NOT FULL | Alarm | 2006/02/07 15:16:22 | | First alarm |
| | 2006/02/07 15:14:16 | DiskFile \$DATA1.JUNK.MCPAY Percent full at 0% (under threshold of 23%) | DISKFILE - NOT VERY FULL | Alarm | 2006/02/07 15:14:16 | | First alarm |
| | 2006/02/07 15:12:22 | Spooler \$NULL.#A.B was not found | SPOOLER - DEVICE \$NULL | Alarm | 2006/02/07 15:12:22 | | First alarm |
| | 2006/02/07 15:12:22 | Spooler \$S Collector - Percent full at 2% (over threshold of 1%) | SPOOLER - COLLECTOR FULL | Alarm | 2006/02/07 15:12:22 | | First alarm |
| | 2006/02/07 15:11:49 | Expand \$EP2BWS2 is DOWN | EXPAND - LINE DOWN | Alarm | 2006/02/07 15:11:49 | | First alarm |
| | 2006/02/07 15:11:22 | CPU 1 Physical memory locked at 11% (current 212 / available 1789) | CPU-PHYSICAL MEMORY LOCKED | Alarm | 2006/02/07 15:11:22 | | First alarm |
| | 2006/02/07 15:11:22 | CPU 0 Physical memory locked at 11% (current 201 / available 1789) | CPU-PHYSICAL MEMORY LOCKED | Alarm | 2006/02/07 15:11:22 | | First alarm |
| | 2006/02/07 15:11:20 | Process \$FRED1 is not running | PROCESS - NOT RUNNING 1 - \$FRED | Alarm | 2006/02/07 15:11:20 | | First alarm |
| | 2006/02/07 15:11:20 | Process \$FRED is not running | PROCESS - NOT RUNNING - \$FRED | Alarm | 2006/02/07 15:11:20 | | First alarm |
| | 2006/02/07 15:11:03 | MOMI started - Version 4.06 02/07/2006 *DJW* | | | | NET.DW | Info message |
| | 2006/02/07 14:45:39 | Spooler \$S Collector - Percent full at 2% (under threshold of 5%) | SPOOLER - COLLECTOR NOT FULL | Alarm | 2006/02/05 17:09:00 | | Alarm update |

TOOL <- Scroll Speed and Direction ->

Filters

Filter NO Filter Define

Clear Config Export Pause

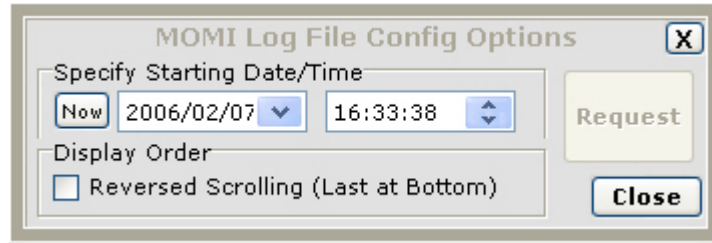
Waiting for new records after 2006/02/07 15:16:22

net.dw Hints On ? Help Print Screen

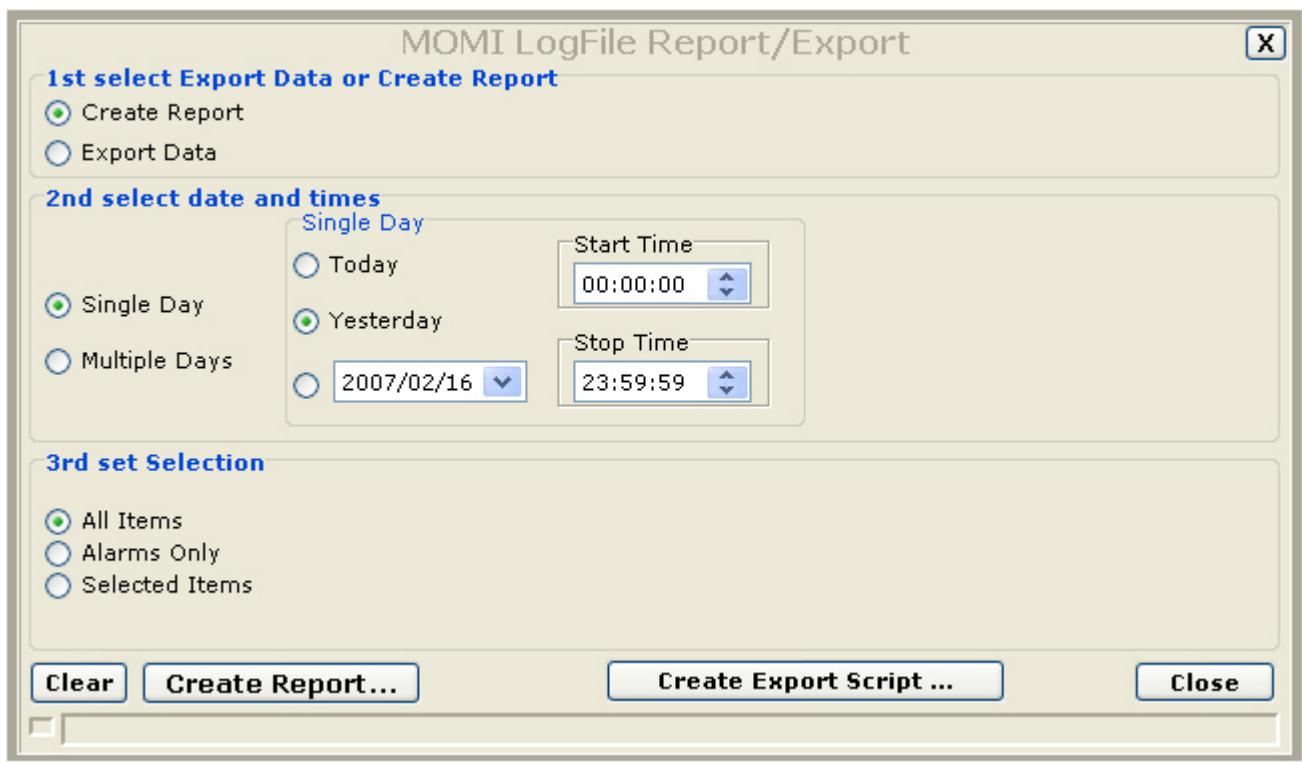
The MOMI Log screen displays records from the MOMI log file, provides an export capability and the definition of an export script. Records in this file are specific to MOMI.

Pressing the Request button, when the screen is clear, causes the client to read and display the last or most recent records in the file. The client then goes into a mode where new records are automatically displayed. Once data is display, used the slider to scroll forward and backward in time through the file.

The Config button is used to configure the starting location for record retrieval.



The Report/Export button is used to generate a report, export records or create an export script. To create a report or export data, first select report/export. Second, select a single day or multiple days. Third, select to report on all records or on specific Alarm records. Press Create Report... to begin generation (a pop-up window is displayed to select the Report/Export file name and location).



The Create Export Script button provides a means to define a script to define an export operation launched via the MOMI PC client run-time parameter [SCRIPT-LOG](#). A script is defined and saved prior to referencing it via the run-time parameter. To place the current date within the Export File Name, in YYYYMMDD format, insert the field <date> (see the tool-tip over this field for an example).

Export Script Creation X

Current Script names Delete Selected Script

Script Definition

System to Export
 Set by Current Monitored System

Export Date and Time
 Today This Week This Month
 Yesterday Last Week Last Month

Start Time
Stop Time

Export Data Type
 All Items
 Alarms Only
 Selected Items

Settings
 Tab-Delimited
 HTML Ouput

Export File Name (including Directory)

Name of Script to save

See [LOG01DB](#) for additional information.

EMS EVENTCX

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.13) window. The title bar includes the BlackWood Systems, Inc. logo and a progress indicator. The main window has a navigation menu with buttons for Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The SubSystems menu is active, showing a dropdown for \BWS1-2004 and a Pause... button. The date and time are 2006/05/17 16:48:49. The main content area has a Logs menu with Spool, TCP/IP, OSS, and Expand options. The EMS EVENTCX screen is displayed, showing input fields for Owner (TANDEM), SubSystem (8), and Event Nbr (0). Below these are two text areas: User Defined Probable Cause and User Defined Recommended Action. The Probable Cause area has lines L1-L6, with L1 containing the text "this is the probable cause for the problem". The Recommended Action area has lines L3-L6, with L3-L6 containing "RA". At the bottom, there are buttons for Prev, Next, Clear, Display, Save New, Change, and Delete. The status bar at the bottom right shows net.dw, Hints On, Help, and Print Screen.

The EMS EVENTCX screen allows the creation, display and maintenance of records in the EVENTCX file. This file is defined by Viewpt.

The EVENTCX file allows a user defined probable cause and recommended action for EMS events. An EMS message displayed in detail will add the content of this record if a matching Owner, SubSystem and Event Number is found.

The field layout of this file is not really 'user friendly' as it stores the SubSystem number and not the Sub-System name. For example, Tandem.8 is the equivalent of Tandem.Pathway. MOMI attempts to help in this area as it will automatically convert a SubSystem name into the SubSystem number if it is valid for that

Owner. It is necessary that EMS Templates be present (which is built-in for Tandem subsystems) for this conversion to occur.

The screen provides navigation through the file in that the Prev and Next buttons allow scrolling forward and backwards through the file. Pressing Next with a blank screen displays the first record in the file. Pressing Prev with a blank screen displays the last record in the file.

See the CONFMOMI keyword [EVENTCX](#) for additional information.

Spool

Spool / Spooler

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.07) window. The title bar includes the BlackWood Systems, Inc. logo, a progress bar at 4%, the system name '\BWS1-2004', a 'Pause...' button, and the date '2006/02/08' and time '16:18:50'. The main navigation menu includes 'Back', 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. The 'Spool' tab is selected, and the 'Expand' button is active. The 'Spooler' sub-tab is selected, showing a table with columns: Process, Type, State, LogFile, and Last Error. The table contains two rows: '\$SPLS' (STANDARD, ACTIVE, \$0) and '\$PLUS1' (PLUS, ACTIVE, \$0). A context menu is open over the '\$PLUS1' row, listing options: '\$PLUS1 - View Collectors', '\$PLUS1 - View Devices', '\$PLUS1 - View Jobs', '\$PLUS1 - View Locations', and '\$PLUS1 - View Print Processes'. The bottom of the window features a 'Clear' button, an 'AutoUpdate' checkbox, a 'Request' button, and a status bar showing 'data collected 2006/02/08 16:16:46'. The bottom right corner has buttons for 'Not Logged On', 'Hints On', '?', 'Help', and 'Print Screen'.

| Process | Type | State | LogFile | Last Error |
|---------|----------|--------|---------|------------|
| \$SPLS | STANDARD | ACTIVE | \$0 | |
| \$PLUS1 | PLUS | ACTIVE | \$0 | |

The Spool / Spooler screen presents the Spoolers present on the System and their state.

MOMI supports both the standard Spooler and Spooler Plus. See [FNAME-SPOOLER-PLUS-n](#) for additional information concerning configuration considerations for Spooler Plus.

The processes listed on this screen are the supervisor, or controlling process, for a Spooler. A Spooler is generally comprised of a single supervisor and then one or more of the following: collector, device, location and print process.

Spool / Collector

The screenshot displays the MOMI - Multi-system Online Measure Interface (Client version 4.07) window. The title bar includes the BlackWood Systems, Inc. logo and the system name \BWS1-2004. The interface features a navigation menu with options like Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The main area is titled 'Spool / Collector' and contains a table of processes.

| Process | Collector | State | Full% | Percent Full Gauge | Last Error | UnitSz | UnitAlloc | UnitTotal | PageSz | DataFile |
|---------|-----------|--------|-------|--------------------|------------|--------|-----------|-----------|--------|------------------|
| \$SPLS | \$S | ACTIVE | 2.6% | | | 4 | 2,135 | 79,996 | 60 | \$SWAP1.SPLS.SI |
| \$SPLS | \$S1 | ACTIVE | 0.0% | | | 4 | 0 | 3,998 | 60 | \$SWAP1.SPLS.SI |
| \$SPLS | \$S2 | ACTIVE | 0.0% | | | 4 | 0 | 3,998 | 60 | \$SWAP1.SPLS.SI |
| \$PLUS1 | \$SC1 | ACTIVE | 0.1% | | | 4 | 14 | 7,998 | 60 | \$SWAP1.PLUS1.SI |
| \$PLUS1 | \$SC2 | ACTIVE | 0.0% | | | 4 | 0 | 7,998 | 60 | \$SWAP1.PLUS1.SI |
| \$PLUS1 | \$SC3 | ACTIVE | 0.0% | | | 4 | 0 | 7,998 | 60 | \$SWAP1.PLUS1.SI |

A context menu is open over the '\$SC3' row, showing options: '\$SC3 - View Collector Jobs', '\$SC3 - Start Collector', and '\$SC3 - Drain Collector'. The bottom of the screen includes filter controls for Spooler and Collector, a 'Request' button, and a status bar with 'Not Logged On', 'Hints On', 'Help', and 'Print Screen' buttons.

The Spool / Collector screen presents the state and status of the Spooler collector processes.

A Spooler collector process is a system location where process output is directed. This output is usually formatted in a manner for printing. The collector process has an underlying data file where space for each output (i.e. job) is allocated. A space available in the data file is organized in units where a unit is equal to 1024 bytes.

Spool / Device

MOMI - Multi-system Online Measure Interface (Client version 3.82)

Black Wood Systems, Inc. | \BWS1 Fast - 2002 | 2004/12/03 16:25:13

Systems Overview CPUs Processes Files **SubSystems** History Configure

EMS Msgs **Spool** TCP/IP OSS Expand

Spooler Collector **Device** Job Loc Print View Job

| Process | Device | State | Last Error | B | E | T | P | D | H | X | F | FormName | RetryI | RetryX | Speed | PrintP | Job# | Param | Width | R |
|---------|--------|---------|------------|---|---|---|---|---|---|---|---|----------|--------|--------|-------|--------|------|-------|-------|---|
| \$PLUS1 | \$SD1 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$SP1 | | 1088 | | |
| \$PLUS1 | \$SD2 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$SP2 | | 1088 | | |
| \$PLUS1 | \$SD3 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$SP3 | | 1088 | | |
| \$PLUS1 | \$SD4 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$SP4 | | 1088 | | |
| \$SPLS | \$HP1 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$PP1 | | 1088 | | |
| \$SPLS | \$HP2 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$PP2 | | 1088 | | |
| \$SPLS | \$HP3 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$PP3 | | 1088 | | |
| \$SPLS | \$HP4 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$PP4 | | 1088 | | |
| \$SPLS | \$HP5 | WAITING | 0 | | | | | | | | | | 5 | 360 | 100 | \$PP5 | | 1088 | | |

Spooler: * Device: * No Filter Displayed 9 of 9

Clear AutoUpdate Request data collected 2004/12/03 16:18:10

Not Logged On ? Help Print Screen

The Spool / Device screen presents the status of the devices that handle generation of hard-copy from the Spooler.

Each hard-copy device in the Spooler is represented and associated with a print process. The print process is an actual process running on the Tandem .

Spool / Job

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.07) window. The title bar includes the BlackWood Systems, Inc. logo, a progress bar, the system name \BWS1-2004, a Pause button, and the date/time 2006/02/08 16:36:22. The main menu includes Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The Spool / Job screen is active, showing a table of spooler jobs. The table has columns for Spooler, Collector, Device, Job, Loc, Print, View Job, Process, Job#, State, Location, Collector, Report, C, H, A, P, PageSz, OwnerId, Copies, Pages, Lines, and Time Oper. The data shows four jobs, all in a READY state, with various locations and collector information. The status bar at the bottom includes a Clear button, checkboxes for All Users and AutoUpdate, a Request button, and a status message: data collected 2006/02/08 16:36:15. The bottom right corner has buttons for net.dw, Hints On, Help, and Print Screen.

| Spooler | Collector | Device | Job | Loc | Print | View Job | Process | Job# | State | Location | Collector | Report | C | H | A | P | PageSz | OwnerId | Copies | Pages | Lines | Time Oper |
|---------|-----------|--------|-----|-----|-------|----------|---------|------|-------|----------|-----------|--------|---|---|---|---|--------|---------|--------|-------|--------|-----------|
| | | | | | | | \$SPLS | 16 | READY | #MOMIDT | \$S | NET DW | | | | 4 | 60 | 100,109 | 1 | 959 | 47,914 | 2006/02/0 |
| | | | | | | | \$SPLS | 19 | READY | #MOMIDT | \$S | NET DW | | | | 4 | 60 | 100,109 | 1 | 959 | 47,931 | 2006/02/0 |
| | | | | | | | \$SPLS | 20 | READY | #MOMIDT | \$S | NET DW | | | | 4 | 60 | 100,109 | 1 | 959 | 47,932 | 2006/02/0 |
| | | | | | | | \$SPLS | 21 | READY | #FILES | \$S | NET DW | | | | 4 | 60 | 100,109 | 1 | 1 | 11 | 2006/02/0 |

The Spool / Job screen presents the status and state of data waiting in the Spooler.

Data is organized in the Spooler in units known as jobs. Generally, a job represents the output of a single process sending data to the Spooler.

Jobs are displayed when the User presses the Request button. In the logged off state, all jobs are displayed. If a User is logged on, only the user's jobs are displayed by default. Checking the All Users box will cause all jobs to be displayed.

Spool / Loc

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.07) window. The title bar includes the Black Wood Systems, Inc. logo, a progress bar at 4%, the system name \BWS1-2004, a Pause button, and the date 2006/02/08 and time 16:38:22. The main menu includes Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The current view is Spool / Loc, with sub-tabs for Logs, Spool, TCP/IP, OSS, and Expand. The Spool / Loc screen displays a table with columns for Process, Location, B, Device, and Font. The table lists 15 entries for the \$SPLS process, each associated with a specific location and device. Below the table, there are search filters for Spooler and Location, both set to *. The status bar shows 'No Filter', 'Displayed 115 of 115', and a 'Request' button. The bottom of the window has buttons for 'Not Logged On', 'Hints On', 'Help', and 'Print Screen'.

| Process | Location | B | Device | Font |
|---------|------------------|---|--------|---------|
| \$SPLS | #BACKSYS.PORT16T | | | |
| \$SPLS | #BACKSYS.DEFAULT | | | |
| \$SPLS | #BW1KSYS.DEFAULT | | | |
| \$SPLS | #BW1.DEFAULT | | \$HP4 | PORT10 |
| \$SPLS | #BW1.LAND10T | | \$HP4 | LAND10 |
| \$SPLS | #BW1.LAND10D | | \$HP4 | LAND10D |
| \$SPLS | #BW1.LAND12D | | \$HP4 | LAND12 |
| \$SPLS | #BW1.LAND12D | | \$HP4 | LAND12D |
| \$SPLS | #BW1.LAND16D | | \$HP4 | LAND16 |
| \$SPLS | #BW1.LAND16D | | \$HP4 | LAND16D |
| \$SPLS | #BW1.LIST16D | | \$HP4 | LISTD |
| \$SPLS | #BW1.PORT10D | | \$HP4 | PORT10 |
| \$SPLS | #BW1.PORT10D | | \$HP4 | PORT10D |
| \$SPLS | #BW1.PORT12D | | \$HP4 | PORT12 |
| \$SPLS | #BW1.PORT12D | | \$HP4 | PORT12D |
| \$SPLS | #BW1.PORT16D | | \$HP4 | PORT16 |
| \$SPLS | #BW1.PORT16D | | \$HP4 | PORT16D |

The Spool / Loc screen presents information about the locations in the Spooler.

A location defines the device to receive a job. Locations have various attributes associated with them, such as font. If no Device is defined, the job waits in the Spooler.

Locations are defined as associated with a Device and optionally a Font. Locations are statically and dynamically created. Static locations are created when the Spooler is configured. Dynamic locations are created when a process opens a Spool Collector and outputs to a location not statically defined. Dynamic locations

generally cause jobs to sit in the Ready state until they are either deleted or their location is changed to a Static, which in turn causes the Job to print.

Spool / Print

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.07) window. The title bar includes the BlackWood Systems, Inc. logo and a progress bar. The main window has a navigation menu with options: Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The 'Spool' tab is selected, and the 'Print' sub-tab is active. A table displays the status of spooler and print processes. A tooltip for '\$SP4 - Start Device' is visible over the table. The status bar at the bottom shows 'Spooler *', 'Print *', 'No Filter', 'Displayed 9 of 9', 'Clear', 'AutoUpdate', 'Request', and 'data collected 2006/02/08 16:39:08'. The bottom right corner has buttons for 'Not Logged On', 'Hints On', 'Help', and 'Print Screen'.

| Spooler | Collector | Device | Job | Loc | Print | View Job | | | | |
|---------|-----------|---------|-----|-----|------------|--------------------------|-----|-----|-----|-------|
| Process | Print | State | A | D | Last Error | Program File | Pri | Bak | Pri | Param |
| \$SPLS | \$PP1 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 1 | 0 | 145 | 0 |
| \$SPLS | \$PP2 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 0 | 1 | 145 | 0 |
| \$SPLS | \$PP3 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 1 | 0 | 145 | 0 |
| \$SPLS | \$PP4 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 0 | 1 | 145 | 0 |
| \$SPLS | \$PP5 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 1 | 0 | 145 | 0 |
| \$PLUS1 | \$SP1 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 1 | 0 | 145 | 0 |
| \$PLUS1 | \$SP2 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 0 | 1 | 145 | 0 |
| \$PLUS1 | \$SP3 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 1 | 0 | 145 | 0 |
| \$PLUS1 | \$SP4 | DORMANT | | | | \$SYSTEM.SYSTEM.FASTPTCP | 0 | 1 | 145 | 0 |

The Spool / Print screen presents the status of the Spool Print processes.

A Print process handles the actual transfer of data from the Spooler to the hard-copy device or to another Spool Collector.

Spool / View Job

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.07) window. The title bar includes the BlackWood Systems, Inc. logo and a progress indicator. The main interface has a navigation menu with options like Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. Below this is a sub-menu with Logs, Spool, TCP/IP, OSS, and Expand. The Spool menu is active, showing a sub-menu with Spooler, Collector, Device, Job, Loc, Print, and View Job. The View Job option is selected, displaying a list of spooler jobs in a table format. The table has columns for Spooler, Collector, Device, Job, Loc, Print, and View Job. The data is as follows:

| Spooler | Collector | Device | Job | Loc | Print | View Job |
|----------|-----------|---------|---------|----------|---------|-------------------|
| A | ADSIZE | AFRED | ALOOP | AOT | ARCH | AST BOT |
| BST | BSY020T | BSY02ST | COT | CPT010T | CPT01ST | CREAT CSC |
| CST | DATA1 | DATAM | DATAM2 | DATM | DOT | DSAPCSTM DSK010T |
| DSK01ST | DSK020T | DSK02ST | DST | EMSCOMP | EMSTEST | EMSTESTO EOT |
| EST | FFREP | FILE | FOT | FST | FUPA | FUPCSTM INSPCSTM |
| INSPSRC | LIBOT | LIBST | LOCK20T | LOCK2ST | LOCKOT | LOCKST LOG |
| MAY220 | NERODIGI | NOFCSTM | NULL0T | NULLST | NULXX0T | NULXXST OB |
| OB2 | READ20T | READ2ST | READ0T | READST | SCFCSTM | SCFPLAM4 SCFZZPAM |
| SHHISTOR | TACLCSTM | TALOT | TALST | TEDPROFL | TIE | TIEG TIEGS |
| TIESO | TODO | TRAN20T | TRAN2ST | TRAN30T | TRAN3ST | TRANOT TRANST |
| VHSCSTM | WORKDB | WORKDB1 | WRITE0T | WRITEST | WRT0T | WRTST ZZSA001 |
| ZZSA1111 | | | | | | |

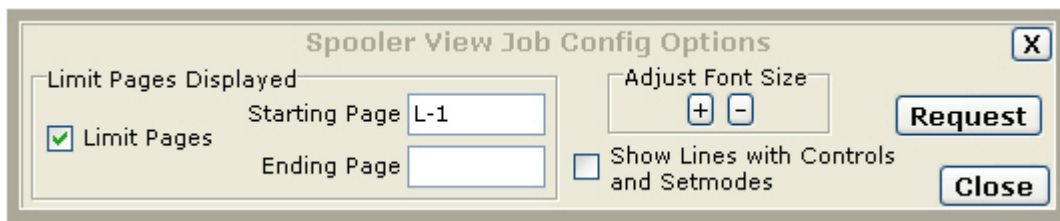
At the bottom of the window, there is a search bar with a 'Search' button and a 'Found' field. Below the search bar are buttons for 'Clear', 'Config', 'Export Tools', and 'Request'. The 'Request' button has a red square icon. The bottom right corner of the window has buttons for 'net.dw', 'Hints On', '?', 'Help', and 'Print Screen'.

The Spool / View Job screen displays the contents of a Spooler Job.

The User must be logged on. Standard Spooler security will apply before the contents of a Spooler job may be viewed.

Pressing the Config button brings up a pop-up window. This window can be used before a job is requested to allow limiting the number of pages downloaded and displayed. This is particularly useful for large jobs where only a few pages need to be examined. The characters F and L represent First page and Last page

with an optional + / - followed by a number. In the screen below, only the last page of the job is retrieved and displayed.

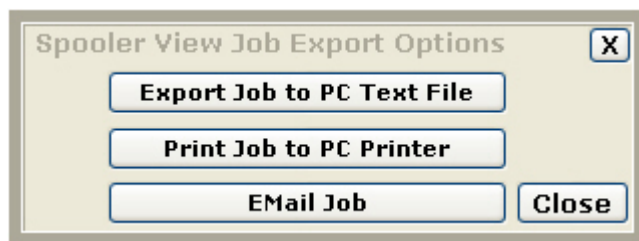


After a job is displayed, bring up the Config window to change font size. Press Close or X to leave the existing job in place. It is not necessary to re-request the job to just change the font size.

In the display window, special lines present various Spooler operations rather than a line of data. Below are examples:

```
>*Controlbuf*<  
>*Setmode* Function ##### Param1 ##### Param2 #####<  
>*Control* Operation <?INT16> Param <?INT16><  
>*FormFeed*<
```

The Export Tools button displays a window to allow the displayed job to 1) export to a text file on the PC, 2) sent to a PC printer, or 3) loaded into an Email (MOMI invokes the default email client configured for the PC).



TCP/IP

TCP/IP / Process Info

The screenshot shows the MOMI interface with the following components:

- Header:** MOMI - Multi-system Online Measure Interface (Client version 4.07). Includes a Black Wood Systems logo, a progress bar, and system information: \BWS1-2004, 2006/02/09, 22:27:38.
- Navigation:** Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, Configure.
- Sub-Menu:** Logs, Spool, TCP/IP (selected), OSS, Expand.
- Process Info Table:**

| Process | HostID | HostName | TcpSend | TcpRecv | UdpSend | UdpRecv | A | AckDelay | QIO | Kidle | Kintv | Kcnt | MinQ |
|---------|---------------|------------|---------|---------|---------|---------|---|----------|-----|-------|-------|------|------|
| \$ZTCH1 | 0.0.0.0 | BWS1swanh1 | 8,192 | 8,192 | 9,216 | 20,800 | A | 5 | 100 | 45 | 45 | 8 | 5 |
| \$ZTCP1 | 0.0.0.0 | tsmlany | 8,192 | 8,192 | 9,216 | 20,800 | A | 5 | 100 | 45 | 45 | 8 | 5 |
| \$ZSAM1 | 192.168.10.11 | BWS1p | 61,440 | 61,440 | 9,216 | 42,080 | A | 20 | 100 | 75 | 75 | 8 | 128 |
| \$ZTC0 | 0.0.0.0 | BWS1LAM0 | 30,000 | 30,000 | 9,216 | 20,800 | A | 5 | 100 | 45 | 45 | 8 | 5 |
| \$ZTCH2 | 0.0.0.0 | BWS1swanh2 | 8,192 | 8,192 | 9,216 | 20,800 | A | 5 | 100 | 45 | 45 | 8 | 5 |
| \$ZTCP0 | 0.0.0.0 | tsmlanx | 8,192 | 8,192 | 9,216 | 20,800 | A | 5 | 100 | 45 | 45 | 8 | 5 |

Filter Section: TCP/IP Process: * (dropdown), No Filter, Displayed: 6 of 6. Includes buttons for Clear, AutoUpdate, Request (checked), and data collected 2006/02/09 22:27:23.

Footer: net.dw, Hints On, Help, Print Screen.

The TCP/IP / Process Info screen presents the TCP/IP processes or protocol stacks running on the System.

The TCP/IP process is the IOP (Input/Output Process) responsible for handling the TCP/IP traffic for a communication interface.

S-Series systems always have two TCP/IP processes used in support of the system console. These are \$ZTCP0 and \$ZTCP1. Most systems have a \$ZTC0 TCP/IP process running, which is the default selection for socket programs.

At a TACL prompt, the default TCP/IP process is changed by using a DEFINE. Below is an example which sets the default process to \$ZSAM1 and then starts an FTP:

```
1> ADD DEFINE =TCPIP^PROCESS^NAME, FILE $ZSAM1
2> TRACER www.hp.com
```

TCP/IP / Process Status

The screenshot shows the MOMI interface with the following components:

- Header:** MOMI - Multi-system Online Measure Interface (Client version 4.07), BlackWood Systems, Inc. logo, and system name \BWS1-2004.
- Navigation:** Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, Configure.
- Sub-Menu:** Logs, Spool, TCP/IP, OSS, Expand.
- Table:** Process Info, Process Status, Subnet, Route. The table lists various processes like \$ZTCH1 and \$ZTCP1 with their states, addresses, ports, and protocols.
- Controls:** TCP/IP Process dropdown, No Filter, Displayed 112 of 112, Clear, Mini-Reports, AutoUpdate checkbox, Request button, and data collected timestamp.
- Footer:** net.dw, Hints On, Help, Print Screen.

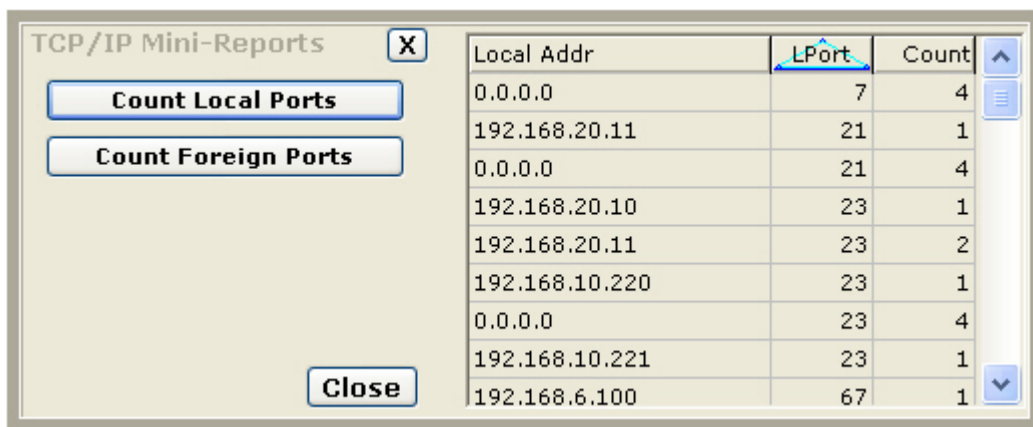
| Process | State | Local Addr | LPort | Foreign Addr | FPort | Proto | SendQ | RecvQ | SokQ | SokQL | PcbQ | PcbQL | Multic: |
|---------|--------|----------------|-------|----------------|-------|-------|-------|-------|--------|--------|--------|-------|---------|
| \$ZTCH1 | ESTAB | 192.168.5.100 | 1026 | 192.168.5.111 | 5000 | TCP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCH1 | ESTAB | 192.168.5.100 | 1025 | 192.168.5.111 | 5001 | TCP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCH1 | LISTEN | 192.168.5.100 | 9000 | 0.0.0.0 | 0 | TCP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCH1 | | 192.168.5.100 | 1025 | 0.0.0.0 | 0 | UDP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCH1 | | 0.0.0.0 | 161 | 0.0.0.0 | 0 | UDP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCH1 | | 192.168.5.100 | 162 | 0.0.0.0 | 0 | UDP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCH1 | | 192.168.5.100 | 68 | 0.0.0.0 | 0 | UDP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCH1 | | 192.168.5.100 | 67 | 0.0.0.0 | 0 | UDP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCH1 | | 192.168.5.100 | 69 | 0.0.0.0 | 0 | UDP | 0 | 0 | 65,535 | 24,942 | 26,673 | 0 | |
| \$ZTCP1 | ESTAB | 192.168.10.221 | 23 | 192.168.10.200 | 3781 | TCP | 0 | 0 | 65,535 | 30,976 | 0 | 0 | |
| \$ZTCP1 | ESTAB | 192.168.10.221 | 5988 | 192.168.10.200 | 4163 | TCP | 0 | 0 | 65,535 | 30,976 | 0 | 0 | |
| \$ZTCP1 | LISTEN | 0.0.0.0 | 5988 | 0.0.0.0 | 0 | TCP | 0 | 0 | 65,535 | 30,976 | 0 | 0 | |
| \$ZTCP1 | LISTEN | 0.0.0.0 | 9990 | 0.0.0.0 | 0 | TCP | 0 | 0 | 65,535 | 30,976 | 0 | 0 | |
| \$ZTCP1 | LISTEN | 0.0.0.0 | 9991 | 0.0.0.0 | 0 | TCP | 0 | 0 | 65,535 | 30,976 | 0 | 0 | |
| \$ZTCP1 | LISTEN | 0.0.0.0 | 23 | 0.0.0.0 | 0 | TCP | 0 | 0 | 65,535 | 30,976 | 0 | 0 | |
| \$ZTCP1 | LISTEN | 0.0.0.0 | 21 | 0.0.0.0 | 0 | TCP | 0 | 0 | 65,535 | 30,976 | 0 | 0 | |

The TCP/IP / Process Status screen presents all of the active sockets.

A socket is the term for a TCP/IP communications connection. The states of connection displayed include Listen (waiting for a connection), Established (where communication is taking place) or Closing (where the communications connection is terminating).

Established TCP level sockets will have an LPort (local port) that is the same as the listening port but will have a randomly chosen FPort (foreign port). The combination of the local address, local port, foreign address and foreign port make a socket unique to the TCP/IP stack.

The Mini-Reports button brings up a pop-up screen that provides quick statistics for the count of local and foreign ports based on the address.



| Local Addr | LPort | Count |
|----------------|-------|-------|
| 0.0.0.0 | 7 | 4 |
| 192.168.20.11 | 21 | 1 |
| 0.0.0.0 | 21 | 4 |
| 192.168.20.10 | 23 | 1 |
| 192.168.20.11 | 23 | 2 |
| 192.168.10.220 | 23 | 1 |
| 0.0.0.0 | 23 | 4 |
| 192.168.10.221 | 23 | 1 |
| 192.168.6.100 | 67 | 1 |

TCP/IP / Subnet

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.07) window. The title bar includes the Black Wood Systems, Inc. logo and a progress bar. The main window has a navigation menu with options: Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The 'SubSystems' menu is expanded to show 'Logs', 'Spool', 'TCP/IP', 'OSS', and 'Expand'. The 'TCP/IP' menu is further expanded to show 'Process Info', 'Process Status', 'Subnet', and 'Route'. The 'Subnet' menu is selected, displaying a table of process information.

| Process | SubNet | State | Type | IP Addr | CIDR | Mask(Hex) | Mask(Dec) | G | Q | R | A | MTU | Sub |
|---------|--------|---------|-----------|----------------|------|-------------|---------------|---|---|---|---|-------|-----|
| \$ZTCH1 | #LOOP0 | STARTED | LOOP-BACK | 127.0.0.1 | /8 | %hFFFFFFF00 | 255.0.0.0 | | | | A | 32728 | |
| \$ZTCH1 | #SN1 | STARTED | ETHERNET | 192.168.5.100 | /24 | %hFFFFFFF00 | 255.255.255.0 | | Q | | A | 1500 | |
| \$ZTCP1 | #LOOP0 | STARTED | LOOP-BACK | 127.0.0.1 | /8 | %hFFFFFFF00 | 255.0.0.0 | | | | A | 32728 | |
| \$ZTCP1 | #SN1 | STARTED | ETHERNET | 192.168.10.221 | /24 | %hFFFFFFF00 | 255.255.255.0 | | Q | | A | 1500 | |
| \$ZSAM1 | #SN1 | STARTED | ETHERNET | 192.168.20.11 | /24 | %hFFFFFFF00 | 255.255.255.0 | | Q | | | 1500 | |
| \$ZSAM1 | #LOOP0 | STARTED | LOOP-BACK | 127.0.0.1 | /8 | %hFFFFFFF00 | 255.0.0.0 | | | | | 32768 | |
| \$ZTC0 | #LOOP0 | STARTED | LOOP-BACK | 127.0.0.1 | /8 | %hFFFFFFF00 | 255.0.0.0 | | | | A | 32728 | |
| \$ZTC0 | #SN1 | STARTED | ETHERNET | 192.168.20.10 | /24 | %hFFFFFFF00 | 255.255.255.0 | | Q | | A | 1500 | |
| \$ZTCH2 | #LOOP0 | STARTED | LOOP-BACK | 127.0.0.1 | /8 | %hFFFFFFF00 | 255.0.0.0 | | | | A | 32728 | |
| \$ZTCH2 | #SN1 | STARTED | ETHERNET | 192.168.6.100 | /24 | %hFFFFFFF00 | 255.255.255.0 | | Q | | A | 1500 | |
| \$ZTCP0 | #LOOP0 | STARTED | LOOP-BACK | 127.0.0.1 | /8 | %hFFFFFFF00 | 255.0.0.0 | | | | A | 32728 | |
| \$ZTCP0 | #SN1 | STARTED | ETHERNET | 192.168.10.220 | /24 | %hFFFFFFF00 | 255.255.255.0 | | Q | | A | 1500 | |

At the bottom of the window, there are control elements: a 'Clear' button, an 'AutoUpdate' checkbox (unchecked), a 'Request' button (highlighted in red), and a status bar showing 'data collected 2006/02/09 22:30:08'. The bottom right corner contains buttons for 'net.dw', 'Hints On', '? Help', and 'Print Screen'.

The TCP/IP / Subnet screen presents the status of the connection between the protocol stack and the physical LAN interfaces.

A Subnet is associated with an address and 1) an IOP (Input/Output Process) on older platforms, or 2) a LIF (Logical InterFace) on newer platforms.

The Subnet Mask determines when routing of outgoing messages requires the usage of a default gateway.

The TCP/IP address of 127.0.0.1 is a built-in address used for loop-back testing. This is an address that does not go anywhere but is still valid.

TCP/IP / Route

The screenshot shows the MOMI interface with the following components:

- Header:** MOMI - Multi-system Online Measure Interface (Client version 4.07)
- Navigation:** Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, Configure
- Sub-Menu:** Logs, Spool, TCP/IP, OSS, Expand
- Table:**

| Process | Route | State | Dest Addr | Gateway Addr | CIDR | Mask(Hex) | Mask(Dec) | H | G | I | Subnet |
|---------|----------|---------|---------------|----------------|------|-------------|-----------------|---|---|---|--------|
| \$ZTCH1 | #RT1 | STARTED | 192.168.5.0 | 192.168.5.100 | /24 | %hFFFFFFF00 | 255.255.255.0 | | | | #SN |
| \$ZTCH1 | #RT2 | STARTED | 127.0.0.1 | 127.0.0.1 | /8 | %hFF000000 | 255.0.0.0 | H | | | #LO |
| \$ZTCP1 | #GW | STARTED | 0.0.0.0 | 192.168.10.1 | /0 | %h00000000 | 0.0.0.0 | | G | | #SN |
| \$ZTCP1 | #RT1 | STARTED | 192.168.10.0 | 192.168.10.221 | /24 | %hFFFFFFF00 | 255.255.255.0 | | | | #SN |
| \$ZTCP1 | #RT2 | STARTED | 127.0.0.1 | 127.0.0.1 | /8 | %hFF000000 | 255.0.0.0 | H | | | #LO |
| \$ZSAM1 | #RT2 | STARTED | 127.0.0.1 | 127.0.0.1 | /32 | %hFFFFFFFF | 255.255.255.255 | H | | | #LO |
| \$ZSAM1 | #RT3 | STARTED | 192.168.20.0 | 192.168.20.11 | /24 | %hFFFFFFF00 | 255.255.255.0 | | | | #SN |
| \$ZSAM1 | #RT4 | STARTED | 192.168.20.11 | 192.168.20.11 | /32 | %hFFFFFFFF | 255.255.255.255 | H | | | #SN |
| \$ZSAM1 | #ROUTE1 | STARTED | 0.0.0.0 | 192.168.20.1 | /0 | %h00000000 | 0.0.0.0 | | G | | #SN |
| \$ZSAM1 | #DA1_2 | STARTED | 192.168.20.12 | 192.168.20.12 | /32 | %hFFFFFFFF | 255.255.255.255 | H | | | #SN |
| \$ZSAM1 | #DA1_3 | STARTED | 192.168.20.41 | 192.168.20.41 | /32 | %hFFFFFFFF | 255.255.255.255 | H | | | #SN |
| \$ZSAM1 | #DA1_4 | STARTED | 192.168.20.1 | 192.168.20.1 | /32 | %hFFFFFFFF | 255.255.255.255 | H | | | #SN |
| \$ZSAM1 | #DA1_33 | STARTED | 192.168.20.21 | 192.168.20.21 | /32 | %hFFFFFFFF | 255.255.255.255 | H | | | #SN |
| \$ZTC0 | #ROU0001 | STARTED | 0.0.0.0 | 192.168.20.1 | /0 | %h00000000 | 0.0.0.0 | | G | | #SN |
| \$ZTC0 | #RT1 | STARTED | 192.168.20.0 | 192.168.20.10 | /24 | %hFFFFFFF00 | 255.255.255.0 | | | | #SN |
- Footer:** net.dw, Hints On, Help, Print Screen

The TCP/IP / Route screen presents the paths used in determining where data is sent if the destination is not on the local Subnet.

TCP/IP routing generally comes into play if the destination is not local. Data is sent to a default gateway (usually a router) so that it may be forwarded either to the destination or to another router in order to reach the final destination.

OSS

OSS / CPU Info

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.07) window. The title bar includes the BlackWood Systems, Inc. logo and a progress bar. The main window has a navigation menu with buttons for Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The 'SubSystems' button is highlighted. Below the navigation menu, there are buttons for Logs, Spool, TCP/IP, OSS, and Expand. The 'OSS' button is selected. The main content area displays the 'CPU Info' tab, which contains a table with 16 columns and 2 rows of data. The columns are: CPU Nbr, Cache Block Size, Cache Blocks Allowed, FileSys Direct Reads, FileSys Direct RBytes, FileSys Direct Writes, FileSys Direct WBytes, FileSys Cache Reads, FileSys Cache RBytes, FileSys Cache Writes, FileSys Cache WBytes, FileSys Cache VQTime, FileSys Cache VMax, FileSys Cache AQTime, and FileSys Cache AMax. The data for CPU 0 and 1 is as follows:

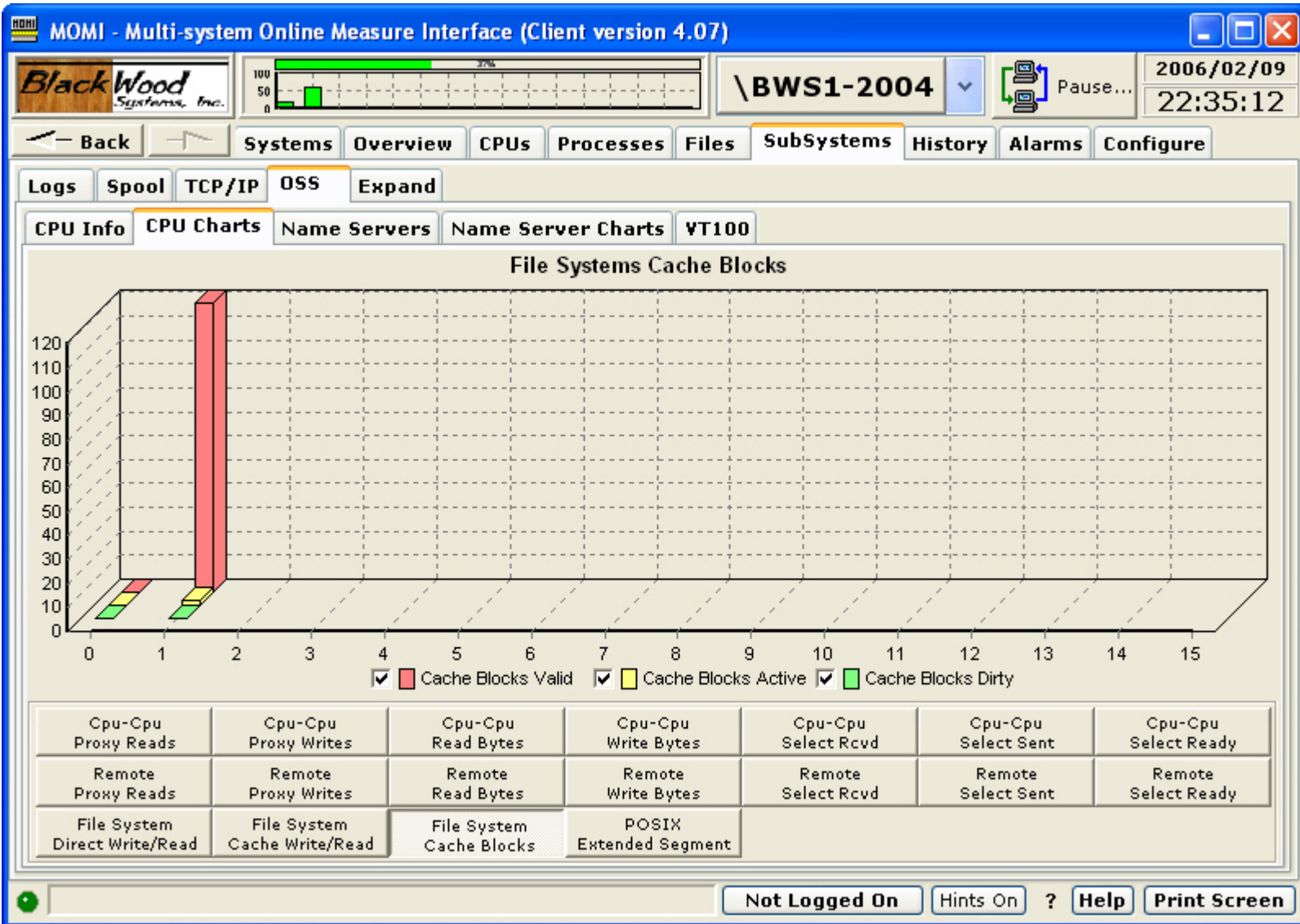
| CPU Nbr | Cache Block Size | Cache Blocks Allowed | FileSys Direct Reads | FileSys Direct RBytes | FileSys Direct Writes | FileSys Direct WBytes | FileSys Cache Reads | FileSys Cache RBytes | FileSys Cache Writes | FileSys Cache WBytes | FileSys Cache VQTime | FileSys Cache VMax | FileSys Cache AQTime | FileSys Cache AMax |
|---------|------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|---------------------|----------------------|----------------------|----------------------|----------------------|--------------------|----------------------|--------------------|
| 0 | 4,096 | 2,048 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0.00 | 0 |
| 1 | 4,096 | 2,048 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0.00 | 0 |

At the bottom of the window, there is a status bar with a 'TOOL' button, a checked 'Rated Values' checkbox, and buttons for 'net.dw', 'Hints On', '?', 'Help', and 'Print Screen'.

The OSS / CPU Info screen presents the MEASURE OSS CPU entity.

The MEASURE OSS CPU entity provides insight into the various counters concerning OSS at the CPU level. This primarily deals with file cache blocks, local CPU-to-CPU I/O activity and remote CPU-to-CPU I/O activity.

OSS / CPU Charts



The OSS / CPU Charts screen presents selected data from the OSS / CPU Info screen in graphical form. The information displayed is obtained from the MEASURE OSS CPU entity.

Press the desired button to display the graph.

The MEASURE OSS CPU entity provides insight into the various counters concerning OSS at the CPU level. This primarily deals with file cache blocks, local CPU-to-CPU I/O activity and remote CPU-to-CPU I/O activity.

OSS / Name Servers

The screenshot shows the MOMI interface with the following components:

- Header:** MOMI - Multi-system Online Measure Interface (Client version 4.07). Includes a logo for BlackWood Systems, Inc., a progress bar at 30%, and system information: \BWS1-2004, 2006/02/09, 22:36:13.
- Navigation:** Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, Configure.
- Sub-Menu:** Logs, Spool, TCP/IP, OSS (selected), Expand.
- Table:**

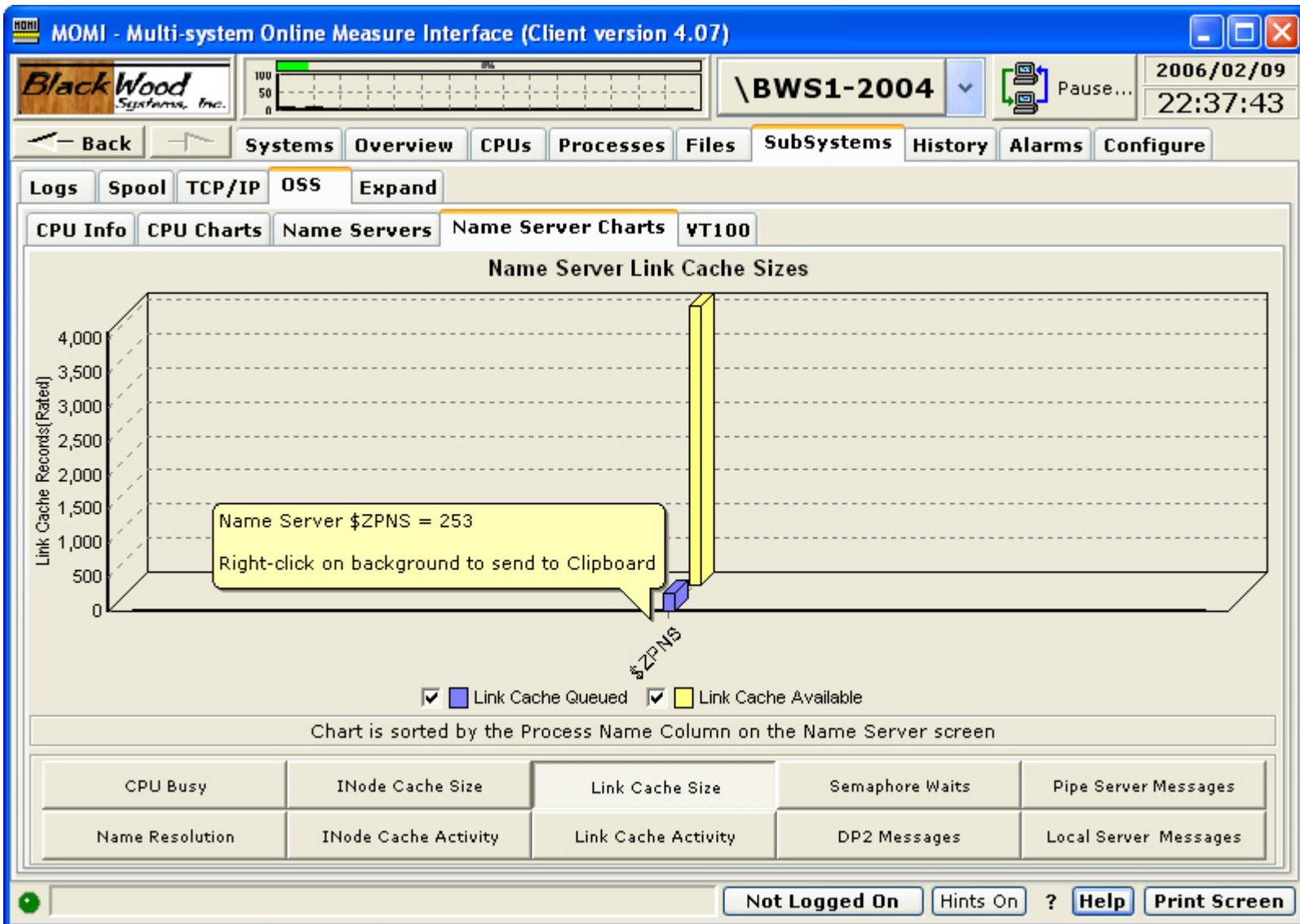
| Process Name | CPU,Pin | CPU Busy Pct | Name ResReqs Processed | Name ResReqs ReDirect | Name RR ReDirect Processed | Inode Cache Avail | Inode Cache QTime/Q | Inode Cache Lookups | Inode Cache Hits | Inode Cache Misses | Link Cache Avail |
|--------------|----------|--------------|------------------------|-----------------------|----------------------------|-------------------|---------------------|---------------------|------------------|--------------------|------------------|
| \$ZPNS | 00,00385 | 1.90 | 418.00 | 0.00 | 0.00 | 4,096 | 4.89 | 1,578.00 | 1,578.00 | 0.00 | 4,096.00 |
- Footer:** Includes a "TOOL" icon, a "Rated Values" checkbox (checked), "No Filter" button, "Displayed 1 of 1", and "Not Logged On", "Hints On", "Help", and "Print Screen" buttons.

The OSS / Name Server Charts screen presents the MEASURE OSS Name Server entity.

The OSS Name Server is responsible for translating OSS path names into Guardian \$volume.subvol.file type names and vice versa. The Name Server also provides the isolation of physical disk drives from the unified path names. Path names do not generally represent physical volumes except when representing Guardian format file names.

A system running OSS has at least one Name Server running, but usually one Name Server per CPU.

OSS / Name Server Charts



The OSS / Name Server Charts screen presents selected data from the Name Server screen in graphical form. The information displayed is obtained from the MEASURE OSS Name Server entity.

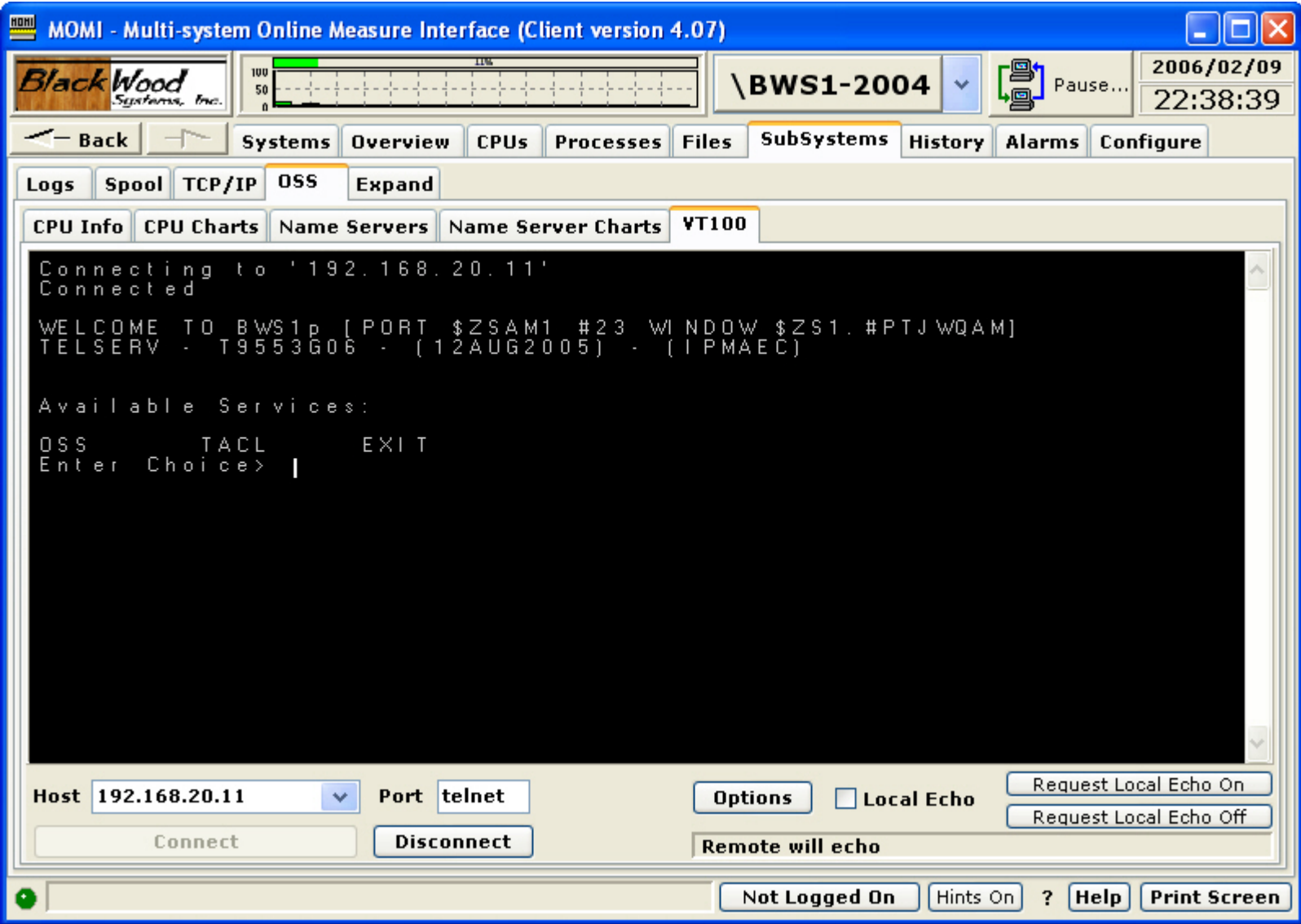
Press the desired button to display the graph.

The OSS Name Server is responsible for translating OSS path names into Guardian \$volume.subvol.file type names and vice versa. The Name Server also provides the isolation of physical disk drives from the

unified path names. Path names do not generally represent physical volumes except when representing Guardian format file names.

A system running OSS has at least one Name Server running, but usually one Name Server per CPU.

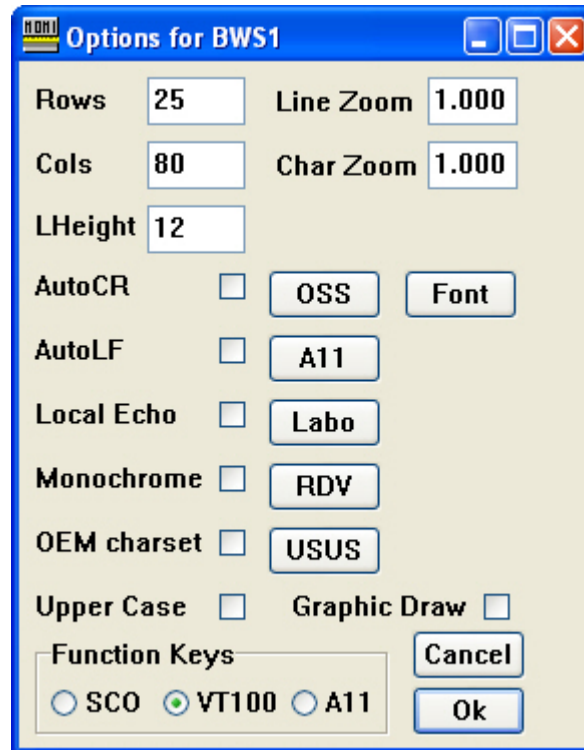
OSS / VT100



The OSS / VT100 screen provides a simple emulator useful in the OSS environment.

Enter the Host TCP/IP address (or Name) and press Connect.

Various options can be set by pressing the Options button. Options selected are saved in the INI file. Buttons in the center of the pop-up provide commonly used defaults. Pressing the OSS button and selecting the VT100 Function Keys are recommended for OSS.



Expand

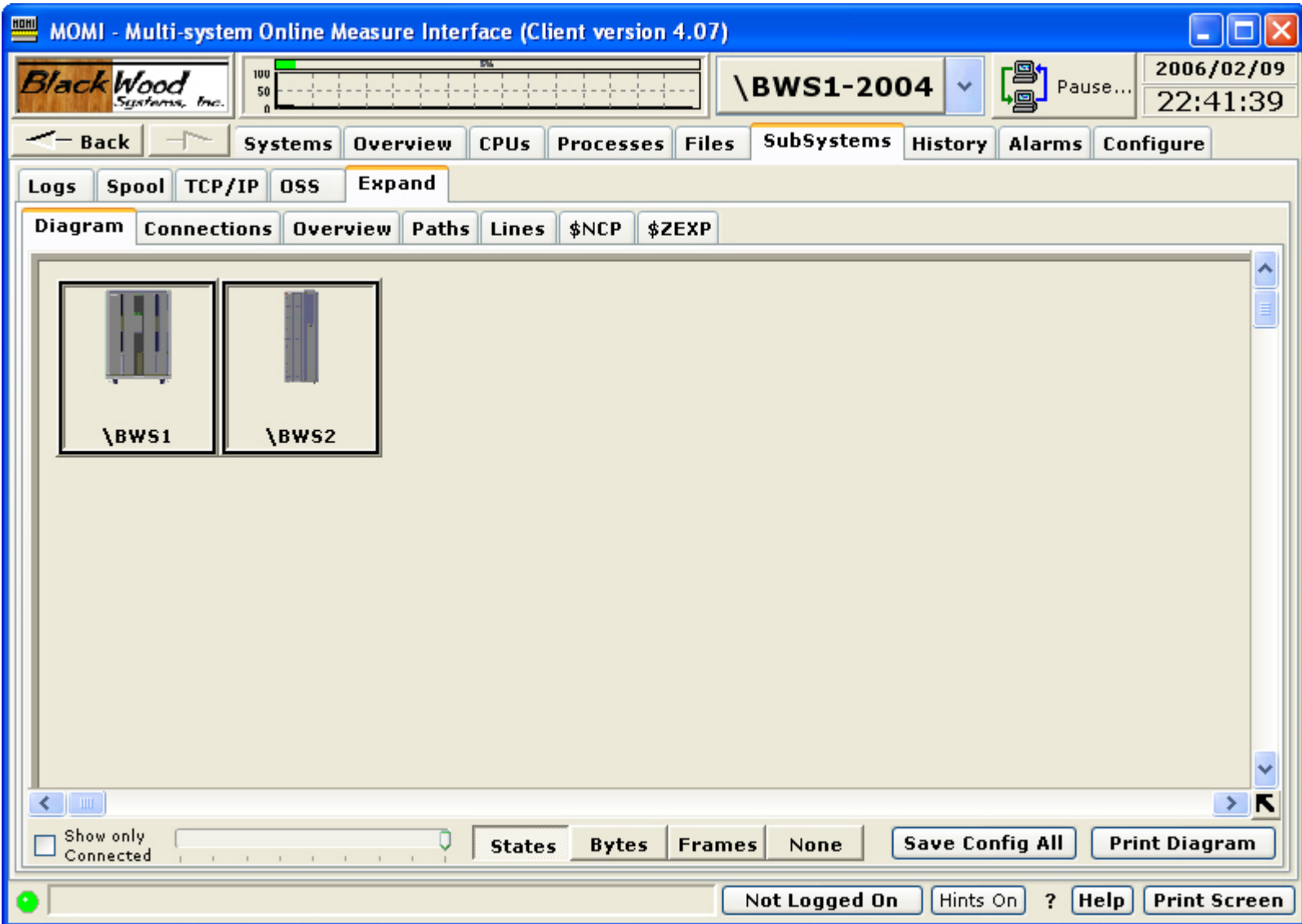
Overview

The Expand subsystem provides information on the status of the communication interconnects linking systems within a network.

All screens under this tab are automatically updated either by timer operation or by events as seen by MOMI. Certain fields such as a time stamp in the stats output are only updated when other values within the stats record change. In other words, stats records are not updated just to update the time stamp, but are updated when 'real' stats values change.

Expand / Diagram

see [System Quirks](#)



The Expand / Diagram screen provides a pictorial view of the Expand network.

Expand is the name of the subsystem and system software that provides transparent communication between two or more Tandem systems.

When first started, the nodes or systems on the network are placed right next to each other. Place the mouse within the system box in the 'unused' area and press and hold the mouse to drag the Systems to desired locations. Press the **Save Config All** button to store the screen layout (the locations are not automatically saved). Placing the mouse over a connection line displays additional detail about the underlying paths and lines.

MOMI - Multi-system Online Measure Interface (Client version 4.07)

BlackWood Systems, Inc.

100 50 0 0%

\BWS1-2004

Pause...

2006/02/09 22:43:14

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Logs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

DEGRADED Paths up=3/3 Lines up=3/4

between \BWS1 and \BWS2

System \BWS1 is ACCESSIBLE

- Path \$EP2BWS2 is CONNECTING
 - Line \$EP2BWS2 is PASSIVE
- Path \$EP1BWS2 is UP
 - Line \$EL2BWS2 is UP LineQual=100
 - Line \$EL1BWS2 is UP LineQual=100
- Path \$EXBWS2 is UP
 - Line \$EXBWS2 is UP

System \BWS2 is ACCESSIBLE

- System NOT currently being Probed.
- To obtain more info, the system must:
 - 1) be running MOMI.
 - 2) be in the list of defined systems. (Config:Define Systems).
 - 3) have Probing turned on. (Systems:Basic).

DEGRADED Paths up=3/3 Lines up=3/4

\BWS1 \BWS2

Show only Connected

States Bytes Frames None

Save Config All Print Diagram

Not Logged On Hints On ? Help Print Screen

The boxes representing each System on the network may be configured by right-clicking over the image in the center of the box. Various visual attributes such as the system image and color of the box frame may be changed. The box "Hide this System" is used to prevent display on this screen of undesired Systems in the network. Systems are restored on the [Expand / Connections](#) screen.

MOMI - Multi-system Online Measure Interface (Client version 4.07)

Black Wood Systems, Inc.

\BWS1-2004

2006/02/09 22:44:25

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Logs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

Change \BWS1

Hide this System

Select Picture

Red Chevron K-Series NS-Series

Blue Chevron S-Series HP Logo

Select Color

Red Blue Yellow Lime

Fuchsia Aqua Purple Black

Make Changes Cancel

\BWS1

p=3/4

\BWS2

Show only Connected

States Bytes Frames None Save Config All Print Diagram

Not Logged On Hints On ? Help Print Screen

Placing the mouse over a connection between two Systems and clicking will bring up a detailed diagram of the connections, states, frame rate and byte rate between the two nodes. Frame rate and byte rate (if available) are also displayed for each line and a total for the path.

MOMI - Multi-system Online Measure Interface (Client version 4.07)

Black Wood Systems, Inc.

100% CPU usage graph

\BWS1-2004

2006/02/09 22:48:32

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Logs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

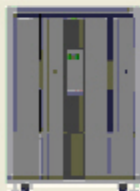
DEGRADED Paths up=3/3 Lines up=3/4

\BWS1

System Nbr: 1

System State: Accessible

System Type: S-Series



F/s: 17

B/s: 2,568

Path \$EP2BWS2 is CONNECTING

\$EP2BWS2 -PASSIVE

Path \$EP1BWS2 is UP

| | | | |
|----------------|-----|---|---|
| \$EL2BWS2 | -UP | 0 | 0 |
| \$EL1BWS2 | -UP | 0 | 0 |
| Total For Path | | 0 | 0 |

Path \$EXBWS2 is UP

| | | | |
|----------|-----|----|-------|
| \$EXBWS2 | -UP | 17 | 2,568 |
|----------|-----|----|-------|

System NOT currently being Probed

To obtain more info, the system must:


- 1) be running MOMI
- 2) be in the list of defined systems (Config:Define Systems)
- 3) have Probing turned on (Systems:Basic)

\BWS2

System Nbr: 2

System State: Accessible

System Type: K-Series



F/s: 0

B/s: 0

Close Connection Detail

Show only Connected

States Bytes Frames None

Save Config All Print Diagram

Not Logged On Hints On ? Help Print Screen

If a MOMI client connects to multiple systems, and the multiple systems are interconnected using different Expand networks, it is possible group them separately. This differentiation is define within the CONFMOMI file using the keyword [EXPAND-NETWORK-NAME](#). Below is a diagram showing two networks. The first network comprised of \BWS1 and \BWS2 is unnamed. The second network is called ITUG2005. Notice the network name appears in the box with each system.

MOMI - Multi-system Online Measure Interface (Client version 4.02)

Alarms \BWS1-2004 2005/10/12 15:58:24

Back | *Systems | Overview | CPUs | Processes | Files | **SubSystems** | History | Alarms | Configure

EMS Msgs | Spool | TCP/IP | OSS | Expand

Diagram | Connections | Overview | Paths | Lines | \$NCP | \$ZEXP

Diagram details:

- \BWS1** (blue box) ↔ **\BWS2** (red box): DEGRADED Paths up=3/3 Lines up=3/4
- \ANSEL on ITUG2005 Network** ↔ **\GLACR on ITUG2005 Network**: UP All Paths(1) and Lines(1) are UP
- \ANSEL on ITUG2005 Network** ↔ **\PEAK on ITUG2005 Network**: UP All Paths(1) and Lines(1) are UP
- \ANSEL on ITUG2005 Network** ↔ **\PEAK on ITUG2005 Network** (diagonal): UP All Paths(1) and Lines(1) are UP

States: States | Bytes | Frames | None | **Save Config All** | Print Diagram

Not Logged On | ? | Help | Print Screen

To obtain the maximum amount of detail available, MOMI must be installed on all nodes. Monitoring is activated for all nodes under the [Systems / Basic](#) tab.

Expand / Connections

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 3.76) window. The interface includes a top menu bar with options like *Systems, Overview, CPUs, *Processes, Files, *SubSystems, History, and Configure. A central table displays system details for \BWS1 and \BWS2. The bottom status bar shows 'Not Logged On', 'Help', and 'Print Screen' buttons.

| Net Name | System Name | System Number | System Accessible | System Type | Hide System |
|----------|-------------|---------------|-------------------|-------------|-------------|
| | \BWS1 | 1 | YES | S-Series | NO |
| | \BWS2 | 2 | YES | K-Series | NO |

The Expand / Connections screen displays the details, or internal values, used to construct the Expand / Diagram screen. The values and format of this screen may change from time-to-time.

Tabs along the left hand side of the screen provide access to the different categories of information available.

The Systems tab displays all of the known Expand nodes in the network.

Once a system is hidden from view (see the Expand / Diagram page), it is restored by right clicking the NO value in the Hide Systems column, here high-lighted in yellow.

The Paths tab displays information about each known path.

MOMI - Multi-system Online Measure Interface (Client version 3.76)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/06/16 13:26:30

Back *Systems Overview CPUs *Processes Files *SubSystems History Configure

*EMS Msgs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

| Net Name | Path Name | Origin SysName | Origin SysNbr | Dest SysName | Dest SysNbr | Path Status | Lines Count | Lines Down | Lines Not Connected |
|----------|-----------|----------------|---------------|--------------|-------------|-------------|-------------|------------|---------------------|
| | \$EP1BWS1 | \BWS2 | 2 | \BWS1 | 1 | UP | 2 | 0 | 0 |
| | \$EP1BWS2 | \BWS1 | 1 | \BWS2 | 2 | UP | 2 | 0 | 0 |
| | \$EP2BWS1 | \BWS2 | 2 | \BWS1 | 1 | DEGRADED | 1 | 1 | 0 |
| | \$EP2BWS2 | \BWS1 | 1 | \BWS2 | 2 | DOWN | 1 | 1 | 0 |
| | \$EXBWS1 | \BWS2 | 2 | \BWS1 | 1 | UP | 1 | 0 | 0 |
| | \$EXBWS2 | \BWS1 | 1 | \BWS2 | 2 | UP | 1 | 0 | 0 |

No Filter Displayed 6 of 6

Not Logged On ? Help Print Screen

The Lines tab displays information about each know Line.

MOMI - Multi-system Online Measure Interface (Client version 3.76)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/06/16 13:27:28

Back Overview CPUs *Processes Files *SubSystems History Configure

*EMS Msgs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

| | Net Name | Line Name | Origin SysName | Origin SysNbr | Line Status | Path Name |
|------------|----------|-----------|----------------|---------------|-------------|-----------|
| Systems | | \$EL1BWS1 | \BWS2 | 2 | UP | \$EP1BWS1 |
| | | \$EL1BWS2 | \BWS1 | 1 | UP | \$EP1BWS2 |
| | | \$EL2BWS1 | \BWS2 | 2 | UP | \$EP1BWS1 |
| | | \$EL2BWS2 | \BWS1 | 1 | UP | \$EP1BWS2 |
| Paths | | \$EP2BWS1 | \BWS2 | 2 | DEGRADED | \$EP2BWS1 |
| | | \$EP2BWS2 | \BWS1 | 1 | DOWN | \$EP2BWS2 |
| | | \$EXBWS1 | \BWS2 | 2 | UP | \$EXBWS1 |
| | | \$EXBWS2 | \BWS1 | 1 | UP | \$EXBWS2 |
| Lines | | | | | | |
| Line Stats | | | | | | |

No Filter Displayed 8 of 8

Not Logged On ? Help Print Screen

The Line Stats tab displays information about each known line. Frames and/or Bytes per second values are not available on all Expand line types.

MOMI - Multi-system Online Measure Interface (Client version 3.76)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/06/16 13:27:57

Back Overview CPUs *Processes Files *SubSystems History Configure

*EMS Msgs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

| | Net Name | Line Name | Origin SysName | Origin SysNbr | Dest SysName | Dest SysNbr | Path Name | Frames perSec | Bytes perSec | Line Qual |
|---------|----------|-----------|----------------|---------------|--------------|-------------|-----------|---------------|--------------|-----------|
| Systems | | \$EL1BWS1 | \BWS2 | 2 | \BWS1 | 1 | \$EP1BWS1 | 0 | 0 | 100 |
| | | \$EL1BWS2 | \BWS1 | 1 | \BWS2 | 2 | \$EP1BWS2 | 0 | 0 | 100 |
| | | \$EL2BWS1 | \BWS2 | 2 | \BWS1 | 1 | \$EP1BWS1 | 0 | 0 | 100 |
| | | \$EL2BWS2 | \BWS1 | 1 | \BWS2 | 2 | \$EP1BWS2 | 0 | 0 | 100 |
| | | \$EP2BWS1 | \BWS2 | 2 | \BWS1 | 1 | \$EP2BWS1 | 0 | 0 | 0 |
| | | \$EP2BWS2 | \BWS1 | 1 | \BWS2 | 2 | \$EP2BWS2 | 0 | 0 | 0 |

Expand / Overview

MOMI - Multi-system Online Measure Interface (Client version 3.76)

Black Wood Systems, Inc. | \BWS1 Fast - 2002 | 2004/06/16 13:40:33

Back | *Systems | Overview | CPUs | *Processes | Files | *SubSystems | History | Configure

*EMS Msgs | Spool | TCP/IP | OSS | Expand

Diagram | Connections | Overview | Paths | Lines | \$NCP | \$ZEXP

Expand is Available | \$NCP is Running | \$ZEXP is Running

System Name: \BWS1 | System Number: 1

SYSTEMS
 Count: 3 | Not Accessible: 0

| Net | System | Nbr | State |
|------------------------|--------|-----|-------|
| Systems NOT Accessible | | | |

PATHS
 Count: 3 | Degraded: 0 | Down: 1

| Net | System | Path | State |
|-------|--------|-----------|----------|
| \BWS2 | | \$EP2BWS1 | DEGRADED |
| \BWS1 | | \$EP2BWS2 | DOWN |

LINES
 Count: 4 | Not Connected: 0 | Down: 1

| Net | System | Line | State |
|-------|--------|-----------|----------|
| \BWS2 | | \$EP2BWS1 | DEGRADED |
| \BWS1 | | \$EP2BWS2 | DOWN |

Not Logged On | ? | Help | Print Screen

The Expand / Overview screen presents a general view of the status of the Expand subsystem.

The top portion of the screen shows the result of a general determination of Expand availability by checking the existence of mandatory processes \$NCP and \$ZEXP . The lower portion of the screen shows any System not accessible via Expand, and any path or line not in a 'good' state. The middle portion of the screen reflects counts for these problem areas.

In the event of a severe error, an additional error message is displayed.



\BWS1 Fast - 2002



2004/06/16
13:42:48

Back Overview CPUs Processes Files SubSystems History Configure

EMS Msgs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

Expand is NOT Available \$NCP is Running \$ZEXP is Running

Error obtaining info from \$NCP - Error 40

System Name \BWS1 System Number 1

SYSTEMS
Count Not Accessible
3 0

PATHS
Count Degraded Down
0 0 0

LINES
Count Not Connected Down
0 0 0

Systems NOT Accessible

| Net | System | Nbr | State |
|-----|--------|-----|-------|
| | | | |

Paths NOT Up

| Net | System | Path | State |
|-------|-----------|------|----------|
| \BWS2 | \$EP2BWS1 | | DEGRADED |
| \BWS1 | \$EP2BWS2 | | DOWN |

Lines NOT Up

| Net | System | Line | State |
|-------|-----------|------|----------|
| \BWS2 | \$EP2BWS1 | | DEGRADED |
| \BWS1 | \$EP2BWS2 | | DOWN |

Paths

Paths / Detail

The screenshot displays the MOMI - Multi-system Online Measure Interface (Client version 3.76) window. The interface includes a title bar, a logo for BlackWood Systems, Inc., a progress bar, a dropdown menu for the system name (\BWS1 Fast - 2002), a Pause button, and a date/time display (2004/06/16 13:46:10). The main menu consists of buttons for Back, *Systems, Overview, CPUs, *Processes, Files, *SubSystems, History, and Configure. Below this is a sub-menu with *EMS Msgs, Spool, TCP/IP, OSS, and Expand. The main content area is divided into several sections: Diagram, Connections, Overview, Paths, Lines, \$NCP, and \$ZEXP. The Paths section is active, showing a Detail view for the path \$EP1BWS2. This view is organized into three main sections: Info Path \$EP1BWS2, Status Path \$EP1BWS2, and Stats Path \$EP1BWS2. The Info section contains various configuration parameters such as Compress (ON), Next System (2), OOS Space (32,767), OOS Timeout (00:00:03.00), L4 Retries (3), PathTF (0), L4 Timeout (00:00:20.00), L4 Send Window (254), TimeFactor (93), L4 ExtPackets (ON), L4 Congest Ctrl (ON), SuperPath (OFF), and Discard (ON). The Status section shows PPID (1,342), BPID (0,359), Number of Lines (2), and State (STARTED). The Stats section displays Reset Time (2004/05/21 17:35:48), Sample Time (2004/06/16 13:21:19), Current Ext Mem KBytes Used (576), and Max Ext Mem KBytes Used (576). A Path Name dropdown menu is set to \$EP1BWS2, and a Print button is visible. The bottom of the window features a status bar with 'Not Logged On', a question mark, 'Help', and 'Print Screen' buttons.

Info Path \$EP1BWS2

| | | | | | | | |
|---------------|--|-----------------|----------------------------------|------------|-------------------------------------|-----------------------------|-----------------------------|
| Compress | <input type="checkbox"/> ON | Next System | <input type="text" value="2"/> | OOS Space | <input type="text" value="32,767"/> | Expand - Multi-line handler | |
| OOS Timeout | <input type="text" value="00:00:03.00"/> | L4 Retries | <input type="text" value="3"/> | PathTF | <input type="text" value="0"/> | | |
| L4 Timeout | <input type="text" value="00:00:20.00"/> | L4 Send Window | <input type="text" value="254"/> | TimeFactor | <input type="text" value="93"/> | | |
| L4 ExtPackets | <input type="checkbox"/> ON | L4 Congest Ctrl | <input type="checkbox"/> ON | SuperPath | <input type="checkbox"/> OFF | Discard | <input type="checkbox"/> ON |

Status Path \$EP1BWS2

| | | | | | | | |
|--------------|--|--|------------------------------------|----------------------|--------------------------------|----------------------|--------------------------------------|
| PPID | <input type="text" value="1,342"/> | BPID | <input type="text" value="0,359"/> | Number of Lines | <input type="text" value="2"/> | State | <input type="text" value="STARTED"/> |
| Trace Status | <input type="checkbox"/> OFF | Trace File | <input type="text"/> | | | | |
| LDEVs | <input type="text" value="137"/> | <input type="text" value="138"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| LDEV Names | <input type="text" value="\$EL2BWS2"/> | <input type="text" value="\$EL1BWS2"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Stats Path \$EP1BWS2

| | | | |
|-----------------------------|--|-------------------------|--|
| Reset Time | <input type="text" value="2004/05/21 17:35:48"/> | Sample Time | <input type="text" value="2004/06/16 13:21:19"/> |
| Current Ext Mem KBytes Used | <input type="text" value="576"/> | Max Ext Mem KBytes Used | <input type="text" value="576"/> |
| Number of known systems | <input type="text" value="0"/> | Number of OOS Timeouts | <input type="text" value="0"/> |

Path Name:

The Paths / Detail screen presents an SCF-type view of the Info, Status and Stats for an Expand Path.

The purpose of this format is to provide the User a familiar layout showing all possible data for a given path. Use the scroll bar on the right to view all of the available information.

The screenshot shows the MOMI interface with the following components:

- Header:** MOMI - Multi-system Online Measure Interface (Client version 3.76)
- Logo:** Black Wood Systems, Inc.
- System:** \BWS1 Fast - 2002
- Date/Time:** 2004/06/16 13:47:17
- Navigation:** Back, *Systems, Overview, CPUs, *Processes, Files, *SubSystems, History, Configure
- Sub-Menu:** *EMS Msgs, Spool, TCP/IP, OSS, Expand
- Path Selection:** Diagram, Connections, Overview, Paths, Lines, \$NCP, \$ZEXP
- Table:**

| Path Name | Current SysNbr | Next SysNbr | C | D | E | CC | S | OOS Space | OOS Timeout | Retries | Time Factor | Timeout | Path Type | Path SType | Path Typ Descript |
|-----------|----------------|-------------|---|---|---|----|---|-----------|-------------|---------|-------------|-------------|-----------|------------|-------------------|
| \$EP1BWS2 | 1 | 2 | C | D | E | CC | | 32,767 | 00:00:03.00 | 3 | 93 | 00:00:20.00 | 63 | 1 | Expand |
| \$EP2BWS2 | 1 | 2 | C | D | E | CC | | 32,767 | 00:00:03.00 | 3 | 32767 | 00:00:20.00 | 63 | 0 | Expand |
| \$EXBWS2 | 1 | 2 | | D | E | CC | | 32,767 | 00:00:03.00 | 3 | 1 | 00:00:20.00 | 63 | 0 | Expand |
- Footer:** No Filter, Displayed 3 of 3, Not Logged On, Help, Print Screen

The Paths / Info screen presents the configuration information for Expand Paths.

Various fields concerning Path Block Bytes and Path Packet Bytes used for Expand over IP are updated by Expand after the line is connected with the remote system. This update reflects final negotiated values.

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 3.76) window. The title bar includes the Black Wood Systems, Inc. logo and a progress indicator. The main window has a navigation menu with options like *Systems, Overview, CPUs, Processes, Files, *SubSystems, History, and Configure. Below this is a sub-menu with *EMS Msgs, Spool, TCP/IP, OSS, and Expand. The main content area is divided into tabs: Diagram, Connections, Overview, Paths, Lines, \$NCP, and \$ZEXP. The 'Paths' tab is active, showing a table with columns for Path Name, Path State, Last Error, Clip, Total Lines, Pri Cpu, Pri Pin, Bak Cpu, Bak Pin, S, T, Trace File, LDEV1, LDEV1 Name, LDEV2, LDEV2 Name, and LD. The table contains three rows of data. At the bottom, there is a status bar with 'No Filter' and 'Displayed 3 of 3'.

| Path Name | Path State | Last Error | Clip | Total Lines | Pri Cpu | Pri Pin | Bak Cpu | Bak Pin | S | T | Trace File | LDEV1 | LDEV1 Name | LDEV2 | LDEV2 Name | LD |
|-----------|------------|------------|------|-------------|---------|---------|---------|---------|---|---|------------|-------|------------|-------|------------|----|
| \$EP1BWS2 | STARTED | 0 | | 2 | 1 | 342 | 0 | 359 | | | | 137 | \$EL2BWS2 | 138 | \$EL1BWS2 | |
| \$EP2BWS2 | STOPPED | 0 | | 1 | 1 | 343 | 0 | 356 | | | | 136 | \$EP2BWS2 | | | |
| \$EXBWS2 | STARTED | 0 | | 1 | 1 | 336 | 0 | 355 | | | | 135 | \$EXBWS2 | | | |

The Paths / Status screen presents the state and status of Expand Paths.

A path is made up of one or more physical lines. The fields LDEV1 - LDEV8 list these lines.

Right-clicking on a Path Name allows the jump to display the Paths / Detail screen or perform actions on the path when logged on.

| Path Name | Path State | Last Error | Clip | Total Lines | Pri Cpu | Pri Pin | Bak Cpu | Bak Pin |
|-----------|------------|------------|------|-------------|---------|---------|---------|---------|
| \$EP1BWS2 | STARTED | 0 | | 2 | 1 | 332 | 0 | 353 |
| \$EP2BWS2 | STOPPED | 0 | | 1 | 1 | 330 | 0 | 351 |
| \$EXBWS2 | | | | | | 334 | 0 | 345 |

\$EP2BWS2 - Display Path Detail

\$EP2BWS2 - Start Path

\$EP2BWS2 - Stop Path

\$EP2BWS2 - Abort Path

Paths / Stats

MOMI - Multi-system Online Measure Interface (Client version 3.76)
2004/06/16
13:49:26

\BWS1 Fast - 2002

Back
Pause...

*Systems
*SubSystems

*EMS Msgs
Expand

Diagram
\$ZEXP

Detail
Stats

| Path Name | Stats Last Reset | Stats Last Updated | L4 Packets Sent | L4 Packets Received | L4 Forward Sent | L4 Forward Received | L4 Link Request Sent | L4 Link Request Received | L4 CO Requ. St |
|-----------|---------------------|---------------------|-----------------|---------------------|-----------------|---------------------|----------------------|--------------------------|----------------|
| \$EP1BWS2 | 2004/05/21 17:35:48 | 2004/06/16 13:21:19 | 16 | 15 | 0 | 0 | 0 | 0 | |
| \$EP2BWS2 | 2004/05/21 17:35:47 | 2004/06/16 13:20:42 | 2,484 | 2,485 | 0 | 0 | 0 | 2 | |
| \$EXBWS2 | 2004/05/21 17:35:47 | 2004/06/16 13:43:24 | 104,099 | 103,635 | 0 | 0 | 103,542 | 4 | |

No Filter
Displayed 3 of 3

Not Logged On ? Help Print Screen

The Paths / Stats screen presents statistical information about an Expand Path.

An Expand Path is made up of one or more physical lines. The statistics present a total of the underlying lines.

Some older versions of Expand do not report all fields displayed, in particular Frames > 32K. QIO memory information is not reported by all Expand Path types.

Lines

Lines / Detail

MOMI - Multi-system Online Measure Interface (Client version 3.76)

Black Wood Systems, Inc. | \BWS1 Fast - 2002 | Pause... | 2004/06/16 13:50:31

Navigation: Back | *Systems | Overview | CPUs | *Processes | Files | *SubSystems | History | Configure

Sub-Menu: *EMS Msgs | Spool | TCP/IP | OSS | **Expand**

Expand Sub-Menu: Diagram | Connections | Overview | Paths | **Lines** | \$NCP | \$ZEXP

Line Detail Sub-Menu: **Detail** | Info | Status | Stats

Info Line \$EL2BWS2

| | | | | | |
|------------------|-------------|------------------------|-------------------------|--------------------|-------------|
| Linetype | CSM | Path Name | \$EP1BWS2 | LDEV | 137 |
| L2Protocol | SWAN_DIRECT | TimeFactor(LineTF/FTF) | 0 186 | SpeedK | 100 |
| Framesize | 132 | Rsize | 0 | Speed | 0 |
| LinePriority | 1 | Start Up | OFF | Delay | 00:00:00.10 |
| DownIfBadQuality | OFF | QualityThreshold | 96 | QualityTimer | 00:01:00.00 |
| TxWindow | 7 | Address | (1,2) | AutoLoad | ON |
| LineBufSize | 47288 | DsrTimer | 00:00:01.00 | IdleTimeout | 00:00:10.00 |
| Interface | RS-232 | ReadBuffers | 8 | L2Retries | 10 |
| DRtimeout | 00:00:03.00 | CLBidleTimer | 00:00:10.00 | Threshold | 500 |
| L2Timeout | 00:00:01.00 | ProtocolId | 1 | FlagFill | ON |
| ClockMode | DTE | ClockSpeed | 115200 | CLBdownloadRetries | 3 |
| CLBdownloadTimer | 00:00:30.00 | Program | \$SYSTEM.CSS23.C1097P00 | | |

Status Line \$EL2BWS2

| | | | | | |
|-----------|-------|------------------|-------|----------------|-----------|
| PPID | 1,342 | BPID | 0,359 | Line State | STARTED |
| Path LDEV | 63 | Connect-Mgr LDEV | 66 | Detailed State | CONNECTED |

Line Name: \$EL2BWS2 | Print

Not Logged On | ? | Help | Print Screen

The Lines / Detail screen presents an SCF-type view of the Info, Status and Stats for an Expand Line.

The purpose of this format is to provide the User a familiar layout showing all possible data for a given line. Use the scroll bar on the right to view all of the available information.

Lines / Info

MOMI - Multi-system Online Measure Interface (Client version 3.76)

BlackWood Systems, Inc. | \BWS1 Fast - 2002 | 2004/06/16 13:51:31

Back | *Systems | Overview | CPUs | *Processes | Files | *SubSystems | History | Configure

*EMS Msgs | Spool | TCP/IP | OSS | **Expand**

Diagram | Connections | Overview | Paths | **Lines** | \$NCP | \$ZEXP

Detail | Info | Status | Stats

| Line Name | Path Name | LDEV | Assoc Dev | Assoc SubDev | IP Vers | v4 Dest IP Address | v4 Dest IP AddrName | v6 Dest IP Address | Dest IP Port | v4 Src IP Address |
|-----------|-----------|------|-----------|--------------|---------|--------------------|---------------------|--------------------|--------------|-------------------|
| \$EXBWS2 | \$EXBWS2 | 135 | \$ZSAM1 | | IPV4 | 192.168.20.12 | | :: | 2000 | 192.168.20.11 |

No Filter | Displayed 1 of 1

Not Logged On | ? | Help | Print Screen

The Lines / Info screen presents configuration information for Expand Lines.

Various Expand Line types report different information. Each different line type detected causes tabs along the left side of the screen to appear. There is only a one tab if a single line type is used.



\BWS1 Fast - 2002

Pause...

2004/06/16
13:52:41

Back *Systems Overview CPUs *Processes Files *SubSystems History Configure

*EMS Msgs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

Detail Info Status Stats

| Line Name | Path Name | LDEV | Addr Pri | Addr Sec | AL | Delay | DSR Timeout | Frame Size | Idle Timeout | Elec Iface | Program |
|-----------|-----------|------|----------|----------|----|-------------|-------------|------------|--------------|------------|-------------|
| \$EL2BWS2 | \$EP1BWS2 | 137 | 1 | 2 | AL | 00:00:00.10 | 00:00:01.00 | 132 | 00:00:10.00 | RS-232 | \$SYSTEM.CS |
| \$EL1BWS2 | \$EP1BWS2 | 138 | 1 | 2 | AL | 00:00:00.10 | 00:00:01.00 | 132 | 00:00:10.00 | RS-232 | \$SYSTEM.CS |

TCP/IP

CSM

NAM

No Filter Displayed 2 of 2

Not Logged On ? Help Print Screen

MOMI - Multi-system Online Measure Interface (Client version 3.76)

BlackWood Systems, Inc.

\BWS1 Fast - 2002

2004/06/16 14:36:24

Back *Systems Overview CPUs Processes Files *SubSystems History Configure

*EMS Msgs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

Detail Info Status Stats

| Line Name | Line State | Detail State | Line Not Ready | Last Error | P | Primary SubChan Address | Backup SubChan Address | ConMgr LDEV Nbr | ConMgr LDEV Name | Path LDEV Nbr | Path LDEV Name | Li F CP |
|-----------|------------|--------------|----------------|------------|---|-------------------------|------------------------|-----------------|------------------|---------------|----------------|---------------|
| \$EL2BWS2 | STARTED | CONNECTED | 0 | 0 | A | | | 66 | \$ZZW01 | 63 | \$ZZW01 | |
| \$EL1BWS2 | STARTED | CONNECTED | 0 | 0 | A | | | 66 | \$ZZW01 | 63 | \$ZZW01 | |
| \$EP2BWS2 | STOPPED | DOWN | 66 | 0 | - | | | 136 | \$EP2BWS2 | 136 | \$EP2BWS2 | |
| \$EXBWS2 | STARTED | CONNECTED | 0 | 0 | - | | | 135 | \$EXBWS2 | 135 | \$EXBWS2 | |

No Filter Displayed 4 of 4

Not Logged On ? Help Print Screen

The Lines / Status screen presents status and additional configuration information about Expand Lines.

Not all configuration fields are used by all Expand Line types. The Detail Info fields off the screen (scroll to display) supply additional information under error conditions.

Right-clicking on a Line Name allows the jump to display the Lines / Detail screen or perform actions on the line when logged on.

| Detail | Info | Status | Stats | | | |
|-----------|------------|--------------|----------------|------------|---|---|
| Line Name | Line State | Detail State | Line Not Ready | Last Error | P | S |
| \$EL2BWS2 | STARTED | CONNECTED | 0 | 0 | A | |
| \$EL1BWS2 | STARTED | CONNECTED | 0 | 0 | A | |
| \$EP2BWS2 | STOPPED | DOWN | 66 | 0 | - | |
| \$EXBWS2 | | | | 0 | - | |

\$EP2BWS2 - Display Line Detail

- \$EP2BWS2 - Start Line
- \$EP2BWS2 - Stop Line
- \$EP2BWS2 - Abort Line

MOMI - Multi-system Online Measure Interface (Client version 3.76)

Black Wood Systems, Inc. | \BWS1 Fast - 2002 | 2004/06/16 13:54:34

Navigation: Back | *Systems | Overview | CPUs | *Processes | Files | *SubSystems | History | Configure

Expand: *EMS Msgs | Spool | TCP/IP | OSS | Expand

Diagram: Diagram | Connections | Overview | Paths | Lines | \$NCP | \$ZEXP

Detail: Detail | Info | Status | Stats

| Line Name | Path Name | Stats Last Reset | Stats Last Updated | Pri Cpu | Pri Pin | Bak Cpu | Bak Pin | Connect Cmds Sent | Connect Cmds Rcvd | Connect Resp Sent |
|-----------|-----------|---------------------|---------------------|---------|---------|---------|---------|-------------------|-------------------|-------------------|
| \$EXBWS2 | \$EXBWS2 | 2004/05/21 17:35:47 | 2004/06/16 13:54:20 | 1 | 336 | 0 | 355 | 1 | 1 | 1 |

Sidebar: TCP/IP (selected), CSM, NAM

Footer: No Filter | Displayed 1 of 1 | Not Logged On | Help | Print Screen

The Lines / Stats screen presents statistical information about an Expand Line.

Various Expand Line types report different information. Each different line type detected causes tabs along the left side of the screen to appear. There is only one tab if only one line type is used.



\BWS1 Fast - 2002

Pause...

2004/06/16
13:55:45

Back *Systems Overview CPUs *Processes Files *SubSystems History Configure

*EMS Msgs Spool TCP/IP OSS Expand

Diagram Connections Overview Paths Lines \$NCP \$ZEXP

Detail Info Status Stats

| Line Name | Path Name | Stats Last Reset | Stats Last Updated | Pri Cpu | Pri Pin | Bak Cpu | Bak Pin | IFrames Sent | IFrames Recv | SFrame Sen |
|-----------|-----------|---------------------|---------------------|---------|---------|---------|---------|--------------|--------------|------------|
| \$EL2BWS2 | \$EP1BWS2 | 2004/05/21 17:35:48 | 2004/06/16 13:55:38 | 1 | 342 | 0 | 359 | 10 | 8 | 16,35 |
| \$EL1BWS2 | \$EP1BWS2 | 2004/05/21 17:35:48 | 2004/06/16 13:55:40 | 1 | 342 | 0 | 359 | 6 | 6 | 16,35 |

TCP/IP

CSM

NAM

No Filter Displayed 2 of 2

Not Logged On ? Help Print Screen

Expand / \$NCP

The screenshot shows the MOMI Multi-system Online Measure Interface (Client version 3.76) window. The title bar includes the Black Wood Systems, Inc. logo and a progress bar. The main menu includes Back, *Systems, Overview, CPUs, *Processes, Files, *SubSystems, History, and Configure. The current view is the Expand / \$NCP configuration screen, which is divided into several tabs: *EMS Msgs, Spool, TCP/IP, OSS, Expand, Diagram, Connections, Overview, Paths, Lines, \$NCP, and \$ZEXP. The \$NCP tab is active, displaying a list of configuration parameters and their values:

| | | | |
|----------------------|------------------------------|----------------------|-------------|
| Max System Number | 254 | AbortTimer | 00:00:00.30 |
| Algorithm | Modified Split Horizon (MSH) | AutomaticMapTimer | ON |
| ConnectTime | 00:00:00.00 | FrameSize | 132 |
| MaxTimeouts | 3 | MaxConnects | 5 |
| NetworkDiameter | 15 | Message 43 Enabled * | OFF |
| Message 43 Enabled * | OFF | Message 44 Enabled | ON |
| Message 45 Enabled | ON | Message 46 Enabled * | OFF |
| Message 47 Enabled | ON | Message 48 Enabled * | OFF |
| Message 49 Enabled * | OFF | AutoReBalance | OFF |
| Next ReBalance Time | 0 00:00:00 | AutoReBalanceTime | 1 00:00:00 |
| Trace File Name | | | |

At the bottom of the window, there are buttons for "Not Logged On", "?", "Help", and "Print Screen".

The Expand / \$NCP screen presents information about the Network Control Process.

The NCP process is the main 'traffic cop' for the Expand subsystem. While actual 'user data' does not flow through this process, it does determine which Paths are used for transport. It maintains routes and the list of systems on the network.

Certain messages are logged to \$0 as the result of changes in the Expand network, such as paths/lines up/down and processors in remote nodes up/down. These messages can be turned on or off. Right-click on fields marked with an * to perform the action. Changes may not update the screen right away.

| | | |
|----------------------|---|--------------------------|
| NetworkDiameter | <input type="text" value="15"/> | |
| Message 43 Enabled * | <input type="text" value="OFF"/> | Message 44 Enabled |
| Message 45 Enabled | <input type="text" value="ON"/> | Enable Message 43 |
| Message 47 Enabled | <input type="text" value="ON"/> | Disable Message 43 |
| Message 49 Enabled * | <input type="text" value="OFF"/> | Message 46 Enabled |
| Next ReBalance Time | <input type="text" value="0 00:00:00"/> | AutoReBalance |
| Trace File Name | <input type="text"/> | AutoReBalanceTime |

Expand / \$ZEXP

MOMI - Multi-system Online Measure Interface (Client version 3.76)

Black Wood Systems, Inc. | \BWS1 Fast - 2002 | 2004/06/16 13:57:50

Back | *Systems | Overview | CPUs | *Processes | Files | *SubSystems | History | Configure

*EMS Msgs | Spool | TCP/IP | OSS | **Expand**

Diagram | Connections | Overview | Paths | Lines | \$NCP | **\$ZEXP**

Primary PID: Backup PID:
 Reset Time: Sample Time:

| | Configured | Allocated | Max Alloc | Alloc Tries | Total Waits | Curr Waits | Max Waits |
|---------|------------|-----------|-----------|-------------|-------------|------------|-----------|
| BUFPOOL | 56,180 | 10,176 | 10,296 | 2,778,208 | 0 | 0 | C |
| MSGPOOL | 41,344 | 0 | 10,048 | 2,778,162 | 0 | 0 | C |
| EXTPOOL | 1,117,316 | 29,272 | 54,968 | 9,376,277 | 0 | 0 | C |
| TCBS | 37 | 4 | 4 | 5 | 0 | 0 | C |
| STACKS | 3,582 | 61 | 937 | 5,299,564 | 0 | 0 | 12,923 |
| CPSTACK | 0 | 0 | 0 | 0 | 0 | 0 | C |
| FCBS | 48 | 1 | 1 | 2 | 0 | 0 | C |
| IOCBS | 128 | 3 | 5 | 2,778,167 | 0 | 0 | C |
| RCBS | 48 | 1 | 1 | 1 | 0 | 0 | C |
| BUFFERS | 2,048 | 0 | 0 | 0 | 0 | 0 | C |
| CPBUF | 3,072 | 1 | 107 | 6 | 0 | 0 | C |
| SEMAPH | 0 | 0 | 0 | 15 | 0 | 0 | C |

REQUESTS: Time Last Task:
 REPLIES:

Not Logged On | ? | Help | Print Screen

The Expand / \$ZEXP screen presents various statistics about the Expand Manager Process. This information is the equivalent of the command "SCF stats process \$ZEXP".

The Expand Manager Process supervises the Expand Path and Line handler processes. This process must be running on a system with Expand active. Information requests through SCF and the SPI interface are routed through \$ZEXP.

Unfortunately, the meaning of the values displayed on this screen are not known. The information presented is undocumented and nothing is available (that we can find) to interpret these values. We have included this screen because it looked interesting. This information is only available on newer platforms.

User Defined

User Defined / Diagram

The screenshot shows the MOMI PC Client interface. At the top, the title bar reads 'BWS1-2004 MOMI (Client version 5.00)'. The main menu includes 'Back', '*Systems', 'Overview', 'CPUs', 'Processes', 'Files', '*SubSystems', 'History', 'Alarms', and 'Configure'. Below this, there are sub-menus for '*Logs', 'Spool', 'TCP/IP', 'OSS', 'Expand', and '*User Defined'. The 'User Defined' menu is active, showing a 'Diagram List'.

The main display area is titled 'MY USER DEFINED SCREEN' and contains the text 'My User defined screen'. On the left, there are two input fields: 'O/S Version' with the value 'G06.31.00' and 'MOMI Version' with the value '5.00'. A large black box with the word 'ALARMS' in red is positioned below these fields.

On the right, there is a table titled 'Top Processes in CPU 0 on <Current System>'. The table has five columns: CPU,Pin, Process, Object, Priority, and Busy%. The data is as follows:

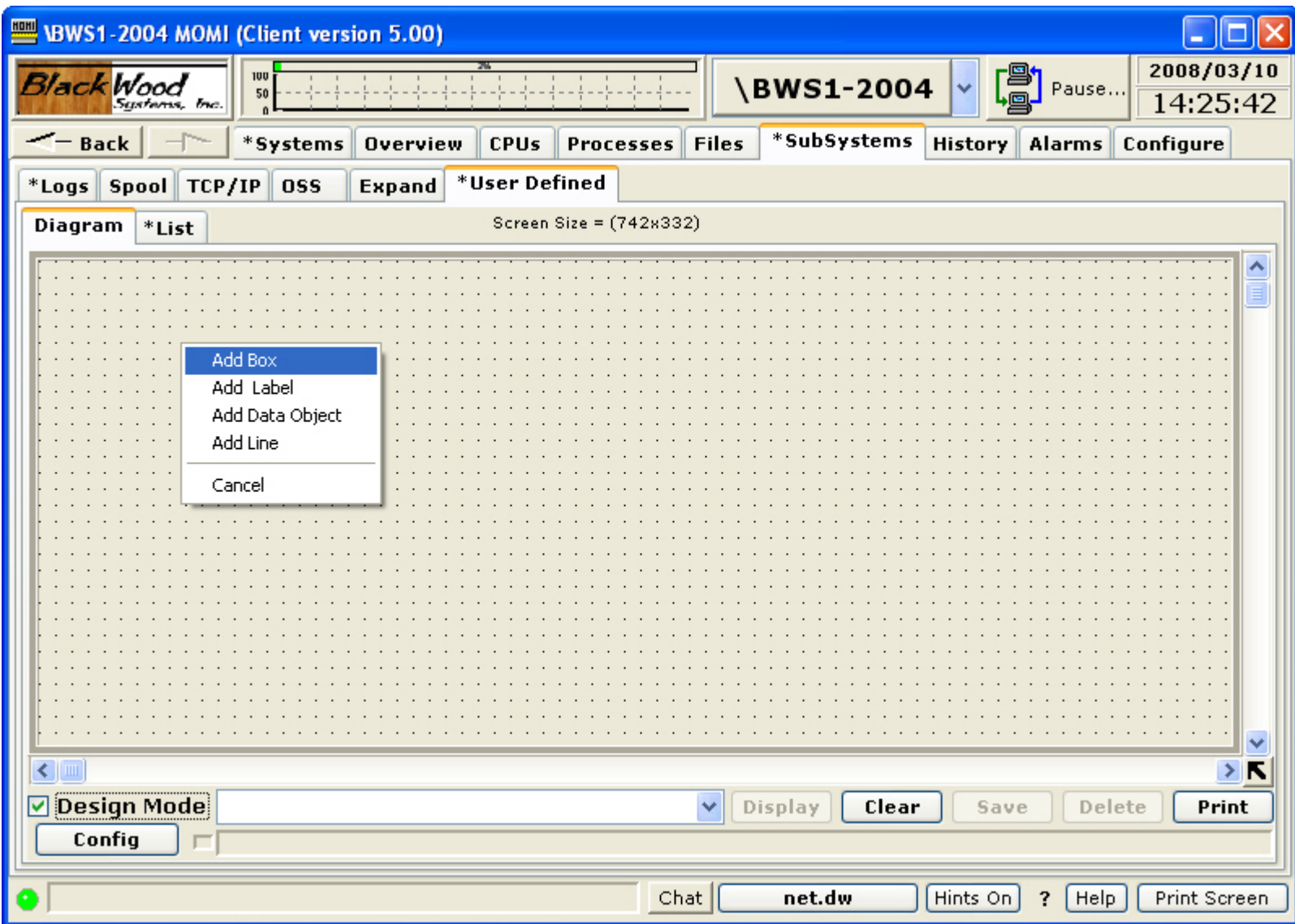
| CPU,Pin | Process | Object | Priority | Busy% |
|----------|---------|---------|----------|-------|
| 00,00436 | \$Z3787 | BWMOMI | 156 | 9.74 |
| 00,00352 | \$MOMI4 | BWMOMI | 160 | 3.72 |
| 00,00332 | \$ZPTM0 | TCP6MON | 201 | 1.18 |
| 00,00393 | \$Z3785 | BWMOMI | 160 | 0.24 |
| 00,00287 | \$OSS | TSYSDP2 | 220 | 0.23 |
| 00,00291 | \$DATA1 | TSYSDP2 | 220 | 0.22 |

At the bottom of the screen, there is a 'Design Mode' checkbox which is checked, and a dropdown menu showing 'MY USER DEFINED SCREEN'. To the right of this are buttons for 'Display', 'Clear', 'Save', 'Delete', and 'Print'. At the very bottom, there is a 'Chat' window with the text 'net.dw' and buttons for 'Hints On', 'Help', and 'Print Screen'.

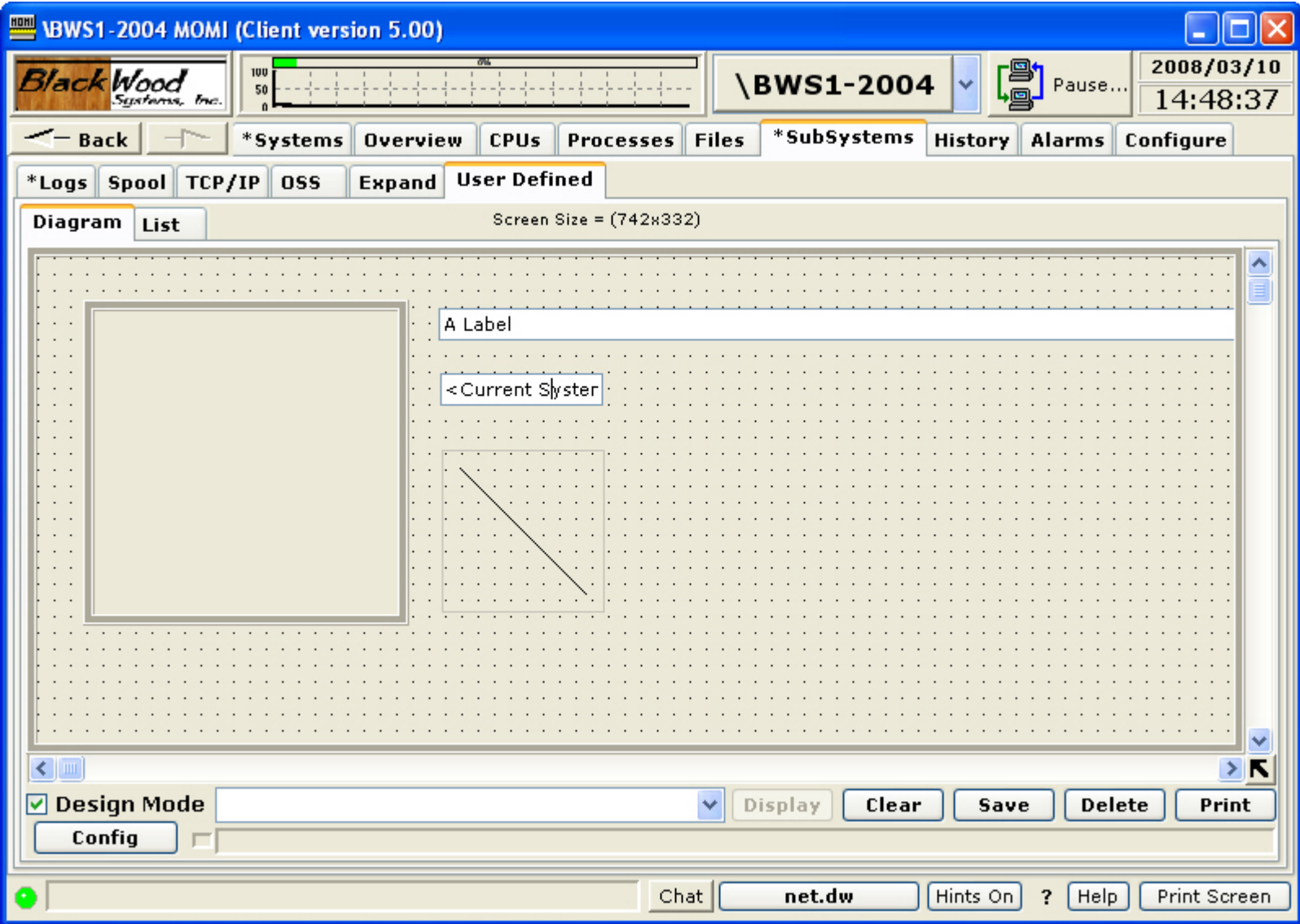
The User Defined / Diagram page allows the user to construct, in a some-what free-form manner, a page of items to display. The items on-screen automatically update. The User Defined page, once created, may be saved for later use and may be displayed within the Diagram page or in a window independent of the main MOMI PC Client screen. The MOMI PC Client must be running as the independent windows are still created by it.

The Diagram page starts 'empty'. The user clicks the box next to Design Mode to allow entry/definition of items on screen. The Design mode must be entered to initial place items on screen or later to move, remove,

change values associated with an item or save the screen for later reuse. User Define screens are saved by the logged on User ID. Uncheck Design Mode to activate the screen. It may take several seconds for all fields to populate.

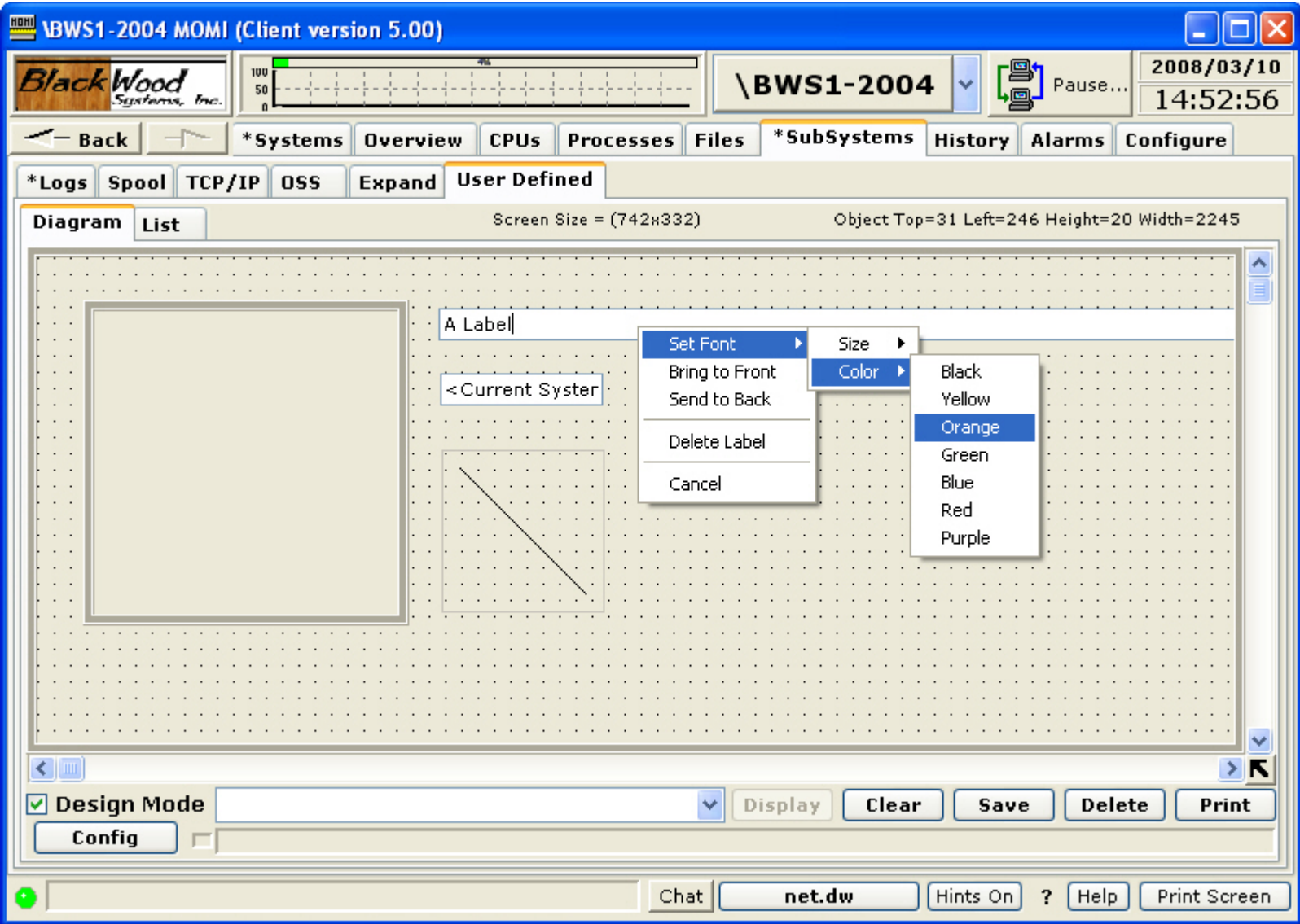


The following picture shows a box, label, data object and line added to the screen.

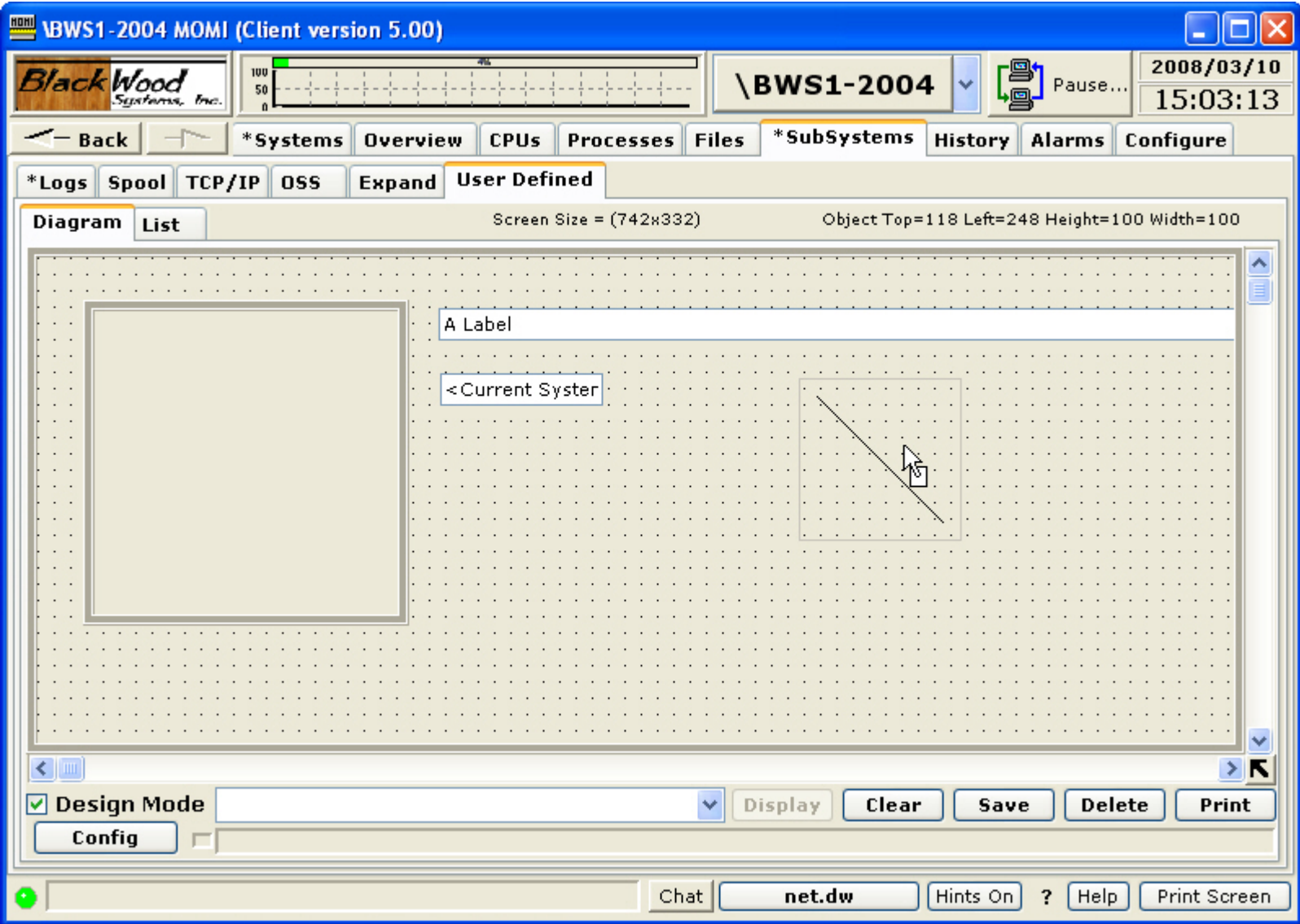


The box is an object used to group or gather items. A label allows the entry to user defined text to provide fixed text information. The data object provides many items for the user to choose from such as CPU, Process and System entities. The line provides an additional graphic for the user to separate or perhaps indicate data flows.

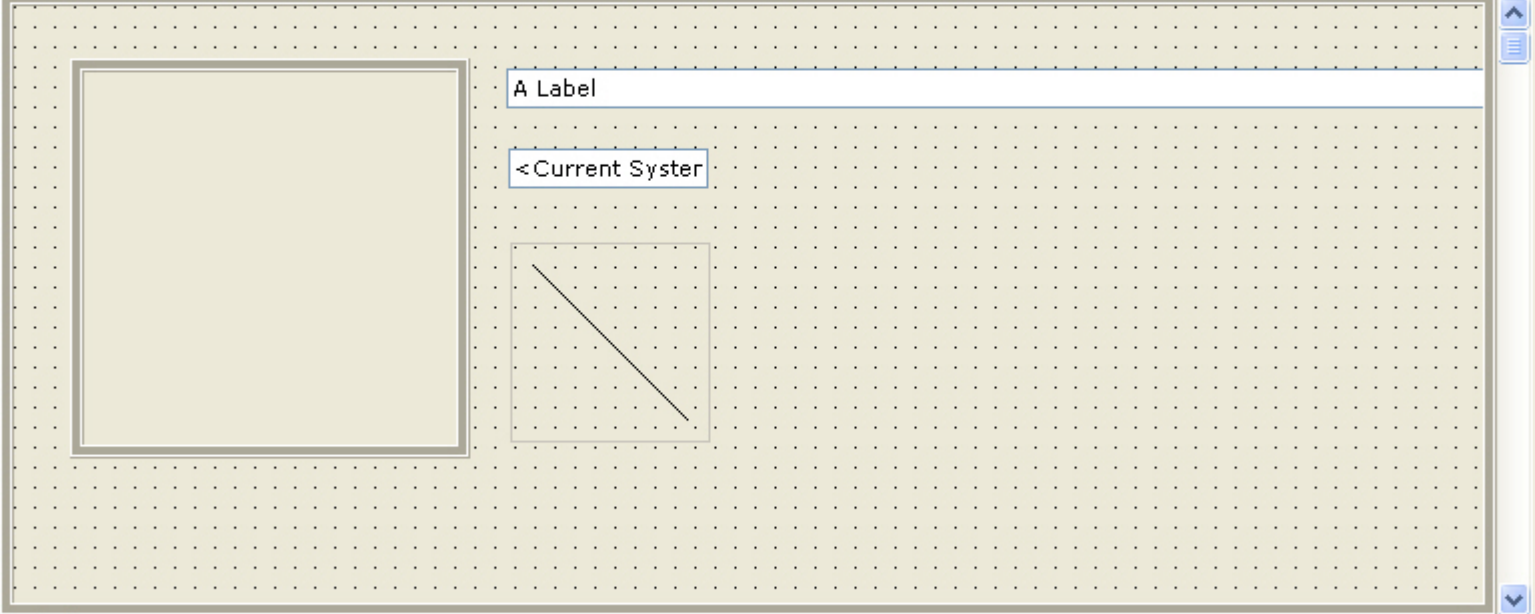
Once an item is on screen, such as the label, right-click over the item to bring up available properties. For the label, the font size and color may be changed. Many items may also be brought forward and placed on top of other items (i.e. Bring to Front) to moved behind other items (i.e. Send to Back).



Items may also be moved by placing the mouse over the item, the actual position varies, and left-clicking the mouse and holding while moving to the new location. The line is made to go in different directions by grabbing the size of the box and dragging it larger or smaller.



Enter a name for the User Defined screen in the field next to Design Mode and push Save so the screen may be available later for reuse. Existing screens are displayed by using the drop-down box at the end of the field then push Display.



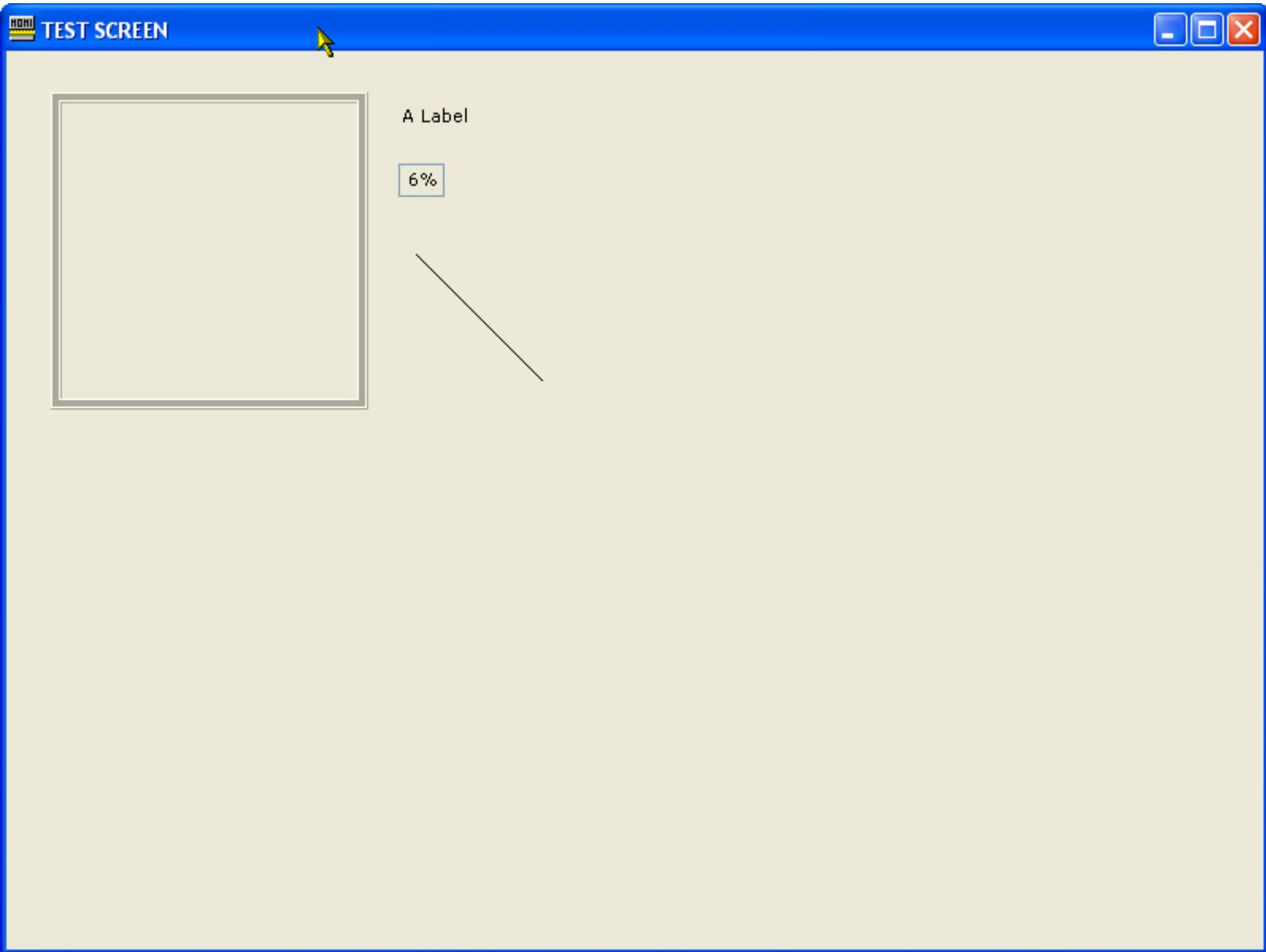
User Defined / List

The screenshot displays the MOMI PC Client interface for 'BWS1-2004 MOMI (Client version 5.00)'. The window title bar includes the BlackWood Systems, Inc. logo, a progress bar at 4%, the host name '\BWS1-2004', a 'Pause...' button, and the date '2008/03/11' and time '15:51:28'. The main menu includes 'Back', '*Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. Below this is a secondary menu with 'Logs', 'Spool', 'TCP/IP', 'OSS', 'Expand', and 'User Defined'. The 'User Defined' menu is active, showing 'Diagram' and 'List' options. The 'List' option is selected, displaying a list of user-defined screens under the heading 'Check name to Display Screen in independent window'. The list includes three items: 'MY USER DEFINED SCREEN', 'MY USER DEFINED SCREEN - SB', and 'TEST SCREEN', each with an unchecked checkbox. To the right of the list is a 'User Designed Screen Transparency' slider, ranging from 'Clear' to 'Opaque', currently set near 'Opaque'. The bottom status bar contains 'Chat', 'net.dw', 'Hints On', '?', 'Help', and 'Print Screen' buttons.

The User Defined / List screen displays screens previously defined and saved and allows them to be displayed as independent windows.

Screen definitions are physically saved on the NonStop System (i.e. not on the PC) and are organized by logged on user.

An independent window appears outside of the MOMI PC Client however the MOMI PC Client must be running for the independent window to display. A window or windows are checked and display separately from the MOMI PC Client on the PC monitor. The following window is a simple display.



The following window displays additional items.



My User defined screen

O/S Version

MOMI Version



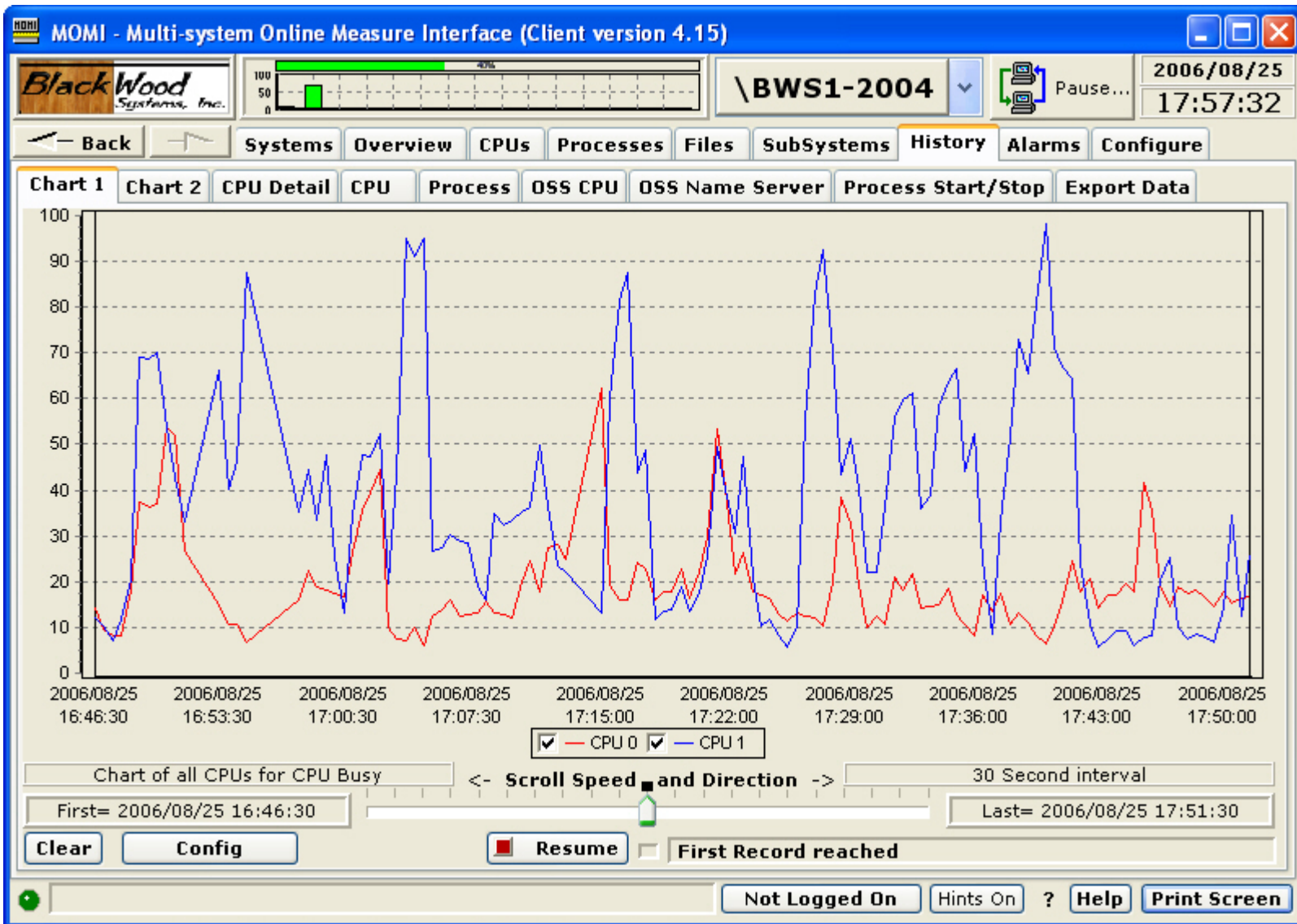
Top Processes in CPU 0 on <Current System>

| CPU,Pin | Process | Object | Priority | Busy% |
|----------|-----------|---------|----------|-------|
| 00,00352 | \$MOMI4 | BWMOMI | 160 | 1.03 |
| 00,00332 | \$ZPTM0 | TCP6MON | 201 | 0.51 |
| 00,00393 | \$Z3785 | BWMOMI | 160 | 0.24 |
| 00,00287 | \$OSS | TSYSDP2 | 220 | 0.23 |
| 00,00000 | \$MONITOR | OSIMAGE | 201 | 0.14 |
| 00,00015 | \$ZNET | SCP | 175 | 0.14 |

Processes to closely watch

History.

History / Chart 1

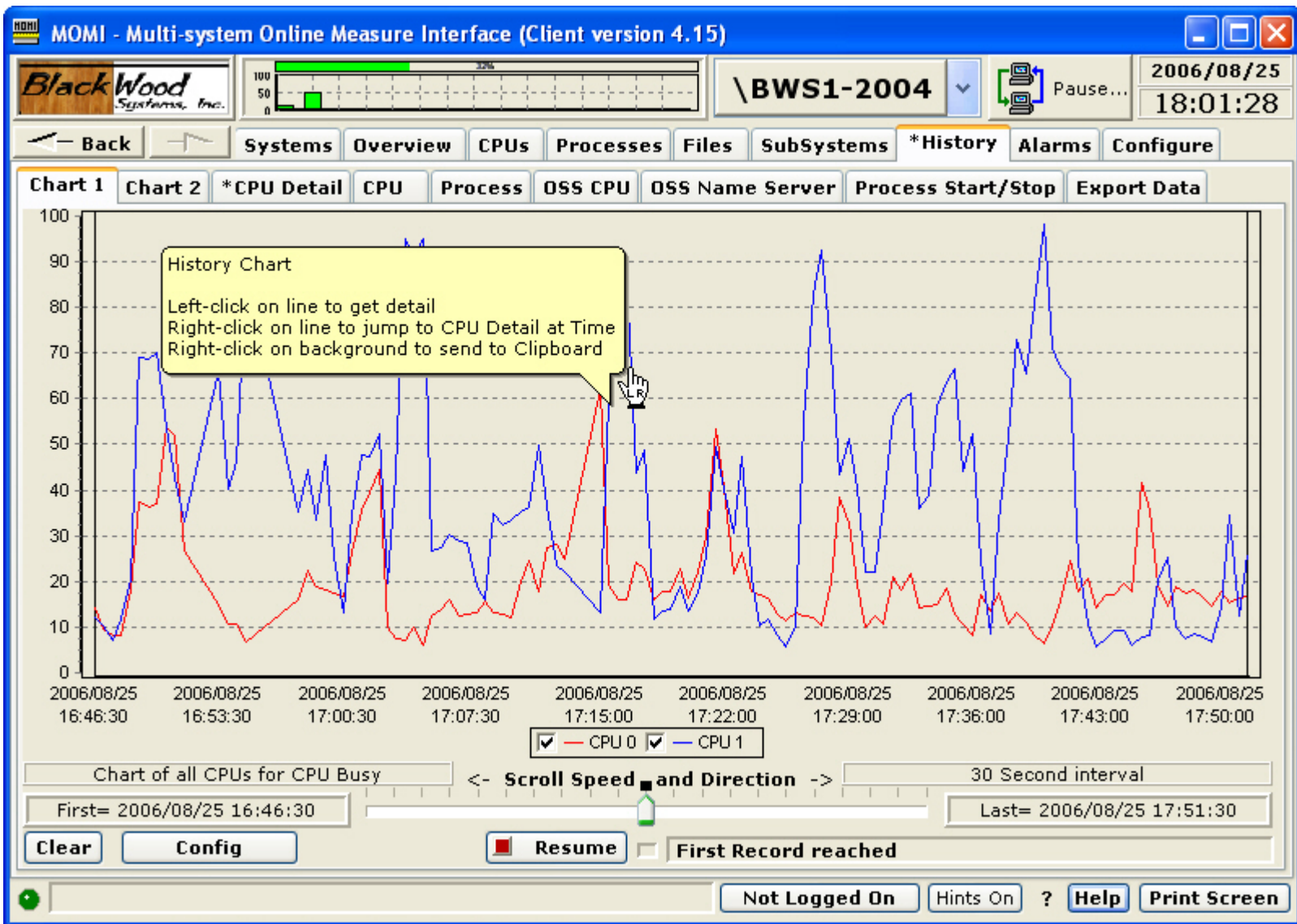


The History / Chart 1 screen presents User-selected data from the MOMI history files.

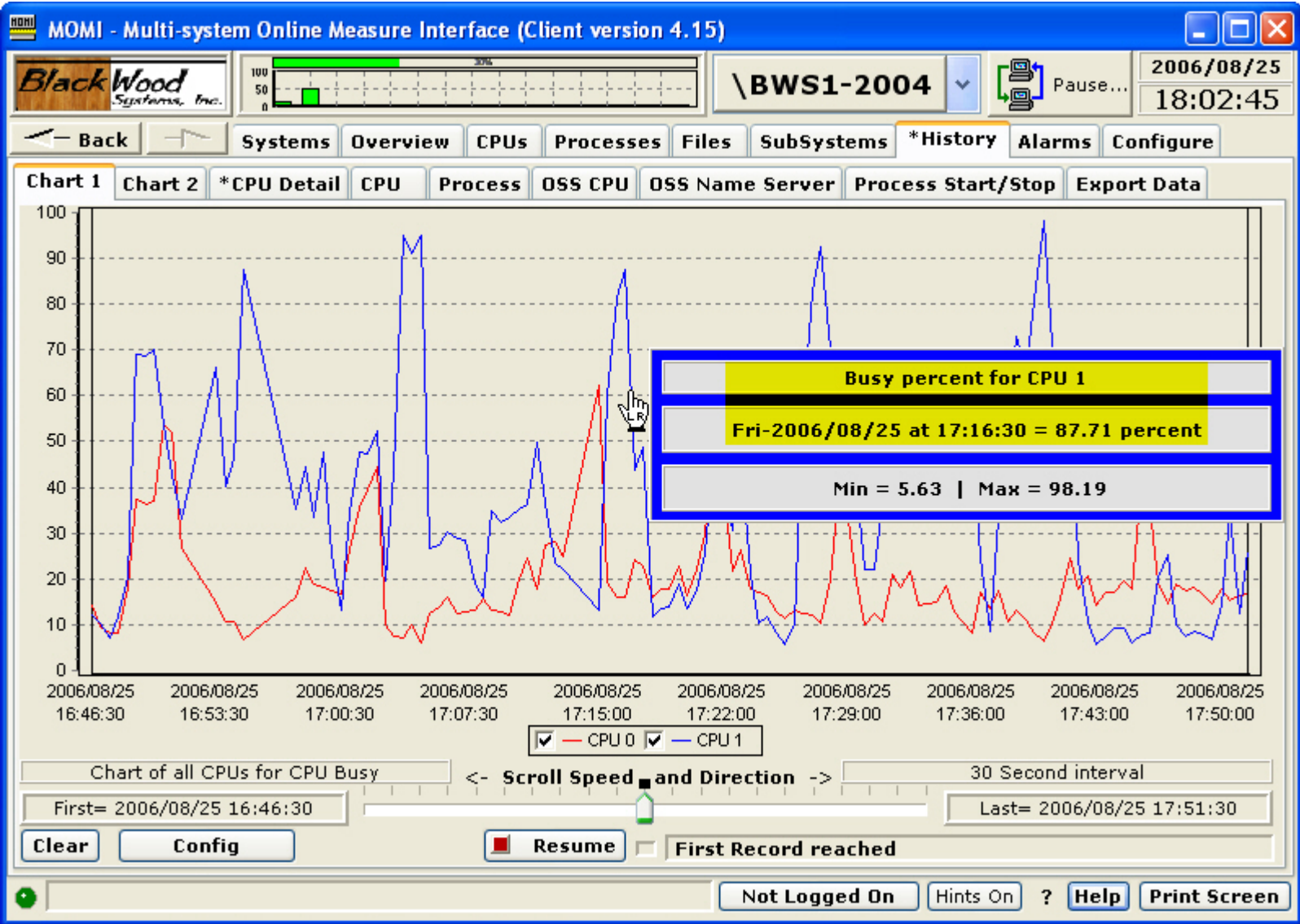
History to be charted is selected from the Config pop-up screen. Start time, History database and item are selected. Up to 16 different history items may be selected. When an Element Type is selected, the available items appear in the Element Sub Type. Additional information may be required in the Element ID. For example, selecting a Process Element Type requires a process name (or cpu,pin for unnamed processes) in the Element ID.

The "Chart All CPUs for CPU Busy" is a built-in selection.

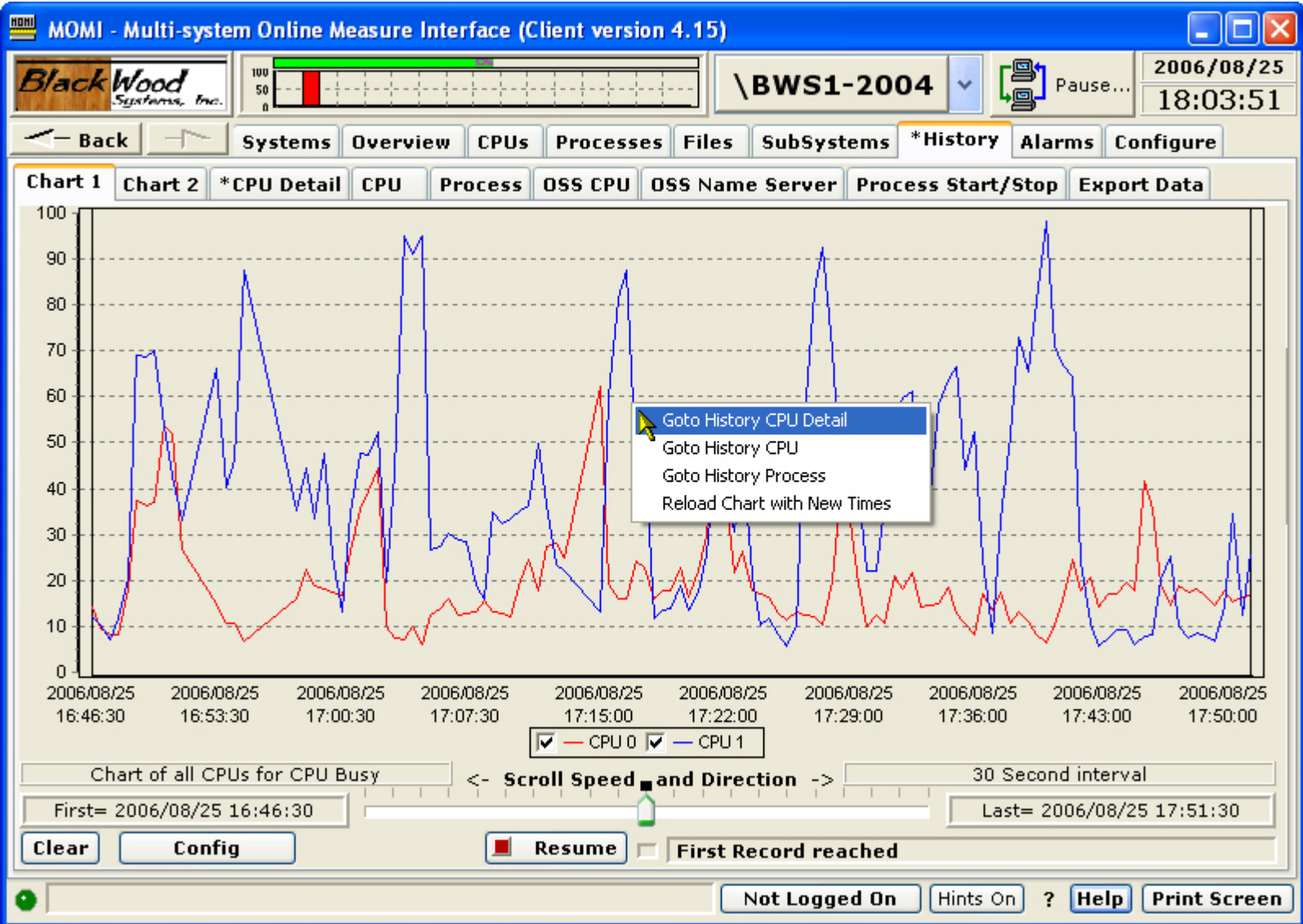
Additional information and drill down options are available; place the mouse over a chart line.



Clicking on a chart line will display the date/time and exact value at the point as well as the minimum and maximum values present on the screen for that line.



Right-clicking over a line will bring up a menu to allow 1) drill-down of that CPU and its processes, 2) display of all CPUs, 3) display of all processes or 4) bring up the Config screen and reload the chart with a New Time.



[History CPU Detail](#) selection jumps to the History / CPU Detail screen to display selected CPU information and all processes at that point in time. The Backward and Forward button allow stepping at the history interval.

MOMI - Multi-system Online Measure Interface (Client version 4.15)

Black Wood Systems, Inc. | \BWS1-2004 | 2006/08/25 18:05:21

Systems Overview CPUs Processes Files SubSystems *History Alarms Configure

Chart 1 Chart 2 *CPU Detail CPU Process OSS CPU OSS Name Server Process Start/Stop Export Data

CPU 1 detail per second over 30 Second interval at Friday 2006/08/25 17:16:30

CPU 1

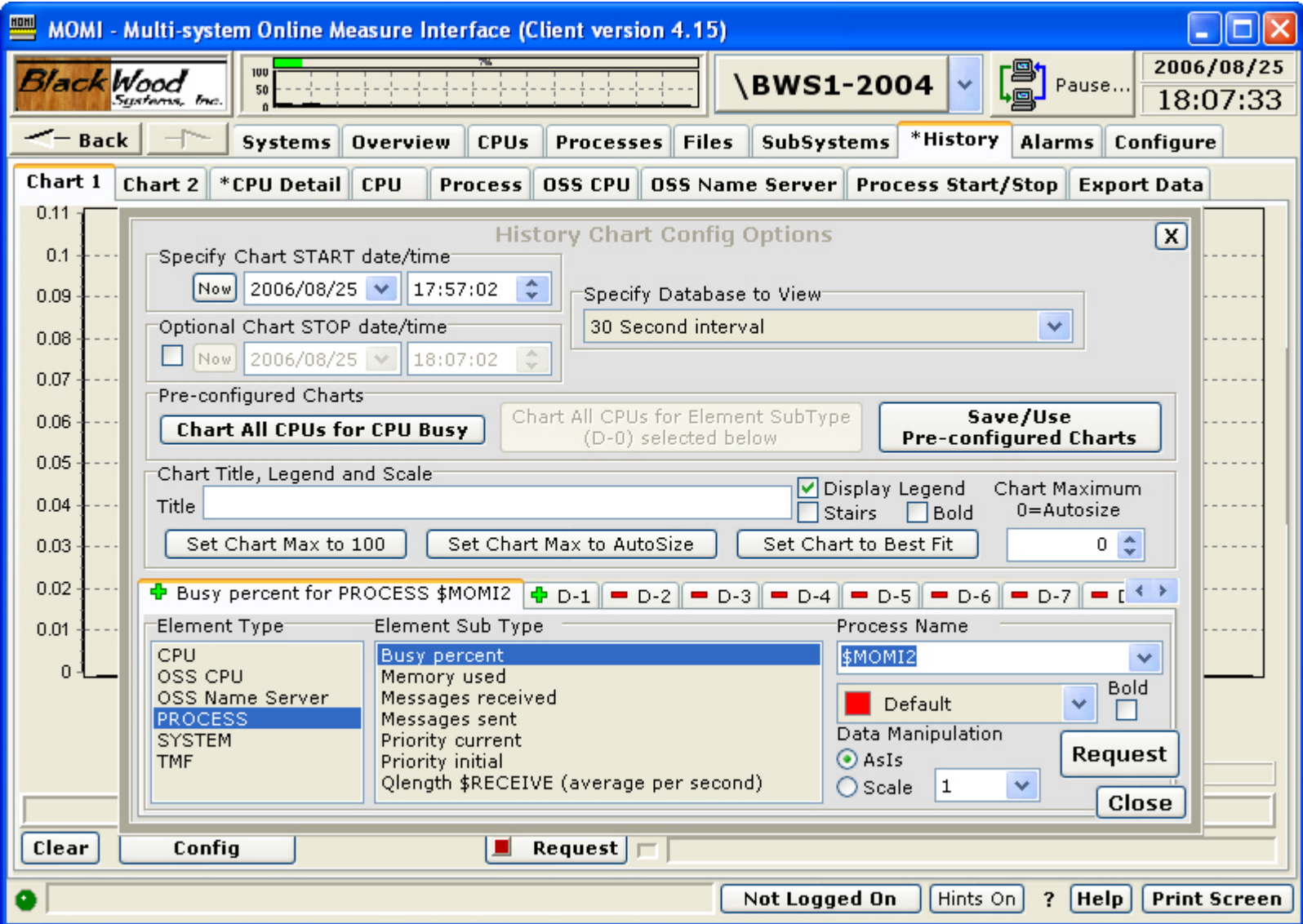
| | | | | | | | |
|----------------|---------|------------|--------|---------------|-------|-------------------|------|
| Busy Time | 87.72 % | Disk I/O's | 93.02 | Free Memory | 1,397 | Processes Created | 0.00 |
| Interrupt Time | 2.32 % | Cache Hits | 130.36 | Locked Memory | 252 | Processes Deleted | 0.00 |
| Idle Time | 12.28 % | Dispatches | 982.33 | Page Faults | 1.17 | Memory Pressure | 0 |

| Process | CPU,PIN | Busy Time | B | IPri | CPri | P | F | R | I | S | SI | PT | Mem | MemBytes | SwapSpaceG | UserID | Login Name | Ot |
|----------|----------|-----------|---|------|------|---|---|---|---|---|----|----|------|------------|------------|---------|-------------|-----|
| \$Z6H9 | 01,00167 | 77.5614% | | 50 | 49 | | | R | | | | G | 2.6 | 2,861,738 | 163,840 | 255,255 | SUPER.SUPER | \$S |
| \$S | 01,00363 | 0.9905% | B | 145 | 145 | | | | | | | G | 5.4 | 5,668,864 | 163,840 | 255,1 | SUPER.OPER | \$S |
| \$PCS1 | 01,00272 | 0.9772% | | 220 | 220 | P | | | | | | G | 23.9 | 25,081,173 | 0 | 255,255 | SUPER.SUPER | \$S |
| \$DATA1 | 01,00269 | 0.9641% | | 220 | 220 | P | | | | | | G | 44.6 | 46,891,008 | 0 | 255,255 | SUPER.SUPER | \$S |
| \$ZPTM1 | 01,00332 | 0.5053% | | 201 | 201 | P | | R | | | | G | 2.8 | 3,031,040 | 294,912 | 255,255 | SUPER.SUPER | \$S |
| \$Z5203 | 01,00613 | 0.5006% | | 160 | 160 | | | R | | | | G | 3.5 | 3,686,400 | 360,448 | 100,109 | NET.DW | \$C |
| \$SWAP1 | 01,00273 | 0.4921% | B | 220 | 220 | P | | | | | | G | 29.4 | 30,851,072 | 0 | 255,255 | SUPER.SUPER | \$S |
| | 01,00000 | 0.3631% | | 201 | 201 | P | | R | | | | G | 1.2 | 1,310,720 | 0 | 255,255 | SUPER.SUPER | \$S |
| \$MOMI01 | 01,00271 | 0.3401% | B | 220 | 220 | P | | | | | | G | 28.7 | 30,113,792 | 0 | 255,255 | SUPER.SUPER | \$S |
| \$Z5148 | 01,00607 | 0.3188% | | 170 | 170 | | | | | | | G | 2.8 | 2,949,120 | 360,448 | 100,109 | NET.DW | \$C |
| \$PCS1 | 01,00295 | 0.2884% | | 220 | 220 | P | | | | | | G | 4.0 | 4,262,570 | 0 | 255,255 | SUPER.SUPER | \$S |
| \$MOMI6 | 01,00592 | 0.2664% | | 170 | 170 | | | | | | | G | 8.2 | 8,601,600 | 360,448 | 100,109 | NET.DW | \$C |

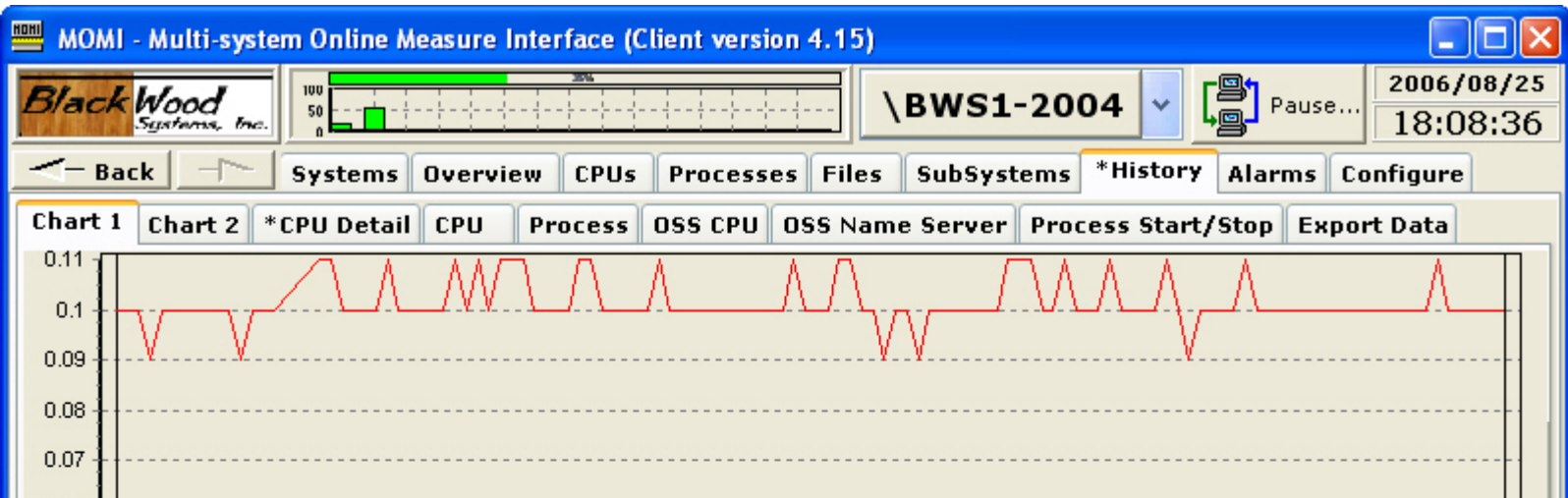
Clear Config Rated Values Stop

Not Logged On Hints On ? Help Print Screen

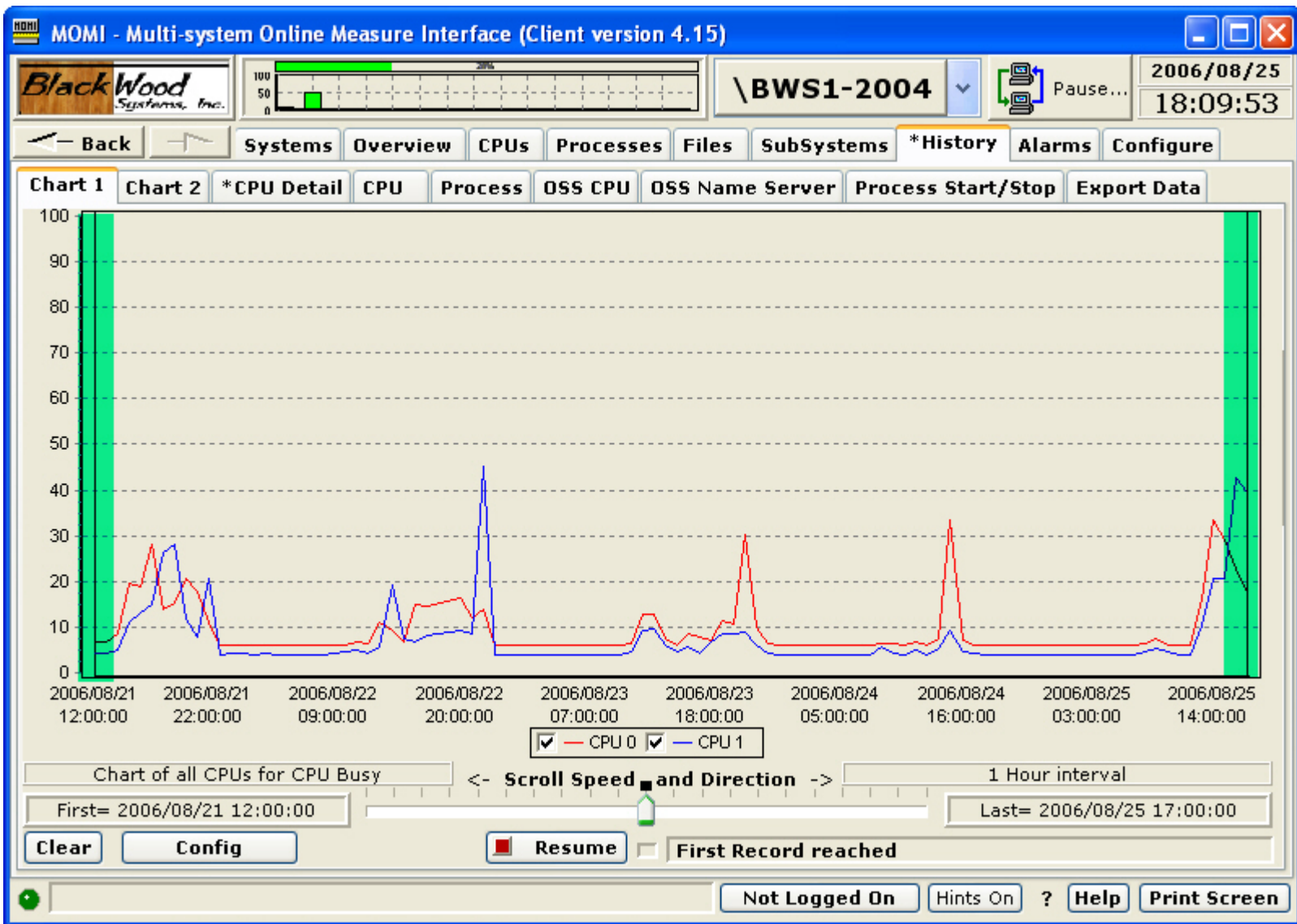
The display of some entities, for example a Process, require additional information. In the picture below, after PROCESS and Busy percent is selected, the Element ID field is enabled (in this example the process name \$MOMI2 is entered).



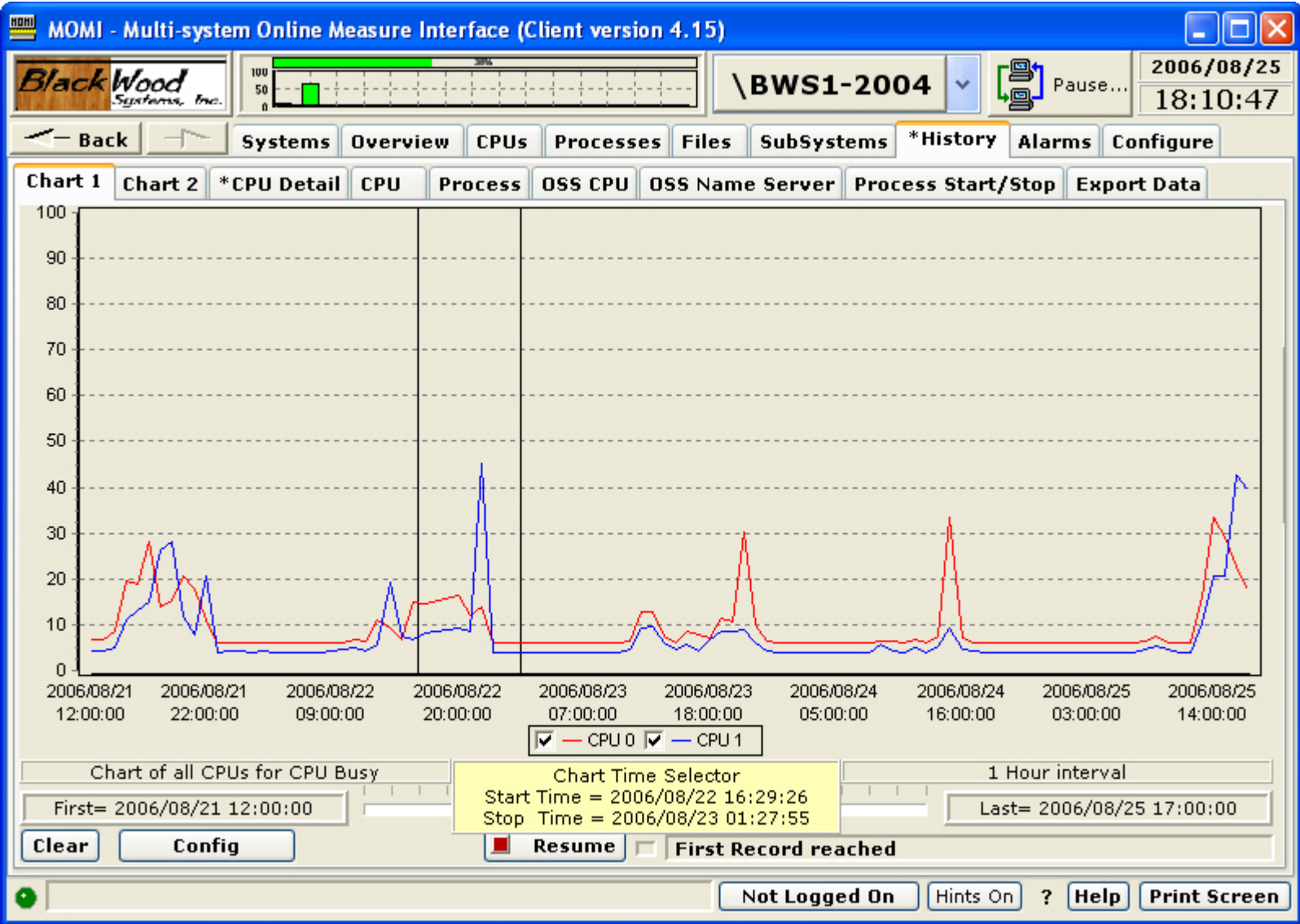
The scrolling feature in history provides the ability to look before and/or after a point in time. This powerful feature allows the User to easily scroll forward and backward in time and visually search for unexpected activities.



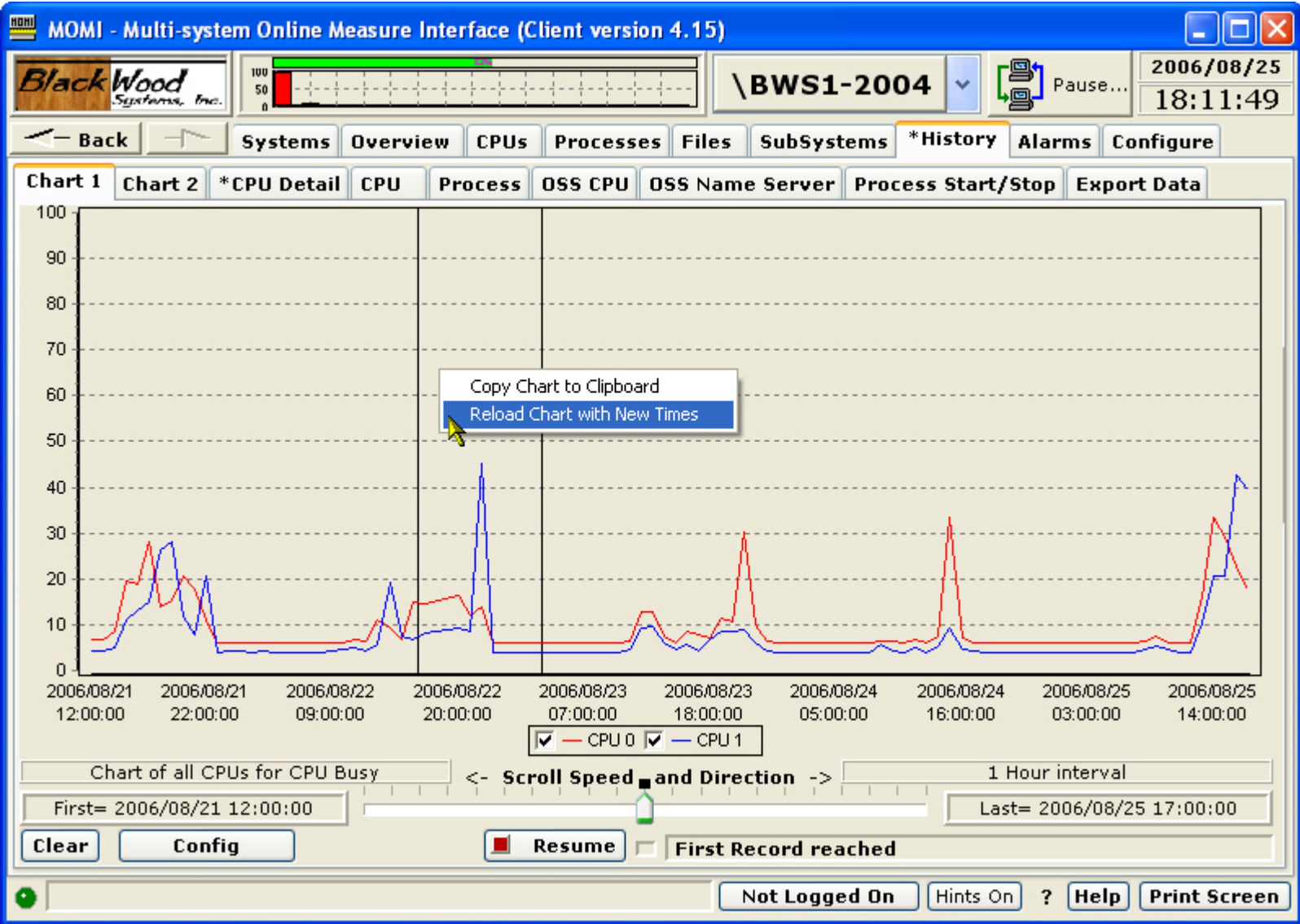
History drill-down is aided by two bars (highlighted in green) on the left and right hand sides of the chart. They provide a graphical means to select a window of time based on the current data displayed. In the image below, history at 1 hour is displayed.



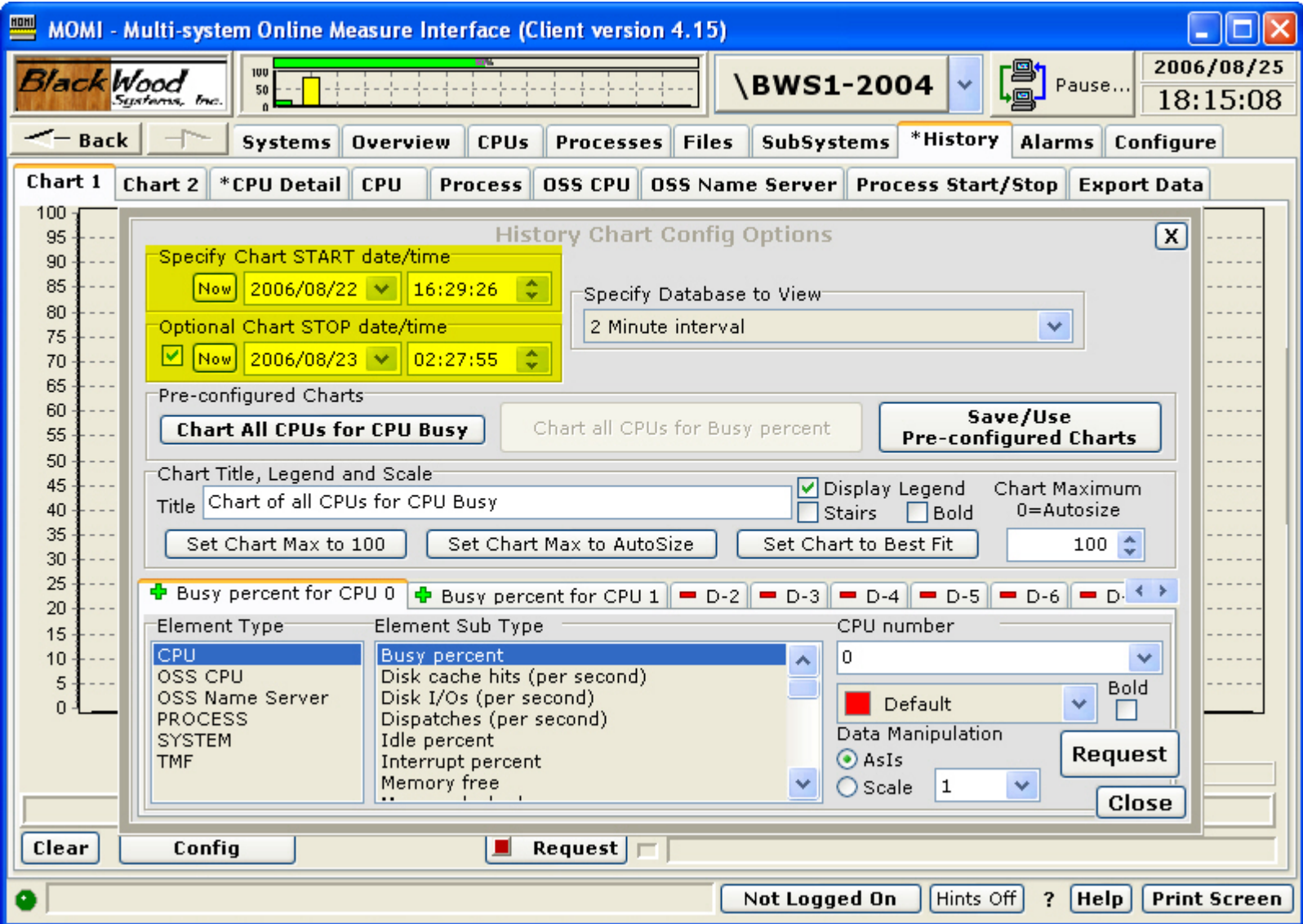
Left-click and hold on a line to move it left and right. A pop-up tool tip appears in the bottom center to show the current time values with the history bar selection. In this example, the scroll bars are moved to just either side of a 'bump' in the history chart graph data.



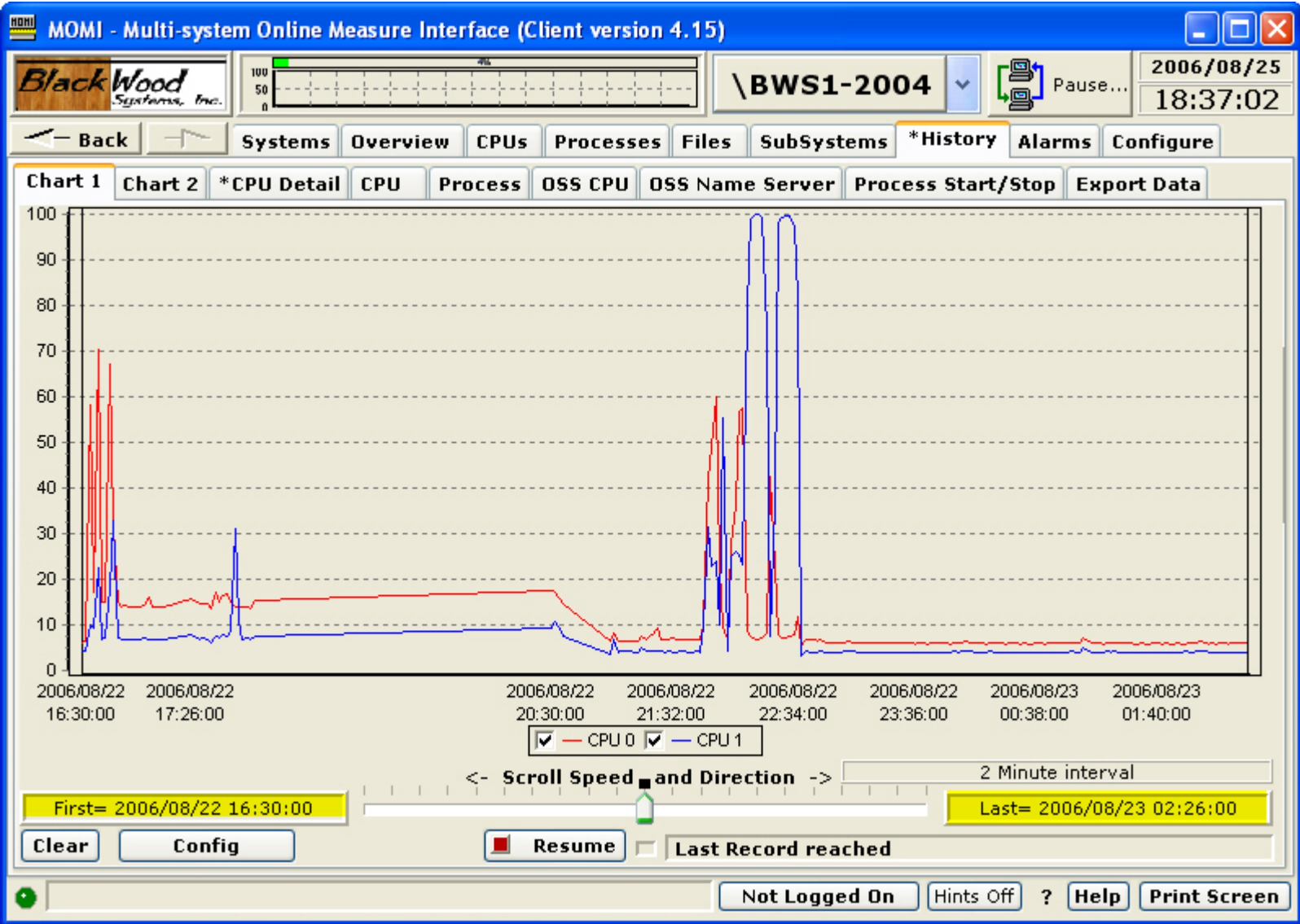
After the bars are positioned, right click on the chart area and select "Reload Chart with New Times".



The History Chart Config Options pop-up window is displayed. Note that the Chart START and STOP times are pre-loaded with the values displayed when the history bars were positioned. Additionally, the History database was pre-selected to the next higher resolution. Press Request to reload the chart based on the new time values and selected database.

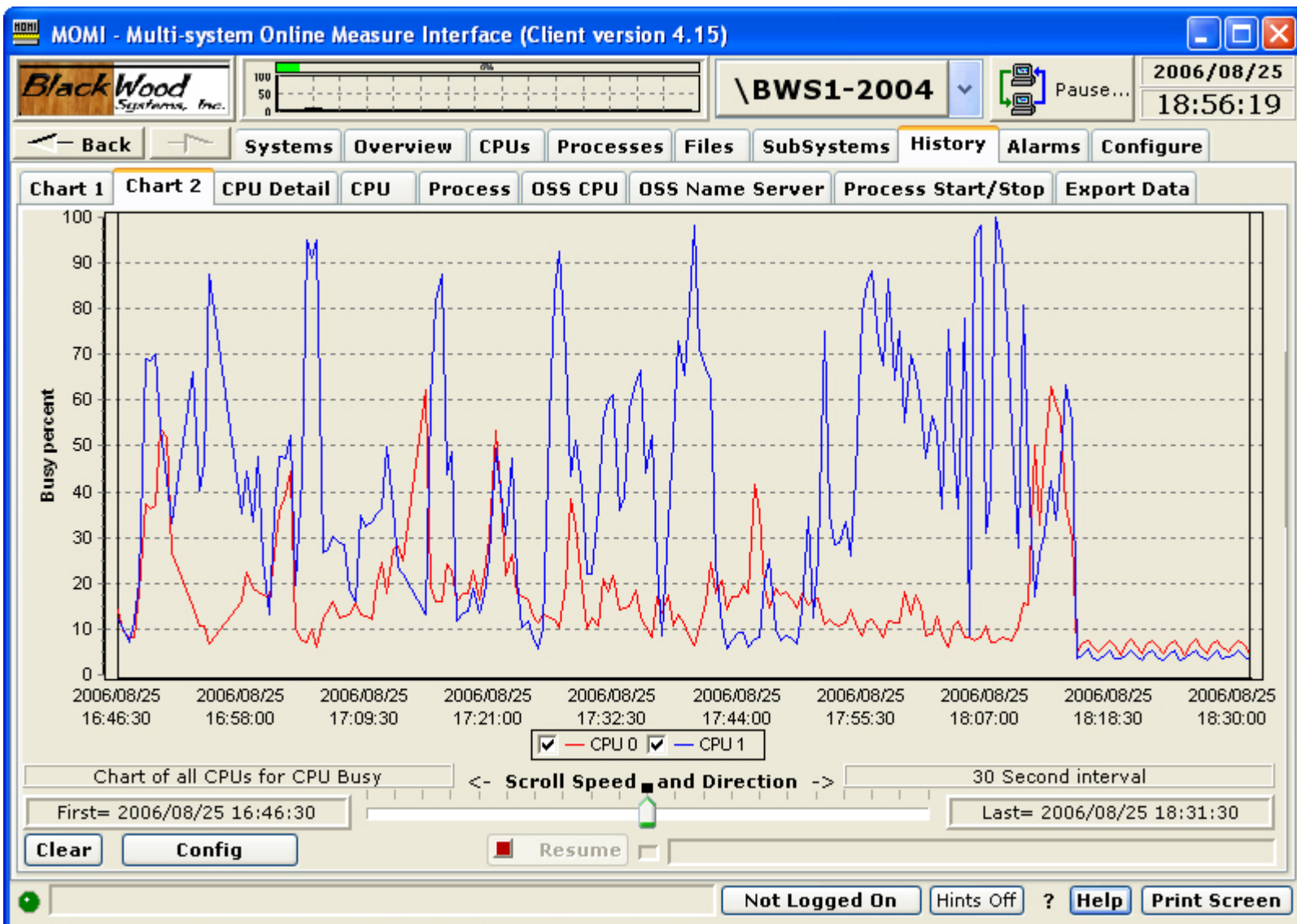


The screen is reloaded with the times selected (perhaps adjusted to the capture interval).



Further history drill-down can occur until the highest resolution data is reached (assuming the history is still available). Available history may be see on [Server / Server Info 5](#).

History / Chart 2

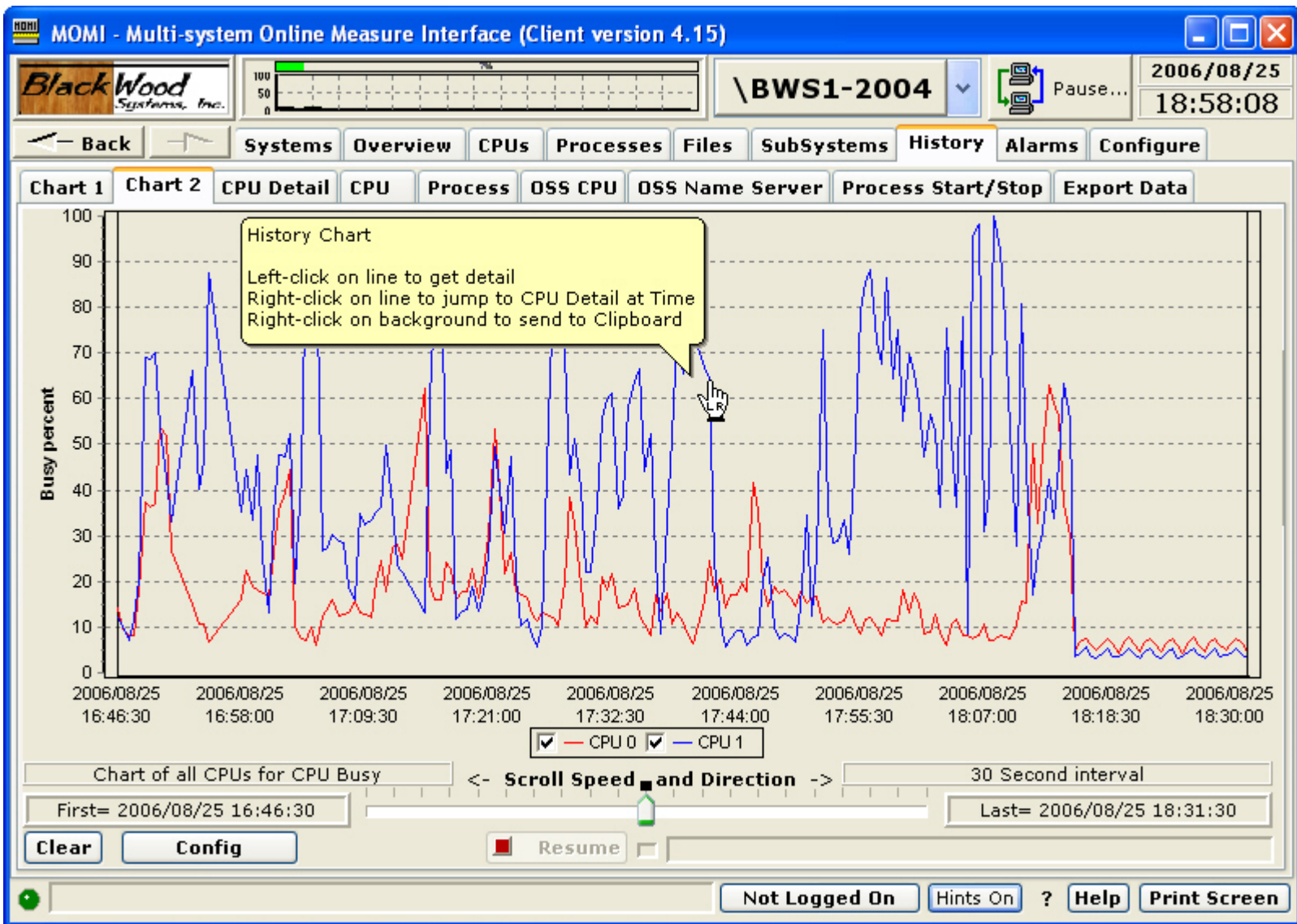


The History / Chart 2 screen presents User-selected data from the MOMI history files.

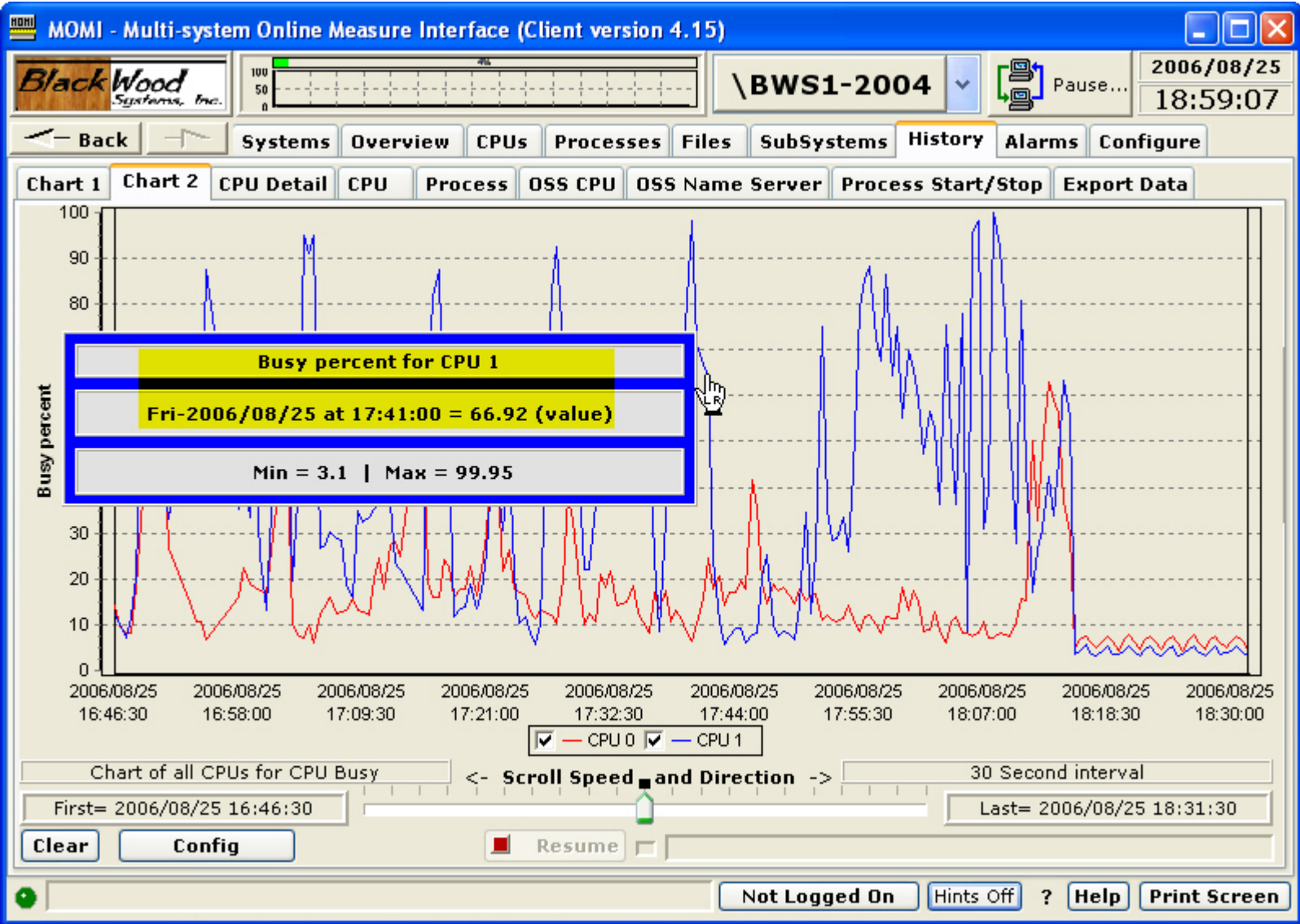
History to be charted is selected from the Config pop-up screen. Start time, History database and item are selected. Up to 16 different history items may be selected. When an Element Type is selected, the available items appear in the Element Sub Type. Additional information may be required in the Element ID. For example, selecting a Process Element Type requires a process name (or cpu,pin for unnamed processes) in the Element ID.

The "Chart All CPUs for CPU Busy" is a built-in selection.

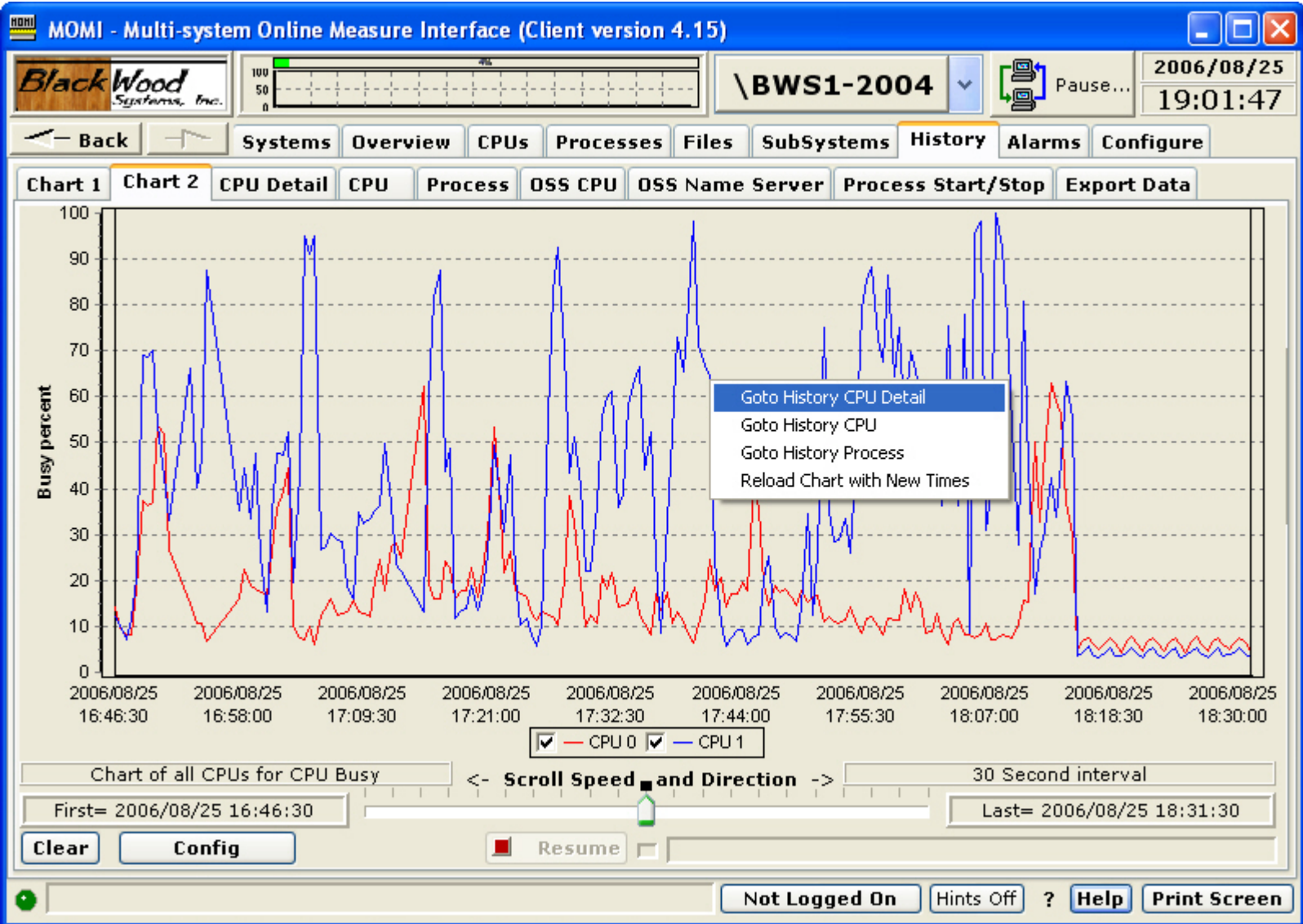
Additional information and drill down options are available; place the mouse over a chart line.



Clicking on a chart line will display the date/time and exact value at the point as well as the minimum and maximum values present on the screen for that line.



Right-clicking over a line will bring up a menu to allow 1) drill-down of that CPU and its processes, 2) display of all CPUs, 3) display of all processes or 4) bring up the Config screen and reload the chart with a New Time.



Clicking on History CPU Detail jumps to the [History CPU Detail](#) screen and displays selected CPU information and all processes at that point in time. The Backward and Forward button allow stepping through the history intervals.

MOMI - Multi-system Online Measure Interface (Client version 4.15)

Black Wood Systems, Inc. | \BWS1-2004 | 2006/08/25

Systems Overview CPUs Processes Files SubSystems *History Alarms Configure

Chart 1 Chart 2 *CPU Detail CPU Process OSS CPU OSS Name Server Process Start/Stop Export Data

CPU 1 detail per second over 30 Second interval at Friday 2006/08/25 17:41:00

CPU 1

| | | | | | | | |
|----------------|---------|------------|--------|---------------|-------|-------------------|------|
| Busy Time | 66.93 % | Disk I/O's | 11.70 | Free Memory | 1,375 | Processes Created | 0.00 |
| Interrupt Time | 1.69 % | Cache Hits | 11.53 | Locked Memory | 255 | Processes Deleted | 0.00 |
| Idle Time | 33.07 % | Dispatches | 620.79 | Page Faults | 2.30 | Memory Pressure | 0 |

| Process | CPU,PIN | Busy Time | B | IPri | CPri | P | F | R | I | S | SI | PT | Mem | MemBytes | SwapSpaceG | UserID | Login Name | Ot |
|----------|----------|-----------|---|------|------|---|---|---|---|---|----|----|------|------------|------------|---------|-------------|-----|
| \$Z6JH | 01,00185 | 54.1538% | | 50 | 50 | | | | | | | G | 0.8 | 854,698 | 163,840 | 255,255 | SUPER.SUPER | \$S |
| \$Z6JC | 01,00203 | 7.3654% | | 50 | 50 | P | | | | | | G | 19.0 | 20,015,786 | 163,840 | 255,255 | SUPER.SUPER | \$S |
| \$Z5203 | 01,00613 | 0.4919% | | 160 | 160 | | | R | | | | G | 3.7 | 3,948,544 | 360,448 | 100,109 | NET.DW | \$C |
| \$ZPTM1 | 01,00332 | 0.4036% | | 201 | 201 | P | | | | | | G | 2.8 | 3,031,040 | 294,912 | 255,255 | SUPER.SUPER | \$S |
| | 01,00000 | 0.3578% | | 201 | 201 | P | | R | | | | G | 1.2 | 1,310,720 | 0 | 255,255 | SUPER.SUPER | \$S |
| \$Z5148 | 01,00607 | 0.3249% | | 170 | 170 | | | | | | | G | 3.0 | 3,208,533 | 360,448 | 100,109 | NET.DW | \$C |
| \$MOMI6 | 01,00592 | 0.2565% | | 170 | 170 | | | | | | | G | 8.2 | 8,601,600 | 360,448 | 100,109 | NET.DW | \$C |
| \$MOM0 | 01,00379 | 0.2544% | | 170 | 170 | | | | | | | G | 13.9 | 14,630,912 | 360,448 | 200,1 | OPER.MAIN | \$C |
| \$PCS1 | 01,00272 | 0.1735% | | 220 | 220 | P | | | | | | G | 23.9 | 25,116,672 | 0 | 255,255 | SUPER.SUPER | \$S |
| \$Z02X | 01,00389 | 0.1668% | | 160 | 160 | | | | | | | G | 3.6 | 3,784,704 | 425,984 | 100,109 | NET.DW | \$C |
| \$Z0005 | 01,00383 | 0.1611% | | 170 | 170 | | | | | | | G | 3.4 | 3,653,632 | 360,448 | 200,1 | OPER.MAIN | \$C |
| \$MOMI01 | 01,00271 | 0.0740% | B | 220 | 220 | P | | | | | | G | 28.7 | 30,113,792 | 0 | 255,255 | SUPER.SUPER | \$S |

Backward Forward No Filter Displayed 69 of 69

Clear Config Rated Values Stop

Not Logged On Hints Off ? Help Print Screen

The display of some entities, for example a Process, require additional information. In the picture below, after PROCESS and Busy percent is selected, the Element ID field is enabled (in this example the process name \$MOMI2 is entered).

MOMI - Multi-system Online Measure Interface (Client version 4.19)

BlackWood Systems, Inc.

100 50 0

\BWS1-2004

Pause...

2006/11/08 15:17:37

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Chart 1 Chart 2 CPU Detail CPU Process OSS CPU OSS Name Server Process Start/Stop Export Data

History Chart Configuration

Time and Database Chart Definition Chart Elements PreConfigured Charts

D-0

| Element Type | Element Sub Type | Process or Object File Name |
|-----------------|--|-----------------------------|
| CPU | Busy percent | \$MOMI2 |
| OSS CPU | Memory used | |
| OSS Name Server | Messages received | |
| PROCESS | Messages sent | |
| SYSTEM | Priority current | |
| TMF | Priority initial | |
| | Qlength \$RECEIVE (average per second) | |

Element Color: ■ Default Bold Stairs

Element Style: Solid Line

Duplicate Records: Total plus individuals Total only

Data Manipulation: AsIs Scale 1

Clear All Elements Add New Element

Close Clear current chart Request Close

Not Logged On Hints On ? Help Print Screen

The scrolling feature in history provides the ability to look before and/or after a point in time. This powerful feature allows the User to easily scroll forward and backward in time and visually search for unexpected activities.

MOMI - Multi-system Online Measure Interface (Client version 4.15)

BlackWood Systems, Inc.

100 50 0

\BWS1-2004

Pause...

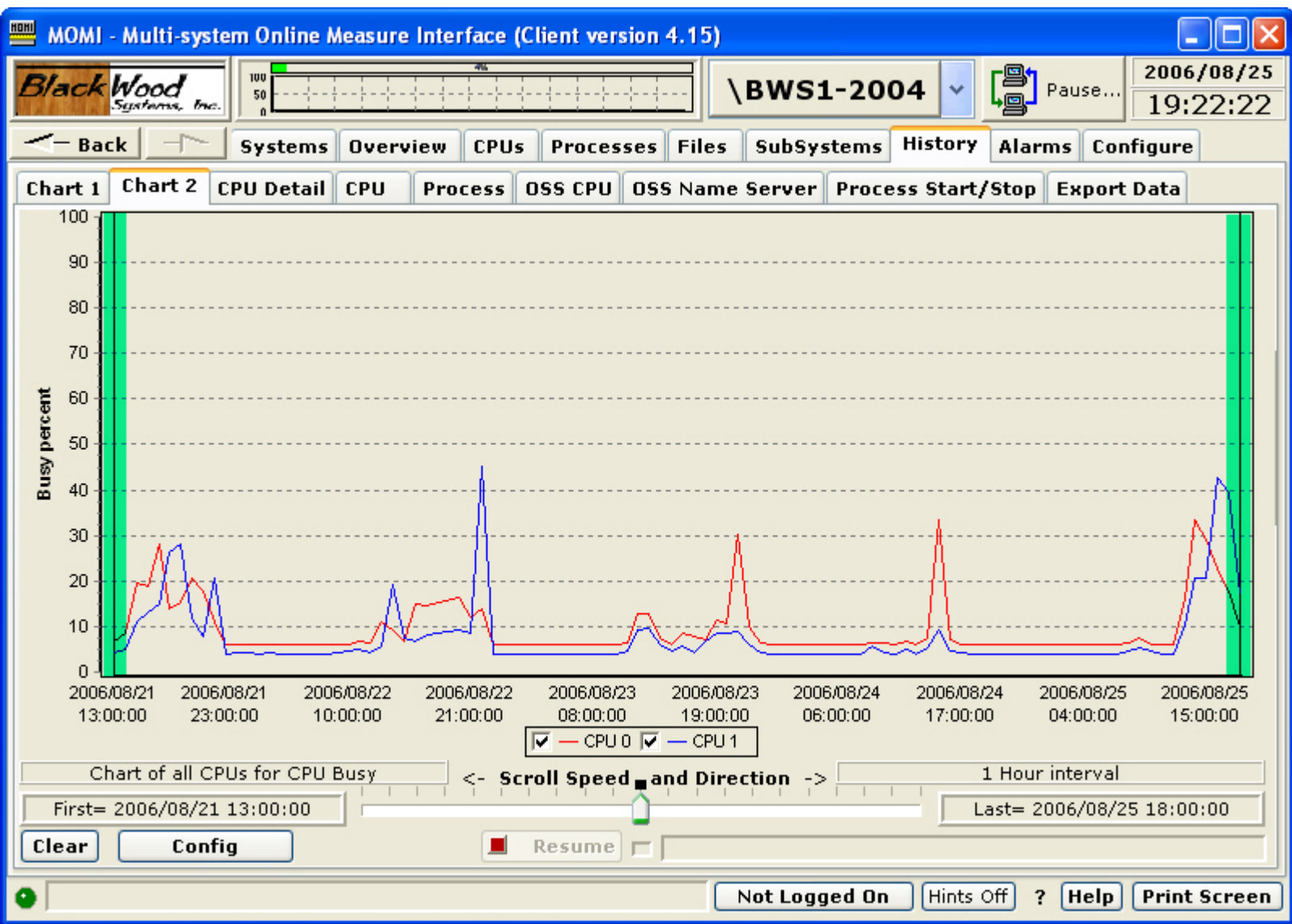
2006/08/25 19:21:37

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

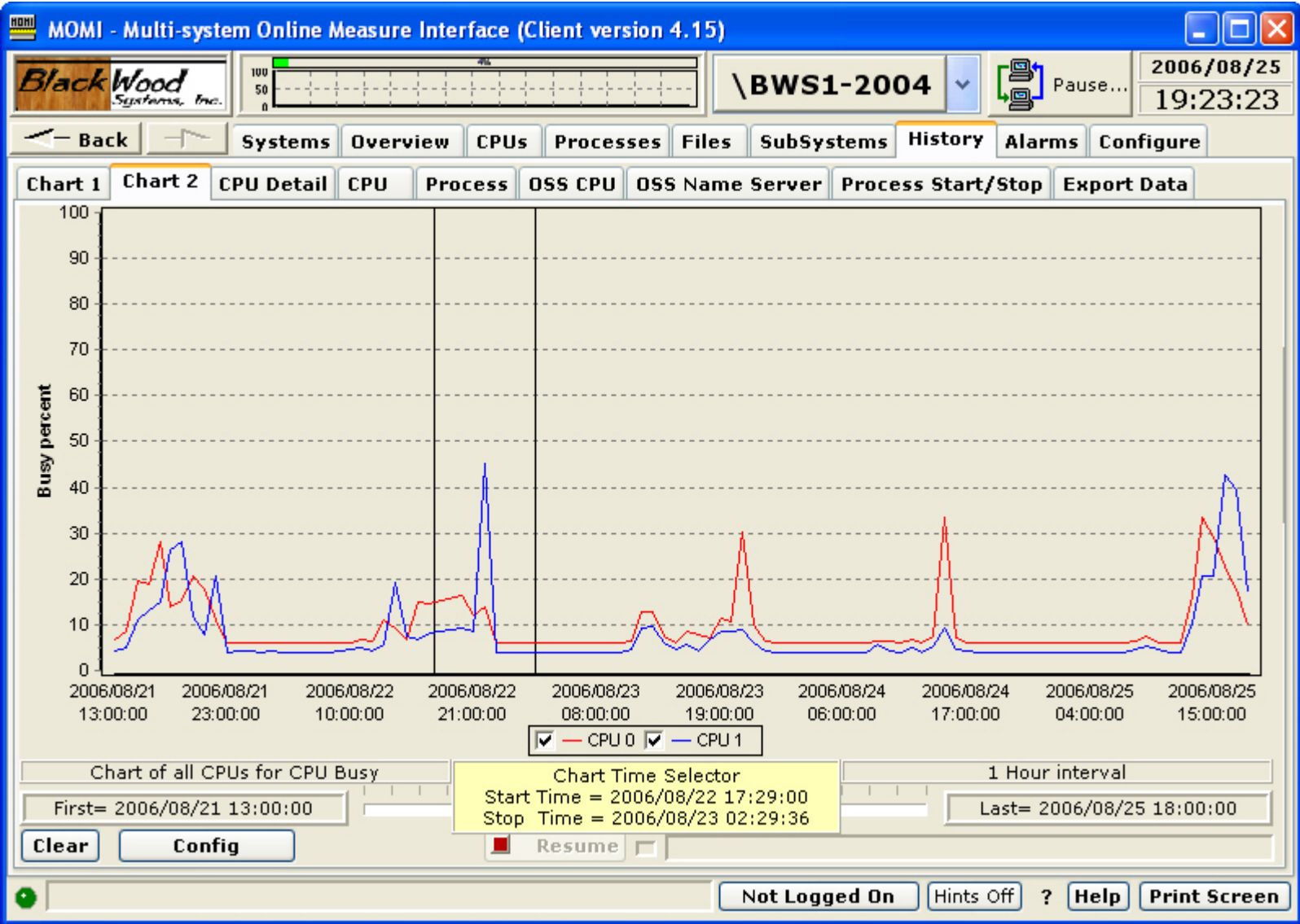
Chart 1 Chart 2 CPU Detail CPU Process OSS CPU OSS Name Server Process Start/Stop Export Data

cpu

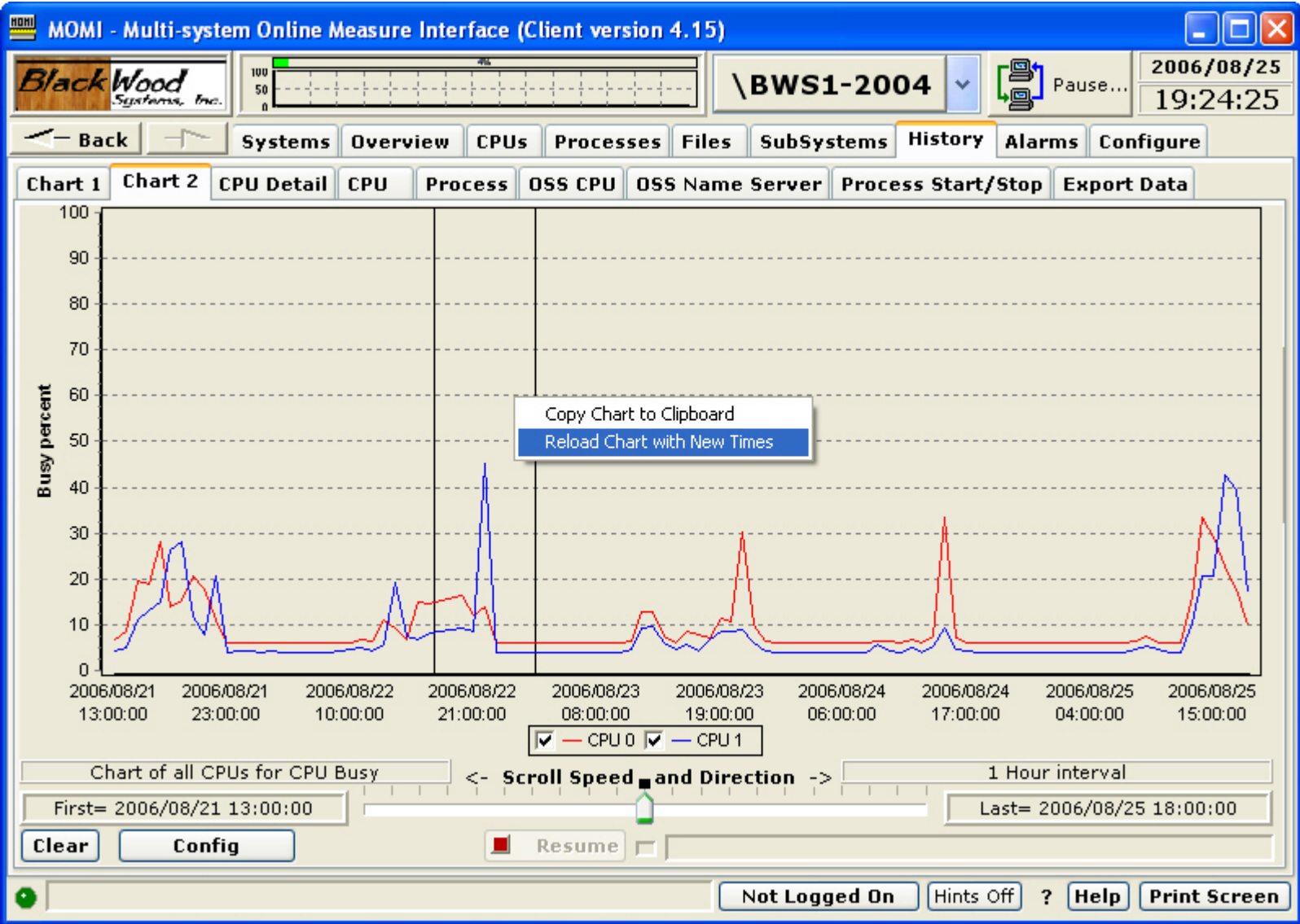
History drill-down is aided by two bars (highlighted in green) on the left and right hand sides of the chart. They provide a graphical means to select a window of time based on the current data displayed. In the image below, history at 1 hour is displayed.



Left-click and hold on a line to move it left and right. A pop-up tool tip appears in the bottom center to show the current time values with the history bar selection. In this example, the scroll bars are moved to just either side of a 'bump' in the history chart graph data.



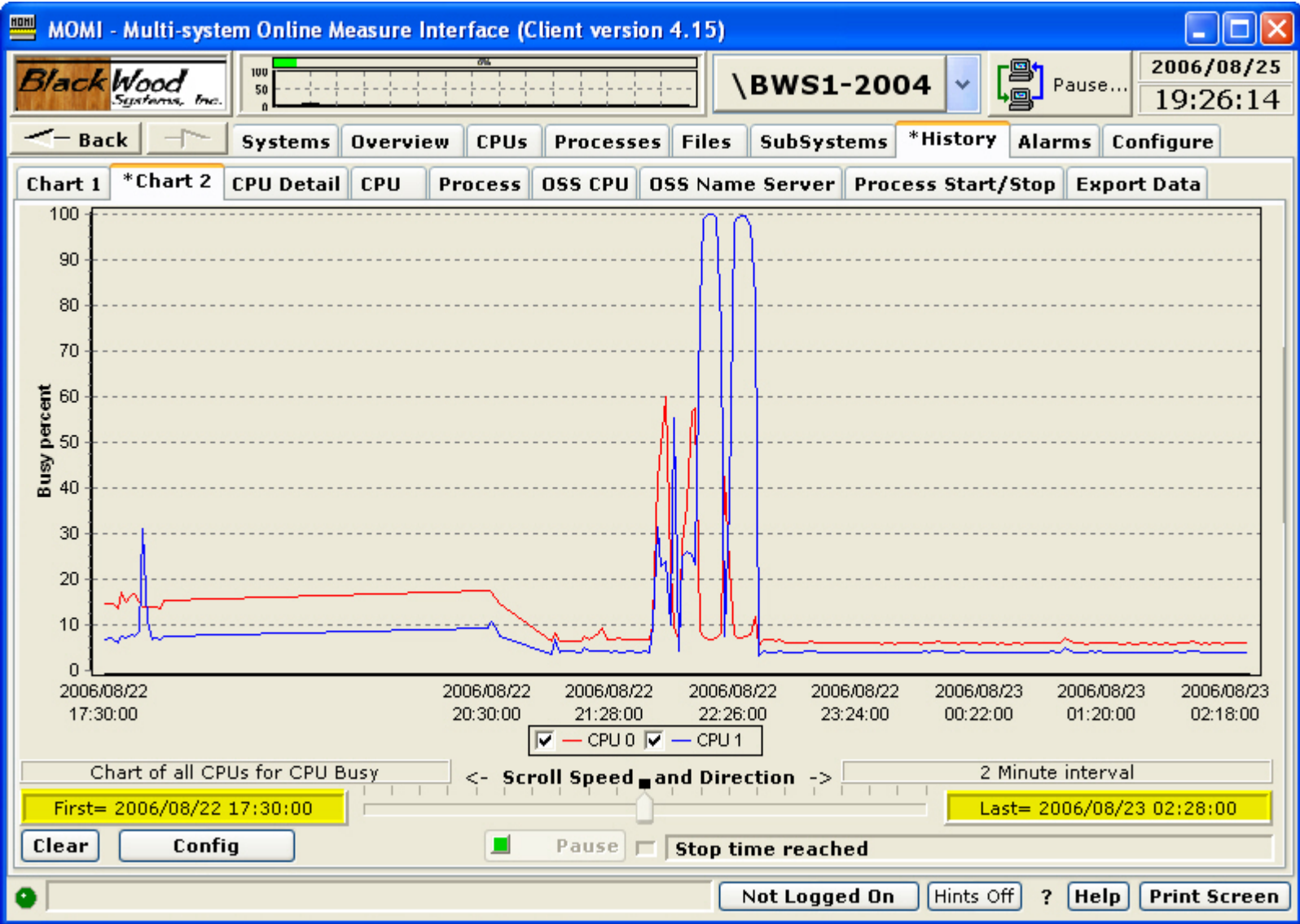
After the bars are positioned, right click on the chart area and select "Reload Chart with New Times".



The History Chart Config Options pop-up window is displayed. Note that the Chart START and STOP times are pre-loaded with the values displayed when the history bars were positioned. Additionally, the History database was pre-selected to the next higher resolution. Press Request to reload the chart based on the new time values and selected database.

The screenshot displays the MOMI - Multi-system Online Measure Interface (Client version 4.15) window. The main interface includes a navigation menu with options like Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The History tab is active, showing a History Chart Configuration dialog box. The dialog box has four tabs: Time and Database, PreConfigured Charts, Chart Definition, and Chart Elements. The Time and Database tab is selected, showing fields for Specify Chart START date/time (2006/08/22 17:29:00) and Optional Chart STOP date/time (2006/08/23 02:29:36). A Specify Database to View dropdown is set to 2 Minute interval. Below these fields are buttons for Chart All CPUs for CPU Busy, Chart all CPUs for Busy percent, and User defined Pre-configured Charts. At the bottom of the dialog are buttons for Close, Clear current chart, Request, and Close. The main window also shows a status bar with Not Logged On, Hints Off, Help, and Print Screen buttons.

The screen is reloaded with the times selected (perhaps adjusted to the capture interval).



Further history drill-down can occur until the highest resolution data is reached (assuming the history is still available). Available history may be see on [Server / Server Info 5](#).

History / CPU Detail

MOMI - Multi-system Online Measure Interface (Client version 3.80)

Black Wood Systems, Inc. | \BWS1 Fast - 2002 | 2004/10/28 13:36:51

Systems Overview CPUs Processes Files SubSystems ***History** Configure

Chart *CPU Detail CPU Process OSS CPU OSS Name Server Process Start/Stop Export Data

CPU 0 detail per second over 30 Second interval at Thursday 2004/10/28 12:23:30

| | | | | | | | |
|----------------|---------|------------|--------|---------------|------|-------------------|------|
| Busy Time | 58.41 % | Disk I/O's | 19.80 | Free Memory | 122 | Processes Created | 0.00 |
| Interrupt Time | 7.99 % | Cache Hits | 46.55 | Locked Memory | 162 | Processes Deleted | 0.00 |
| Idle Time | 41.59 % | Dispatches | 842.43 | Page Faults | 0.47 | Memory Pressure | 0 |

| Process | CPU,PIN | Busy Time | B | IPri | CPri | P | F | R | I | S | SI | PT | Mem | UserID | Login Name | Object |
|----------|----------|-----------|---|------|------|---|---|---|---|---|----|----|------|---------|-------------|-------------------------|
| \$DDL | 00,00392 | 24.9446% | | 31 | 31 | | | R | | | | G | 1.0 | 100,109 | NET.DW | \$SYSTEM.SYSTEM.DDL |
| \$Z00S | 00,00338 | 3.0839% | | 30 | 30 | | | | | | | G | 3.7 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.EVNTPRVD |
| \$TMP | 00,00012 | 2.6507% | | 204 | 204 | P | | | | | | G | 2.1 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TMFTMP |
| \$DATA1 | 00,00292 | 2.4251% | B | 220 | 220 | P | | | | | | G | 17.3 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYS2P2 |
| \$ZOEV | 00,00327 | 1.9957% | | 100 | 100 | | | | | | | G | 3.8 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.EVTMGR |
| \$MOMI2 | 00,00414 | 1.6124% | | 160 | 160 | | | | | | | G | 3.0 | 100,109 | NET.DW | \$DATA1.DALEMOMI.BWMOMI |
| \$MOMI01 | 00,00290 | 1.2212% | | 220 | 213 | P | | | | | | G | 1.9 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYS2P2 |
| \$SWAP1 | 00,00288 | 1.0878% | | 220 | 220 | P | | | | | | G | 8.7 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYS2P2 |
| | 00,00000 | 1.0687% | | 201 | 201 | P | | R | | | | G | 0.7 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.OSIMAGE |
| \$ZCMOM | 00,00330 | 0.8894% | | 30 | 30 | | | | | | | G | 16.3 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.CIMOM |
| \$Z2P8 | 00,00395 | 0.8765% | | 160 | 160 | | | R | | | | G | 0.8 | 100,109 | NET.DW | \$DATA1.MOMI4.BWMOMI |
| \$MOMI4 | 00,00341 | 0.7807% | | 160 | 160 | | | | | | | G | 3.7 | 100,109 | NET.DW | \$DATA1.MOMI4.BWMOMI |

Backward Forward No Filter Displayed 87 of 87

Clear Config Rated Values Stop

Not Logged On ? Help Print Screen

The History / CPU Detail screen presents details of a CPU and the processes in that CPU at a given point in time. Once data is displayed, scrolling forward and backward based on interval in time may be performed.

The Config button displays a pop-up window allowing the specific Date/Time, CPU and Database to retrieve the data.

History CPU Detail Config Options

X

Specify Date/Time

Now

2003/10/22

15:35:00

CPU

1

Specify Database to View

30 Second interval

30 Second interval

2 Minute interval

1 Hour interval

1 Day interval

Request

Close

History / CPU

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 3.82) window. The title bar includes the MOMI logo and the text "MOMI - Multi-system Online Measure Interface (Client version 3.82)". The main window has a blue header with the Black Wood Systems, Inc. logo on the left and a system selection dropdown set to "\BWS1 Fast - 2002" on the right. Below the header is a navigation menu with buttons for "Systems", "Overview", "CPUs", "*Processes", "Files", "SubSystems", "History" (highlighted), and "Configure".

Below the navigation menu is a sub-menu with buttons for "Chart", "CPU Detail", "CPU" (highlighted), "Process", "OSS CPU", "OSS Name Server", "Process Start/Stop", and "Export Data".

The main content area displays a table titled "All CPU detail per second over 30 Second interval at Friday 2004/12/03 15:21:00". The table has 15 columns: CPU, Busy Time, Iruprt Time, Idle Time, Queue Time, Free Pages, Mem Lock, Page Fault, Mem Pressure, Process Created, Process Deleted, Disk I/Os, Cache Hits, and Dispatches. There are two rows of data for CPU 0 and CPU 1.

| CPU | Busy Time | Iruprt Time | Idle Time | Queue Time | Free Pages | Mem Lock | Page Fault | Mem Pressure | Process Created | Process Deleted | Disk I/Os | Cache Hits | Dispatches |
|-----|-----------|-------------|-----------|------------|------------|----------|------------|--------------|-----------------|-----------------|-----------|------------|------------|
| 0 | 18.17% | 1.51% | 81.83% | 0.46 | 108 | 165 | 0.00 | 0 | 0.00 | 0.00 | 15.16 | 25.23 | 268.42 |
| 1 | 22.21% | 1.14% | 77.54% | 0.64 | 98 | 164 | 1.71 | 1 | 0.20 | 0.10 | 12.93 | 15.62 | 221.55 |

At the bottom of the window, there is a control bar with buttons for "Clear", "Config", "Rated Values" (checked), "Request" (highlighted), "Backward", "Forward", "No Filter", "Displayed 2 of 2", "Not Logged On", "?", "Help", and "Print Screen".

The History / CPU screen presents all CPUs at a given point in time. Once data is displayed, scrolling forward and backward based on interval in time may be performed.

The Config button displays a pop-up window allowing the specific Date/Time and Database to retrieve the data.

History CPU Config Options X

| | |
|--|--|
| <p>Specify Date/Time</p> <p><input type="button" value="Now"/> 2003/10/24 <input type="button" value="v"/> 10:27:41 <input type="button" value="v"/></p> | <p>Specify Database to View</p> <p>30 Second interval <input type="button" value="v"/></p> |
|--|--|

History / Process

MOMI - Multi-system Online Measure Interface (Client version 3.80)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/10/28 13:38:03

Back Systems Overview CPUs Processes Files SubSystems *History Configure

Chart *CPU Detail CPU Process OSS CPU OSS Name Server Process Start/Stop Export Data

All Process detail per second over 30 Second interval at Thursday 2004/10/28 12:24:00

| Process | CPU,PIN | Busy Time | B | IPri | CPri | P | F | R | I | S | SI | PT | Mem | UserID | Login Name | Object |
|---------|----------|-----------|---|------|------|---|---|---|---|---|----|----|------|---------|-------------|-------------------------|
| \$DDL | 00,00392 | 32.2908% | | 31 | 31 | | | | | | | G | 1.1 | 100,109 | NET.DW | \$SYSTEM.SYSTEM.DDL |
| \$DATA1 | 01,00267 | 29.7099% | | 220 | 94 | P | | R | | | | G | 11.8 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYSDP2 |
| \$DATA1 | 00,00292 | 3.1829% | B | 220 | 220 | P | | | | | | G | 17.3 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYSDP2 |
| \$DATA1 | 01,00293 | 3.0433% | | 220 | 188 | P | | | | | | G | 2.5 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYSDP2 |
| \$ZOOMY | 01,00332 | 3.0281% | | 30 | 30 | | | | | | | G | 3.6 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.EVNTPRVD |
| \$ZOOMS | 00,00338 | 2.2832% | | 30 | 30 | | | | | | | G | 3.7 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.EVNTPRVD |
| \$DATA1 | 01,00265 | 1.6769% | | 220 | 188 | P | | | | | | G | 0.8 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYSDP2 |
| \$ZCMOM | 00,00330 | 1.6607% | | 30 | 30 | | | | | | | G | 16.3 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.CIMOM |
| \$MOMI2 | 00,00414 | 1.4007% | | 160 | 160 | | | | | | | G | 3.0 | 100,109 | NET.DW | \$DATA1.DALEMOMI.BWMOMI |
| \$ZOSM | 00,00329 | 1.3709% | | 100 | 100 | | | | | | | G | 3.8 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.APPSRVR |
| \$AUDIT | 01,00266 | 1.3348% | | 220 | 220 | P | | | | | | G | 6.2 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYSDP2 |
| \$ZNET | 00,00015 | 1.2957% | | 175 | 175 | P | | | | | | G | 0.8 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.SCP |
| | 00,00000 | 1.1111% | | 201 | 201 | P | | R | | | | G | 0.7 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.OSIMAGE |
| \$SWAP1 | 00,00288 | 1.0939% | | 220 | 220 | P | | | | | | G | 8.7 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.TSYSDP2 |
| | 01,00000 | 1.0362% | | 201 | 201 | P | | R | | | | G | 1.0 | 255,255 | SUPER.SUPER | \$SYSTEM.SYS30.OSIMAGE |
| \$ZEXP | 00,00040 | 0.8956% | | 180 | 180 | P | | | | | | G | 0.8 | 255,1 | SUPER.OPER | \$SYSTEM.SYS30.OZEXP |

Clear Config Rated Values Request

Not Logged On ? Help Print Screen

The History / Process screen presents all processes at a given point in time. Once data is displayed, scrolling forward and backward based on interval in time may be performed.

The Config button displays a pop-up window allowing the specific Date/Time and Database to retrieve the data.

History Process Config Options [X]

Specify Date/Time: [Now] [2003/10/24] [15:13:48]

Specify Database to View: [30 Second interval]

If Process Exists

[Request] [Close]

A search feature is available when a process name is desired and the exact time is not known. Click on the Checkbox "If Process Exists". A field to enter a process name is displayed. Type in the name of the process desired and a search will take place from the Date/Time specified forward until the process is found. Once the process is found, all processes for that 'found' Date/Time are displayed.

History Process Config Options [X]

Specify Date/Time: [Now] [2003/10/24] [15:13:48]

Specify Database to View: [30 Second interval]

If Process Exists [fred]

[Request] [Close]

History / OSS CPU

MOMI - Multi-system Online Measure Interface (Client version 3.82)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/12/03 15:29:40

Systems Overview CPUs *Processes Files SubSystems History Configure

Chart CPU Detail CPU Process OSS CPU OSS Name Server Process Start/Stop Export Data

All OSS CPU detail per second over 30 Second interval at Friday 2004/12/03 15:19:00

| CPU Nbr | Cache Block Size | Cache Blocks Allowed | FileSys Direct Reads | FileSys Direct RBytes | FileSys Direct Writes | FileSys Direct WBytes | FileSys Cache Reads | FileSys Cache RBytes | FileSys Cache Writes | FileSys Cache WBytes | FileSys Cache VQTime | FileSys Cache VMax | FileSys Cache AQTime | File Ca Af |
|---------|------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|---------------------|----------------------|----------------------|----------------------|----------------------|--------------------|----------------------|------------|
| 0 | 4,096 | 2,048 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 121 | 121 | 0.00 | |
| 1 | 4,096 | 2,048 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 107 | 107 | 0.00 | |

Clear Config Rated Values Request

Not Logged On ? Help Print Screen

The History / OSS CPU screen presents the MEASURE OSS CPU entity for all processors at a given point in time. Once data is displayed, scrolling forward and backward based on interval in time may be performed.

The Config button displays a pop-up window allowing the specific Date/Time and Database to retrieve the data.

History OSS CPU Config Options X

| | |
|--|--|
| <p>Specify Date/Time</p> <p><input type="button" value="Now"/> 2003/10/24 <input type="button" value="v"/> 15:13:48 <input type="button" value="v"/></p> | <p>Specify Database to View</p> <p>30 Second interval <input type="button" value="v"/></p> |
|--|--|

History / OSS Name Server

MOMI - Multi-system Online Measure Interface (Client version 3.80)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/10/28 12:27:50

Back Systems Overview CPUs Processes Files SubSystems ***History** Configure

*Chart *CPU Detail CPU Process OSS CPU **OSS Name Server** Process Start/Stop Export Data

All OSS Name Server detail per second over 30 Second interval at Thursday 2004/10/28 12:26:30

| Process Name | CPU,Pin | CPU Busy Pct | Name ResReqs Processed | Name ResReqs ReDirect | Name RR ReDirect Processed | Inode Cache Avail | Inode Cache QTime/Q | Inode Cache Lookups | Inode Cache Hits | Inode Cache Misses | Link Cache Avail |
|--------------|----------|--------------|------------------------|-----------------------|----------------------------|-------------------|---------------------|---------------------|------------------|--------------------|------------------|
| \$ZPNS | 00,00386 | 4.52 | 94.50 | 0.00 | 0.00 | 4,096 | 0.00 | 538.16 | 538.16 | 0.00 | 4,096.00 |

Clear Config Rated Values Request

Not Logged On ? Help Print Screen

The History / OSS Name Server screen presents the MEASURE OSS Name Server entity for all name servers running on the System. Once data is displayed, scrolling forward and backward based on interval in time may be performed.

Not all Name Servers will have information reported. Name Servers running, but unused, seem to not have MEASURE records reported.

The Config button displays a pop-up window allowing the specific Date/Time and Database to retrieve the data.

History OSS Name Servers Config Options X

| | | | | | | |
|---|---|---|---|---|--------------------|---|
| <p>Specify Date/Time</p> <table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 15%;"><input type="button" value="Now"/></td><td style="width: 25%;">2003/10/24 ▼</td><td style="width: 15%;">15:13:48 ↕</td></tr></table> | <input type="button" value="Now"/> | 2003/10/24 ▼ | 15:13:48 ↕ | <p>Specify Database to View</p> <table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 80%;">30 Second interval</td><td style="width: 20%; text-align: right;">▼</td></tr></table> | 30 Second interval | ▼ |
| <input type="button" value="Now"/> | 2003/10/24 ▼ | 15:13:48 ↕ | | | | |
| 30 Second interval | ▼ | | | | | |

History / Process Start/Stop

MOMI - Multi-system Online Measure Interface (Client version 3.80)

Black Wood Systems, Inc.

\BWS1 Fast - 2002

2004/10/28 13:43:15

Back Systems Overview CPUs Processes Files SubSystems *History Configure

Chart *CPU Detail CPU Process OSS CPU OSS Name Server **Process Start/Stop** Export Data

Processes STARTED

| Date/Time | Cpu,Pin | Process | B | Pri | PT | SI | Object | UserID | LoginName | Ancestor | Hor |
|---------------------|----------|---------|---|-----|----|----|-------------------------|---------|------------|----------|-----|
| 2004/10/28 13:11:59 | 00,00034 | \$STUCK | | 149 | G | | \$DATA1.DALE.FUP | 100,109 | NET.DW | \$Z2TG | \$Z |
| 2004/10/28 13:06:50 | 01,00406 | \$Z2V8 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 | \$Z |
| 2004/10/28 13:06:44 | 00,00035 | \$STUCK | | 149 | G | SI | \$DATA1.DALE.FUP | 100,109 | NET.DW | \$Z2TG | \$Z |
| 2004/10/28 13:05:37 | 01,00425 | \$Z2V7 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 | \$Z |
| 2004/10/28 13:05:34 | 01,00409 | \$Z2V6 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 | \$Z |
| 2004/10/28 13:19:52 | 00,00405 | \$Z2VQ | | 90 | G | | \$DATA1.MOMI2010.BWMOMI | 255,1 | SUPER.OPER | \$MOM0 | \$Z |

Processes STOPPED

| Date/Time | Cpu,Pin | Process | B | Pri | PT | SI | Object | UserID | LoginName | Ancestor | Home Ter |
|---------------------|----------|---------|---|-----|----|----|----------------------|---------|-----------|----------|----------|
| 2004/10/28 13:11:15 | 00,00035 | \$STUCK | | 149 | G | SI | \$DATA1.DALE.FUP | 100,109 | NET.DW | \$Z2TG | \$ZS1.#P |
| 2004/10/28 13:08:05 | 01,00406 | \$Z2V8 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 | \$ZHOME |
| 2004/10/28 13:06:00 | 01,00425 | \$Z2V7 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 | \$ZHOME |
| 2004/10/28 13:06:00 | 01,00409 | \$Z2V6 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 | \$ZHOME |
| 2004/10/28 13:05:20 | 01,00389 | \$Z2V4 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 | \$ZHOME |
| 2004/10/28 13:05:20 | 01,00399 | \$Z2V5 | | 90 | G | | \$DATA1.MOMI4.BWMOMI | 100,109 | NET.DW | \$MOMI4 | \$ZHOME |

First= 2004/10/28 13:13:26 Backward Forward Last= 2004/10/28 13:11:59

Clear Config Request Not Logged On ? Help Print Screen

The History / Process Start/Stop screen presents processes started and stopped from a given point in time. Once data is displayed, scrolling forward and backward based on interval in time may be performed.

The screen is similar to the [Processes / Last Start/Stop](#) screen except that the underlying information is derived from the MOMI history file. Searching for start/stop records through MOMI history may take some time.

The Config button displays a pop-up window allowing the specific Date/Time and Database to retrieve the data.

History Process Start/Stop Config Options X

| | |
|--|--|
| <p>Specify Date/Time</p> <p><input type="button" value="Now"/> 2003/10/24 <input type="button" value="v"/> 15:28:51 <input type="button" value="v"/></p> | <p>Specify Database to View</p> <p>30 Second interval <input type="button" value="v"/></p> |
|--|--|

History / Export Data

MOMI - Multi-system Online Measure Interface (Client version 4.19)

Black Wood Systems, Inc.

100
50
0

\BWS1-2004

Pause...

2006/11/09
15:22:14

Back

Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Chart 1 Chart 2 CPU Detail CPU Process OSS CPU OSS Name Server Process Start/Stop Export Data

1st select date and times and output format

Specify Start Date/Time
Now 2006/11/09 15:03:04

Limit Days and Times within
 Selected Start and Stop times

Specify Stop Date/Time
Now 2006/11/09 15:03:04

Report records in GMT Time

Delimited HTML

2nd select database

Specify Database to View
30 Second interval

3rd select type of data to export

CPU TMF Process System
 OSS CPU OSS Name Server

Limit Record Items to be Exported

4th select filtering criteria

Rated Values CPU: 0

All CPUs Process Name: All Processes

Select Limited Days and Times (optional)

Only these days
 All Days
 Sun Mon Tue Wed Thu Fri Sat

Only these Times
 All Times
Only from 00:00:00 Until 00:00:00

Select PROCESS Items to Export

System(non-rated)
 Date
 Time
 LCT/GMT
 CPU
 Pin
 Process

Export All

Create Export Script ...

Clear Export Data ...

Not Logged On Hints On ? Help Print Screen

The History / Export Data screen allows the creation of raw history of either delimited separated fields or HTML. The delimiter character, TAB by default, may be changed on [Settings / System Wide](#).

The export function provides a means to obtain raw MOMI data so that the User may generate desired reports or otherwise format data to meet their requirements.

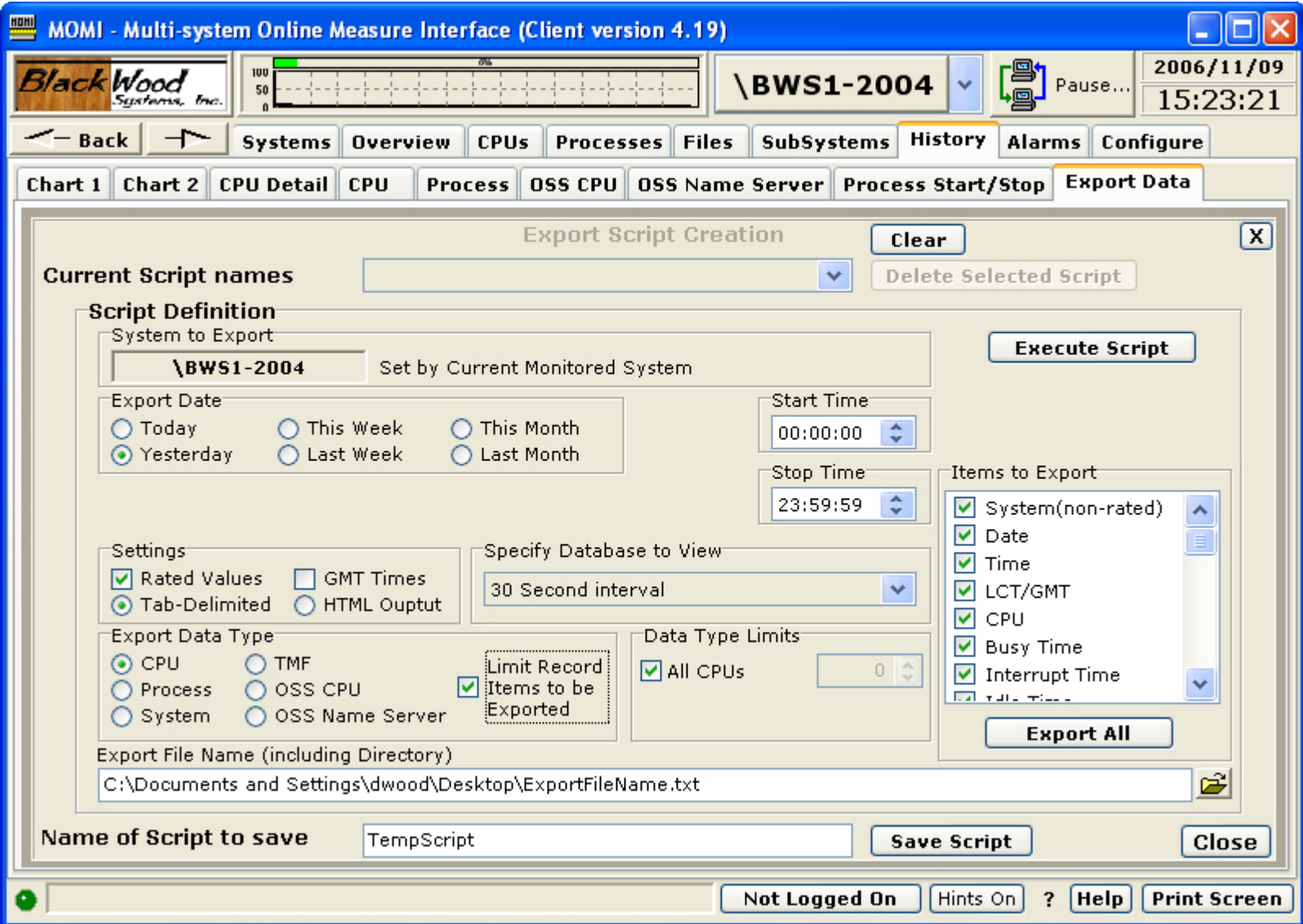
The column order of data exported is fixed, however the columns exported are selectable. New information provided with an entity is placed on the end of the export line.

History export may move a great deal of data. It is suggested that a 100 megabit or faster Ethernet network connection be used. The older 10 megabit half duplex Ethernet controller becomes a limiting factor to data transfer.

Start and Stop Date and Time are selected. The checkbox to "Limit Days and Times..." provides a means to report only certain days of the weeks and certain times of the day. By default, time stamps in the output records are in LCT (Local Civil Time). The checkbox "Report records in GMT Time" causes the time stamps to output in GMT (Greenwich Mean Time). This is particularly helpful when dealing with multiple systems in different time zones.

Database and type of data can be selected. Based on the type of data, different limiting criteria will display (CPU selection and/or process name).

An Export Script may be created providing a means to generate export based on predefined settings. Using an external means to start the PC MOMI Client (such as a scheduler), MOMI history export may be automatically generated to a predetermined location. A spreadsheet or database may then utilize the exported data.



The Export Script Creation dialog generally follows the same fields except providing relative export dates such as Today, Yesterday and Last Week.

The Export Script is given a name and is saved in the MOMI.INI file. Information on starting the Client with a script is found on the [Specifying run-time parameters](#) page.

Alarms

Alarms / Active

Alarms

2008/07/08 12:50:15

Back *Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Active Define List

| Started | Alarm Name | Alarm Info |
|----------|-----------------------------------|---|
| 11:04:31 | DISKFILE - TIMESTAMP OVER/UNDER | [+] DiskFile \$DATA1.ANDY2.FRED Timestamp age at 5 22:12:51 (over threshold |
| 11:04:31 | DISKFILE - OSS | DiskFile /home/dale/zzsa1234 is present |
| 11:04:31 | DISKFILE - OPEN / CLOSED | DiskFile \$SYSTEM.FRED.* was not found |
| 11:03:36 | PROCESS - NOT RUNNNG - \$B1->\$F1 | Process \$F1 is not running |
| 11:03:36 | PROCESS - NOT RUNNNG - \$B1->\$F1 | Process \$E1 is not running |
| 11:03:36 | PROCESS - NOT RUNNNG - \$B1->\$F1 | Process \$D1 is not running |
| 11:03:36 | PROCESS - NOT RUNNNG - \$B1->\$F1 | Process \$C1 is not running |
| 11:03:36 | PROCESS - NOT RUNNNG - \$B1 \$C1 | Process \$C1 is not running |
| 11:03:36 | PROCESS - NOT RUNNNG - \$B1->\$F1 | Process \$B1 is not running |
| 11:03:36 | PROCESS - NOT RUNNNG - \$B1 \$C1 | Process \$B1 is not running |
| 12:50:06 | SPOOLER - COLLECTOR FULL | Spooler \$S Collector - Percent full at 9% (over threshold of 1%) |
| 11:04:32 | TMF - TAPE MOUNT | [+] TMF Tape mount: DAT019 |
| 11:03:43 | EXPAND - LINE DOWN | Expand \$EP2BWS2 is DOWN |
| 12:40:00 | CPU - TOO MANY CPU CYCLES | CPU 1 Busy percent at 4% (under threshold of 80%) |
| 12:40:00 | CPU - TOO MANY CPU CYCLES | CPU 0 Busy percent at 5% (under threshold of 80%) |

Active (15) All (15) Only (0) TempOff/Hidden (0) Legend Actions Displayed 15

Chat Not Logged On Hints On ? Help Print Screen

The Alarms / Active screen presents a list of alarms currently triggered or have met the required threshold criteria.

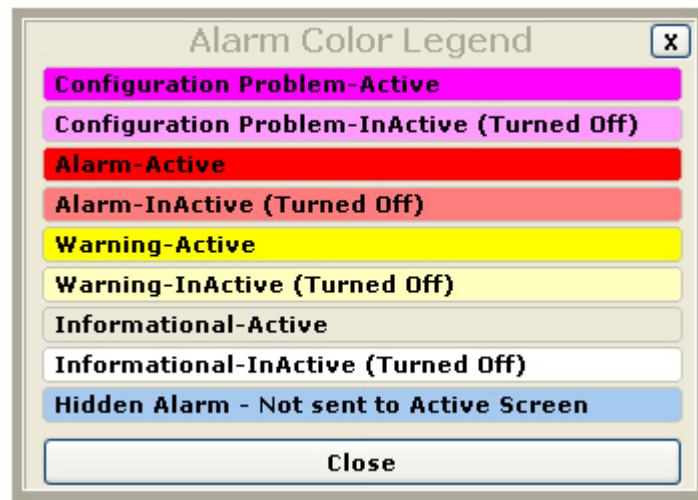
Alarms are initially defined on the [Define / Alarm](#) screen. If the defined threshold is reached, and an on-screen action is requested, the alarm appears on this screen.

The buttons **Active**, **All**, **Only** and **TempOff/Hidden** control the information displayed in the main portion of the screen. The **Active** button displays only alarms that are triggered or have met their criteria. The **All** button displays every active alarm. The **Only** button displays a particular selected type of alarm after right-clicking over the button and choosing an alarm type.

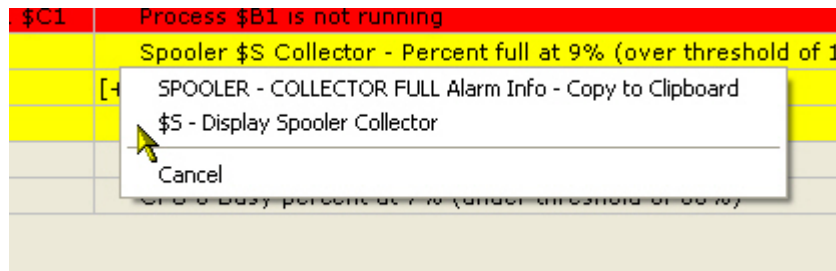


These image buttons control sounds associated with alarms. In order from left to right, they stop current sounds, replay last sound and replay all sounds.

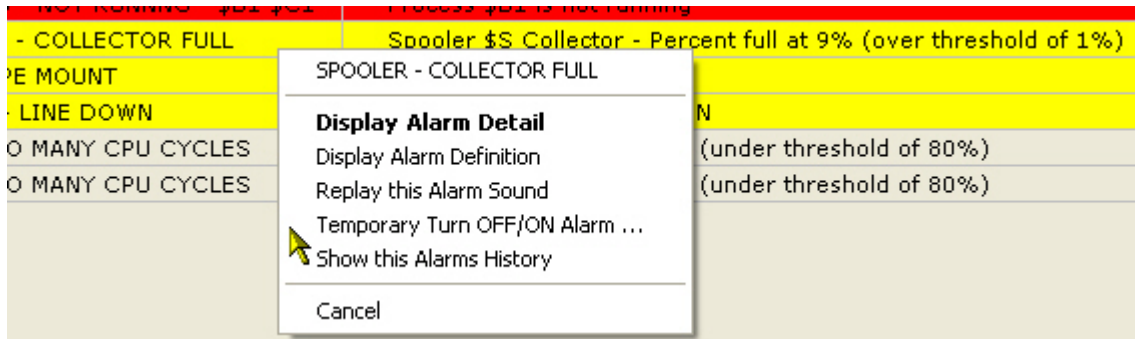
The **Legend** button displays a description of the colors used on screen. The primary alarm colors used are normal, yellow, red and purple (or really red) in order of least to greatest concern. Purple alarms are reserved for internal MOMI use to alert the user that an alarm configuration error was detected.



Right-clicking over the Alarm Info provides a jump, if one is available, to a MOMI screen that applies to the Alarm. In the image below, jump for a Spooler Collector percent full is to the screen Subsystems / Spool / Collector.



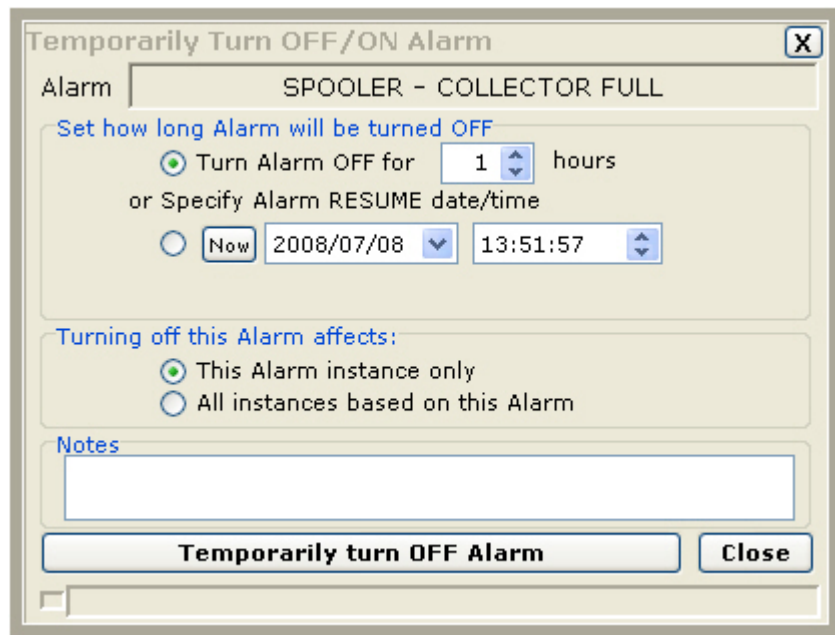
Right-clicking over the Alarm Name to display a list of options.



Jumping to the [Alarm Definition](#) screen allows the user to quickly access the threshold for an alarm.

Jumping to **Show this Alarms History** (i.e. LogFile) screen displays creates a temporary filter on this screen to show only the items associated with the selected alarm. LogFile records are only generated if the action is configured to do so.

Temporary Turn OFF/ON Alarm allows a secured user the ability remove an active alarm from the screen. This feature provides an ability to remove an alarm when it cannot be resolved for a period of time.



By default the screen display only active alarms. Temporarily turned off alarms or otherwise hidden alarms may also be displayed along with all alarms. The screen below displays Temporarily turned off alarms.

2008/07/08
12:52:11

Alarms
\BWS1-2004
Pause...

Back *Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Active Define List

| Started | Alarm Name | Alarm Info |
|----------|--------------------------|---|
| 12:50:06 | SPOOLER - COLLECTOR FULL | Spooler \$S Collector - Percent full at 9% (over threshold of 1%) |

Active (14) All (15) Only (0) TempOff/Hidden (1)
Legend Actions Displayed 1

Chat Not Logged On Hints On ? Help Print Screen

Pressing the **Actions** button allows a secured user the ability suspend or resume all alarm processing. Any active alarm is removed if processing is suspended. This feature is used, for example, to prevent alarm processing during a maintenance window. This function may be used in conjunction with the CONFMOMI keyword [ALARM-SUSPEND-DELAY](#) that suspends alarm processing at the startup of MOMI.

Suspend/Resume ALL Alarm processing X

Set how long Alarm processing will be **SUSPENDED**

Suspend Alarms for hours

or Specify Alarm RESUME date/time

or Suspend Alarms PERMANENTLY

or **RESUME All Alarm processing NOW**

Notes

Define

Define / Alarm

The screenshot shows the 'Define Alarm Entity' window in the MOMI software. The window title is 'MOMI - Multi-system Online Measure Interface (Client version 4.01)'. The interface includes a navigation bar with tabs for 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. The 'Alarms' tab is selected. Below the navigation bar, there are sub-tabs for 'Active', 'Define', and 'List', with 'Define' being the active one. The 'Define Alarm Entity' screen contains the following elements:

- Disable this Alarm** (checkbox)
- Alarm Name**: PROCESS - NOT RUNNING - \$FRED (dropdown menu)
- Description**: process not running (text input field)
- Entity Type**: Process (dropdown menu)
- Entity Sub Type**: State running/stopped (dropdown menu)
- Settings 1** and **Sound** tabs
- Event**: Entity is Stopped (DOWN) (dropdown menu)
- Delay Alarm**: Do NOT Delay Alarm (dropdown menu)
- Times**: <ALWAYS> (dropdown menu) with a **View** button
- Action**: SCREEN RED - LOG (dropdown menu) with a **View** button
- Entity Name**: \$fred (text input field)
- Buttons**: Display, Save New, Change, Delete
- Clear Screen** button
- Footer**: net.dw, ?, Help, Print Screen

The Define / Alarm screen allows the creation and maintenance of alarms and the trigger threshold(s).

The field **Disable this Alarm** provides the ability to turn-off or prevent the processing of the record without deleting it.

The field **Alarm Name** is used to give the alarm a unique identification. This name appears on the [Active](#) Alarm screen and should provide a general idea of what the alarm represents. Existing alarms are selected in the drop-down box.

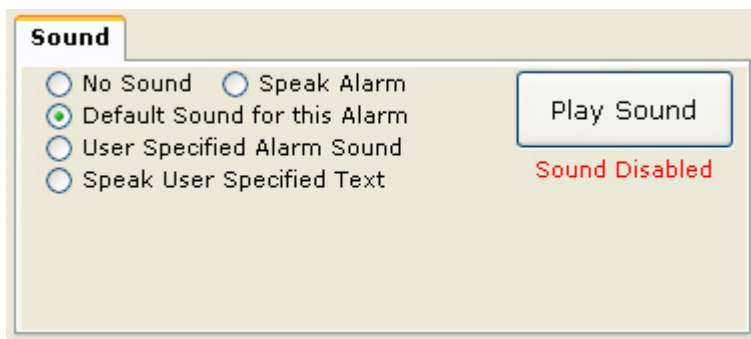
The Alarm Name field may contain the characters [] to enclose text that will not display on the [Active](#) Alarm screen. This may be used to cause the Alarm Name to appear more generic if needed. Examples:

| <u>Alarm Name</u> | <u>What displays on Active Alarm</u> |
|--------------------------------|--------------------------------------|
| PROCESS - NOT RUNNING \$FRED | PROCESS - NOT RUNNING \$FRED |
| PROCESS - NOT RUNNING [\$FRED] | PROCESS - NOT RUNNING |

The description field provides free form text to explain the nature of the definition.

The Entity Type column provides a list of general categories available. A selection in this column determines the contents of the Entity Sub Type column.

The Entity Sub Type column is a list of the alarm-able items under an Entity. A selection in this column determines the contents of events just to the right. Events are specific to each Sub Type. Place the mouse over events for additional information.



Sounds may be associated with an active Alarm. The available options are 1) speak the alarm, 2) a default or pre-selected message, 3) a user specified sound or 4) speak a user specified text string.

The ability to generate sound requires sound card capability in the PC. See [Speech](#) for additional information concerning the ability to speak.

The [Times](#) drop-down box selects the monitor times for the alarm. By default, if no selection is made, monitoring is continuous.

The Action drop-down box selects what should occur in the event an alarm occurs. By default, if no selection is made, the Alarm appears on the [Active](#) screen in red.

The Entity Name field is used to enter CPU numbers, file and process names.

Creating an Alarm or a Change (i.e. update) of an existing alarm causes all current Alarms (if any) to clear.

Detailed Information

EMS - User Defined

The screenshot displays the MOMI (Client version 5.08) interface. The title bar shows the path \BWS1-2004 MOMI (Client version 5.08). The main window features a navigation bar with tabs: Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The 'Alarms' tab is active, and the 'Define Alarm Entity' window is open. The 'Define Alarm Entity' window has a 'Disable this Alarm' checkbox (unchecked) and a 'Last Update' field showing 2008/12/24 15:14:55. The 'Alarm Name' is 'EMSTEST' and the 'Description' is 'found specific message'. The 'Entity Type' is 'EMS' and the 'Entity Sub Type' is 'User defined'. The 'Settings 1' tab is selected, showing options for 'Include if ANY', '*Include if ALL', 'Exclude if ANY', and 'Exclude if ALL'. The 'Include if ALL' option is selected, and the text 'fred smith' is entered in the adjacent text area. The 'Action' is set to 'SCREEN YELLOW'. The 'Entity Name' is '\$0 \$clog \$*' and the 'Action' is 'SCREEN YELLOW'. The interface includes buttons for 'Display', 'Save New', 'Change', 'Delete', and 'Clear Screen'. The status bar at the bottom shows 'Chat', 'Not Logged On', 'Hints On', '?', 'Help', and 'Print Screen'.

The alarm EMS / User defined provides a method to generate an alarm based on the content of an EMS message. The EMS message may be located in \$0 or in another EMS collector that MOMI can access.

The alarm is triggered, and potentially cleared, by defining a series of logical conditions. The criteria for the logical conditions are entered into the text area next to the selections of "Include if ANY", "Include if ALL", "Exclude if ANY" and "Exclude if ALL". Each selection has its own text area where zero or more lines of text are entered. A line of text is evaluated in its entirety. For example, "Fred Smith" is considered as one single

entry whereas one line of "Fred" and a second line of "Smith" means that these words may appear anywhere within the EMS message (i.e. don't have to be together). The text comparison is not case sensitive.

If criteria for "include" is successful, while considering "excludes", then the alarm is triggered, or potentially cleared. Here is the general order of how entered text (i.e. criteria) is evaluated:

- **Exclude if ANY** means that if any single line of text matches, no alarm is generated.
- **Exclude if ALL** means that if ALL lines of text matches, no alarm is generated.
- **Include if ANY** means that if any single line of text matches, the alarm is generated.
- **Include if ALL** means that if all lines of text matches, the alarm is generated.

Note that Excludes are evaluated first. Any 'match' of excludes means that no alarm is generated. Once Excludes are evaluated, then Includes are examined. It is necessary to successfully match an Include in order to generate an alarm.

The **EMS Set** tab fields are used to determine if an alarm is generated. The **EMS Clear** fields, which are optional, are used to determine if an alarm triggered by EMS Set should be automatically cleared.

EMS messages with an SSID of BWS, which is the SSID used by MOMI, are ignored. This prevents a potential "looping" situation where an Alarm triggered by an EMS message, causes an EMS message that triggers an alarm, that causes an EMS message that triggers an alarm, and so on...

Define / Action

MOMI - Multi-system Online Measure Interface (Client version 4.01)

Black Wood Systems, Inc.

\BWS1-2004

2005/09/30 15:10:23

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Active Define List

Alarm Action Times Email Email Group Export Import

Disable this Action Define Alarm Action Last Update 2005/08/29 14:40:50

Action Name SCREEN RED - LOG

Description send to screen in red and to MOMI log, EMS and EMAIL

Alarm Action to perform

Send to Screen Red Alarm Send Changes

Send to LOG Red Alarm Send Changes

Send to EMS Normal Message Send Changes

Send to EMAIL DALE WOOD Send EMAIL when Alarm is Cleared

View

Display Save New Change Delete

Clear Screen

net.dw ? Help Print Screen

The Define / Action screen allows the creation and maintenance of what happens when an alarm is triggered.

An Action is a set of notifications that occur when the alarm is triggered. The notification consists of any or all of the following:

- display on the [Active Alarm](#) screen
- generate an event to the MOMI LogFile
- generate an EMS message
- generate an [Email](#)

The field **Disable this Action** provides the ability to prevent the processing of the record without deleting it. However, a disabled Action still results in the default of Send to Screen as red.

A color is associated with Send to Screen and Send to LOG. Red is considered the most severe and Screen the least. An incrementing alarm starts with on screen, changes to yellow and finally to red based on the Escalation Interval.

Alarm Action to perform

Send to Screen
 Send to LOG
 Send to EMS
 Send to EMAIL

Incrementing Alarm
Screen Alarm
Yellow Alarm
Red Alarm
Incrementing Alarm

Severity Escalation Interval in minutes: 60

The MOMI LOG is an event file maintained by MOMI. It is accessed on the screen LogFile. Send Changes indicates that any change in the Alarm messages is logged. By default, only the first and last (or clear) are logged.

Alarm Action to perform

Send to Screen
 Send to LOG
 Send to EMS
 Send to EMAIL

Incrementing Alarm
Screen Alarm
Yellow Alarm
Red Alarm
Incrementing Alarm

Send Changes

Severity Escalation Interval in minutes: 60

An EMS message has the attributes of Action, Emphasis and Normal. EMS messages are access on the screen [EMS Msgs](#). Send Changes indicates that any change in the Alarm messages is logged. By default, only the first and last (or clear) are logged.

Alarm Action to perform

Send to Screen
 Send to LOG
 Send to EMS
 Send to EMAIL

Action Message
Normal Message
Emphasis Message
Action Message

Send Changes

Email may be sent to either an individual address or a group. By default, only the first Alarm message is sent. The option "Send EMAIL when Alarm is Cleared" cause the Alarm clear to also be sent.

Alarm Action to perform

Send to Screen

Send to LOG

Send to EMS

Send to EMAIL

Send EMAIL when Alarm is Cleared

<NONE>

*GRP-EVERYBODY

<NONE >

DALE WOOD

STEVE BLACK

Define / Times

MOMI - Multi-system Online Measure Interface (Client version 4.01)

BlackWood Systems, Inc.

\BWS1-2004

2005/09/30 15:11:12

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Active Define List

Alarm Action Times Email Email Group Export Import

Disable this Monitor Time Define Alarm Monitor Times Last Update 2005/09/01 11:51:05

Times Name: PRODUCTION HOURS

Description: 8 to 5 monday through friday

Left-click - select time
Right-click - clear time

| Sel/Clear All | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monday | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Tuesday | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Wednesday | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Thursday | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Friday | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Saturday | | | | | | | | | | | | | | | | | | | | | | | | |
| Sunday | | | | | | | | | | | | | | | | | | | | | | | | |

Clear All Times Select All Times Display Save New Change Delete

Clear Screen

net.dw ? Help Print Screen

The Define / Times screen allows the creation and maintenance records used to determine periods of time.

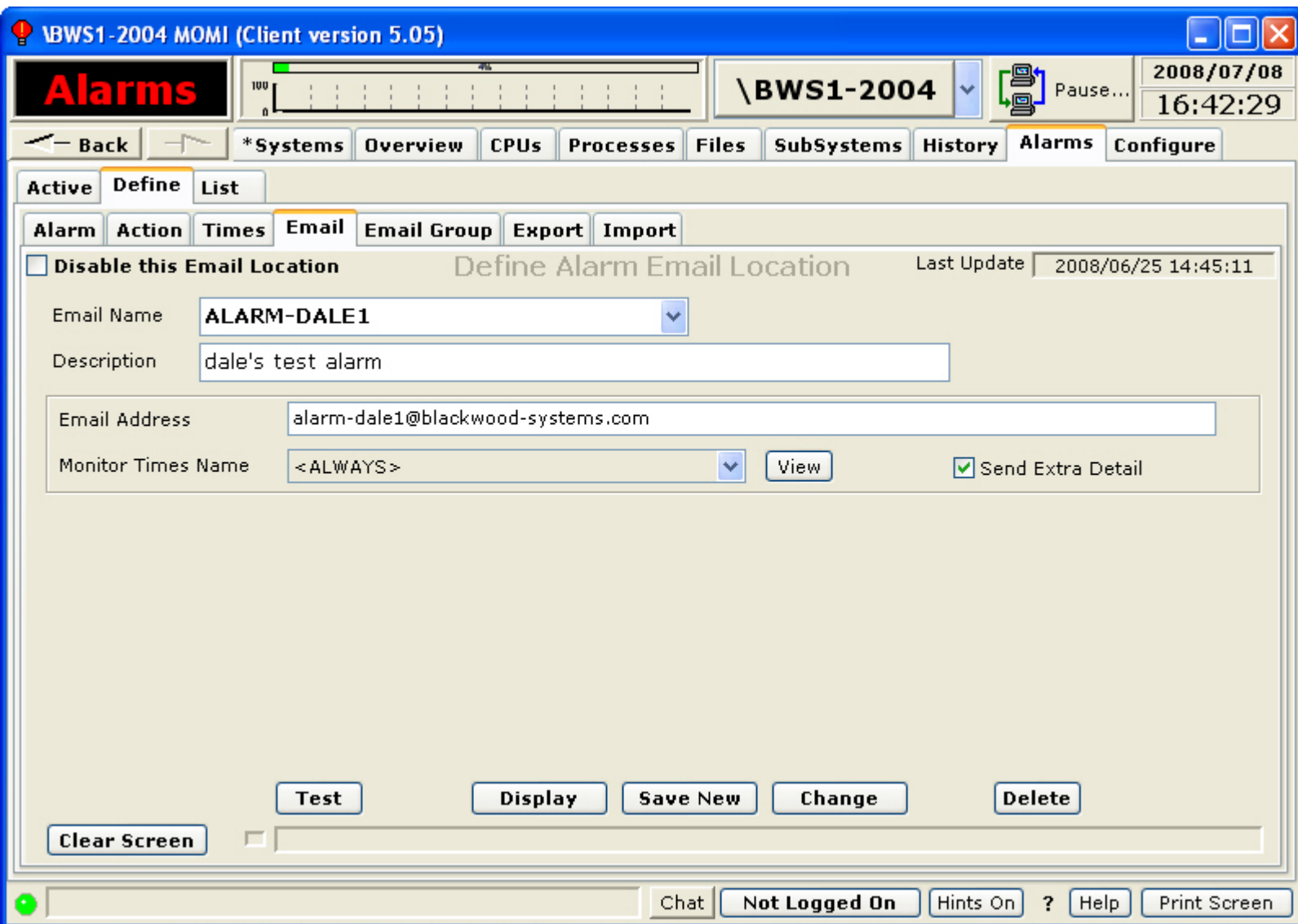
Records defined here do not in-and-of themselves perform any action. But rather are referenced in other definitions, such as in Alarm and Email.

The field **Disable this Monitor Time** provides the ability to prevent the processing of the record without deleting it. However, a disabled Monitor Time still results in the default of monitored all the time.

A Monitor Times record provides 1/2 hour increments Monday through Sunday.

Place the mouse over a desired time period and press the left mouse button. Holding the button down and moving the mouse allows setting of multiple cells. Using the right mouse button clears cells. All cells may be set or cleared by clicking on the Clear All Times or Select All Times buttons.

Define / Email



The Define / Email screen allows the creation and maintenance of Email records.

Records defined here do not in-and-of themselves perform any action. But rather are referenced in other definitions.

The field **Disable this Email Location** when checked prevents sending of an email to the recipient.

The field **Send Extra Detail** causes the inclusion of additional information, if available, within the email for this particular entry.

The field **Monitor Times Name** may be specified to place a time limitation on emails.

The Test button generates a test email. This helps insure that the information entered is correct and that MOMI is configured properly.

In order to generate email, it is necessary to define several keywords in the CONFMOMI file. See [Alarm Overview](#) for more information.

Define / Email Group

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.18) window. The title bar includes the BlackWood Systems, Inc. logo, a progress bar, the system name '\BWS1-2004', a 'Pause...' button, and the date/time '2006/10/03 17:28:42'. The main menu includes 'Back', 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. The 'Alarms' tab is active, and the 'Define Alarm Email Group' sub-tab is selected. The 'Define Alarm Email Group' window has a 'Last Update' of '2006/10/03 14:50:06'. It contains a 'Group Name' dropdown menu set to '*GRP-EVERYBODY', a 'Description' text box with 'the whole gang', and a 'User Emails included in this Group' section with a 'View' button and an 'Add User to Group' button. Below this is a table with columns: Disabled, Email Name, Description, Email Address, and Monitor Times. The table contains two rows of data. At the bottom of the window are buttons for 'Test', 'Display', 'Save New', 'Change', and 'Delete', along with a 'Clear Screen' button and a status bar with 'net.dw', 'Hints On', '?', 'Help', and 'Print Screen'.

Disable this Email Group

Group Name: *GRP-EVERYBODY

Description: the whole gang

User Emails included in this Group

| Disabled | Email Name | Description | Email Address | Monitor Times |
|----------|-------------|-------------------|-----------------------------------|---------------|
| Disabled | ALARM-DALE3 | dale's test alarm | alarm-dale3@blackwood-systems.com | - |
| | ALARM-DALE1 | dale's test alarm | alarm-dale1@blackwood-systems.com | - |

The Define / Email Group screen allows the creation and maintenance of Email group records. A group record is a reference to one name that represents one or more previously created [Email](#) definitions.

Records defined here do not in-and-of themselves perform any action. But rather are referenced in other definitions.

The field **Disable this Email Group** provides the ability to prevent the processing of the record without deleting it.

In order to use email, it is necessary to set several keywords in the CONFMOMI file. See the [Alarm Overview](#) page for more information.

The Test button generates a test email using the settings defined for Alarm Email.

Define / Export

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.18) window. The title bar includes the BlackWood Systems, Inc. logo and a progress bar. The main menu includes Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The 'Alarms' tab is active, and the 'Export' sub-tab is selected. The 'ALARMS' list contains the following items:

| Alarm | Action | Times | Email | Email Group | Export | Import |
|-------------------------------------|------------------------------|-------|-------|-------------|--|--------|
| <input checked="" type="checkbox"/> | CPU - PROCESS LOOPING | | | | - process looping and o/s is reducing cpu priority | |
| <input type="checkbox"/> | CPU BUSY | | | | - cpu busy testing | |
| <input checked="" type="checkbox"/> | CPU-PHYSICAL-MEMORY-LOCKED | | | | - | |
| <input type="checkbox"/> | DEVICE - ENVOY | | | | - | |
| <input type="checkbox"/> | DEVICE - TEST X.25 | | | | - | |
| <input type="checkbox"/> | DISKFILE - EXTENTS | | | | - testing with extents and audited file | |
| <input type="checkbox"/> | DISKFILE - FILE FULL TEST | | | | - testing fill full with exceptions | |
| <input type="checkbox"/> | DISKFILE - NOT VERY FULL | | | | - file with not much data | |
| <input type="checkbox"/> | DISKFILE - OPEN / CLOSED | | | | - check open/closed state | |
| <input type="checkbox"/> | DISKFILE - PERCENT FULL | | | | - testing with extents and audited file | |
| <input type="checkbox"/> | DUST | | | | - some description | |
| <input type="checkbox"/> | EMS - USER DEFINED - STORAGE | | | | - DP2 message logged | |
| <input type="checkbox"/> | EMS EXPAND | | | | - | |
| <input type="checkbox"/> | EMS WAKE MESSAGE INDICATOR | | | | - alarm based on an ems message? | |
| <input type="checkbox"/> | EMSTEST | | | | - found specific message | |
| <input type="checkbox"/> | EXPAND - LINE DOWN | | | | - | |
| <input type="checkbox"/> | EXPAND - LINE DOWN \$EL1EWS2 | | | | - asdf | |

Buttons at the bottom of the screen include: Clear Screen, Select ALL, Select NONE, Export Selected, net.dw, Hints On, Help, and Print Screen. The system name is \BWS1-2004 and the date/time is 2006/10/03 17:44:20.

The Define / Export screen provides a means to transfer to a text file Alarm and supporting definitions. The screen [Import](#) is used to bring the information back into the system, usually in a different MOMI environment.

Check the desired items to export and press Export Selected button. Items selected for Export will automatically contain any dependencies.

A pop-up window displays the result of the export operation.



\BWS1-2004

Pause...

2006/10/03
17:45:17

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Active Define List

Alarm Action Times Email Email Group Export Import

ALARMS

- CPU - PROCESS LOOPING - p
- CPU BUSY - c
- CPU-PHYSICAL-MEMORY-LOCKED -
- DEVICE - ENVOY -
- DEVICE - TEST X.25 -
- DISKFILE - EXTENTS - t
- DISKFILE - FILE FULL TEST - t
- DISKFILE - NOT VERY FULL - f
- DISKFILE - OPEN / CLOSED - c
- DISKFILE - PERCENT FULL - t
- DUST - s
- EMS - USER DEFINED - STORAGE - D
- EMS EXPAND -
- EMS WAKE MESSAGE INDICATOR - a
- EMSTEST - f
- EXPAND - LINE DOWN -
- EXPAND - LINE DOWN \$EL1BWS2 - a

Export Items Status

```

ALARM "CPU - PROCESS LOOPING" Exported OK
ALARM "CPU-PHYSICAL-MEMORY-LOCKED" Exported OK
ACTION "EMAIL_EVERYONE" Exported OK
EMAIL "ALARM-DALE3" Exported OK
EMAIL "ALARM-DALE1" Exported OK
EMAILGROUP "*GRP-EVERYBODY" Exported OK
***** Export Finished *****

```

Select ALL

Select NONE

Export Selected

Clear Screen

Exported total of 6 records

net.dw

Hints On

?

Help

Print Screen

Define / Import

The screenshot displays the MOMI - Multi-system Online Measure Interface (Client version 4.18) in the 'Define / Import' mode. The window title bar shows the system name as '\BWS1-2004' and the date/time as '2006/10/03 17:36:42'. The interface includes a navigation menu with options like 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. The 'Alarms' section is currently active, showing a list of items under various categories: ALARMS, ACTIONS, MONITOR TIMES, EMAILS, and EMAIL GROUPS. The 'CPU - CPU BOUND' alarm is selected and checked. The 'Import' tab is active, and the 'Import Selected' button is visible. The interface also includes a 'Back' button, a 'Pause...' button, and a 'net.dw' button at the bottom.

| Alarm | Action | Times | Email | Email Group | Export | Import |
|---|------------------------------|-------|-------|-------------|--------|--------|
| <input checked="" type="checkbox"/> CPU - CPU BOUND | - CPU - CPU BOUND | | | | | |
| <input type="checkbox"/> CPU - PROCESS LOOPING | - CPU - PROCESS LOOPING | | | | | |
| <input type="checkbox"/> CPU-PHYSICAL-MEMORY-LOCKED | - CPU-PHYSICAL-MEMORY-LOCKED | | | | | |
| <input type="checkbox"/> DEVICE - ENVOY | - DEVICE - ENVOY | | | | | |
| ACTIONS | | | | | | |
| <input type="checkbox"/> EMAIL_EVERYONE | - EMAIL_EVERYONE | | | | | |
| <input type="checkbox"/> INFO-TEST | - INFO-TEST | | | | | |
| MONITOR TIMES | | | | | | |
| <input type="checkbox"/> 24-HOURS | - 24-HOURS | | | | | |
| <input type="checkbox"/> PRODUCTION HOURS | - PRODUCTION HOURS | | | | | |
| EMAILS | | | | | | |
| <input type="checkbox"/> ALARM-DALE1 | - ALARM-DALE1 | | | | | |
| <input type="checkbox"/> DALE PHONE | - DALE PHONE | | | | | |
| EMAIL GROUPS | | | | | | |
| <input type="checkbox"/> *GRP-EVERYBODY | - *GRP-EVERYBODY | | | | | |

The Define / Import screen provides a means to transfer from a text file Alarm and supporting definitions.

The import operation involves two phases. The first phase is to read and import file and the second is to perform the actual import operation.

Press the button Open Import File and selected the desired text file. The entries are read and displayed. Check the desired items to Import and press Import Selected button to complete the import operation. Lines that are not enabled (i.e. grayed out) already exist and cannot be imported.

A pop-up window displays the result of the import operation.



\BWS1-2004



2006/10/03
17:38:18

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Active Define List

Alarm Action Times Email Email Group Export Import

- ALARMS**
 - CPU - CPU BOUND - C
 - CPU - PROCESS LOOPING - C
 - CPU-PHYSICAL-MEMORY-LOCKED - C
 - DEVICE - ENVOY - D
- ACTIONS**
 - EMAIL_EVERYONE - E
 - INFO-TEST - I
- MONITOR TIMES**
 - 24-HOURS - 2
 - PRODUCTION HOURS - P
- EMAILS**
 - ALARM-DALE1 - A
 - DALE PHONE - D
- EMAIL GROUPS**
 - *GRP-EVERYBODY - *

Import Items Status [X]

ALARM "CPU - CPU BOUND" Imported OK
 ***** Import Finished *****

Close Import Count 1

Open Import File Select ALL Select NONE Import Selected Clear Screen

List

List / Alarm

The screenshot shows the MOMI interface with the following components:

- Header:** MOMI - Multi-system Online Measure Interface (Client version 4.00)
- System:** \BWS1-2004
- Date/Time:** 2005/08/29 16:19:57
- Navigation:** Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, Configure
- Sub-headers:** Active, Define, List
- Table Headers:** Alarm, Action, Times, Email, Email Group
- Table Columns:** Disabled, Alarm Name, Alarm Description, Entity Name, Entity Type, Entity SubType
- Table Data:** 11 rows of alarm records, including CPU, DISKFILE, EXPAND, PROCESS, SPOOLER, and VOLUME.
- Context Menu:** VOLUME - FULL - Display Alarm Definition, VOLUME - FULL - Display Alarm Monitor Times Definition, VOLUME - FULL - Display Alarm Action Definition, VOLUME - FULL - DISABLE Alarm
- Footer:** No Filter, Displayed 11 of 11, net.dw, Help, Print Screen

The List / Alarm screen displays a tabular summary of currently defined records.

A left-click jumps to the Define screen for an Alarm. Several right-click options are available to jump to the Define / Alarm screen, Monitor Times and Action screens. Also, a record may be disabled (which effectively turns it off but does not delete it).

List / Action

MOMI - Multi-system Online Measure Interface (Client version 4.00)

Alarms | \BWS1-2004 | 2005/09/01 13:18:39

← Back | Systems | Overview | CPUs | Processes | Files | SubSystems | History | **Alarms** | Configure

Active | Define | **List**

| Alarm | Action | Times | Email | Email Group | | | | | |
|----------|------------------|---------------------------------------|----------------|---------------|--------------------|-------------|----------|------------|----------|
| Disabled | Action Name | Action Description | Send To Screen | OnScreen Type | Increment Interval | Send To Log | Log Type | Log Detail | Send EM: |
| | SCREEN | send to screen normal | Screen | Screen | - | - | - | - | - |
| | SCREEN RED - LOG | send to screen in red and to MOMI log | Screen | Red | - | Log | Red | F | - |
| | SCREEN YELLOW | send to screen in yellow | Screen | Yellow | - | - | - | - | - |

SCREEN YELLOW - Display Action Definition
SCREEN YELLOW - DISABLE Action

No Filter | Displayed 3 of 3

Not Logged On | ? | Help | Print Screen

The List / Action screen displays a tabular summary of currently defined records.

A left-click jumps to the Define screen for an Action. A right-click is available to disable a record (which effectively turns it off but does not delete it).

List / Times

MOMI - Multi-system Online Measure Interface (Client version 4.00)

Alarms

\BWS1-2004

2005/09/01 13:20:22

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Active Define List

Alarm Action Times Email Email Group

| Disabled | MonTime Name | MonTime Description | Monitor Times | Last Update |
|----------|------------------|------------------------------|---------------|---------------------|
| | 24-HOURS | round the clock | <Times> | 2005/08/29 16:18:31 |
| | PRODUCTION HOURS | 8 to 5 monday through friday | <Times> | 2005/09/01 11:51:05 |

PRODUCTION HOURS - Display Times Definition
PRODUCTION HOURS - DISABLE Time

No Filter Displayed 2 of 2

Not Logged On ? Help Print Screen

The List / Times screen displays a tabular summary of currently defined records.

A left-click jumps to the Define screen for an Times. A right-click is available to disable a record (which effectively turns it off but does not delete it).

List / Email

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.00) window. The title bar includes a red warning icon, the text 'MOMI - Multi-system Online Measure Interface (Client version 4.00)', and standard window controls. The main interface features a navigation menu with buttons for 'Back', 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. The 'Alarms' tab is selected, and the 'List' sub-tab is active. A table displays the following data:

| Disabled | Email Name | Email Description | Email Address | Last Update |
|----------|-------------|-------------------|------------------------------|---------------------|
| | DALE WOOD | dale's email | dwood@blackwood-systems.com | 2005/08/29 14:43:22 |
| | STEVE BLACK | steve's email | sblack@blackwood-systems.com | 2005/08/29 14:43:36 |

A context menu is open over the 'STEVE BLACK' row, showing the following options:

- STEVE BLACK - Display Email Definition
- STEVE BLACK - DISABLE Email

The bottom of the window shows a status bar with 'No Filter', 'Displayed 2 of 2', and buttons for 'Not Logged On', '?', 'Help', and 'Print Screen'.

The List / Email screen displays a tabular summary of currently defined records.

A left-click jumps to the Define screen for an Email. A right-click is available to disable a record (which effectively turns it off but does not delete it).

List / Email Group

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.00) window. The title bar indicates the system is \BWS1-2004. The main interface has a navigation menu with options: Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The 'Alarms' tab is active, and the 'List' sub-tab is selected. A table displays the following data:

| Disabled | Group Name | Group Description | Email Addresses | Last Update |
|----------|----------------|-------------------|-----------------|---------------------|
| | *GRP-EVERYBODY | the whole gang | <Addresses> | 2005/08/29 14:44:00 |

A context menu is open over the first row, showing the following options:

- *GRP-EVERYBODY - Display Email Group Definition
- *GRP-EVERYBODY - DISABLE Email Group

At the bottom of the window, there are buttons for 'Not Logged On', '?', 'Help', and 'Print Screen'. The status bar shows 'No Filter' and 'Displayed 1 of 1'.

The List / Email Group screen displays a tabular summary of currently defined records.

A left-click jumps to the Define screen for an Email Group. A right-click is available to disable a record (which effectively turns it off but does not delete it).

Configure

Diagnostics

MOMI - Multi-system Online Measure Interface (Client version 4.12)

BlackWood Systems, Inc.

100
50
0

0%

\BWS1-2004

Pause...

2006/04/21
14:56:06

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Diagnostics Server Settings Define Systems Client Access UserHints Tools Reference

Server

Password valid serial # W40344 - Upgrades until 2006/06/30 (yyyy/mm/dd)

None Found

Client

Client Location: D:\Data\dwood\Momi\

None Found

Save Diagnostic and Config Info to File

EMail Diagnostic and Config Info to BlackWood

Not Logged On Hints On ? Help Print Screen

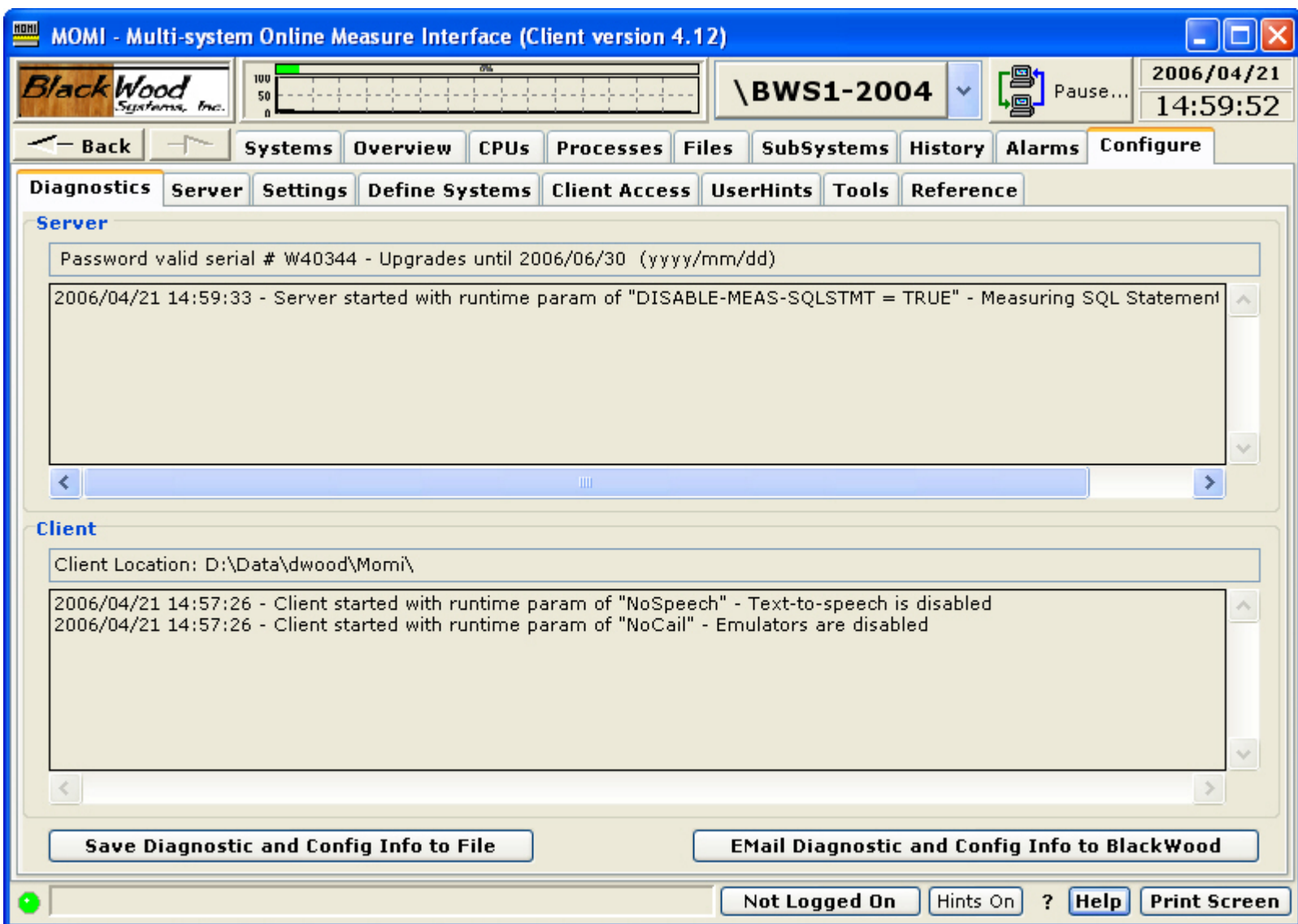
The Configure / Diagnostics screen presents the status of the client and server from a diagnostic point of view to help determine the cause of operational issues with the MOMI PC Client and MOMI server.

The top portion of the screen displays the Server status and the lower portion displays the client status. Server status includes the state of the MOMI Server password and general high level server information. Client status includes items such as Speech status or emulator not available.

The button labeled "Save Diagnostic and Config Info to File" allows the creation of a text file that contains Server, Client and Client PC configuration and status information. This information is helpful to BlackWood Systems in problem resolution and configuration assistance.

The button labeled "Email Diagnostic and Config Info to BlackWood" to bring launch a [utility](#) to directly transmit a message with attachments to BlackWood Systems.

The image below show an example of where the BWMOMI server was started with [DISABLE-MEAS-SQLSTMT](#) set to true and the MOMI PC Client was started with the runtime parameters of [NOSPEECH](#) and [NOCAIL](#).



Server

Server / Server Info 1

The screenshot displays the BlackWood Systems MOMI Client version 5.00 interface. The title bar reads "BWS1-2004 MOMI (Client version 5.00)". The main window features a navigation menu with tabs for "Systems", "Overview", "CPUs", "Processes", "Files", "SubSystems", "History", "Alarms", and "Configure". Below this is a secondary menu with "Diagnostics", "Server", "Settings", "Define Systems", "Client Access", "UserHints", "Tools", "Reference", and "Chat". The "Server" tab is active, showing "Server Info 1" selected among other info tabs. The "Versions / Info" section includes a progress bar at 0%, a dropdown menu set to "\BWS1-2004", and a "Pause..." button. A table displays version and thread information:

| | Client | Client Buffer | Server Buffer | Server | Server Threads | In Use | Max Used | Available |
|---------|--------|---------------|---------------|--------|----------------|--------|----------|-----------|
| Version | 5.00 | 21.16 | 21.16 | 5.00 | | 2 | 2 | 100 |

Below the table, it states "Password will expire on 2009/01/15 (yyyy/mm/dd)". The "System" section provides details such as System Name (\BWS1), Serial # (W40344), OS Version (G06.31.00), Measure (G12), Description (BlackWood S72000), MOMI Process (\$MOMI4), UserID (255,1), Start Time (2008/03/11 16:42:47), Login Name (NET.DW), Security User (NET.DW), Encryption set (0 None), and Encryption in use (0). The "Priorities" section lists various system processes and their priority values:

| Process | Priority |
|---------------------|----------|
| MOMI Start | 160 |
| MOMI Current | 151 |
| Collector Master | 159 |
| Expand | 157 |
| Process Action | 158 |
| EMS | 91 |
| Batch | 90 |
| Alarm EMS | 92 |
| Alarm File | 93 |
| Alarm Database | 156 |
| Logging | 94 |
| HST01DB | 95 |
| HSTxxDB read | 85 |
| HSTxxDB delete | 80 |
| HSTxxDB consolidate | 80 |

An "Update" button and a status indicator "data collected 2008/03/11 16:43:26" are located at the bottom of the main content area. The footer contains "Chat", "Not Logged On", "Hints On", "Help", and "Print Screen" buttons.

The Server / Server Info 1 screen presents a variety of version, password status and configuration information from the server perspective.

Place the mouse over the fields to obtain additional information. If the value is configurable, the tool-tip displays the CONFMOMI keyword.

The **Versions / Info** section displays various version information about the client, server and the message structures. The Server Threads fields shows how many TCP/IP connections (i.e. threads) are current, high-water and available between clients and the server. One client generally requires two threads.

The **System** section displays general information about the NonStop System environment and the MOMI password. See the Security sections [General considerations](#) and [Client Access](#) for additional information on MOMI security.

The **Priorities** section displays the configured for the main MOMI process and the various servers used by MOMI. See [Process Priority considerations](#) for additional information on how MOMI uses priorities to manage the workload.

Server / Server Info 2

BlackWood Systems, Inc. | \BWS1-2004 MOMI (Client version 5.09) | \BWS1-2004 | 2009/01/23 10:19:17

Navigation: Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, Configure

Diagnosics, Server, Settings, Define Systems, Client Access, UserHints, Tools, Reference, Chat

Server Info 1, **Server Info 2**, Server Info 3, Server Info 4, Server Info 5, Trace Log

Values Set

| | | | | | |
|-----------------|-------|---------------------------------|------|--------------------------------|-------|
| Interval | 5.00 | CPU Limit | none | SPI I/O Timeout | 5.00 |
| TCP/IP Limit | none | CPU Limit History Consolidation | 4 | CPU Collector NoReport Timeout | 15.00 |
| TCP/IP Timeout | 60.00 | CPU Limit Alarm Detection | 10 | SQLSTMT wildcard | space |
| OSS API version | 2 | CPU Limit EMS | none | Max Count Context Allowed | 10 |

Values Returned

Last SubType 30 Error: 0 for count of 0

XMEM Pool Sizes

| | | |
|------------|------------|--------|
| In Use | Maximum | Blocks |
| 17,582,912 | 50,000,072 | 2,893 |

Flags

| | | | | | | | | | |
|----------------|-------------------------------------|-------------------------|--------------------------|---------------------|-------------------------------------|--------------|-------------------------------------|-----------------|---|
| History Active | <input checked="" type="checkbox"/> | Disable Logons | <input type="checkbox"/> | Client Accel | <input checked="" type="checkbox"/> | D47 or later | <input checked="" type="checkbox"/> | G06.12 or later | <input checked="" type="checkbox"/> |
| Alarms Active | <input checked="" type="checkbox"/> | Disable SQL Statement | <input type="checkbox"/> | Collect All Process | <input type="checkbox"/> | D48 or later | <input checked="" type="checkbox"/> | G06.26 or later | <input checked="" type="checkbox"/> |
| | | Disable SQL Process | <input type="checkbox"/> | Disable TMF Report | <input type="checkbox"/> | | | H06.04 or later | <input type="checkbox"/> |
| | | Disable OSS CPU | <input type="checkbox"/> | Disable ListLocks | <input type="checkbox"/> | | | H06.09 or later | <input type="checkbox"/> |
| | | Disable OSS NameServer | <input type="checkbox"/> | | | | | H06.14 or later | <input type="checkbox"/> |
| | | Disable MeasCounter Wrt | <input type="checkbox"/> | | | | | Debug1/4 | <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> |

Update | data collected 2009/01/23 09:05:56

Chat | **Not Logged On** | Hints On | ? Help | Print Screen

The Server / Server Info 2 screen presents and continues a variety of configuration information from the server perspective.

Place the mouse over the fields to obtain additional information. If the value is configurable, the tool-tip displays the CONFMOMI keyword.

The **Values Set** section displays the Interval in which MOMI gathers basic System information, various time-out parameters and limits for CPU consumption.

The **Values Returned** section displays internal errors and values reported by MOMI and/or MOMI servers.

The **Flags** section displays settings of flags used to alter the operation of MOMI. Some flags are for internal development and diagnostic purposes.

Server / Server Info 3

The screenshot displays the MOMI (Client version 4.20) software interface. The title bar shows the BlackWood Systems, Inc. logo and the text 'MOMI (Client version 4.20)'. The main window is titled '\BWS1-2004' and shows the date '2007/02/08' and time '10:25:07'. The interface is divided into several sections:

- Navigation:** Includes 'Back' and 'Forward' buttons, and a menu bar with 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'.
- Server Info:** A sub-menu with 'Server Info 1', 'Server Info 2', 'Server Info 3' (selected), 'Server Info 4', 'Server Info 5', and 'Trace Log'.
- Expand Section:** Contains three input fields: 'Expand I/O Delay' (0.50), 'Expand Update Interval' (60.00), and 'Expand Update Interval Error' (30.00).
- Measure Section:** Contains three input fields: 'Starting Interval' (15), 'Increment Interval' (10), and 'Maximum Interval' (30).
- Alarm Section:** Contains several input fields: 'SMTP TCP/IP Name' (\$zsam1), 'SMTP Server Address' (192.168.20.42), 'Domain Name' (blackwood-systems.com), 'Email Address From' (alarm@blackwood-systems.com), 'Email Subject' (MOMI Alarm), and 'Alarms Maximum per Definition' (10).
- Status Bar:** Shows an 'Update' button, a checkbox for 'data collected 2007/02/08 10:05:46', and buttons for 'Not Logged On', 'Hints On', 'Help', and 'Print Screen'.

The Server / Server Info 3 screen presents and continues a variety of configuration information from the server perspective.

Place the mouse over the fields to obtain additional information. If the value is configurable, the tool-tip displays the CONFMOMI keyword.

The **Expand** section display timer values associated with MOMI collecting Expand information.

The **Measure** section displays timer values associated with the collection of MEASURE information for screens such as [Files / Disk Entity](#).

The **Alarm** section displays information associated with resources available and configuration associated with Alarms for MOMI. See [Alarm Overview](#) for additional information.

The [SMTP TCP/IP Name](#) is the process used by MOMI for conversing with the SMTP server. This TCP/IP process definition is separate from the normal TCP/IP processes used by the MOMI server for listening for inbound connections from the MOMI PC Client. Defines the TCP/IP process name that the MOMI uses to access the SMTP server which MOMI uses to send EMAIL. SMTP is outbound email.

The [SMTP Server Address](#) defines the name or IP address of the SMTP server which MOMI uses to send EMAIL. This is the server MOMI uses to send outbound email. Note that the Tandem system must have the resolver active if a DNS-Name is used.

The [Domain Name](#) defines the users domain name which MOMI uses in alarm email. Specifying this keyword activates in the SMTP (i.e. outbound email) protocol the HELO protocol. Some outbound email servers may require the usage of this parameter in conjunction with SPAM detection.

The [EMail Address From](#) defines the return email address which MOMI used in alarm email. This email address should be valid monitored address so that problems in sending email or replies from users receiving email are seen.

The [Email Subject](#) has three possibilities:

1. If the keyword is not present, the default subject reads: MOMI Alarm
2. Use the keyword and specify a subject line.
3. Use the keyword but and specify an empty double quote (i.e. ""). This causes the first line of the alarm message to appear as the subject (in other words the "fixed subject" is eliminated).

Server / Server Info 4

The screenshot displays the MOMI (Client version 5.09) interface for the server \BWS1-2004. The window title is "\BWS1-2004 MOMI (Client version 5.09)". The interface includes a navigation bar with tabs: Back, Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. Below this is a sub-menu with: Diagnostics, Server, Settings, Define Systems, Client Access, UserHints, Tools, Reference, and Chat. The main content area is divided into several sections:

- Server Info 1** | **Server Info 2** | **Server Info 3** | **Server Info 4** | **Server Info 5** | **Trace Log**
- TCP/IP**

| TCP/IP Process Name | Port |
|---------------------|------|
| \$ZTC0 | 2004 |
| \$ZSAM1 | 2004 |
| \$ZTCP0 | 2004 |
- Spooler / SpoolerPlus**

| Spooler | |
|-----------------------|---|
| \$SYSTEM.SYSTEM.SPOOL | T |
| \$DATA2.SYSTEM.SPOOL | F |
| \$DATA3.SYSTEM.SPOOL | F |
| \$DATA4.SYSTEM.SPOOL | F |

| SpoolerPlus | |
|-----------------------|---|
| \$DATA1.SPLPLUS.SPOOL | T |
| \$DATA2.SPLPLUS.SPOOL | F |
| \$DATA3.SPLPLUS.SPOOL | F |
| \$DATA4.SPLPLUS.SPOOL | F |

Spooler I/O Delay: 0.50
Spooler Update Interval: 60.00
Spooler Update Interval Errors: 30.00
- I/O Stuck Checking**

| Exclude Object File Names |
|---------------------------|
| |
| |
| |

I/O Stuck Interval: 30.00
- SNTP (Simple Network Time Protocol)**

Allow Adjustments: Startup Check:
SNTP Verbose:
SNTP TCP/IP Name: \$ZTC0
SNTP Server Address: us.pool.ntp.org
Update Interval: 1 00:00:00

Update data collected 2009/01/23 09:05:56

Chat Hints On Print Screen

The Server / Server Info 4 screen presents and continues a variety of configuration information from the server perspective.

Place the mouse over the fields to obtain additional information. If the value is configurable, the tool-tip displays the CONFMOMI keyword.

The **TCP/IP** section shows the TCP/IP process name and port that MOMI is 'listening' on. See the CONFMOMI keyword [TCPIP-INFO-n](#) for additional information.

The **Spooler / SpoolerPlus** section shows the object file names which are considered Spooler supervisors. Spooler subsystems cannot programmatically identify themselves. MOMI uses these entries to identify supervisors by object file name. See the CONFMOMI keywords [FNAME-SPOOLER-n](#) and [FNAME-SPOOLER-PLUS-n](#) for additional information.

The **I/O Stuck Checking** section shows the object file names which are excluded from the I/O stuck logic. See the CONFMOMI keyword [IO-STUCK-EXCLUDE-n](#) for additional information.

The **SNTP** section displays configuration for Simple Network Time Protocol or the ability for MOMI to maintain the time on the System. See [Adjust System time via SNTP](#) for additional information.

Server / Server Info 5

BlackWood Systems, Inc. | **\BWS1-2004** | 2008/05/02 12:38:15

Back | Systems | Overview | CPUs | Processes | Files | SubSystems | History | Alarms | **Configure**

Diagnosics | **Server** | Settings | Define Systems | Client Access | UserHints | Tools | Reference | Chat

Server Info 1 | Server Info 2 | Server Info 3 | Server Info 4 | **Server Info 5** | Trace Log

MOMI Default Work Location
Vol.SubVol: \$DATA1.MOMI4

VHS Default Location
Vol.SubVol: \$DATA1.VHSLOG

Alternate PATHTCP2 Location
File Name: \$DATA1.DALE.PATHTCP2

BWMOMI Info
File Name: \$DATA1.MOMI4.BWMOMI | Security: CCNC

BWSSG Info
File Name: \$DATA1.MOMI4.BWSSG | Security: MCNN
Present: | Owner ID: 255,1 | ProgID'ed:

History — Compression type 3

| History Database FileName | History Window Size | Full % | Percent Full | Current Size | Max Size | Ex |
|---------------------------|---------------------|--------|--|--------------|----------|----|
| \$DATA1.MOMI4.HST01DB | 30 Second interval | 93% | <div style="width: 93%; background-color: red;"></div> | 1,992 | 2,138 | |
| \$OSS.MOMI4.HST02DB | 2 Minute interval | 35% | <div style="width: 35%; background-color: green;"></div> | 2,148 | 6,054 | |
| \$DATA1.MOMI4.HST03DB | 1 Hour interval | 5% | <div style="width: 5%; background-color: green;"></div> | 104 | 1,774 | |
| \$OSS.MOMI4.HST04DB | 1 Day interval | 21% | <div style="width: 21%; background-color: green;"></div> | 80 | 373 | |

Update | data collected 2008/05/02 12:37:20

Chat | **Not Logged On** | Hints On | ? | Help | Print Screen

The Server / Server Info 5 screen presents and continues a variety of configuration information from the server perspective.

Place the mouse over the fields to obtain additional information. If the value is configurable, the tool-tip displays the CONFMOMI keyword.

The **MOMI Default Work Location** section shows the \$vol.subvol where MOMI work files are created. See the CONFMOMI keyword [DEFAULT-WORK-LOCATION](#) for additional information.

The **VHS Default Location** section shows the \$vol.subvol where MOMI will initially takes a user when selecting a location for displaying VHS Log files. See the CONFMOMI keyword [SELECTION-DEFAULT-VHS](#) for additional information.

The **Alternate PATHTCP2 Location** shows the file name used as an additional object for identifying a Pathway TCP process. See the CONFMOMI keyword [PATHWAY-TCP](#) for additional information.

The **BWSSG Info** section display the File Name and various attributes for the Super Group helper. This file is a copy of the BWMOMI program created by the administrator of the MOMI software during [installation](#). This object is used unless MOMI is started under the Super.Super User ID. See the [General considerations of Security](#) for additional information.

The **History** section shows history files defined and their percentage full. MOMI automatically deletes the oldest data from the file to allow inserting new history data. Running a history file at 100% full does not cause errors. See [Enabling History](#) for additional information.

The extents for a history file may be altered by right-clicking on a value in the Max Ext. (Maximum Extents) column.

| History Database FileName | History Window Size | Ext. Alloc | Max Ext. | Newest Data | Oldest Data |
|---------------------------|---------------------|------------|----------|---------------------|---------------------|
| \$swap1.momi2002.hst01db | 30 Second interval | 1 | 1 | | |
| \$pcs1.momi2002.hst02db | 2 Minute interval | 121 | 201 | 2005/06/28 10:32:00 | 2005/04/29 10:00:00 |
| \$swap1.momi2002.hst03db | 1 Hour interval | 15 | 25 | 2005/06/28 09:00:00 | 2005/04/19 11:00:00 |
| \$pcs1.momi2002.hst04db | 1 Day interval | 30 | 60 | 2005/06/27 00:00:00 | 2003/11/07 00:00:00 |

Server / Trace Log

The screenshot shows the BlackWood Systems MOMI client interface. The window title is "BWS1-2004 MOMI (Client version 4.23)". The interface includes a navigation menu with options like Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. The Trace Log screen displays a list of I/O activity between the client and server, including timestamps, directions (Send/Recv/Probe), and data identifiers.

| Time | Direction | Source | Destination | Flags | Count |
|-----------------|-----------|--------------------------|-------------|--------------------------|------------|
| 11:08:51.363000 | Send | 000440000044000207000400 | | F 02 TF | 07 |
| 11:08:51.379000 | Recv | 006614000044000207000400 | | F 02 TF | 07 |
| 11:08:51.488000 | Send | 000447000044000381000400 | | F 02 TF | 08 |
| 11:08:51.504000 | Send | 000447000044000381000400 | | F 02 TF | 09 |
| 11:08:51.519000 | Recv | 022414000044000381000400 | | F 02 TF | 08 |
| 11:08:51.582000 | Send | 000440000044000208000400 | | F 02 TF | 010 |
| 11:08:51.613000 | Recv | 022414000044000381000400 | | F 02 TF | 09 |
| 11:08:51.644000 | Send | 000442000044000202000400 | | F 02 TF | 011 |
| 11:08:51.660000 | Recv | 000640000044000208000400 | | F 02 TF | 010 |
| 11:08:51.691000 | Send | 000442000044000209000400 | | F 02 TF | 012 |
| 11:08:51.707000 | Recv | 002254000044000202000400 | | F 02 TF | 011 |
| 11:08:51.769000 | Recv | 000520000044000209000400 | | F 02 TF | 012 |
| 11:08:52.691000 | Probe | 192.168.20.11:2004 | Send | 000441000044000201000400 | F 8 |
| 11:08:52.722000 | Probe | 192.168.20.11:2004 | Recv | 001086000044000201000400 | F 02 TF 08 |
| 11:08:52.754000 | Probe | 192.168.20.11:2004 | Send | 000441000044000215000400 | F 8 |
| 11:08:52.769000 | Probe | 192.168.20.11:2004 | Recv | 000596000044000215000400 | F 02 TF 08 |

The Trace Log screen shows the I/O activity between the Client and server.

The screen is provided primarily for internal development purposes, but may be referenced in problem resolution.

Settings

Settings / System Wide

see [PC Quirks](#)

BlackWood Systems, Inc. \BWS1-2004 2007/11/16 10:49:16

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Diagnostics Server **Settings** Define Systems Client Access UserHints Tools Reference Chat

System Wide Single Screen Misc. Settings Actions Transfers File Locations

System Settings

- Disable ScreenSaver when running
- Auto Logon when System changes
- Auto Logoff if inactivity for mins. 60
- Disable all Action Confirmations
- Click "?" to display Page Help
- Non-Rated as Default
- Restart AutoUpdate on ReConnection
- Use Default EMail instead of Momi EMail

Export Characters

Delimiter Char. TAB

String Define Char. HardSpace

Color Triggers

| | | | | |
|----------------------|-------------|--------------------|----------|-----------|
| CPU Graphs | Volume Full | CPU Queue | Pressure | Disk I/Os |
| 80 90 | 50 60 | 3 | 2 | 100 |
| TMF Audit Trail Full | File Full | Virtual Mem In-Use | | |
| 70 90 | 80 90 | 80 90 | | |

Tab Style

- Button-style
- Tab-style

Date Selection

- Calendar
- Roll up/down

Chart Background

cBtnFace

Default

Timers

Screen Refresh Rate 5

AutoUpdate Refresh Rate 10

Connection Timeout Value 30

Limits

DropDown Items Count 8

Hints

Hide Hints Default

Time before display 800

Display time 10000

Time between Hints 50

Save Configuration

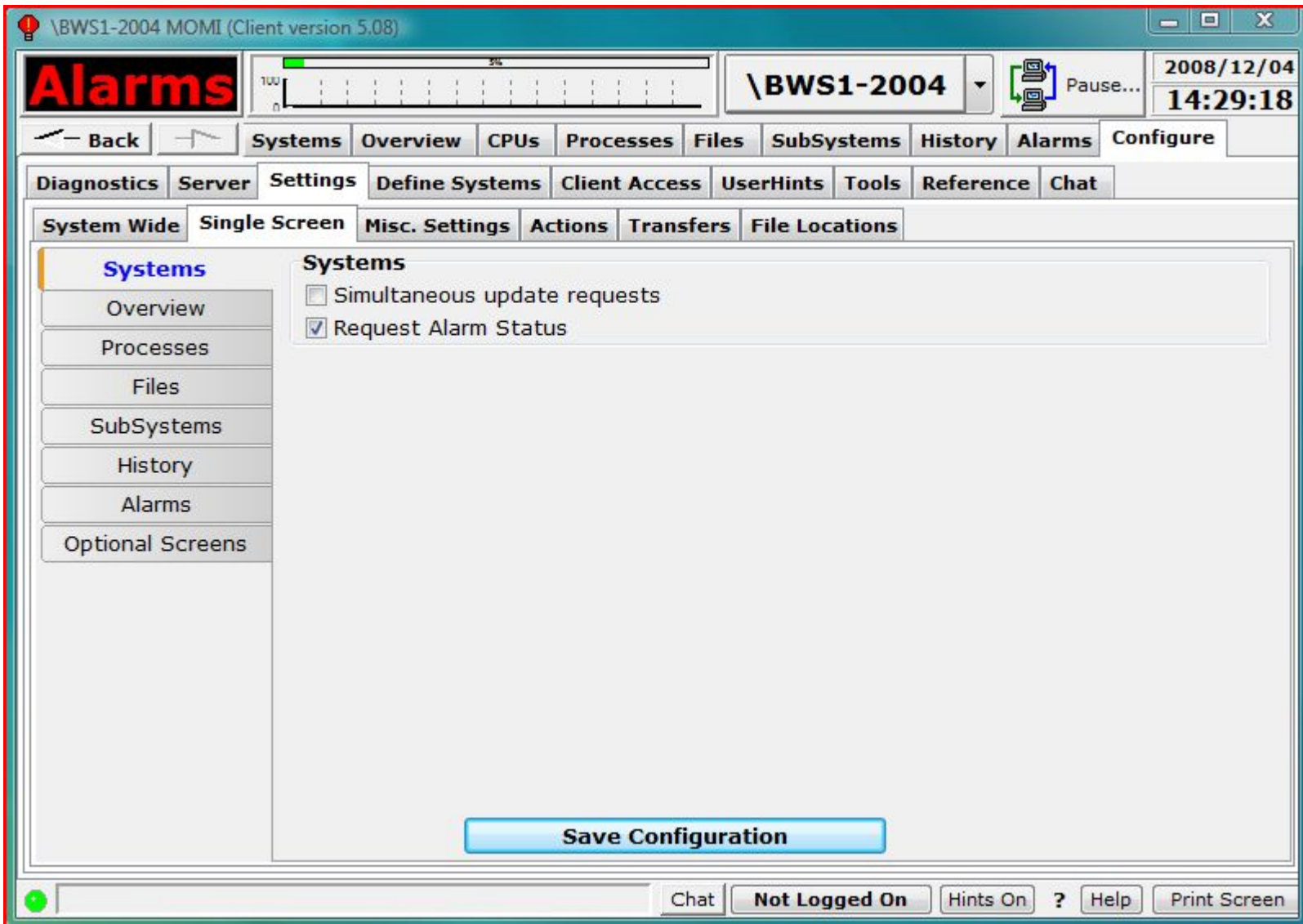
Chat Not Logged On Hints On ? Help Print Screen

The Settings / System Wide screen shows the current state of attributes in the Client. Settings on this page generally affect screens throughout the entire Client.

Click the check box or make the selection to alter the current state of an item. Place the mouse over an item to see a tool-tip for additional information about that setting.

After making any change, press the Save Configuration button to cause the settings to be stored in the MOMI.INI file.

Settings / Single Screen

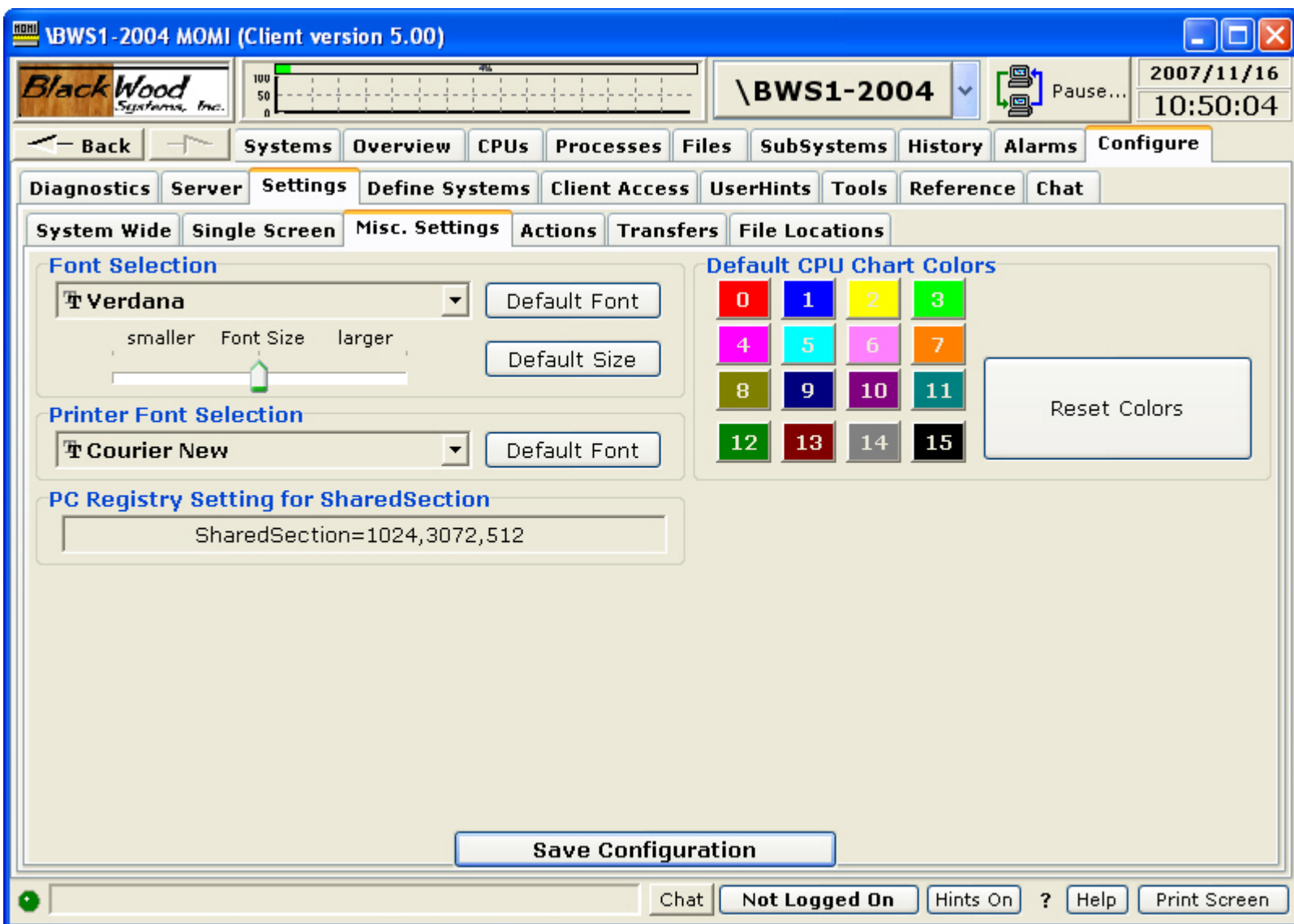


The Settings / Single Screen shows the current state of attributes that are generally specific to a particular screen within MOMI or enable a screen displayed.

Click through the sub-categories on the left hand side of the window to display available options. Place the mouse over an item to see a tool-tip for additional information about a particular setting.

After making any change(s), press the Save Configuration button to cause the settings to be stored in the MOMI.INI file.

Settings / Misc. Settings



The Settings / Misc. Settings screen shows 'other' types of attributes that affect the appearance or operation of the Client.

Click the check box or make the selection to alter the current state of an item. Place the mouse over an item to see a tool-tip for additional information about that setting.

After making any change, press the Save Configuration button to cause the settings to be stored in the MOMI.INI file.

The **Font Selection** area has a slider used to slightly adjust the font size. This adjustment is provided in the event the selected font does not quite 'fit' labels or fields in the Client. Some fonts will not fit in all areas of the MOMI PC Client (i.e. not all fonts will 'work'). The Default Font and Default Size buttons allow a return to the original settings.

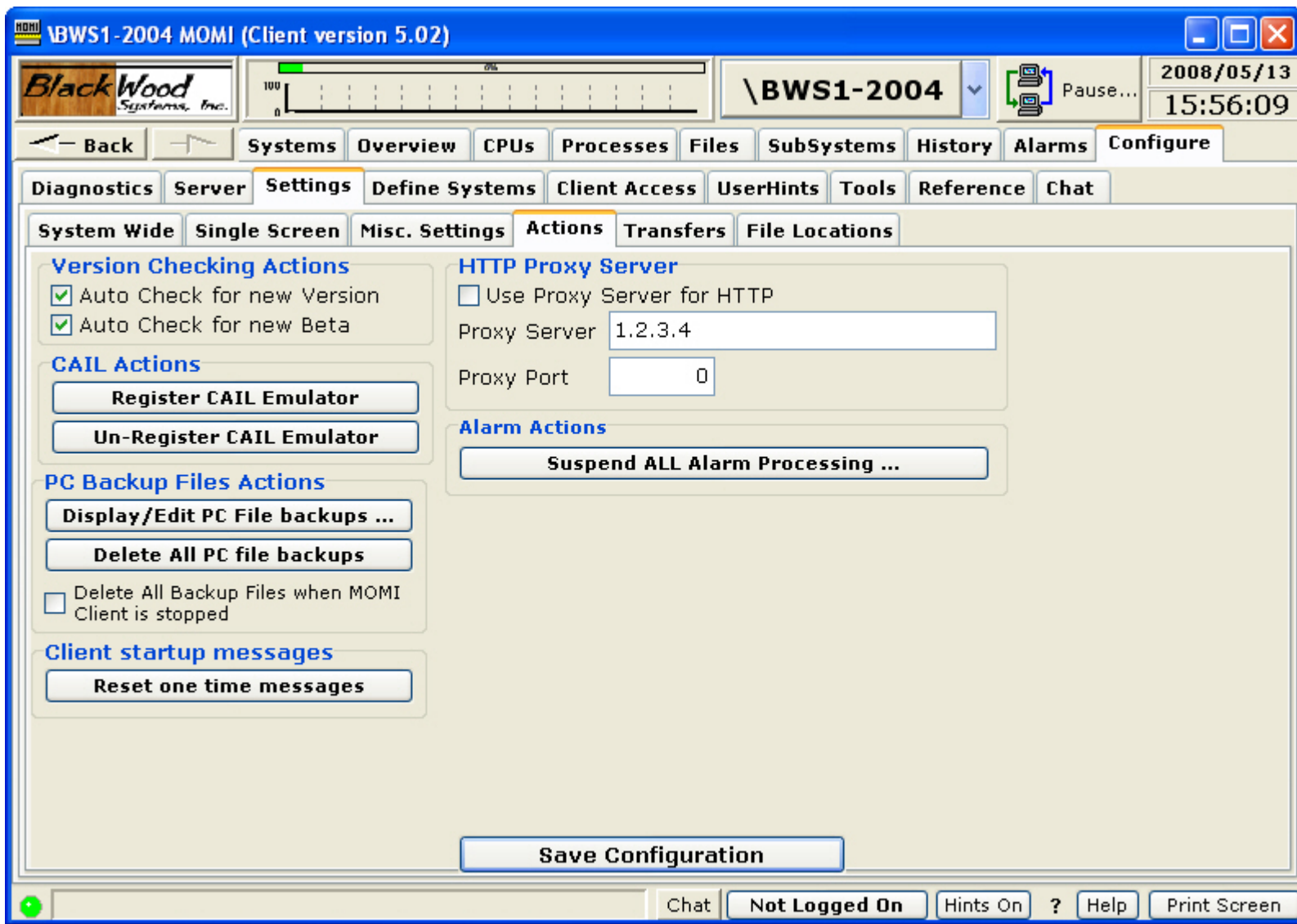
The **Printer Font Selection** determines the font used for printing operations where a local choice is not available. Grids where a Tool button is available, has a local font selection.

The **Default CPU Chart Colors** area allows the selection of colors for charts referencing CPUs. Click on the CPU number to bring up a drop-down box of predefined color selections. Select Custom to display a window that allows the creation of a color.

The **PC Registry Settings for SharedSection** displays a portion a registry key within Windows that determines the maximum amount of Windows resources available. See [System resources - Out of Memory](#) for detailed information.

Settings / Actions

see [PC Quirks](#)



The Settings / Actions screen allows for special functions, Export / Import of the MOMI.INI file and automatic starting of the MOMI PC Client at Windows logon.

The **Version Checking Actions** section cause the client to periodically query the BlackWood Systems web site to determine if new software is available. If so, a small pop-up window will display. The window will continue to display at set intervals for that client session until the OK button is pressed.



The **CAIL Actions** section provides the ability to Register or Un-Register MOMI's limited version of the CAIL emulator (the limited version is courtesy of CAIL). This capability is provided in the event MOMI's CAIL emulator conflicts with any other software product that also provides a CAIL emulator.

For example, if MOMI is installed on a PC and a failure occurs installing (or running) the CAIL emulator of another software product, the user may go into the MOMI PC Client and Un-Register its version of the CAIL emulator and retry the installation (or operation) of the other software product.

Each time the MOMI PC Client is started it automatically checks for or registers the CAIL emulator. If a full featured version of the CAIL emulator is present on the PC, it is used instead of the limited version.

The **PC Backup Files Actions** section displays backup files created by the MOMI PC Client and allows them to be either manually deleted or automatically deleted when the client exits. MOMI creates backups of files that are edited on the PC that originated from the NonStop System.

The **Client startup messages** section provides a button that when pushed resets pop-up message windows that are usually displayed only once. These type of messages are informational in nature but this capability allows the user to see them again.

The **HTTP Proxy Server** section enables proxy server logic to redirect all of MOMI's HTTP (i.e. web) traffic to the indicated proxy server.

The **Alarm Actions** section provides a button that when pressed displays a pop-up window to allow the suspension, modification or resumption of Alarm processing. Text entered in the notes section is added to MOMI log messages. Alarms may be suspended at MOMI startup via the CONFMOMI keyword [ALARM-SUSPEND-DELAY](#) .

Suspend/Resume ALL Alarm processing

Set how long Alarm processing will be SUSPENDED

Suspend Alarms for 1 hours

or Specify Alarm RESUME date/time

Now 2008/04/21 15:16:00

or Suspend Alarms PERMANENTLY

or **RESUME All Alarm processing NOW**

Notes

Temporarily Suspend ALL Alarms Close

Settings / Transfers

Black Wood Systems, Inc. | **\BWS1-2004** | 2007/11/16 10:47:37

Back | **Systems** | Overview | CPUs | Processes | Files | SubSystems | History | Alarms | **Configure**

Diagnostics | Server | **Settings** | Define Systems | Client Access | UserHints | Tools | Reference | Chat

System Wide | Single Screen | Misc. Settings | Actions | **Transfers** | File Locations

Editor
NOTEPAD.EXE | DOS Format | UNIX Format

Edit On PC Settings
Sounds
Download: BEEP | Upload: BEEP | Error: BEEP

FTP Connection Settings
Connection: Port 21 | PASV | One-time Password
Sounds: Download: BEEP | Upload: BEEP | Error: BEEP

Download / Local PC Confirmations: Overwrite | Rename | Delete
Upload / Host Confirmations: Overwrite | Rename | Delete

ASCII File extensions
101, 1ST, ASP, BAT, C, CFM, CGI, CPP, ...
Add, Remove, No File .Ext

Save Configuration

Chat | **Not Logged On** | Hints On | ? | Help | Print Screen

The Settings / Transfers screen displays various options used when files edited and moved.

Place the mouse over an item to see a tool-tip for additional information about that setting.

After making any change, press the Save Configuration button to cause the settings to be stored in the MOMI.INI file.

The **Editor** determines when a text file is brought to the PC for editing what program is launched and how the file is treated. How line termination is handled within the file is selected by the DOS Format and UNIX Format selector. DOS uses a CR/LF at the end of each line where UNIX uses a LF. The selection determines how MOMI will prepare the file for the editor, or in other words this selection determines how the file indicates a 'new line'.

The **Edit On PC Settings** chooses the sound played at various events.

The **FTP Connection Settings** chooses the sound played at various events and other TCP/IP options. Usually, FTP transfers take place over port 21, but the Port field allows an alternate port to be chosen. Checking PASV alters the socket setup sequence and provides an alternate method that is desired when the FTP server is behind a firewall. The One-time Password option instructs MOMI to prompt for a new password and at FTP connect. This is intended for environments that use devices that provide a new password key/pin at regular intervals. The "Confirmations" areas when checked prompt the user to confirm the actions of Overwriting and existing file, renaming a file and deleting a file.

The **ASCII File extensions** box determines what file extensions are considered as ASCII and allow the 'edit' function. The No File .Ext checkbox provides for files without an extension to be treated as ASCII. A file extension is the characters after the last period in the file name (i.e. last being the far right of the file name).

Settings / File Locations

The screenshot shows the 'Settings / File Locations' window in the MOMI client. The window title is 'BWS1-2004 MOMI (Client version 5.00)'. The interface includes a navigation pane on the left with tabs for 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. The 'Configure' tab is active, and the 'File Locations' sub-tab is selected. The main area contains several sections: 'Type of Help' with radio buttons for 'HTML Help', 'Windows Help' (selected), 'Web Help', and 'User-Defined Help location'; 'MOMI.INI, CALENDAR.MOM, and CUSTERRORS.MOM File path in use' with a text field containing 'C:\Documents and Settings\dwood\Application Data\BlackWood Systems\MOMI\'; 'Default File Export path' with a text field containing 'C:\Documents and Settings\dwood\Desktop' and a 'Set File Path' button; 'MOMI.LOG Client Crash Log File' with a text field containing 'C:\Documents and Settings\dwood\Desktop\MOMI.LOG' and a 'Delete Log File' button; 'Export/Import MOMI.INI' with 'Export' and 'Import...' buttons; and 'Auto-Start MOMI' with checkboxes for 'when I log on' and 'when anyone logs on'. A 'Save Configuration' button is located at the bottom. The status bar at the bottom shows 'Chat', 'Not Logged On', 'Hints On', 'Help', and 'Print Screen' buttons.

The Settings / File Locations screen shows the path or URL for various resources used by MOMI.

Place the mouse over an item to see a tool-tip for additional information about that setting.

After making any change, press the Save Configuration button to cause the settings to be stored in the MOMI.INI file.

The **Type of Help** allows selection for the various visual formats of the MOMI Help are available (options are grayed out if the other formats are not installed). All formats contain the same content, but different

visual appearances. When MOMI is installed locally, the default is the local HTML Help. Web Help accesses help at the BlackWood Web site based on the version of the MOMI PC client. User-Define Help specifies a fixed location for help.

The **MOMI.INI, CALENDAR.MOM, and CUSTERRORS.MOM File path in use** displays the location for these configuration files. The MOMI.INI file stores the primary configuration information for the MOMI PC Client.

The **Default File Export path** is the default location where any export from the MOMI PC Client is located.

The **MOMI.LOG Client Crash Log File** is the default location and name for the file automatically created should the client encounter a fatal error. This file should be included in any problem report.

The **Export / Import MOMI.INI** section provides a method to transfer MOMI PC Client settings from/to other environments. The MOMI.INI file contains the configuration settings for the PC MOMI Client.

The **Export** MOMI.INI button creates a copy of the clients current configuration. Pressing this button will display a pop-up window to select the location of the copy. If the output already exists, it is renamed to *.bak (the existing name will have .bak added) and the output is created. A second Export will cause the *.bak file to be deleted prior to the export sequence.

The **Import** MOMI.INI button loads a new configuration file in preparation to replace the existing. Pressing this button will display a pop-up window to select the location where to read. Once read, status information appears indicating the status of the import. It is necessary to stop and restart the PC MOMI Client in order to activate the new configuration file.

The **Auto-Start MOMI** section function allows the automatic startup of the PC MOMI Client when a User logs on to Windows. The first option allows the current User to enable this function. The second option allows a System Administrator to enable this function for any user on the PC. Only one option in this section may be checked (otherwise two instances of the Client would automatically start).

Define Systems

MOMI - Multi-system Online Measure Interface (Client version 4.09)

Black Wood Systems, Inc.

100
50
0

\BWS1-2004

Pause...

2006/03/17
15:00:07

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Diagnostics Server Settings Define Systems Client Access UserHints Tools Reference

Set default system Default System \BWS1-2004 - 192.168.20.11:2004 Delete selected system

| TCP/IP Address:Port | Logical Name from Collector |
|---------------------|-----------------------------|
| 192.168.20.10:2000 | \BWS1-2000 |
| 192.168.20.10:2002 | \BWS1-2002 |
| 192.168.20.10:2006 | \BWS1-2006 |
| 192.168.20.11:2002 | \BWS1 Fast - 2002 |
| 192.168.20.12:2000 | \BWS2-2000 |
| 192.168.20.11:2006 | \BWS1 Fast - 2006 |
| 192.168.20.12:2002 | \BWS2-2002 |
| 192.168.20.11:2004 | \BWS1-2004 |
| 192.168.20.10:8080 | \BWS1-8080 |
| 80.127.78.71:2000 | \PAT |
| 192.168.20.10:2004 | \BWS1-2004-Old IP |
| 192.168.20.11:2010 | \BWS1-2010 |
| 204.160.19.31:3000 | \NSKIT06-3000 |

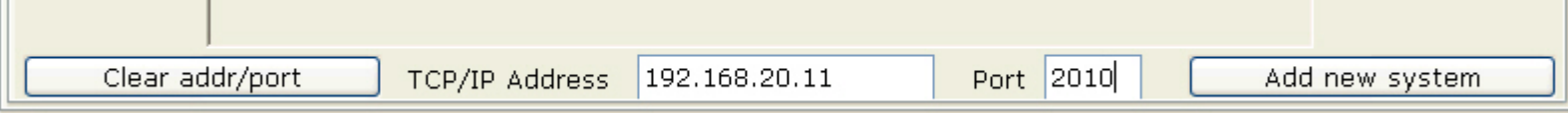
Clear addr/port TCP/IP Address Port Add new system

Not Logged On Hints On ? Help Print Screen

The Define Systems screen presents the TCP/IP addresses and ports for the MOMI server configured with the Client.

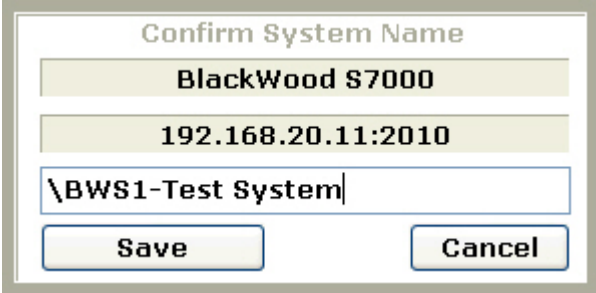
Existing entries are deleted by clicking on an entry (which highlights it) and pressing the 'Delete selected system' button. The System currently connected may not be deleted. The default entry, or entry automatically connected at Client startup, is made by clicking on an entry and pressing the 'Set default system' button.

The initial start of the Client presents this screen. The User enters the TCP/IP address (or DNS name) and port, then presses the 'Add new system' button. The Client will then attempt communication with MOMI on that System.



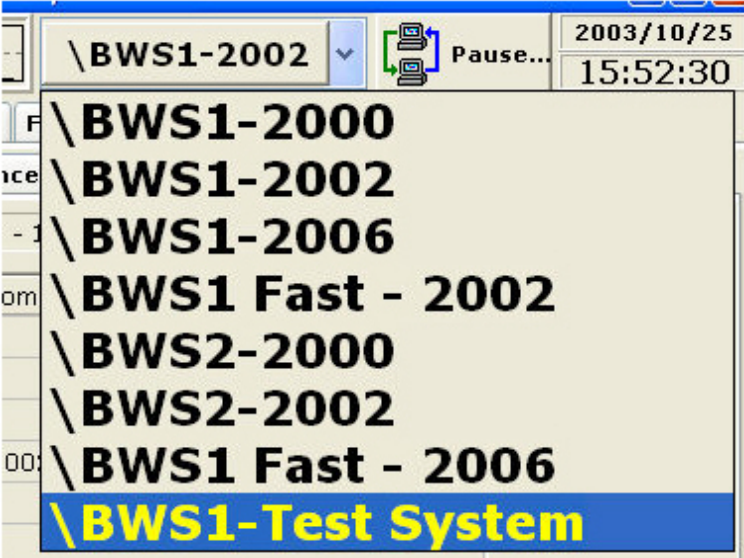
A screenshot of a software interface for adding a new system. It features a 'Clear addr/port' button on the left, followed by a 'TCP/IP Address' field containing '192.168.20.11', a 'Port' field containing '2010', and an 'Add new system' button on the right.

If communication is successful, a pop-up window will display to allow entry of descriptive text for this connection. Press save to confirm and save the entry.



A 'Confirm System Name' dialog box. It contains a text field with 'BlackWood S7000', another text field with '192.168.20.11:2010', and a third text field with '\BWS1-Test System'. At the bottom are 'Save' and 'Cancel' buttons.

The initial entry will cause the Client to connect to that entry and display data. Subsequent entries are made available on the drop down list at the top right of the screen.



A screenshot of the client interface showing a dropdown menu. The dropdown is open, displaying a list of system names: '\BWS1-2000', '\BWS1-2002', '\BWS1-2006', '\BWS1 Fast - 2002', '\BWS2-2000', '\BWS2-2002', '\BWS1 Fast - 2006', and '\BWS1-Test System'. The last item, '\BWS1-Test System', is highlighted in blue. Above the dropdown is a 'Pause...' button and a date/time display showing '2003/10/25 15:52:30'.

Client Access

Client Access / Global Settings

see [Client Access](#)

The screenshot shows the BlackWood Systems, Inc. MOMI (Client version 5.00) interface. The title bar displays the company logo and the text "BWS1-2004 MOMI (Client version 5.00)". The main window has a navigation menu with tabs for "Systems", "Overview", "CPUs", "Processes", "Files", "SubSystems", "History", "Alarms", and "Configure". The "Client Access" tab is selected, and the "Global Settings" sub-tab is active. The "Global Settings" section includes a "Last Update" field showing "2007/11/08 08:17:10". Under "Default Security User ONLY", there are two checked options: "Enable Client Access Checking on this System" and "Enable User Access Checking on this System". A note states "Only the 'Default Security User' (NET.DW) can change this setting". A red warning box says "Delete ALL the Client Access and User Access Records...". Under "Any Security User", there are several unchecked options: "Disable AutoLogon", "Disable CAIL Emulator for ALL Users", "Disable FTP for ALL Users", "Disable PING for ALL Users", "Disable TraceRoute for ALL Users", and "Disable VT100 for ALL Users". There is one checked option: "New screens enabled by default". On the right side, there are two settings for "Auto Logoff if inactivity for minutes" (set to 5) and "Limit AutoUpdate minutes to" (set to 1). There are also two settings for "Set Recommended Minimum Client version to" (set to 4.20) and "Set Required Minimum Client version to" (set to 4.20), both with a note "Contact your System Administrator about updating the MOM". A "Change Global Client Access Settings" button is at the bottom. The status bar at the bottom shows "Chat", "net.dw", "Hints On", "?", "Help", and "Print Screen".

The Client Access / Global Settings screen is used to enable/disable Client Access, enable/disable certain features and set certain global limits. After making any change, press the **Change global Client Access Settings** button to save and activate the changes.

The [Default Security User](#) is required to enable/disable Client Access along with the deletion of all Client Access configuration records. Any Security User may change the remaining settings.

Enable Client Access Checking on this System is the overall activation/deactivation of Client Access. On the Default Security User may change this setting.

Enable User Access Checking on this System controls checking of specific users. If this item is checked, all other settings (i.e. the other screens) are now in effect. If this item is not checked, only the settings on this screen are effective. This option may be thought of as providing a means to activate general configuration items without regard to individual users.

Disable AutoLogon provides the ability to control if the Client issues a logon after changing systems if the user had already logged on in that session of MOMI. In shops where passwords may only be used one time, Disable AutoLogon should be checked.

Disable CAIL Emulator for ALL Users, Disable FTP for ALL Users, Disable PING for ALL Users, Disable TraceRoute for ALL Users and Disable VT100 for ALL Users provides the ability to control access to these tools.

New screens enabled by default, when checked, allows users to access MOMI PC Client screens added to a new software version without explicate authorization. If not checked, new MOMI screens must be authorized under the [User Define](#) tab.

Auto Logoff if inactivity for minutes enables the capability to cause the MOMI PC Client to automatically logoff from the NonStop System after the specified number of minutes occur and no activity occurs. Activity is defined as keys pressed in the client.

Limit AutoUpdate minutes to limits the amount of time screens directed by the user continue to update. Many MOMI screens provide data gathered for the benefit of all users and to perform other internal activity. However, screens that are specifically activated or gathering data as a result of user selection, such as the [Process Detail](#), are limited by this setting. Screens that have the AutoUpdate option are also affected by this setting.

Set Recommended Minimum version to and **Set Required Minimum Client version to** allows control of the software versions of the MOMI PC Client that may in use. Set Recommended Minimum version to displays a by-passable warning when the MOMI PC Client is below the specified value. Set Required Minimum Client version to displays an error messages and prevents further access if the MOMI PC Client version is below the specified value. These options provide the MOMI administrator the ability to initially warn users they should upgrade their software and then force users to upgrade their software.

The **Delete All the Client Access and User Access Records...** button is provided in the event the MOMI administrator wants a 'clean slate' in client access configuration. This button would normally be used only as a last resort or in the event the client access portion of the configuration database was corrupt.

Client Access / Define

see [Client Access](#)

The screenshot displays the 'Client Access / Define' interface for MOMI. The window title is '\\BWS1-2004 MOMI (Client version 5.08)'. The top right corner shows the date '2008/12/04' and time '15:02:00'. The main navigation bar includes 'Back', 'Systems', 'Overview', 'CPUs', 'Processes', 'Files', 'SubSystems', 'History', 'Alarms', and 'Configure'. The 'Client Access' tab is active, showing 'Global Settings', 'User Define', and 'User List'. Under 'User Define', the 'User ID' is 'NET.DW' and the 'Member of Group' is '*GRP-TEST'. The 'Description' is 'User that started MOMI' and the 'Last Update' is '2008/10/28 13:33:36'. The 'System Wide' section has several checked options: 'Allow Logon to NonStop', 'Allow Process Action', 'Auto Logoff if inactivity for minutes' (set to 60), and 'Allow AutoUpdate Forever'. There are also 'Check All' and 'Clear All' buttons for 'Security User'. A 'Systems' list on the left includes 'CPUs', 'Processes', 'Files...', 'SubSystems...', 'History', 'Alarms', and 'Configure'. The 'Systems' section has several checked options: 'Display Basic', 'Jump to other systems', 'Display Detail', 'Jump to other systems', 'Display FTP', 'Display PING', 'Display TraceRoute', and 'Display Emulators'. At the bottom, there are buttons for 'Current User', 'Display User', 'Save New User', 'Change User', 'Delete User', and 'Clear Screen'. The bottom status bar shows 'Chat', 'net.dw', 'Hints On', '?', 'Help', and 'Print Screen'.

The Client Access / Define screen is used to determine which screens and features within MOMI are available to individual users or groups of users.

In the lower left portion of the screen, click through the sub-categories on the left hand side of the screen to see what options are available for the currently selected User ID or Group ID. Change as needed. Place the mouse over an item to see a tool-tip for additional information about a particular setting.

Two types of ID's are used; a User ID and a Group ID. A User ID corresponds to a Guardian User or SafeGuard Alias defined on the Tandem server. A Group ID is a MOMI specific entity used to assign specific settings to one or more User ID's.

No passwords are defined. All security validation is performed on the Nonstop System.

Two special User ID's are provided (and automatically created) by MOMI :

- "NOT LOGGED ON" represents a MOMI PC Client that has not logged on via MOMI. This defines the capabilities of the client when it initially connects to the server and until (or if) the user logs on.
- "USER NOT DEFINED" represents a logon to MOMI where the User ID has not been defined to MOMI. This "catch all" provides for a default level of configuration where the specific user ID is not known. This feature may be disabled by not checking "Allow Logon to Nonstop".

To change an existing entry, first select if a User ID or Group ID is to be displayed in the upper left hand corner then select the existing entity in the drop-down box.

To add a new **User ID**, select **User ID**, enter the HP Guardian User ID or SafeGuard Alias, description and configure the various options.

To add a new **User ID** into a group, select **User ID**, enter the HP Guardian User ID or SafeGuard Alias, description and select the desired group in the drop-down box.

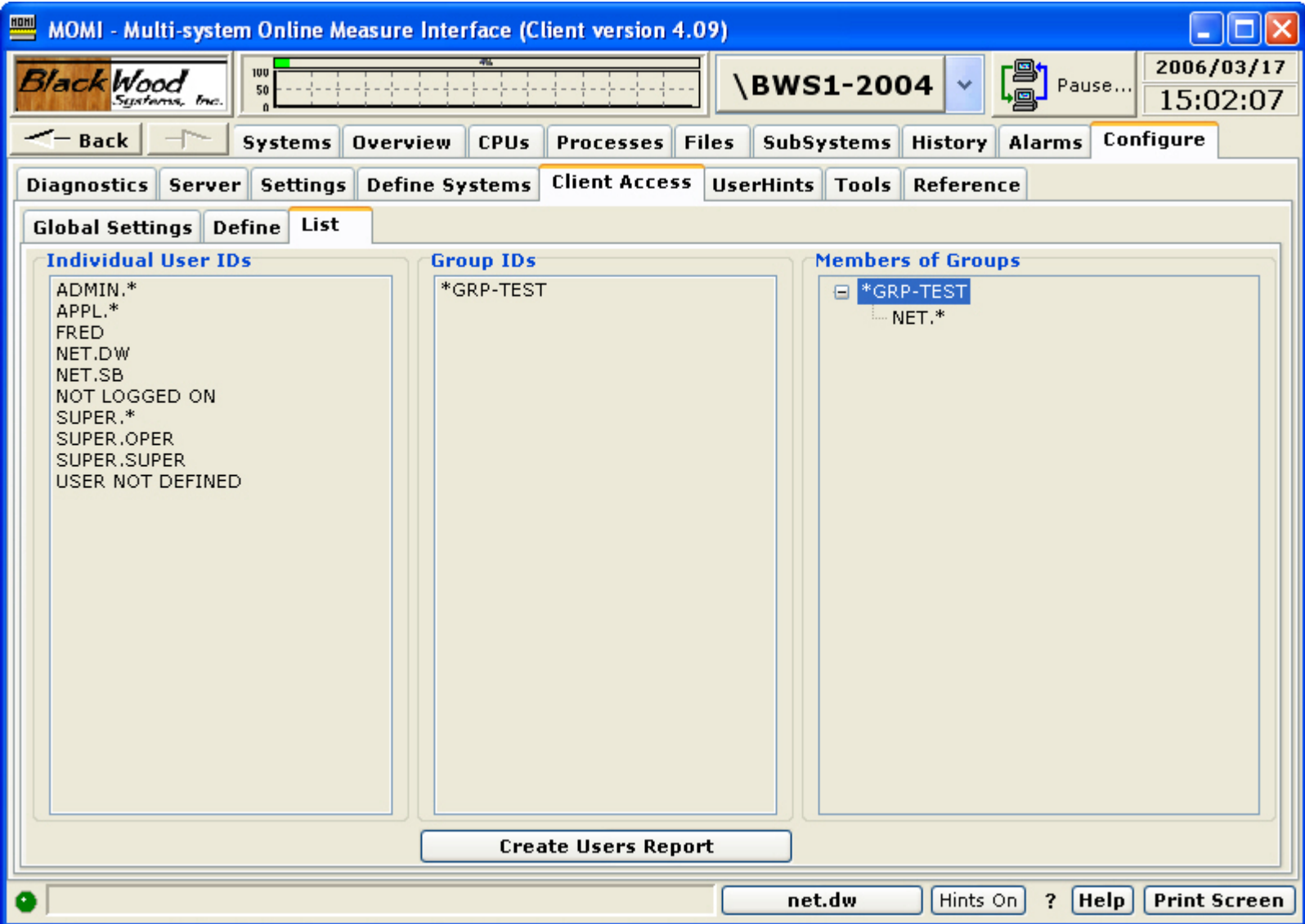
To add a new **Group ID**, enter the Group ID (an arbitrary name), description and configure the various options applicable to that group.

Individual users or Groups are given various permissions. The section System Wide area provides for general abilities such as allowing process actions or automatic Logoff. The tabbed area below selects what screens are available and other screen features.

A User ID or Group ID may be assigned as a Security User (in **RED** above). These additional Security Users, have the same authority as the Default Security User with the exception they may NOT change certain settings on the [Global Settings](#) screen such as disabling Client Access checking.

Client Access / List

see [Client Access](#)



The Client Access / List screen displays the User and Group ID's established with MOMI. A report can be generated with the Create Users Report button.

Left-click on a User or Group ID to jump to [Define](#) screen.

UserHints

The screenshot shows the MOMI - Multi-system Online Measure Interface (Client version 4.09) window. The title bar includes the MOMI logo and the text "MOMI - Multi-system Online Measure Interface (Client version 4.09)". The interface features a navigation menu with tabs for Systems, Overview, CPUs, Processes, Files, SubSystems, History, Alarms, and Configure. Below this is a secondary menu with tabs for Diagnostics, Server, Settings, Define Systems, Client Access, UserHints (selected), Tools, and Reference. The main content area displays a table of user hints:

| Value (click to display) | UserHint (multiple lines separated by) |
|--------------------------|---|
| \$dta0.proddb.tbl00db | Alternate main transaction database |
| 100,109 | net.dw |
| 255,255 | The Super user (fred smith) |

Below the table is a form for adding or changing hints. It includes a "Value" input field containing "\$dta0.proddb.tbl00db", a "UserHint" text area containing "Alternate main transaction database", and buttons for "Delete", "Export to File", "Import from File", "Add/Change", and "Clear". There is also a checkbox labeled "Record successfully changed". At the bottom of the window, there are buttons for "net.dw", "Hints On", "?", "Help", and "Print Screen".

The UserHints screen presents current user hints currently defined and provides maintenance (add/change/delete) functions.

Throughout the MOMI PC Client Tool tips, or Hints, are provided 'all over the place'. This information is usually static based on that particular field. This screen allows the user to define a Value (i.e. text) that if it matches the current value displayed on the screen (in that particular cell or location) the supplied UserHint is added to the existing Tool Tip.

Note that the Value must match EXACTLY for the UserHint to display or be added to a standard MOMI Tool tip.

Tools

MOMI (Client version 4.19)

Black Wood Systems, Inc.

\BWS1-2004

2006/12/28 15:36:58

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Diagnostics Server Settings Define Systems Client Access UserHints Tools Reference

Calculator

0

Back CE C

MC 7 8 9 / sqrt

MR 4 5 6 * %

MS 1 2 3 - 1/x

M+ 0 +/- . + =

CountDown Timer

CountDown Event

Now 2006/12/28 13:40:54 Save Delete Start

Bandwidth Conversion

Enter Value 1,024 Bytes is equal to

| | | | |
|-------------|----------------|-------------|----------|
| 1,024 | Bytes | 8,192 | Bits |
| 1 | Kilobytes (KB) | 8 | Kilobits |
| 0.000976563 | Megabytes (MB) | 0.0078125 | Megabits |
| 0.000000954 | Gigabytes (GB) | 0.000007629 | Gigabits |
| 0.000000001 | Terabytes (TB) | 0.000000007 | Terabits |
| 0 | Petabytes (PB) | 0 | Petabits |

byte=8 bits | KB = 1024 bytes | MB = 1024 KB | GB = 1024 MB | TB = 1024 GB | PB = 1024 TB

Convert Number base

Clear Decimal (10) Octal (8) Hex (16) Binary (2) Word Bits

10| 12 A 1010 <0:7> 0 <8:15> 10

net.dw Hints On ? Help Print Screen

The Tools screen provides quick access to a Calculator, Stopwatch, Count down timer, approximate Bandwidth conversion and numeric base converter.

The Countdown Timer drop-down box allows storing of multiple events for later reference.

The IP Workshop Pro TCP/IP Subnet calculator is provided courtesy of Peter Kostov and Peko Software. This tool supports a wide range of IPv4 address operations such as converting the classical subnet format into a CIDR, split up a Class B network into different sized subnets and obtain a quick summarization of subnets.

Reference

Reference

MOMI - Multi-system Online Measure Interface (Client version 4.09)

BlackWood Systems, Inc.

\BWS1-2004

2006/03/17 15:10:39

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Diagnostics Server Settings Define Systems Client Access UserHints Tools Reference

Unit Conversion ASCII Chart Errors/Codes 6530 Codes BlackWood Systems

Area Distance Mass Temperature Time Volume

Value to Convert: 1 Decimal Precision: 2

| From | To |
|-------------------|------------------------------------|
| Acres | 1.00 Acres |
| Ares | 40.47 Ares |
| Centares | 4,046.86 Centares |
| Hectares | 0.40 Hectares |
| SquareCentimeters | 40,468,564.22 SquareCentimeters |
| SquareDecameters | 40.47 SquareDecameters |
| SquareDecimeters | 404,685.64 SquareDecimeters |
| SquareFeet | 43,560.00 SquareFeet |
| SquareHectometers | 0.40 SquareHectometers |
| SquareInches | 6,272,640.00 SquareInches |
| SquareKilometers | 0.00 SquareKilometers |
| SquareMeters | 4,046.86 SquareMeters |
| SquareMiles | 0.00 SquareMiles |
| SquareMillimeters | 4,046,856,422.40 SquareMillimeters |
| SquareRods | 160.00 SquareRods |
| SquareYards | 4,840.00 SquareYards |

net.dw Hints On ? Help Print Screen

Remember the last time you needed to know how many Hectares there were in an Acre (0.40)? The Reference section provides the answer to this question and many others. Unit Conversion, File System Error codes and the long lost 6530 Control Codes and Escape Sequence references are provided.

Unit Conversion works by selecting the types of units to be converted, entering the value and clicking on the 'From' units. In the example below under Time, 20 Fortnights is equivalent to 280 Days.

MOMI - Multi-system Online Measure Interface (Client version 4.09)

BlackWood Systems, Inc.

100
50
0

\BWS1-2004

Pause...

2006/03/17
15:13:58

← Back →

Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Diagnostics Server Settings Define Systems Client Access UserHints Tools Reference

Unit Conversion ASCII Chart Errors/Codes 6530 Codes BlackWood Systems

Area Distance Mass Temperature Time Volume

Value to Convert: 20

Decimal Precision: 2

| From | To |
|--------------------|--------------------------------|
| Centuries | 0.01 Centuries |
| DateTime | 280.00 DateTime |
| Days | 280.00 Days |
| Decades | 0.08 Decades |
| Fortnights | 20.00 Fortnights |
| Hours | 6,720.00 Hours |
| JulianDate | 2,415,298.50 JulianDate |
| Millennia | 0.00 Millennia |
| MilliSeconds | 24,192,000,000.00 MilliSeconds |
| Minutes | 403,200.00 Minutes |
| ModifiedJulianDate | 15,298.00 ModifiedJulianDate |
| Months | 9.20 Months |
| Seconds | 24,192,000.00 Seconds |
| Weeks | 40.00 Weeks |
| Years | 0.77 Years |

net.dw Hints On ? Help Print Screen

The ASCII to EBCDIC chart may be sorted in different ways by placing the mouse over the column heading and right-clicking. Place the mouse over the center two columns, ASCII Char and EBCDIC Char, for a tooltip description.

MOMI - Multi-system Online Measure Interface (Client version 4.09)

BlackWood Systems, Inc.

100 50 0 0%

\BWS1-2004

Pause...

2006/03/17
15:09:12

Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Diagnostics Server Settings Define Systems Client Access UserHints Tools Reference

Unit Conversion ASCII Chart Errors/Codes 6530 Codes BlackWood Systems

ASCII / EBCDIC Chart

| ASCII Dec | ASCII Oct | ASCII Hex | ASCII Bin | ASCII Char | EBCDIC Char | EBCDIC Dec | EBCDIC Oct | EBCDIC Hex | EBCDIC Bin |
|-----------|-----------|-----------|-----------|------------|-------------|------------|------------|------------|------------|
| 0 | 000 | 00 | 0000 0000 | NUL | NUL | 0 | 000 | 00 | 0000 0000 |
| 1 | 001 | 01 | 0000 0001 | SOH | SOH | 1 | 001 | 01 | 0000 0001 |
| 2 | 002 | 02 | 0000 0010 | STX | STX | 2 | 002 | 02 | 0000 0010 |
| 3 | 003 | 03 | 0000 0011 | ETX | ETX | 3 | 003 | 03 | 0000 0011 |
| 4 | 004 | 04 | 0000 0100 | EOT | EOT | 55 | 067 | 37 | 0011 0111 |
| 5 | 005 | 05 | 0000 0101 | ENQ | ENQ | 45 | 055 | 2D | 0010 1101 |
| 6 | 006 | 06 | 0000 0110 | ACK | ACK | 46 | 056 | 2E | 0010 1110 |
| 7 | 007 | 07 | 0000 0111 | BEL | BEL | 47 | 057 | 2F | 0010 1111 |
| 8 | 010 | 08 | 0000 1000 | BS | BS | 22 | 026 | 16 | 0001 0110 |
| 9 | 011 | 09 | 0000 1001 | HT | HT | 5 | 005 | 05 | 0000 0101 |
| 10 | 012 | 0A | 0000 1010 | LF | LF | 37 | 045 | 25 | 0010 0101 |
| 11 | 013 | 0B | 0000 1011 | VT | VT | 11 | 013 | 0B | 0000 1011 |
| 12 | 014 | 0C | 0000 1100 | FF | FF | 12 | 014 | 0C | 0000 1100 |
| 13 | 015 | 0D | 0000 1101 | CR | CR | 13 | 015 | 0D | 0000 1101 |

Control Chars
Punctuation Chars
Numbers
Upper Case Letters
Lower Case Letters
Extend Chars
NOT USED

net.dw Hints On ? Help Print Screen

The Errors/Codes screen provides brief description / translation of commonly used numbers including Defines, file system error codes, MEASURE, process creation, Pathcom, Pathmon, Pathsend, SPI and TCP/IP are available. User defined error codes are added by typing in the fields Error / Keyword, System and Error Text and then pressing Update/Add.



\BWS1-2004



← Back Systems Overview CPUs Processes Files SubSystems History Alarms Configure

Diagnostics Server Settings Define Systems Client Access UserHints Tools Reference

Unit Conversion ASCII Chart **Errors/Codes** 6530 Codes BlackWood Systems

| S/U | Err/Key | System | Error Text |
|-----|---------|----------------|--|
| Sys | 0 | File System | [ENOERR] The operation completed successfully. |
| Sys | 1 | File System | A read procedure reached end-of-file or a write procedure reached end of tape. |
| Sys | 1 | NewProcess | Undefined external(s) |
| Sys | 1 | Process Create | A File system error was encountered on the program file |
| Sys | 1 | TCP/IPv6 | Invalid File Name |
| Sys | 2 | File System | The operation specified is not allowed on this type of file. |
| Sys | 2 | NewProcess | No PCB available |
| Sys | 2 | Process Create | Parameter error |
| Sys | 2 | TCP/IPv6 | INTERNAL ERROR: Case value out of range |
| Sys | 3 | File System | An open or purge of a partition failed. |
| Sys | 3 | NewProcess | File-System error on <program file> |
| Sys | 3 | Process Create | Bounds violation |
| Sys | 3 | TCP/IPv6 | Missing Attribute |
| Sys | 4 | File System | An open operation for an alternate key file failed. |
| Sys | 4 | NewProcess | Unable to allocate map |

BlackWood Systems

MOMI - Multi-system Online Measure Interface (Client version 4.15)

BlackWood Systems, Inc.

100
50
0

4%

\BWS1-2004

Pause...

2006/08/25
18:46:22

Back Systems Overview CPUs Processes Files SubSystems *History Alarms Configure

Diagnostics Server Settings Define Systems Client Access UserHints Tools Reference

Unit Conversion ASCII Chart Errors/Codes 6530 Codes BlackWood Systems

BlackWood Systems, Inc.
15982 N 78th Street - Suite B
Scottsdale, AZ 85260
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Phone 602-569-8766
Fax 480-905-8778

Email Support@BlackWood-Systems.com

Web www.BlackWood-Systems.com

Forum Forum.BlackWood-Systems.com

Versions [Check for MOMI updates](#)

Not Logged On Hints Off ? Help Print Screen

The Reference / BlackWood Systems screen provides short cuts to bring up the BlackWood System web site or Forum, generate an email to MOMI support , and check for MOMI software updates.

The Web and Forum functions will launch the Window PC browser to these web sites.

The Email function will cause the email client configured on the PC to launch a 'send email' window. To, Subject, System Serial Number and Client / Server version information are automatically loaded into the email.

The Versions function accesses the BlackWood Systems web site to obtain version information. An area on the screen is populated with the currently installed version information, latest version available and Beta version (if available).

MOMI - Multi-system Online Measure Interface (Client version 4.15)

BlackWood Systems, Inc. logo and progress bar (4%)

System: \BWS1-2004 | Date: 2006/08/25 | Time: 18:47:46

Navigation: Back, Systems, Overview, CPUs, Processes, Files, SubSystems, *History, Alarms, Configure

Diagnosics, Server, Settings, Define Systems, Client Access, UserHints, Tools, Reference

Unit Conversion, ASCII Chart, Errors/Codes, 6530 Codes, **BlackWood Systems**

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Email: Support@BlackWood-Systems.com
 Web: www.BlackWood-Systems.com
 Forum: Forum.BlackWood-Systems.com
 Versions: [Check for MOMI updates](#)

You have the current Release

| Versions | Current | Latest | Beta |
|-------------|-------------------------------------|--------------------------------------|----------------------------------|
| Release | <input type="button" value=""/> | <input type="button" value="4.14"/> | <input type="button" value="-"/> |
| Client | <input type="button" value="4.15"/> | <input type="button" value="4.14"/> | <input type="button" value="-"/> |
| Server | <input type="button" value="4.11"/> | <input type="button" value="4.10"/> | <input type="button" value="-"/> |
| MomiFTP | <input type="button" value=""/> | <input type="button" value="1.60"/> | <input type="button" value="-"/> |
| ssMOMI | <input type="button" value=""/> | <input type="button" value="4.10"/> | <input type="button" value="-"/> |
| MomiEMail | <input type="button" value=""/> | <input type="button" value="1.01"/> | <input type="button" value="-"/> |
| IP Workshop | <input type="button" value=""/> | <input type="button" value="1.3.3"/> | <input type="button" value="-"/> |

Not Logged On | Hints Off | ? | Help | Print Screen

Pressing the buttons under Current, Latest and Beta accesses the BlackWood Systems web site and retrieves the corresponding ReadMe.txt file (right click to access the history file).

  \BWS1-2004 Pause... 2006/08/25
18:48:30

[Back](#) [Systems](#) [Overview](#) [CPUs](#) [Processes](#) [Files](#) [SubSystems](#) [*History](#) [Alarms](#) [Configure](#)

[Diagnostics](#) [Server](#) [Settings](#) [Define Systems](#) [Client Access](#) [UserHints](#) [Tools](#) [Reference](#)

[Unit Conversion](#) [ASCII Chart](#) [Errors/Codes](#) [6530 Codes](#) [BlackWood Systems](#)

[ReadMe.Txt for Latest Version 4.14](#) X

MOMI Readme.txt Date 2006/05/26

BlackWood Systems, Inc.
15982 N 78th Street
Suite B
Scottsdale, AZ 85260
phone: 602-569-8766
fax: 480-905-8778
email: support@blackwood-systems.com
web: www.blackwood-systems.com

This file contains the latest version and upgrade information. This file is the first place to look for initial installation and upgrade information.

Please thoroughly read and agree to the License.txt file before using this software.

For an initial install, further in this document the section entitled

Chat

The screenshot shows the MOMI Chat interface. At the top, the title bar reads "BWS1-2004 MOMI (Client version 4.23)". Below the title bar is a navigation menu with buttons for "Systems", "Overview", "CPUs", "Processes", "Files", "SubSystems", "History", "Alarms", and "Configure". The "Chat" button is highlighted. Below the navigation menu is a sub-menu with buttons for "Diagnostics", "Server", "Settings", "Define Systems", "Client Access", "UserHints", "Tools", "Reference", and "Chat". The "Chat" button is also highlighted here. Below the sub-menu is a channel selection area with a "Channel" dropdown set to "ALL". There are radio buttons for "ALL Public", "Public 1", "Public 2", "Public 3", "Public 4", "Private 5", and "Private 6". A "My Color" dropdown is set to "clBlack". Below the channel selection is a text input field containing "Thank you!". There are "Clear" and "Send" buttons. Below the input field is a chat log showing three messages:

| Channel | User | Message | Time |
|---------|--------------|---|---------------------|
| ALL | - net.dw | This is a test of the chat subsystem | 2007/10/01 14:42:23 |
| ALL | - net.dw | The quick brown fox needs to know if the network is now up! | 2007/10/01 14:42:57 |
| ALL | - super.oper | Yes, the network has been restored! | 2007/10/01 14:44:56 |

At the bottom of the chat window, there is a status bar with a "net.dw" button, a "Chat" button, "Hints On", "?", "Help", and "Print Screen" buttons.

The Chat screen provides a simple means to communicate with other MOMI users.

Anyone may view Chat, unless restricted by by [Client Access](#), but you must be logged on in order to participate. Chat is NOT a secured means of communication.

To use chat, logon, select a Channel, type in text and press Send.

Chat is grouped into channels. The default selection ALL, displays all chat over the public channels. The selection of any of the other channels, Public 1 - 4 or Private 5 & 6 displays only its traffic. The Chat

selection at the bottom on the MOMI PC Client window displays green if any Chat has been entered in the last 5 minutes.

Additional Screens

Lunch Finder



This little gem is located by right-clicking the BlackWood Systems Emblem. It solves a major problem we have discovered for Tech Support people, "Where to have lunch today?" It's amazing how people who are able to make major decisions involving the 'care-and-feeding' of a multi-million dollar computer system are unable to decide where to eat! This was the major reason for the development of MOMI but it is hidden behind all the Tech Support stuff to make management happy.



To use the lunch finder:

1. Press the **Config** button and enter available lunch locations (press **Load** for a pre-configured list)
2. Press "Save" to store the list (step 1 & 2 are only required for initial, new or updated locations)
3. Press "**Where do I go for lunch today?**"
4. Consider the location displayed - if unsure of the location, repeat step 3
5. Press **Close**

6. Goto and eat lunch at indicated location
7. Return back to work

MOMI's lunch finder uses the latest in Human Biometrics to determine the optimum lunch for the User for that day. Some of the many factors it takes into account are:

- a) Key press impact strength (your need for nourishment)
- b) User Biorhythm cycle (your Emotional, Intellectual, and Physical needs)
- c) What lunch you've had the last week (reduce duplication and increase oral stimulation)
- d) Recent computer use (if you've been making a lot of mistakes lately indicating a lack of certain minerals)

After MOMI has taken all these factors into account it uses an advanced 'Needs Requirement' formula and determines the correct lunch destination by picking one from your list at random.

The ROI (Return on Investment) of this tool alone will pay for MOMI within a few months when you figure Systems Management people spend a half hour trying to decide where to eat. The resulting increase in productivity could be phenomenal!!!

Calendar

The screenshot shows the MOMI software interface. At the top, it displays 'MOMI (Client version 4.19)', 'BlackWood Systems, Inc.', and the user name '\BWS1-2004'. The current date is '2006/12/28' and the time is '15:41:53'. The main window is titled 'CALENDAR' and shows a grid for the year 2006. The days of the week are labeled M, T, W, T, F, S, S, M, T, W, T, F, S, S, M, T, W, T, F, S, S, M, T, W, T, F, S, S, M, T. The calendar grid shows the months from January to December. A legend at the bottom identifies the colors used in the calendar: yellow for 'US Holidays', orange, lime, green, aqua, blue, and pink for 'On this day in history'. A red circle highlights the date December 27th.

The Calendar is located by clicking the current date panel at the top of the screen. It allows Users to set up dates on a calendar with a color coded display to indicate some information. For example: a User might define the color ORANGE as an indicator for a scheduled Maintenance window, or BLUE and AQUA as vacation days for the Tech Support personnel. The User can define 7 colors (YELLOW, ORANGE, LIME, GREEN, AQUA, BLUE and PINK) as anything they want. The RED color is reserved for any date with more than 1 color assigned to it.

Clicking on a day will display a pop-up with information saved about that day in history.

Calendar items for

Select item to alter/add/delete

| | |
|---|----------------------|
| New Year's Day | <input type="text"/> |
| 2000 Largest collective hangover in human history | <input type="text"/> |
| <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> |

Calendar color labels are saved in the MOMI.INI file and Calendar date items are saved in the CALENDAR.MOM database. MOMI is shipped with a basic CALENDAR.MOM database containing a couple years of US Holidays and some interesting 'On this day in history' facts.

To exit this screen, click on the X below the date/time.

World TimeZone Map

The screenshot shows the MOMI (Client version 4.19) application window. The title bar includes the MOMI logo and the file path \BWS1-2004. The main area displays a world map with vertical color-coded bands representing time zones, labeled with letters (A-M) and offsets from GMT (-12 to +12). The map is titled "World TimeZone Map". Below the map, there are controls for "Time Base" (Tandem Time selected), "Time in selected TimeZone (-7:00)" (2006/12/28 15:38:43), and "GMT Time" (2006/12/28 22:38:43). The bottom of the window features buttons for "net.dw", "Hints On", "Help", and "Print Screen".

The TimeZone Map is located by clicking the time at the top right of the screen. It allows Users to get basic time zone info around the world. It does NOT account for daylight savings time. The information is just a guide and please don't consider it accurate. The file that loads the supplied default TimeZone list is TIMEZONE.MOM . You may make changes and add new time zones by editing this file using Notepad. Instructions on the format are located in the file.

MOMI is shipped with a basic TIMEZONE.MOM database containing several hundred entries.

A User may select a time zone either by selecting an entry from the drop-down list or by clicking an offset from the GMT value near the bottom of the window.

The **Time in selected TimeZone** and **GMT Time** fields originates from either the Tandem system currently selected, which is the time displayed in the upper right corner of the screen, or time from the PC. This selection is made in the **Time Base** field.

To exit this screen, click on the X below the date/time.

PC Quirks

This section describes various situations or "quirks" present on the PC:

[Client will not minimize](#)

[Client window resize](#)

[Specifying run-time parameters](#)

[Speech](#)

[System resources - Out of Memory](#)

[Tool tip \(i.e. Hint\) does not display](#)

[Viewing Help across Network Share](#)

[Windows Vista](#)

Client will not minimize

Certain Windows programs issue a non-standard "minimize window" command to other programs running on the User's PC. This non-standard command can affect the ability of the PC MOMI Client to minimize when directed.

This situation does not directly affect the operation of the PC MOMI Client and does not involve "main-line" MOMI code. The situation appears to only affect the program's run-time library, which deals with Windows interactions.

Previous versions of the client provided an option to activate alternate processing to work around this situation.

Update ➡ As of MOMI PC Client version 4.19 and later special logic was added that should prevent this problem. The logic is always enabled.

Client window resize

The MOMI PC Client adjusts the size of most screen elements when its window size is changed to allow most aspects to remain in proportion.

This entire adjustment process may take, depending on how many screens are active and the micro-processor speed, 15-30 seconds.

Speech

MOMI functions that utilize speech require Windows XP (or later).

Speech can be enabled on Windows 2000 by searching Microsoft's web site for the following download:

Speech SDK 5.1 (or later)

The Speech 5.1 SDK Redistributables are used just to enable Speech. Note that this is a rather large file.

In the event that the Speech environment is not compatible with the MOMI PC Client, the runtime parameter [NOSPEECH](#) may be used to bypass normal client speech detection logic and force the client to disable speech processing.

System resources - "Out of Memory"

If a PC encounters an error indicating, to the effect, that insufficient memory is available, there are three general possibilities:

1. The Windows paging file, also referred to as virtual memory, is nearing capacity.
2. Physical memory is at capacity.
3. Windows internal control blocks are at capacity.

The Windows paging file is physical disk space used for swapping to and from main memory or the computers RAM. This disk space provides an extension of the physical memory, unfortunately at a much slower rate of access. Certain operations within MOMI, such as viewing a Spooler job or a disk file may require a great deal of virtual memory.

With the MOMI PC Client running, open the Windows Task Manager and select the **Performance** tab. The area labeled **PF Usage** shows the amount of paging file space in use and **Page File Usage History** shows a usage over the last few minutes or so. If the paging file is nearing capacity, have the PC administrator increase the amount of virtual memory available (i.e. the Windows paging file).

Virtual memory is great for temporary surges in memory requirements or to hold seldom used programs. However, in a true multi-tasking environment where many Windows programs are active or being activity used, virtual memory is no substitute real physical memory in a PC. In the Windows Task Manager, with MOMI and all other "normally started" programs active look on the tab **Performance** in the section **Physical Memory (K)**. If the Available memory is zero or otherwise really low (perhaps below 100,000 or 100 Megabytes), the PC Administrator should consider adding more physical memory.

If items 1 and 2 are not the issue, another possibility is that Windows has exhausted space for internal control blocks. The default amount of space for Windows versions prior to XP are somewhat limited and unfortunately the counts available and in use are not easily obtained. If a PC encounters the message "Out of Memory" when running more than one copy of the MOMI PC Client simultaneously OR a single MOMI PC client is run with other PC programs such as Lotus Notes, running out of these control blocks is a strong possibility.

If a MOMI PC Client encounters a fatal error and crashes, a file named MOMI.LOG should appear on the desktop. Open this text file and check for the following text just a few lines down (text may vary but this is the general idea):

Not enough storage is available to complete this operation *or*
Not enough storage is available to process this command

If items 1 and 2 described above are not the issue, and these messages (or something close to it) are encountered, a change to the Windows registry should be considered to increase the Windows Desktop Heap. Please see [Configuration recommendations](#) for details.

Tool tip (i.e. Hint) does not display

Version 3.85 of the MOMI PC Client introduces the ability to alter timers associated with the Tool tip or yellow pop-up window hint is displayed.

The Tool tip may fail to display after altering these values on some PCs. If this occurs, press the Default button, located next to these timers, to restore the original values.

Viewing Help across Network Share

Changes in Microsoft security have made viewing MOMI help, when connected via a network drive or share, much more difficult.

HTML Help can generate lots of scripting warnings. Widows Help may only display the Table of Contents, but not individual pages.

If help is not available on the local PC, Flash Help and User-Define Help, which defaults to the BlackWood Web site, seem to be the best choices at this time.

Sometimes, Unblocking a file within Windows (right-click on the file and select Properties) will remove access limitations.

Update ➡ As of MOMI software release 5.00 and later a new help documentation generator is used and adds a special 'mark of the web' so that MOMI HTML Help should display without error.

Windows Vista

CAIL emulator

In order to operate the CAIL emulator, it is necessary to start the PC MOMI Client as Administrator at least once per version in order to allow the registration process to successfully complete. In Vista, this does not mean just logging on as Administrator then starting the PC MOMI Client, but running MOMI "as" Administrator (there is a difference).

The current work-around is to use the runtime parameter of [NOCAIL](#) when starting the MOMI PC Client to disable the emulator.

Support

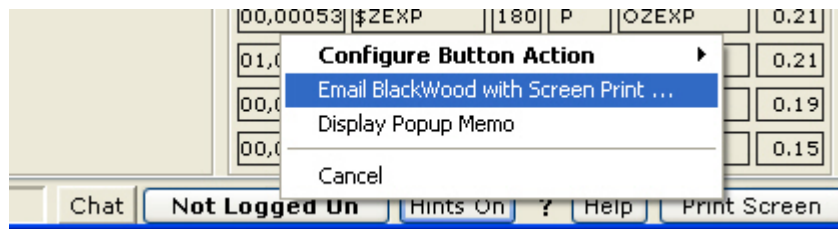
Reporting a problem

To report a problem, ask a question or provide other feed-back you can either use MOMI's built-in problem reporting software or send an email to:

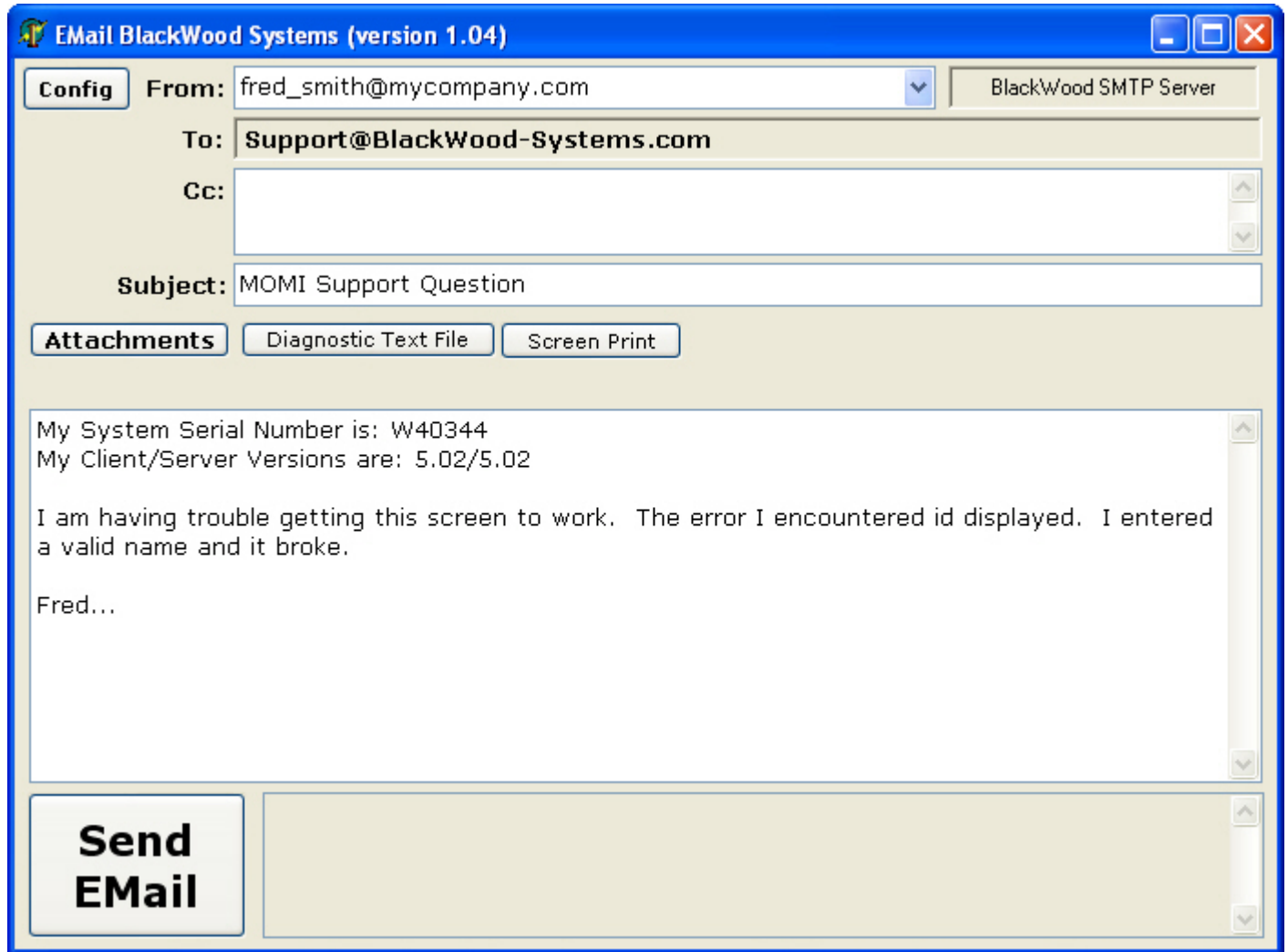
Support@BlackWood-Systems.com

MOMI's built-in problem reporting software captures the current PC MOMI Client screen image, constructs and send a message directly to BlackWood. Additionally, a Diagnostic Text File that contains a great deal of PC, MOMI PC Client and Tandem server configuration information is automatically generated and attached. The Diagnostic Text File is in plain ASCII text and helps us understand your environment and resolve the issue (also saves us from asking lots of basic questions such as what software releases are being used, how many processors, what type of PC O/S, etc). Screen Prints are in JPG format.

On the screen to capture, right-click on the **Print Screen** located in the lower right-hand corner of the window (this button is labeled **Clipboard** if a printer is not available) and select **Email BlackWood with Screen Print**.



This selection displays the window below and captures the current PC MOMI Client screen. Additional screens may also be attached by again displaying the desired screen in the MOMI PC Client and again right-click on the **Print Screen** and select **Email BlackWood with Screen Print** (up to 10 screens may be attached in one message). Once all desired screens are captured, fill in the **From** with your email address and optionally add **CC** email addresses. In the body of the message type in any descriptive information concerning the problem or question (please try to give us enough detail so we may reproduce the problem or understand the question in your environment). Push **Send Email** to transmit the data.



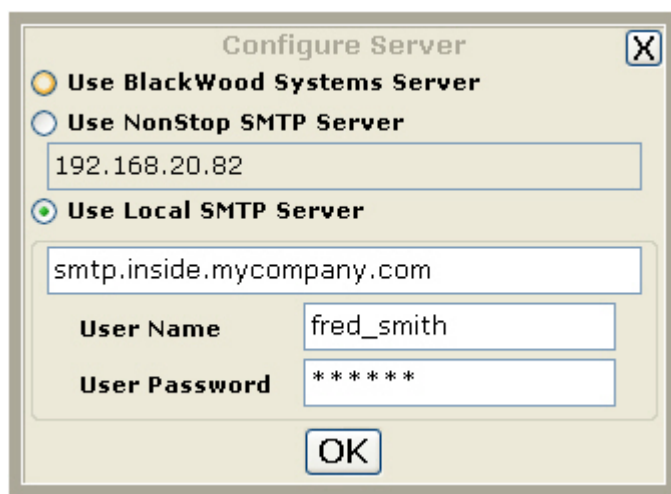
MOMI's problem reporting software uses the DNS addresses of momi-mail.blackwood-systems.com (backup is momi-mail-b.blackwood-systems.com) over port 80. If access via port 80 is blocked in your local network, pressing the Config button displays a window with the following selections:

1) Use the BlackWood Systems Server (the default)

This selection sends directly to BlackWood and does not require any email server nor configuration from the user

2) Use NonStop SMTP server (what is defined in the CONFMOMI file for [ALARM-SMTP-SERVER-ADDR](#)), or

3) **Use Local SMTP Server** and manually enter an SMTP server DNS or IP-Address and optionally specify a User Name and Password (this User Name and Password provide access to this local SMTP server if required).



Any selection other than **Use BlackWood Systems Server** will communicate using standard SMTP protocol over port 25.

In the event a MOMI program abends on the Nonstop Server, please transfer in BINARY the ZZSAnnnn file(s) to our FTP site and then use MOMI's built-in problem reporting software or an email and let us know happened. Please include any information you may have pertaining to the occurrence.

Our FTP site is accessed with the following information:

```
ftp address : ftp.blackwood-systems.com
user name   : momisave
password    : momisave          (both are the same and lower case)
```

The logon will take you to a special area on our FTP site where this User ID has access to place (i.e. write) files. Please send us an email if you have any trouble accessing the FTP site.

If sending a SAVEABEND via email, the file **must** be compressed (either using PAK on the Nonstop Server or ZIP on the PC) then attach the resulting file. When compressing a file, please use a file extension to denote the type of compression (i.e. .zip for ZIP and .1729 for PAK).

➡ **Sending a SAVEABEND file directly attached to an EMAIL does not work. The attached file is unusable.**

Comments and suggestions

We welcome your comments and suggestions. You can either use MOMI's built-in problem reporting software or send an email to:

Support@BlackWood-Systems.com

Please note that while suggestions are considered, they may or may not be included in a future release.