

EXPRESSSCOPE Engine 3 User's Guide (for ft series)

NEC Express Server

Express5800 Series

- 1. Overview**
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ABOUT THIS USER' S GUIDE

This User's Guide provides the instructions for properly using the EXPRESSSCOPE Engine 3. Please keep this document at hand for a quick reference and use it when you encounter any questions or troubles while using the EXPRESSSCOPE Engine 3 for remote control, monitoring, and management of the server.

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SYMBOLS

The following symbols are used throughout this manual.



Items to be observed or points to be noted when using this product.



Items to be checked when using this product or software.



Information useful or convenient for you.



Example of troubles occurred.

PREFACE

The EXPRESSSCOPE Engine 3 enables you to monitor the operating status of the server (power supplies, fans, temperature and so forth), to operate the server's keyboard, video, and mouse (KVM) from a remote console and to access to CD-ROM/Floppy disk drives on a remote site. The EXPRESSSCOPE Engine 3 is enabled by a system management LSI called "BMC (Baseboard Management Controller)" and thus referred to as the "BMC" hereinafter in this User's Guide.

1. Overview

The server comes standard with the BMC (system management LSI) and a management LAN port dedicated to the BMC. By connecting the management LAN port to your network, you can monitor and control the server from a remote site via a Web browser and SSH client.

Also, you can operate the server's KVM (keyboard, video, and mouse) from a remote console and access CD-ROM/DVD-ROM/floppy disk drives and USB memory in a remote site.

2. Configuring the Server

This chapter describes the settings necessary to configure the BMC in the server.

DEFAULT NETWORK SETTINGS

The BMC's default network settings are as follows:

| | |
|--------------------|----------------------|
| IP Address: | 192.168.1.1 |
| User Name: | Administrator |
| Password: | Administrator |

- Connect the management LAN port to the private network on which the default IP address "192.168.1.1" is reachable. If the default IP address is not reachable on the network, assign a new IP address to the management LAN by using the BMC Configuration of the Off-line Tool in the server. Refer to "Management LAN Settings" in the next page for the settings.



For security reasons, change the above default settings (IP address, User Name, and Password) to the ones appropriate in your network environment. Refer to "Chapter 5: Using Remote Management" for details.

- The remote management function is enabled by default. (In some systems, the remote management function is disabled by default.) So, if the remote management function is not used, disable this settings by using the BMC Configuration of the Off-line Tool. Refer to "Management LAN Settings" in the next page for the settings.

MANAGEMENT LAN SETTINGS

You can configure basic setting of management LAN settings of BMC for remote management using Web server function and command line interface of BMC by using some tools

- Web Browser
Please refer to Chapter 5 for details.
- BMC Configuration (Off-line)
Press the F4 key during POST(Power on Self test) or displaying logo immediately after power on or reset the server to enter the BMC Configuration.
- BMC Configuration (On-line Windows/Linux).
It is possible to install it from NEC EXPRESSBUILDER of the server attachment.

The item that can be set with each tool is different. Please refer to help of each tool for details of a set item.

| Setting item | Web Browser | Off-line BMC Configuration | On-line BMC Configuration Tool (Windows/Linux) |
|---|-------------|-------------------------------|--|
| BMC LAN Setting Shared LAN Port or Management LAN Port | NG | NG | NG |
| IP Address Subnet Mask Default Gateway DHCP IPv6 Address Assignment Mode IPv6 Static Address IPv6 Prefix Length IPv6 Global Address IPv6 Gateway Address | NG | OK | OK |
| Service Settings HTTP/HTTPS/SSH | NG | OK | OK |
| BMC Initialization | NG | OK | OK |

Management LAN / Shared BMC LAN

The function for BMC to use operation LAN of the server is called Shared BMC LAN. Select [Enabled] to share a system LAN port with BMC LAN. If you use a management LAN port for the BMC, select [Disabled]. The management LAN port is not available when this setting is set [Enabled]. (Default setting is [Enabled]. In some systems, this menu is not supported. Please refer to the User's Guide of your host system for more details.)

Shared BMC LAN is unsupported by ft series.

Connection Type

Select appropriate setting for link speed and duplex mode which you need.
Following settings are available for Management LAN.

- Auto Negotiation
- 100Mbps Full Duplex
- 100Mbps Half Duplex
- 10Mbps Full Duplex
- 10Mbps Half Duplex



Select [Auto Negotiation] if the link speed and duplex mode (Connection Type) of the switch (such as HUB) connected to the Management LAN is [Auto Negotiation]. If you would like to use the other setting (not “Auto Negotiation”), at first, select the other setting of the switch (such as HUB) connected to the management LAN, and then select the same setting as the switch to the Connection Type of the management LAN. Selectable menu of Connection Type is depends on the server and its configuration.

IP Address

If DHCP is not used to automatically obtain an IP address, enter the BMC's IP address.

If DHCP has been used, an automatically obtained IP address will appear.
(Default setting is 192.168.1.1.)

Subnet Mask

If DHCP is not used to automatically obtain a subnet mask IP address, enter the subnet mask of your management LAN.

If DHCP has been used, an automatically obtained subnet mask IP address will appear. (Default setting is 255.255.255.0.)

Default Gateway

If DHCP is not used to automatically obtain a default gateway IP address, enter the default gateway of your management LAN.

If DHCP has been used, an automatically obtained default gateway will appear.
(Default setting is 0.0.0.0.)

DHCP

If you want to obtain an IP address, choose [Enabled].

If you want to manually configure an IP address, choose [Disabled].

(Default setting is [Disabled](*) .)

IPv6 Address Assignment Mode

Please choose “Static” or “Dynamic”. (Default setting is [Dynamic].)

IPv6 Link Local Address

BMC's IPv6 Link Local Address is displayed.

This address is granted to BMC network interface and It is automatically generated to be unique form as (FE80 ::XXXXXX /64) within one subnet.

IPv6 Static Address

It is displayed for "Static" IPv6 Assignment Mode. Please set a static address. Cannot set the Static Address whose start is "fe8".

IPv6 Prefix Length

Please set a prefix length. (Default setting is [64].)

IPv6 Global Address

It is displayed for "Dynamic" IPv6 Assignment Mode. IPv6 global address which is assigned by RA (Router Advertisement) is displayed.

IPv6 Gateway Address

It is displayed for "Static" IPv6 Assignment Mode. Please set IPv6 Gateway address. (Default setting is [0::0].)

Web Interface:

HTTP Interface

Select [Enabled] to use the Web Server function using the HTTP. If not, select [Disabled]. (Default setting is [Enabled](*) .)

HTTP Port Number

Specify the HTTP port number. (Default setting is 80.)

HTTPS Interface

Select [Enabled] to use the Web Server function using the HTTPS(SSL). If not, select [Disabled]. (Default setting is [Enabled](*) .)

HTTPS Port Number

Specify the HTTPS(SSL)port number. (Default setting is 443.)

Command Line Interface:

SSH

Select [Enabled] to use the Command Line Interface using SSH. If not, select [Disabled]. (Default setting is [Enabled](*) .)

SSH Port Number

Specify the BMC's SSH port number. (Default setting is 22.)

BMC Initialization

The BMC Configuration will be cleared. Please use this function when you forgot your user name and password, etc. for remote management via a Web browser and command line interface. This function will be executed when you select "YES" on confirmation menu which appears after pressing the "Enter" key. This menu invokes the BMC configuration clear operation after selecting the "YES".



- **These BMC Management LAN-related settings of BMC are not changed to default settings by executing the "Load Setup Default" of BIOS Setup Utility. (Execute the "BMC Initialization" to set default settings to the BMC Management LAN settings.)**
- **When "BMC Initialization" is executed, BMC is reset. It will take about tens of seconds by the time initialization is completed after it executes it.**



The BMC Initialization also deletes the settings for ESMPRO/ServerManager(a software application bundled for remote management). Be sure to perform a backup for the ESMPRO/ServerManager settings before you change the BMC settings.

* In some systems, the default settings are different for DHCP, HTTP, HTTPS, and/or SSH.

IPv6 supports both of manual setting and RA (Router Advertisement) setting, but does not support DHCP server. Also, the user interface available in IPv6 is only connection from Web browser and command line interface.

The following list shows the available function menu in each IPv4 and IPv6.

| Function items | | IPv4 | IPv6 |
|-----------------------------|------------------|------|------|
| Connection to Web server | DNS Server | OK | NG |
| | DHCP Server | OK | NG |
| | Active Directory | OK | NG |
| | LDAP | OK | NG |
| | Mail Alert | OK | OK |
| | SNMP Alert | OK | NG |
| | Remote KVM/Media | OK | OK |
| | Access log | OK | OK |
| Command line interface(SSH) | | OK | OK |
| WS-Management | | OK | NG |

3. Configuring a Management PC

This chapter describes the settings necessary for the remote management PC that will be connected to the server.

SETTING YOUR BROWSER

Configure the following settings:

- Allow Java Script execution.
- Allow Java execution.
- Accept Cookies.
- Allow Popup.
- Enable Stylesheet.
- Enable HTTP1.1.

* If you use Microsoft Internet Explorer, the following configurations are required.

- Add BMC's address to Trusted Sites.
- Set Trusted Site's security level to Medium.
- If Enhanced Security is enabled, adding [about:blank] to Trusted Sites is required.
- If the "Do Not Save Encrypted Pages To Disk" of [Security]-[Advanced]- [Internet Options] is check on, un-check this item is required.
- If the "Play animations in web pages" of [Multimedia]-[Advanced]- [Internet Options] is check off, check this item is required.
- Because the security settings of browser are enhanced on server OS, if you use browser, you might find that some of the buttons has no response. In this case, it is necessary to be off the IE SEC settings.
- If you use Internet Explorer 9 under the network environment using a global IP address, You need to check off "Use TLS 1.0" and check on "Use TLS 1.1" and "Use TLS 1.2" of [Internet Options]-[Advanced]-[Security].(TLS1.1/1.2 options are not on Windows Vista, so you can not use Windows Vista as client in this case.)
- To avoid from the vulnerability issue of SSL protocol 3.0 (CVE-2014-3566), please disable "Use SSL 3.0" and enable TLS protocol 1.0 or later from [Advanced]-[Internet Options].

* If you use Mozilla Firefox (Supported only on Linux OS), below configuration is required.

- Enter URL "about:config" and change the value of "network.http.max-persistent-connections-per-server" to 4.
- If IPMI Information window can not be opened and Java Plug-in is crushed, change the value of "network.http.max-persistent-connections-per-server" to 1.
- To avoid from the vulnerability issue of SSL protocol 3.0 (CVE-2014-3566), enter URL "about:config" and change the following value to disable SSL protocol 3.0.
For ESR31 or later, "security.tls.version.min" to "1"

SUPPORTED BROWSERS

The following browsers are supported by Windows Vista (SP2), Windows 7, Windows 8, Windows 8.1, Windows Server 2008, Windows Server 2008 R2 (SP1), Windows Server 2012, Windows Server 2012 R2 and Windows Server 2016:

- Microsoft Internet Explorer 8.0
- Microsoft Internet Explorer 9.0
- Microsoft Internet Explorer 10.0
- Microsoft Internet Explorer 11.0

The following browser is supported by Red Hat Enterprise Linux WS (version 6.5 or more) and Red Hat Enterprise Linux Client (version 6.5 or more):

- Firefox ESR31 or later

*It's recommended that a browser be applied the latest service pack and the security patch.

*Beginning January 12, 2016, only the most current version of Internet Explorer available for a supported operating system will receive technical support and security upgrades. About Microsoft Lifecycle Support policy for Internet Explorer, please refer the following URL.

<https://www.microsoft.com/en-us/WindowsForBusiness/End-of-IE-support>

<https://support.microsoft.com/en-us/lifecycle#gp/Microsoft-Internet-Explorer>

*Operation guarantee of Firefox is only for ESR version.

JAVA RUNTIME ENVIRONMENT

The management PC requires Java2 Runtime Environment (JRE), Standard Edition 8.0 Update121 or later.

JRE is available free of charge from Oracle Corporation. For security reasons, you are recommended to use the latest JRE update. In addition, it is recommended to use the 32 bit In addition, only the 32 bit version of Java Runtime Environment is supported. JRE on the 64 bit Browser.

It is necessary to set the following in the Java control panel.

- Add BMC's IP address (both HTTP/HTTPS) to [Exception Site List]-[Security].
- If the [Enable the next-generation Java Plug-in (requires browser restart)]-[Java Plug-in]-[Advanced] is not checked, please check. This item is required.
- To avoid from the vulnerability issue of SSL protocol 3.0 (CVE-2014-3566), please disable "Use SSL 3.0" and enable TLS protocol 1.0 or later from [Advanced Security Settings]-[Advanced].



If you open multiple BMC Web using Tab browser, you may not use Remote KVM/Media successfully. In this case, please use another browser instead of browser's tab.



If you use Java8, you may see the dialog of 'Running this application may be a security risk'. In this case, you need to check 'I accept the risk and want to run this application' and press Run button.



If you use Java8, you may see the dialog of 'Block potentially unsafe components from being run?'. In this case, you need to press 'Don't Block' button or please choose the 'Enable-hide warning and run with protections' from the Mixed code of Advanced menu of Java control panel.



If you use Java8, it may take some time to start for certificate revocation checking of the signed Java Applet/Application. In this case, once you need to close the browser and choose the 'Do not check (not recommended)' from the [Perform signed code certificate revocation checks on] of Advanced menu of Java control panel and then login again from the browser.

4. Networking

TCP/IP PORTS

The BMC uses the TCP/IP ports listed below. If you use the BMC in a firewall environment, you need to allocate the port numbers (shown in the right column) to the individual non-block ports.

| Module name | Port # | Protocol | Direction | Module name | Port # |
|-------------------------------------|-------------|----------|-----------|-------------|--|
| Remote Media (Non-Encryption) | Dynamic(*1) | TCP | ↔ | BMC | 5120(CD/DVD) 5122(USB MEM) 5123(FD) (*2) |
| Remote Media (Encryption) | Dynamic(*1) | TCP | ↔ | BMC | 5124(CD/DVD) 5126(USB MEM) 5127(FD) (*2) |
| Web browser (Non-Encryption) | Dynamic(*1) | TCP | ↔ | BMC | 80(*3) |
| Web browser (Encryption) | Dynamic(*1) | TCP | ↔ | BMC | 443(*3) |
| Remote KVM Console (Non-Encryption) | Dynamic(*1) | TCP | ↔ | BMC | 7578(*2) |
| Remote KVM Console (Encryption) | Dynamic(*1) | TCP | ↔ | BMC | 7582(*2) |
| SSH client | Dynamic(*1) | TCP | ↔ | BMC | 22(*3) |
| SMTP server | 25(*4) | TCP | ↔ | BMC | Dynamic |
| LDAP server | 389(*5) | TCP | ↔ | BMC | Dynamic |
| SNMP server | 162 | UDP | ↔ | BMC | Dynamic |

*1 The Dynamic ports are dynamically allocated ports and usually ranged from 1024 to 65535.

*2 Go to [Configuration]-[System Operation] to change the port number.

*3 Use BMC Configuration Tool to change the port number.

*4 Use BMC Configuration Tool to change the port number.

*5 Use BMC Configuration Tool to change the port number.



BMC doesn't support connection via HTTP proxy server.



It is recommended to use the network in more than 100BASE-TX (10Mbps bandwidth or more) for remote management feature.

5. Using Remote Management

OVERVIEW

The BMC Web Server function allows you to control the server's power and KVM from a remote console via a Web browser.

Part of the above function is implemented by Java Applet.



The Remote KVM Console function supports the following display resolutions:

- 1600 x 1200 pixels, 256 colors, 16-bit color
- 1280 x 1024 pixels, 256 colors, 16-bit color, 24-bit color
- 1152 x 864 pixels, 256 colors, 16-bit color, 24-bit color
- 1024 x 768 pixels, 256 colors, 16-bit color, 24-bit color, 32-bit color
- 800 x 600 pixels, 256 colors, 16-bit color, 24-bit color, 32-bit color
- 640 x 480 pixels, 256 colors, 16-bit color, 24-bit color, 32-bit color

When displaying the resolution besides 6 kinds indicated by the above by a remote KVM console, it can't normally be displayed. Therefore when using a remote KVM console, **please make the resolution setting of OS of host system same as the resolution above-mentioned.**

CONNECTING TO THE WEB SERVER

Access the following URL from the Web browser on the remote management PC:

`http://BMC_HostPort` or `https://BMC_HostPort`



Tips

The “BMC_HostPort” URL includes the BMC’s IP address or host name and a colon followed by a port number for HTTP or HTTPS connection: e.g. 192.168.1.1:80 If the port number is 80 for HTTP or 443 for HTTPS (default), you may omit the port number.



Tips

For security reasons, you are recommended to use HTTPS (SSL) connection. For better communication performance, use HTTP on a secured network.



Tips

When you connect via SSL, security warning messages may appear.



Tips

If you did not register the SSL server certificate, the following page is displayed and HTTPS connection is blocked. In this case, select “Continue to this website” to continue (The image if you are using Internet Explorer is as follows).



There is a problem with this website's security certificate.

The security certificate presented by this website was not issued by a trusted certificate authority.

Security certificate problems may indicate an attempt to fool you or intercept any data you send to the server.

We recommend that you close this webpage and do not continue to this website.

 [Click here to close this webpage.](#)

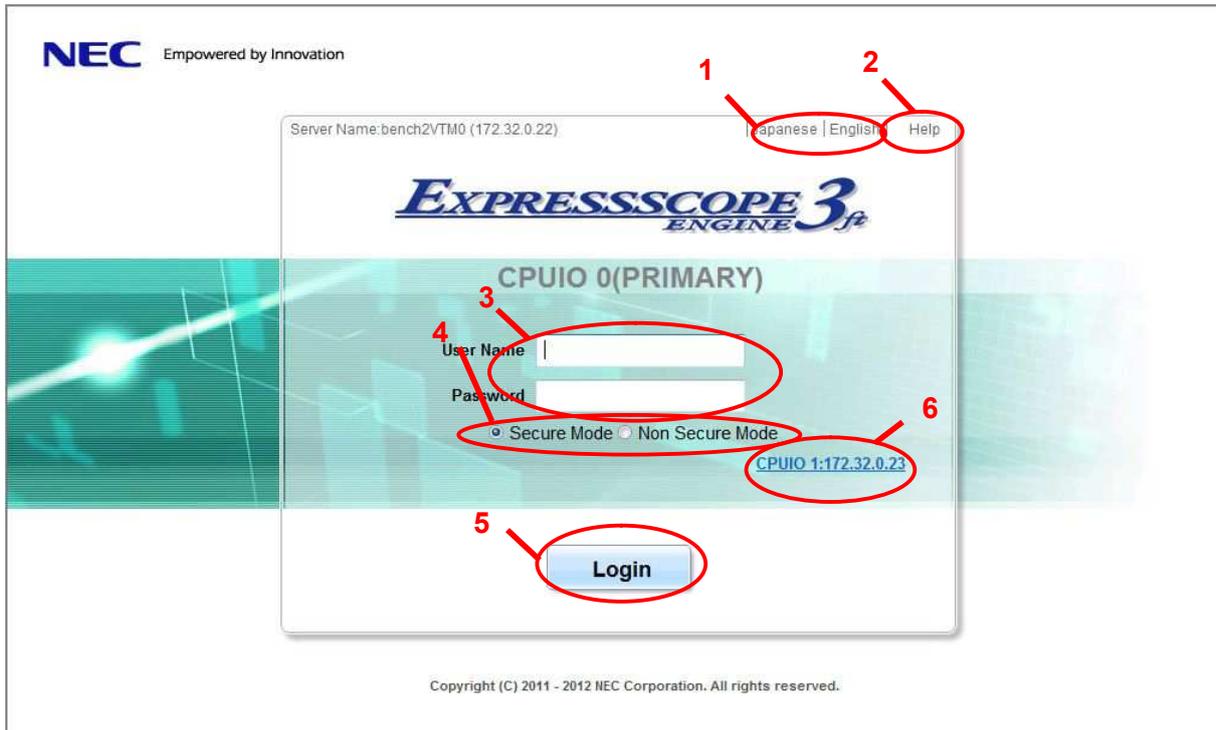
 [Continue to this website \(not recommended\).](#)

 [More information](#)

LOGIN AND LOGOUT

Login

When the login page appears, input the user name and password, and then click [Login].



1. The display language can be selected to English or Japanese.
2. The online help is displayed.
3. Please input username and password.
4. Secure Mode(HTTPS) or Non Secure Mode(HTTP) can be selected.
5. Please push "Login" button.
6. Other CPU/IO module's BMC IP address is displayed.



Notice

You can select the display language only in the login page. If you want to change the language after login, log out once and change the language in the login page.



Notice

Do not use the "Reload" button in your browser after login.



If you use Active Directory authentication, you need to input with the form of `username@domainname` in “User Name”.

Logout

Click “Logout” in the upper right corner of the window. When a confirmation dialog appears, click [OK] to log out.



After you log out, you return to the login page. Besides, all the remote device windows that were opened during login will be closed.



If the browser is slow during login procedure, please restart your browser or logout.



If the BMC becomes high loaded, BMC will be restarted very rare for recovery. In this case, an existing connection will be disconnected, so, please re-connect again.



If it is repeatedly login to the BMC without logout normally, you cannot login to the BMC because it is reached to the maximum number of simultaneous login users caused by the Web sessions that are not terminated and are remained or because it is reached to the maximum number of simultaneous login users (4). In this case, please wait for the BMC’s automatic logout time (30 minutes or more), and try again or press BMC reset button of the server.



Login failure may occur after network setting to the BMC or shortly after the BMC reset. In this case, please try to login again.



Login page of BMC may be displayed when you open BMC Web from NEC ESM PRO Manager. In this case, please log-in from login page or reopen the BMC Web from NEC ESM PRO Manager.

HEADER MENU



1. Login user name is displayed.
2. Login user's privilege is displayed.
3. The environment of management PC is displayed, and set by clicking "Environment"..
4. License information is displayed.
5. The online help is displayed.

SERVER PANEL

The server panel is displayed under a browser after log in. The server panel has following functions.



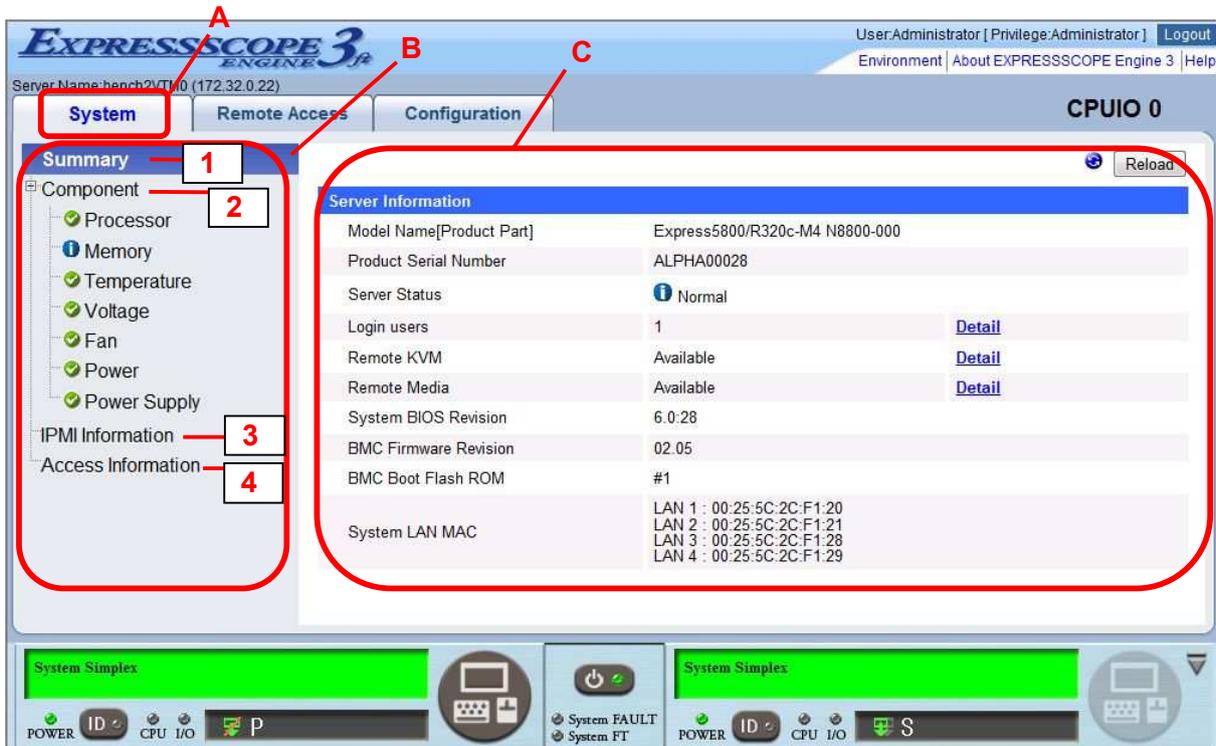
The server panel of CPU / IO module 0 is displayed to the left side and the server panel of CPU / IO module 1 is displayed to the right side.

1. The virtual LCD that displays the state of the server.
2. The Button to start RemoteKVM/Media
3. The button that minimizes the server panel.
4. The power switch and a system POWER lamp of the server. The state of the power supply of the server is shown.
5. The module POWER lamp of the CPU / IO module.
6. The UID(Unit ID) switch and a ID lamp of the CPU / IO module.
7. The CPU FAULT lamp and the I/O FAULT lamp of the CPU / IO module. The state of the CPU / IO module is shown.
8. The state of both the SAFE TO PULL lamp and the PRIMARY lamp of the CPU / IO module are displayed. Also the log in situation and the remote media usage condition of BMC are displayed.
9. The system FAULT lamp and the system FT lamp of the server. The state of the server is shown.

 **Even if actual UID LED is not mounted into the server, the UID LED indicator of the Server Panel functions as virtual UID LED.**

 **For the message displayed in the Virtual LCD, refer to Maintenance Guide of the system.**

SYSTEM



- A. The system tab. BMC supported functions are displayed.
- B. The menu that can be selected in the system tab is displayed.
- C. Information selected by B is displayed. The screen of "Summary" is displayed in the above-mentioned example.

Menu

1 Summary

The state of information and BMC of the server is displayed.

2 Component

Only items supported with the server are displayed for each item of composition information. (processor, memory, temperature, voltage, fan, power, power supply). Moreover, the item supported with the server might not be displayed depending on the state of the system power supply and the presence state of the components such as devices.

3 IPMI Information

Information (SEL,SDR,FRU,MC) is displayed in accordance with IPMI and it backs up. The preserved backup data can be referred to from the server management software (ESRAS utility and off-line maintenance utility).

4 Access Information

Login/Logout information and operation log are displayed.



About the information which is indicated when choosing "processor" or "memory" of "Component", it includes the following notice.

It's sometimes different in information on CPU and memory each module.

It's different in the information displayed in this case, but it doesn't influence operation of equipment.

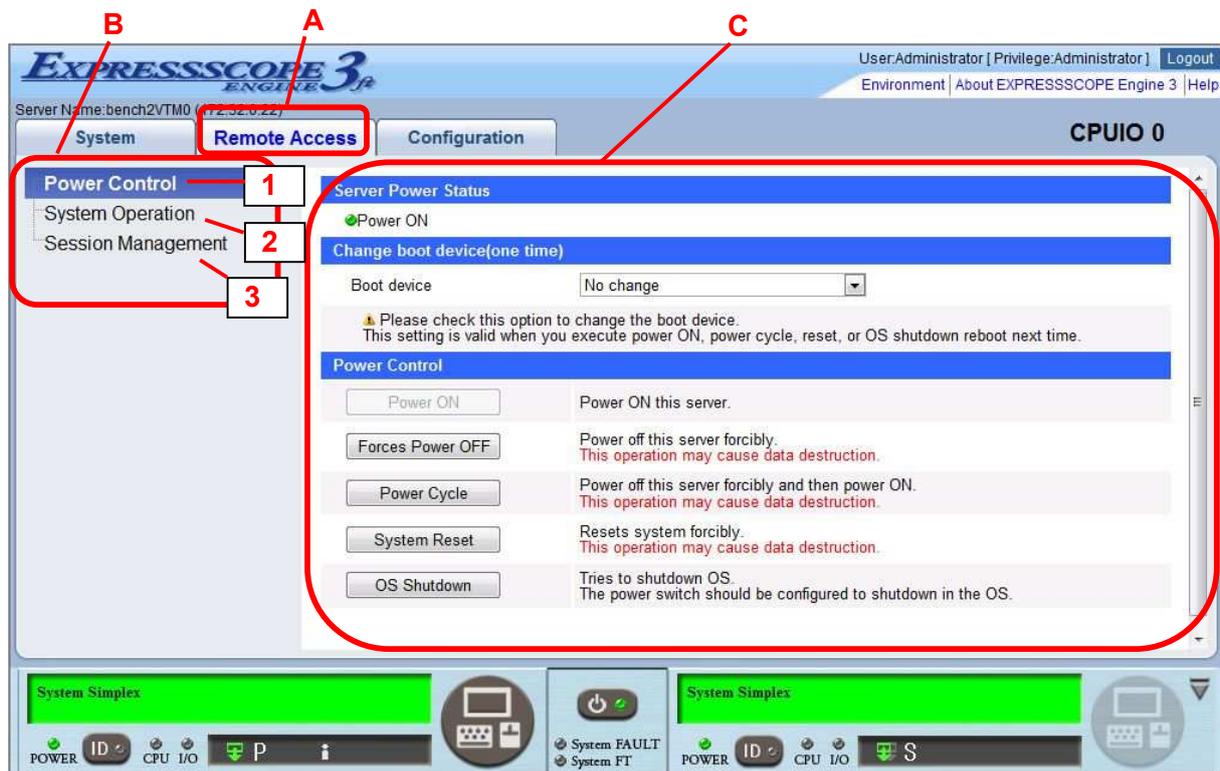
When renewing displayed information, please do the following operation.

- The module which renews information is changed primarily.
- Power on FT server and do an OS boot, Or restart OS.



If the hardware clock setting (RTC) is set by the server OS to the time in UTC offset, The timestamp of SEL (System Event Log) will be set to the time in UTC offset instead of local timestamp. Please notice that the time difference between UTC time and local time will occur.

REMOTE ACCESS

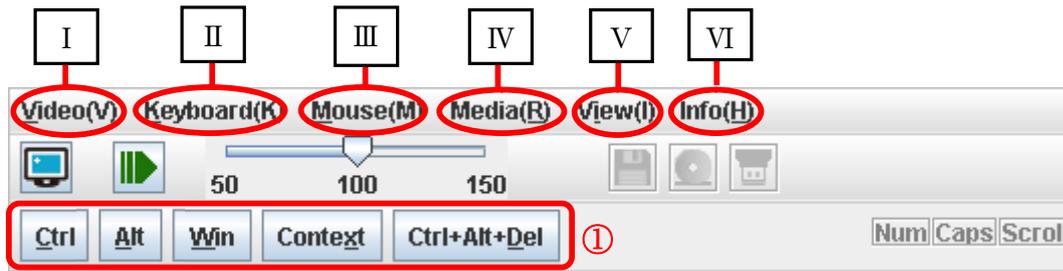


- A. The remote access tab. BMC supported functions are displayed.
- B. The menu that can be selected in the remote access tab is displayed
- C. Information selected by B is displayed. The screen of "Power Control" is displayed in the above-mentioned example.

Menu

- 1 Power Control
 - Select Boot device of the server, powering on/off and reset the system, shutdown the OS.
- 2 System Operation
 - Start RemoteKVM/Media, turn on/off of UID lamp, press Dump switch.
- 3 Session Management
 - The user who is logging in BMC can be managed.

REMOTE KVM/MEDIA



1. The hot keys to support special keys operation. When Ctrl, Alt, Win and Context click this hot key once, each key is locked in the push state. Lock status can be released by clicking hot keys once again or pressing one of keys of keyboard of the remote management PC.



Usual keys operation is impossible by keyboard of the server because lock can't be released by keyboard of the server when hot keys is pressed and it's lock state. Therefore please don't leave while locking hot keys.

Menu

- I. Video
The features such as Refresh screen, Low bandwidth mode.
- II. Keyboard
Virtual keyboard (software keyboard) for Japanese/English/French/German are available.
- III. Mouse
The features such as changing or synchronizing the mouse cursor, changing the mouse coordinate mode are available.
- IV. Media
Enable or disable the remote device and open the remote media window to connect or disconnect the remote media.
- V. View
Control the visibility of tool bar (control box area and hot key area).
- VI. Info
Display the version information.



When [Shift]+[Alt]+[PrintScreen] are input from keyboard of the remote management PC in remote KVM, several keys operation becomes impossible sometimes by both of remote KVM and on the screen of the server.

In this case, When following one of them are operated, you can make it recover.

- [Shift] key of keyboard of the remote management PC or virtual keyboard is pressed.
- Make remote KVM end, and after that, please start remote KVM once again.



The server detects remote media as following devices:

- AMI Remote FD
- AMI Remote CD/DVD
- AMI Remote USB Mem



The access lamp comes to remain lighting after it connects it according to the kind of the floppy disk drive of management PC.



When the operation into which the resolution on the server side frequently changes after remote KVM is started, the remote KVM connection might be disconnect. In that case, please start remote KVM again.

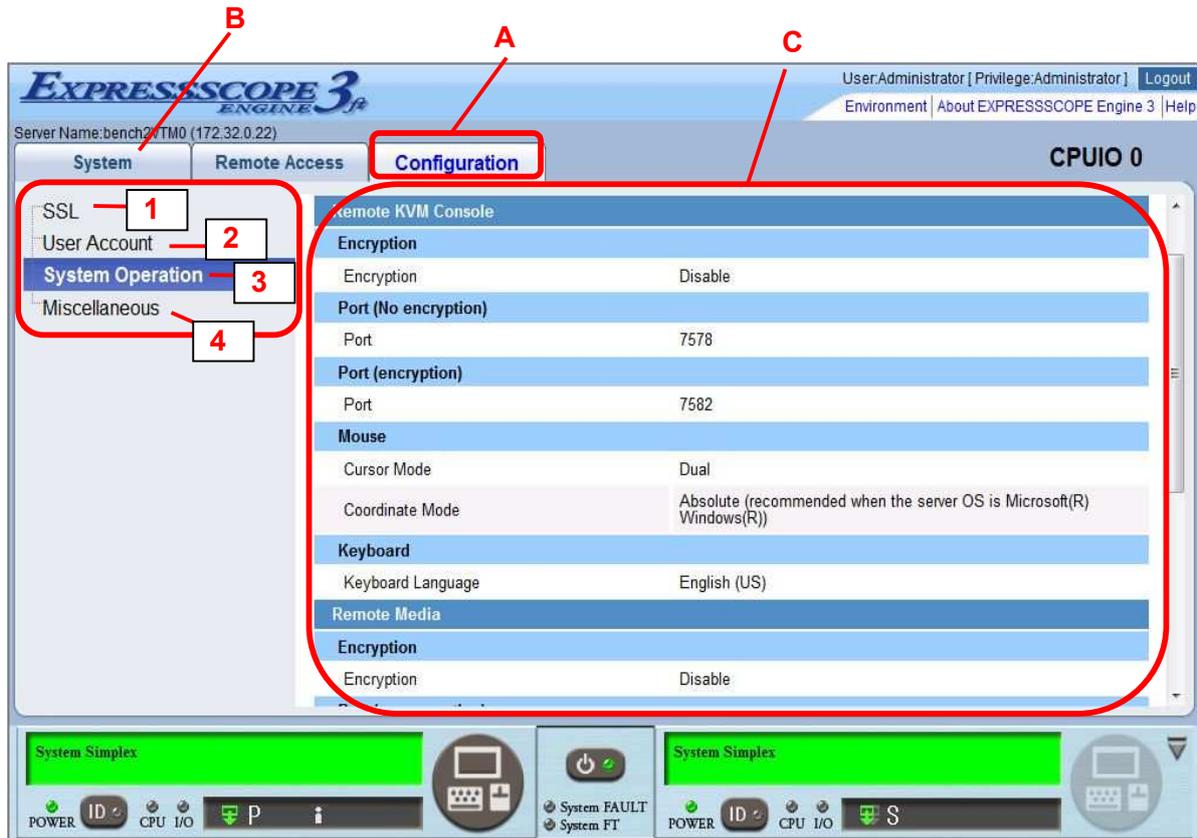


When you log on to the BMC from the server, do not access the Remote KVM Console from a Web browser in the server. You will not be able to use keyboard and mouse.



On some browsers, if you want to start the Remote KVM/Media, you may see the dialog 'jviewer.jnlp couldn't be downloaded'. In this case, please download again by pressing 'Retry'.

CONFIGURATION



- A. The configuration tab. BMC supported functions are displayed.
- B. The menu that can be selected in the configuration tab is displayed
- C. Information selected by B is displayed. The screen of "System Operation" is displayed in the above-mentioned example.

Menu

1 SSL

Create a signing request (CSR) for the SSL server certificate and upload the SSL server certificate signed by a certificate authority to the BMC.

2 User Account

Maintain user setting, register the SSH public Key.

3 System Operation

Set the Remote KVM/Media configuration.

4 Miscellaneous

Set the access log configuration.



To enable SSL server certificate after uploading it, you have to reset BMC. For BMC reset, refer to Maintenance Guide of the system.



The strings “root”, “MWA”, “AccessByEM-Poem”, “Administrator” are reserved by BMC. Please do not add or remove these characters as User Name.

For each BMC setting, the “Default” value of the setting from Web browser of BMC and the initial value of BMC Initialization are as the following table.

| Menu | Setting | Web Browser “Default” value | BMC Initialization |
|------------------|---|--|--------------------|
| System Operation | Remote KVM Console Encryption | Enable | Disable |
| | Port (No Encryption) | 7578 | 7578 |
| | Port (Encryption) | 7582 | 7582 |
| | Cursor Mode | Dual | Single |
| | Coordinate Mode (Refer to the following Tips for the recommendation setting) | Relative | Absolute |
| | Keyboard Language | When login in Japanese; Japanese, When login in English; English | English |
| | Remote Media Encryption | Enable | Disable |
| | Port (No Encryption) | 5120 | 5120 |
| Miscellaneous | Port (Encryption) | 5124 | 5124 |
| | Behavior when SEL repository is full | Stop logging SEL | No change |
| | Access Log HTTP | Disable | Disable |
| | HTTPS | Disable | Disable |
| | SSH | Disable | Disable |
| | Operation | Disable | Disable |



Coordinate Mode recommendation setting

- **Absolute** => Host OS recommends in case of Windows
- **Relative** => Host OS recommends in case of Linux

6. Command Line Interface

OVERVIEW

With the BMC Command Line Interface, you can control the server from a remote SSH client. The BMC supports SSH (Version 2) protocol.

CONNECTING TO BMC

Access the BMC IP address or DNS host name from SSH client on the remote management PC.



To use Command Line Interface, you need to change the configuration of the command line interface (SSH) to be enabled by any of the setting of the Off-line BMC Configuration Tool or On-line BMC Configuration Tool or Setting of Web browser. Refer to the “Management LAN Settings” in the “Chapter 2: Configuring the ”.



You can change the BMC’s SSH port number by using the Off-line BMC Configuration Tool, On-line BMC Configuration Tool or a web browser. The default settings are as follows:

SSH: 22



A security warning messages regarding your server certificate may be displayed when you access the BMC from a SSH client.



SSH connection is disconnected automatically after one minute of inactivity after login prompt is displayed.

LOGIN AND LOGOUT

Login

Enter your user name and password at login prompt. A command prompt will be displayed after login. Also you can login by using public key authentication.



The user account is common to the one for a remote management function via web browser.



The number of users who can log in the system using the command line interface at the same time is three users or less. Therefore, you cannot log in the system when other three users have been logging in the system using SSH clients via the command line interface. Check whether other three users are logging in the system, if you cannot log in via the command line interface.



Only a single user among users who are using the command line interface or ESMPRO/ServerManager can use a character-based remote console via the command line interface. Check whether another user is using a character-based remote console, if you cannot use a character-based remote console.



Refer to the “CONFIGURATION” in the Chapter 5: Using Remote Management” for registering SSH public key.

Logout

Enter the “exit” command at the command prompt. The SSH client will be disconnected from the BMC after logout.

BASIC COMMANDS

This section describes basic commands to use them as the command line interface. These basic commands manage the server by using the concept of command (verb) and target (Managed Element) proposed by DMTF (Distributed Management Task Force).

Each basic command functions to a specified target. The target points the managed element by address path much like the path to a file in a file system.

Both absolute path, which is started from "/", and relative path are available for pointing the target. Specifically, "." and ".." are supported. The "." means the current default target and the ".." means the parent target.

Each basic command functions to the current default target when the <target>, which is an argument pointing a target for the command, is not specified to the basic command. The current default target can be changed by the cd command. The current default target is "/admin1" when the command line interface session is started.

The current default target is displayed at the left side of the command prompt ("->").

Help string, command syntax, of each command appears when "-h" option is specified as the <options> of the command. The argument placed between "[" and "]" is omissible.



The user must have an account as the following user level to use the basic commands:

- **cd, exit, help, show and version can be used under an account as all user levels.**
- **stop, start and reset are needed an account as operator or administrator user level to use these commands.**
- **set is needed an account as administrator user level to use this command.**



Maximum number of input character for command line interface is 250.

cd

Syntax:

cd [<options>] [<target>]

Description:

The cd command changes the current default target to the target specified by the <target> argument.

exit

Syntax:

exit [<options>]

Description:

The exit command terminates and logs out the user session.

help

Syntax:

help [<options>] [<help topics>]

Description:

A basic command, <command>, can be specified for the <help topics>. The help command displays the help string for specified basic command when <command> argument is specified.

reset

Syntax:

reset [<options>] [<target>]

Description:

The reset command performs a hardware reset on the <target>.

/admin1/system1 and /admin1/sp1 are available for the <target> of the reset command. For /admin1/system1, the server is reset. For /admin1/sp1, the BMC is reset.



Reset the BMC only if a problem occurs in the BMC and don't reset the BMC in normal operation. Also the connections with Web browser and SSH client are disconnected if you reset the BMC.

set

Syntax:

set [<options>] [<target>] <propertyname>=<value>

Description:

The set command is used to set the value of one or more properties of target specified by the <target>. The command accepts a target specified by the <target> and series of <propertyname>=<value> pairs which is will try and apply. The <propertyname> means a name of property set by the command. The <value> means a new value set by the command.

One or more <propertyname>=<value> pairs can be specified by delimiting between each pair in space.

The set command requires <propertyname>=<value> command line argument except when -h is specified as the <options>.

show

Syntax:

show [<options>] [<target>] [<properties>]

Description:

The show command is used to display information about the target specified by the <target> argument.

The command displays the target specified by the <target> as the first line of the information. It displays the current default target in the first line if <target> is not specified.

The default behavior of the command for the target specified by the <target> is as follows. The command display targets which are contained by the specified target after the "Targets" string. The command displays properties which are contained by the specified target after the "Properties" string. The properties are displayed in the form of property=value. The command displays basic commands (verbs) and special extended commands which are available for the specified target after the "Verbs" string.

The command displays the property specified by the <properties> in the form of property=value if the <properties> is specified. The command displays all properties which are contained by the specified target if the <properties> is not specified.

There is -display <arg values> option which can be specified by the <options> for the show command. The option can control the type of information that is displayed about the target specified by the <target>. Valid option argument values as the <arg values> for this option include "targets", "properties", "verbs", and "all". The option argument values can select the above "Targets", "Properties" and "Verbs" information that is displayed. "all" displays the whole. The default for the -display option control is "all".

start

Syntax:

start [<options>] [<target>]

Description:

/admin1/system1 and /admin1/system1/textredirectsvc1 are available for the target of the start command.

The start command performs a power on to the server if /admin1/system1 is specified by the <target>.

The start command starts a character-based remote console if /admin1/system1/textredirectsvc1 is specified by the <target>.

stop

Syntax:

stop [<options>] [<target>]

Description:

The stop command performs a normal power off request (OS shutdown request) or a forced power off request.

/admin1/system1 is available for the target of the stop command. The stop command with no option as the <options> performs a normal power off request (OS shutdown request) to the server if /admin1/system1 is specified by the <target>. The command with -f (or -force) as the <options> performs a forced power off request to the server if /admin1/system1 is specified by the <target>.

version

Syntax:

version [<options>]

Description:

The version command is used to display the version of the command line protocol specification which is supported.

REMOTE CONTROL

You can perform remote control of the server at the command prompt.



Performing remote control when the operating system is running may cause the loss of data in the server.



The user must have an account as operator or administrator for remote control.

Power ON

Enter the following command at the command prompt.

```
start /admin1/system1
```

Forced Power OFF

Enter the following command at the command prompt.

```
stop -force /admin1/system1  
or  
stop -f /admin1/system1
```

OS Shutdown

Enter the following command at the command prompt.

```
stop /admin1/system1
```



The above OS shutdown is equivalent to pressing the POWER switch when the power of the server is on. Your operating system must be set to shut down when you power off the system.

System Reset

Enter the following command at the command prompt.

```
reset /admin1/system1
```



An above system reset is failed when the power of the server is off.

Remote Console

To start a character-based remote console, enter the following command at the command prompt.

```
start /admin1/system1/textredirectsvcl
```

To return from the character-based remote console to the command interface session, enter the **<ESC>stop** keys (<ESC>key, <s>key, <t>key, <o>key and <p>key) during the character-based remote console.



Notice

The standard serial port B (COM B) on the server cannot be used for connecting another device in this cases because the BMC occupies the serial port B.



Tips

To use a character-based remote console, set appropriate settings for the console redirection function of the server's serial port on the BIOS Setup Utility in advance.

Especially, please use the following items by the following setting:

- BIOS Redirection Port : Serial Port B
- Baud Rate : 19.2K
- Flow Control: CTS/RTS
- Terminal Type: PC ANSI

For the system BIOS Setup Utility, please refer to the User's Guide of your host system.



Tips

Only a single user among users who are using the command line interface or ESMPRO/ServerManager (a software application bundled for remote management) can use a character-based remote console via the command line interface or ESMPRO/ServerManager. Once the first user uses the character-based remote console, other users cannot use any character-based remote console from any SSH clients or ESMPRO/ServerManager. Check whether another user is using a character-based remote console, if you cannot use a character-based remote console.

To show the usage status of the character-based remote console by other users of the command line interface or ESMPRO/ServerManager, enter the following command at the command prompt.

```
show /admin1/system1/textredirectsvc1/textredirectsap1
```

You can confirm the usage state by value of EnabledState of the "Properties" which is displayed by the command.

EnabledState=2 : Using the character-based remote console by current user or other user.

EnabledState=6 : Not in use.

To stop the character-based remote console using by other user forcibly, enter the following command at the command prompt.

```
set /admin1/system1/textredirectsvc1/textredirectsap1 EnabledState=6
```



Please confirm in advance whether it is OK to stop the character-based remote console using by other user forcibly.



The user must have an account as administrator for stopping the character-based remote console forcibly.

UID Switch Control

You can blinking or turn off the UID (Unit ID) LED on the server by the virtual UID switch through the command line interface.



The user must have an account as administrator for UID Switch Control (blinking or turning off the UID LED) because of using the set command for the UID Switch Control.

Blinking UID LED

Enter the following command at the command prompt.

```
set /admin1/system1/led1 ActivateState=2
```

Turning off UID LED

Enter the following command at the command prompt.

```
set /admin1/system1/led1 ActivateState=4
```

Confirmation of state of turning on UID LED

Enter the following command at the command prompt.

```
show /admin1/system1/led1
```

You can confirm the state of the UID LED by value of ActivateState of the "Properties" which is displayed by the command.

ActivateState=2 : UID LED state is turned on by UID switch .

ActivateState=3 : UID LED state is blinking by the management software .

ActivateState=4 : UID LED state is turned off by UID switch .



- The UID LED will blink (flash) when it is controlled by Chassis Identify function of management software such as ESMPRO/ ServerManager or using UID switch control function of BMC's web server or command line interface. The UID LED will turn on when it is controlled by pushing the UID switch of the server. For actual display state of the UID LED, blinking (flashing) the UID LED is higher priority than turning on it when it is controlled at a same time (blinking state AND turning on state).
- Turning on UID LED by UID switch control (actual switch of the server) can be turned off (release turning on state) only by the UID switch control. Blinking (flashing) UID LED by management software or using UID switch control function of BMC's web server or command line interface can not be turned off (release the blinking state) by UID switch control (actual switch of the server) .

SYSTEM EVENT LOG

You can display system event log and modify setting of the system event log through the command line interface.

Viewing system event log

To move the current default target to /admin1/system1/log1, enter the following command at the command prompt.

```
cd /admin1/system1/log1
```

Here, to confirm the total number of system event log records, enter the following command. The "Targets" section reported by the following command indicates the "record<N>" target(s). <N> means any value between 1 and the total number of the system event log records.

```
show
```



To show the total number of system event log records more than 1000 event logs, it may take about tens of seconds.

Next, when the following command is input, information of a specific record is displayed at "Properties" section: Here, <N> means record number which you would like to confirm.

```
show record<N>
```

For example, enter the following command when you would like to confirm the number 1 record.

```
show record1
```

The example of displaying information in this case is shown below.

```
-> show record1
```

```
Command Status: COMMAND COMPLETED
```

```
uftp=/admin1/system1/log1/record1
```

```
Properties:
```

```
RecordID=1
```

```
CreationTimeStamp=20110324130745.000000+000
```

```
RecordFormat=*RecordID*RecordType*TimeStamp*GeneratorID*EvMRev*Sens  
orType*SensorNumber*EventType*EventData1*EventData2*EventData3*
```

```
RecordData=*1*2*1300972065*32*4*16*9*111*66*143*255*
```

```
Verbs:
```

```
cd
```

```
exit
```

```
help
```

```
show
```

```
version
```

Setting of system event log

To move the current default target to /admin1/system1/log1, enter the following command at the command prompt.

```
cd /admin1/system1/log1
```

The "Properties" section reported by the following command indicates the current setting of system event log.

```
show
```

Enter the following command if you would like to modify a property of the setting of system event log .

```
set <Property>=<New value>
```

The properties which the system event log target contains are as follows:

- **oemnec_selbehavior**

This specifies the behavior when the system event log repository is full. The valid values for this property are followings. This is the dynamic setting.

0 : Stop logging the system event log. The system event log is not recorded any more when the system event log is full.

1: Clear all system event logs. All system event logs are cleared when the system event log is full.

2: Overwrite oldest system event log. Oldest system event log is overwritten with new system event log when the system event log is full.

For example, enter the following command when you would like to enable the auto clear of system event log.

```
set oemnec_selbehavior=1
```



The user must have an account as administrator for modifying the setting of the system event log.

ACCESS LOG

You can display, clear, and set the access log for the management LAN.



The user must have an account as administrator for clearing and setting the access log.



The following are events supported by the Access Log function.

- Login and logout events for HTTP, HTTPS, and SSH connections
- System control (Power OFF/ON, system reset, etc...) via Web browser.
- Modify the setting (Network setting, etc...) via Web browser.
- Start the remote KVM



User Information is not registered by logout events for SSH connections.

Viewing access log

To move the current default target to /admin1/sp1/log1/record1, enter the following command at the command prompt.

```
cd /admin1/sp1/log1/record1
```

Enter the following command, if you would like to confirm the access log.

```
show
```

The example of displaying the access log is shown below.

| timestamp | user | ipaddress | protocol | event |
|------------|-------|--------------|----------|---------------------------|
| 06/10/2009 | ope | 192.168.2.14 | SSH | Login Successful 13:52:19 |
| 06/10/2009 | admin | 192.168.2.14 | SSH | Login Successful 13:53:14 |
| 06/10/2009 | user | 192.168.2.14 | HTTP | Login Successful 13:55:49 |

You can display only access log that corresponded to the specified from following condition.

- **timestamp**

Specify the date by the following format: MM/DD/YYYY

- **user**

Specify the user name.

- **ipaddress**

Specify the IP address on the remote management PC by the following format:
XXX.XXX.XXX.XXX

- **protocol**

Specify the following protocol: HTTP, HTTPS, SSH

- **event**

Specify the following event: normal, error
"normal" means not error event. "error" means error event.

You can change the displaying sequence of access log and display the specified number of access log by the specified from following options.

- **oemnec_headlog <number>**

Display from <number> head of the access log.

- **oemnec_taillog <number>**

Display from <number> back of the access log.

Enter the following command when you would like to use the above condition.

e.g.1) Display the access log whose username is Administrator.

```
show user==Administrator
```

e.g.2) Display the access log whose IP address is 192.168.1.100 and protocol is HTTP and event is error.

```
show ipaddress==192.168.1.100,protocol==HTTP,event==error
```

e.g.3) Display from 100 back of the access log whose timestamp is 10/10/2010 and protocol is HTTPS.

```
show -oemnec_taillog 100 timestamp==01/01/2010,protocol==HTTPS
```



Access log might not be correctly displayed with timestamp condition about the log of recorded from AC ON to DC ON on host system.

Clearing access log

To move the current default target to /admin1/sp1/log1/record1, enter the following command at the command prompt.

```
cd /admin1/sp1/log1/record1
```

Enter the following command, if you would like to clear the access log.

```
delete
```

Setting access log

To move the current default target to /admin1/sp1/log1, enter the following command at the command prompt.

```
cd /admin1/sp1/log1
```

Enter the following command, if you would like to confirm the access log as properties of the access log target which is /admin1/sp1/log1.

```
show
```

Enter the following command if you would like to modify a property of the setting access log.

```
set <Property>=<New value>
```

The properties which the access log target contains are as follows:

- **oemnec_operationlog_enable**

This specifies whether access log for the system control and the BMC setting modification via Web browser is enabled. The valid values for this property are "2" and "3". "2" means that the access log is enabled. "3" means that the access log is disabled. This is the dynamic setting.

- **oemnec_sshlog_enable**

This specifies whether access log for login/logout of SSH is enabled. The valid values for this property are "2" and "3". "2" means that the access log is enabled. "3" means that the access log is disabled. This is the dynamic setting.

- **oemnec_httpslog_enable**

This specifies whether access log for login/logout of HTTPS is enabled. The valid values for this property are "2" and "3". "2" means that the access log is enabled. "3"

means that the access log is disabled. This is the dynamic setting.

- **oemnac_httplog_enable**

This specifies whether access log for login/logout of HTTP is enabled. The valid values for this property are "2" and "3". "2" means that the access log is enabled. "3" means that the access log is disabled. This is the dynamic setting.

For example, enter the following command when you would like to use the access log for login/logout of HTTPS.

```
set oemnac_httpslog_enable=2
```

USER SETTINGS

This section describes how to confirm and modify the user account through the command line interface. To move the current default target to a user account target which you would like to confirm or (and) modify, enter the following command at the command prompt. <N> means any value between 1 and 12: Therefore you can select a user account between account1 and account12. The <N> corresponds to an order from the list of user accounts top on the user account configuration page through a Web browser.

```
cd /admin1/sp1/account<N>
```

Enter the following command, if you would like to confirm the information which the selected user account has as its properties.

```
show
```

Enter the following command if you would like to modify a property of the selected user account.

```
set <Property>=<New value>
```

The properties which the selected user account target contains are as follows:

- **UserID**

This corresponds to a user name (login name). It becomes effective at next login if you change it.

- **UserPassword**

This is the user password (only can be changed). "UserPassword=" is displayed but the password setting, value of this property, is not displayed when this property is displayed. It becomes effective at next login if you change it.

- **oemnec_Group**

This specifies the user level. The valid values for this property are "User", "Operator" and "Administrator". It becomes effective at next login if you change it.



A user name can contain up to 15 alphanumeric characters, including “- (minus)” and “_ (underscore)”. “- (minus)” can not be used for the top of a user name. The password accepts up to 19 ASCII characters, except for “ (space)”, “”(quotation marks)”, “&”, “?”, “=”.



You should set appropriate value to all properties for the user to login with it.

NETWORK SETTINGS

This section describes how to confirm and modify the network setting for management LAN through the command line interface. To move the current default target to /admin1/sp1/enetport1, enter the following command at the command prompt:

```
cd /admin1/sp1/enetport1
```

Enter the following command, if you would like to confirm properties of the Ethernet port target which is /admin1/sp1/enetport1.

```
show
```

The properties which the Ethernet port target contains are as follows:

- **PermanentAddress**

This specifies the MAC address for the management LAN. This property is read-only.

- **AutoSense**

This indicates whether Auto Negotiation is enabled for the LAN Connection Type setting of the management LAN. Note that, the valid values for this property are "TRUE" and "FALSE". "TRUE" means that the Auto Negotiation is enabled. "FALSE" means that the Auto Negotiation is disabled. This property is read-only.

- **FullDuplex**

This indicates whether Full Duplex Mode is enabled for the LAN Connection Type setting of the management LAN when the Auto Negotiation (AutoSense) is disabled (FALSE). The value of this property is not displayed when the Auto Negotiation (AutoSense) is enabled (TRUE). This property is read-only.

- **PortType**

This indicates Link Speed ("10Base-T" or "100Base-TX") for the LAN Connection Type setting of the management LAN when the Auto Negotiation (AutoSense) is disabled (FALSE). The value of this property is not displayed when the Auto Negotiation (AutoSense) is enabled (TRUE). This property is read-only.

Followings describe how to confirm and modify the access limitation setting for management LAN through the command line interface. To move the current default target to /admin1/sp1/enetport1/lanendpt1, enter the following command at the command prompt:

```
cd /admin1/sp1/enetport1/lanendpt1
```

Enter the following command, if you would like to confirm properties of the access limitation target which is /admin1/sp1/enetport1/lanendpt1.

```
show
```

Enter the following command if you would like to modify a property of the access limitation target.

```
set <Property>=<New value>
```

The properties which the access limitation target contains are as follows:

- **oemnec_allowedaccessips**

This specifies the IP addresses that permit access to the management LAN. Divide IP address by "," (ex. 192.168.1.2, 192.168.1.2, ...) or use asterisk (ex. 192.168.1.*), if you would like to set multiple permit IP address. Set "0.0.0.0" or no <value> (*) to this property, if you would like to clear the value of this property, It becomes effective at next login if you change it. The value of this property is cleared if oemnec_deniedaccessips is set.

* "Set no <value>" means to input [Enter] key next to "=" key like following example.
set oemnec_allowedaccessips=[Enter]

- **oemnec_deniedaccessips**

This specifies the IP addresses that reject access to the management LAN. Divide IP address by "," (ex. 192.168.1.2, 192.168.1.2, ...) or use asterisk (ex. 192.168.1.*), if you would like to set multiple reject IP address. Set "0.0.0.0" or no <value> (*) to this property, if you would like to clear the value of this property, It becomes effective at next login if you change it. The value of this property is cleared if oemnec_allowedaccessips is set.

* "Set no <value>" means to input [Enter] key next to "=" key like following example.
set oemnec_deniedaccessips=[Enter]

For example, enter the following command when you would like to permit access from 192.168.1.* and 192.168.3.4.

```
set oemnec_allowedaccessips=192.168.1.*,192.168.3.4
```



Clear all oemnec_allowedaccessips/oemnec_deniedaccessips values, if you would like NOT to restrict access by IP address for the management LAN.



The communication with ESM/ServerManager is also restricted by this configuration. Permit the IP address used by the communication with ESM/ServerManager if you would like to use ESM/ServerManager.



To restrict access by IP address used by logging in to the BMC's SSH server is impossible. So, if you would like to restrict the IP address, the following procedures are necessary.

At first, log out of current BMC's SSH session using the IP address and log in to the BMC's SSH server once again by using other IP address permitted by oemnec_allowedaccessips / oemnec_deniedaccessips (Access Permission Address) Configuration. Then change the configuration for NOT permitting the IP address which is previously used by the BMC's SSH server.



You can set the access restriction settings to 222 characters. The indication by the show command is displayed to 255 characters. The access restriction settings from Web browser are possible to 255 characters.

Followings describe how to confirm and modify the DHCP setting for management LAN through the command line interface. To move the current default target to /admin1/sp1/enetport1/lanendpt1/ipendpt1, enter the following command at the command prompt:

```
cd /admin1/sp1/enetport1/lanendpt1/ipendpt1
```

Enter the following command, if you would like to confirm properties of the DHCP target which is /admin1/sp1/enetport1/lanendpt1/ipendpt1.

```
show
```

Enter the following command if you would like to modify a property of the DHCP target.

```
set <Property>=<New value>
```

The properties which the DHCP target contains are as follows:

- **AddressOrigin**

This specifies whether DHCP is enabled for the management LAN. Note that, the valid values for this property are "3" and "4". "3" means that the DHCP is disabled. "4" means that the DHCP is enabled. This is the dynamic setting.

- **IPv4Address**

This specifies the IP address for the management LAN. This property is read-only.

- **SubnetMask**

This specifies the subnet mask for the management LAN. This property is read-only.

For example, enter the following command when you would like to enable DHCP.

```
set AddressOrigin=4
```

Followings describe how to confirm the gateway setting for management LAN through the command line interface. To move the current default target to /admin1/sp1/enetport1/lanendpt1/ipendpt1/gateway1, enter the following command at the command prompt:

```
cd /admin1/sp1/enetport1/lanendpt1/ipendpt1/gateway1
```

Enter the following command, if you would like to confirm properties of the gateway target which is /admin1/sp1/enetport1/lanendpt1/ipendpt1/gateway1.

```
show
```

The properties which the gateway target contains are as follows:

- **InfoFormat**

The value is "3". This specifies the AccessInfo is IPv4 address. This property is read-only.

- **AccessInfo**

This specifies the IP address of the default gateway for the management LAN. This property is read-only.

Followings describe how to confirm and modify the network setting with disabling DHCP for management LAN through the command line interface. To move the current default target to /admin1/sp1/enetport1/lanendpt1/ipendpt1/staticipsettings1, enter the following command at the command prompt:

```
cd /admin1/sp1/enetport1/lanendpt1/ipendpt1/staticipsettings1
```

Enter the following command, if you would like to confirm properties of the static network setting target which is /admin1/sp1/enetport1/lanendpt1/ipendpt1/staticipsettings1.

```
show
```

Enter the following command if you would like to modify a property of the static network setting target.

```
set <Property>=<New value>
```

The properties which the static network setting target contains are as follows:

- **IPv4Address**

This specifies the IP address for the management LAN when DHCP is disabled. This is the dynamic setting.

- **SubnetMask**

This specifies the subnet mask for the management LAN when DHCP is disabled. This is the dynamic setting.

- **GatewayIPv4Address**

This specifies the IP address of the default gateway for the management LAN when DHCP is disabled. This is the dynamic setting

Followings describe how to confirm and modify the HTTP service for management LAN through the command line interface. To move the current default target to /admin1/sp1/httpsvc1, enter the following command at the command prompt:

```
cd /admin1/sp1/httpsvc1
```

Enter the following command, if you would like to confirm properties of the HTTP service target which is /admin1/sp1/httpsvc1.

```
show
```

Enter the following command if you would like to modify a property of the HTTP service target.

```
set <Property>=<New value>
```

The properties which the HTTP service target contains are as follows:

- **EnabledState**

This specifies whether HTTP port is enabled for the management LAN. The valid values for this property are "2" and "3". "2" means that the HTTP port is enabled. "3" means that the HTTP port is disabled. This is the dynamic setting.

- **oemnec_httpport**

This specifies the HTTP port for the management LAN. This is the dynamic setting.

Followings describe how to confirm and modify the HTTPS service for management LAN through the command line interface. To move the current default target to /admin1/sp1/httpssvc1, enter the following command at the command prompt:

```
cd /admin1/sp1/httpssvc1
```

Enter the following command, if you would like to confirm properties of the HTTPS service target which is /admin1/sp1/httpssvc1.

```
show
```

Enter the following command if you would like to modify a property of the HTTPS service target.

```
set <Property>=<New value>
```

The properties which the HTTPS service target contains are as follows:

- **EnabledState**

This specifies whether HTTPS port is enabled for the management LAN. The valid values for this property are "2" and "3". "2" means that the HTTPS port is enabled. "3" means that the HTTPS port is disabled. This is the dynamic setting.

- **oemnec_httpsport**

This specifies the HTTPS port for the management LAN. This is the dynamic setting.

Followings describe how to confirm and modify the SSH service for management LAN through the command line interface. To move the current default target to /admin1/sp1/sshsvc1, enter the following command at the command prompt:

```
cd /admin1/sp1/sshsvc1
```

Enter the following command, if you would like to confirm properties of the SSH service target which is /admin1/sp1/sshsvc1.

```
show
```

Enter the following command if you would like to modify a property of the SSH service target.

```
set <Property>=<New value>
```

The properties which the SSH service target contains are as follows:

- **EnabledState**

This specifies whether SSH port is enabled for the management LAN. The valid values for this property are "2" and "3". "2" means that the SSH port is enabled. "3" means that the SSH port is disabled. This is the dynamic setting.

- **oemnc_sshport**

This specifies the SSH port for the management LAN. This is the dynamic setting.

CONFIRMING SYSTEM INFORMATION

This section describes how to confirm the system information (product, BIOS/BMC firmware revision, MAC address of System LAN, CPU, Memory) through the command line interface.



The values of the properties for items not supported by the server is not displayed for the system information. Moreover, the values of the properties for items supported with the server might not be displayed the system information according to a state of a power supply and mounting such as a device of the system either.

Confirming Product Information

You can confirm the product information through the command line interface by entering following the basic command at the command prompt.

```
show /admin1/system1
```

In this case, value of `oemnec_productname` property indicates "Product Name" information at the "Properties" section. Also value of `oemnec_modelnumber` property indicates "Part / Model Number" information and value of `oemnec_serialnumber` property indicates "Product Serial Number" information. These properties for the product information are read-only.

Confirming MAC address of System LAN

To move the current default target to `/admin1/system1`, enter the following command at the command prompt.

```
cd /admin1/system1
```

Here, to confirm all the targets for System LAN (onboard LAN), enter the following command at the command prompt. All the System LAN targets are represented as `enetport<N>` strings at "Targets" section. `<N>` means value of one-origin integer.

```
show
```

Next, when the following command is input, the MAC address of the System LAN target is appeared at the right side of "PermanentAddress=" string. `<N>` means the number of the System LAN target which you would like to confirm.

```
show enetport<N>
```

For example, enter the following command when you would like to confirm the MAC address of LAN Port1.

```
show enetport1
```

Confirming System BIOS revision

You can confirm the System BIOS revision through the command line interface by entering following the basic command at the command prompt.

```
show /admin1/system1/swid1
```

In this case, the System BIOS revision is appeared at the right side of "VersionString=" string in the "Properties" section.

Confirming CPU Information

To move the current default target to /admin1/system1, enter the following command at the command prompt.

```
cd /admin1/system1
```

Here, to confirm all the targets for CPU, enter the following command at the command prompt. All the CPU targets are represented as cpu<N> strings at "Targets" section. <N> means value of one-origin integer.

```
show
```

Next, when the following command is input, information of a specific CPU target is displayed at "Properties" section. Here, <N> means CPU target number which you would like to confirm.

```
show cpu<N>
```

The EnabledState property of the CPU target indicates the CPU status. "2" indicates CPU installed. No value (Only "EnabledState=" string is displayed.) indicates CPU not installed. "3" indicates that the CPU is defected. The values of the other properties (such as oemnec_clock) are not displayed (Only property name with "=" string is displayed.). if the CPU is not installed (Only "EnabledState=" string is displayed.). Also, the values of the properties not supported by the server are not displayed.

For example, enter the following command when you would like to confirm the information of CPU1.

```
show cpu1
```

The example of displaying information in this case is shown below.

```
ufip=/admin1/system1/cpu1
```

```
Properties:
```

```
EnabledState=enabled  
oemnec_clock=2660MHz  
oemnec_validcore=4  
oemnec_maxcore=4  
oemnec_validthread=8  
oemnec_maxthread=8  
oemnec_l1cache=256KB  
oemnec_l2cache=1024KB  
oemnec_l3cache=8192KB
```

```
Verbs:
```

```
cd  
exit  
help  
show  
version
```

Confirming Memory Information

To move the current default target to /admin1/system1, enter the following command at the command prompt.

```
cd /admin1/system1
```

Here, to confirm all the targets for memory (DIMM), enter the following command at the command prompt. All the memory (DIMM) targets are represented as memory<N> strings at "Targets" section. <N> means value of one-origin integer.

```
show
```

Next, when the following command is input, information of a specific memory (DIMM) target is displayed at "Properties" section. Here, <N> means memory (DIMM) target number which you would like to confirm.

```
show memory<N>
```

The EnabledState property of the memory target indicates the memory (DIMM) status. "2" indicates memory (DIMM) installed. "3" indicates memory (DIMM) error. If the memory (DIMM) is not installed the target will not be displayed. Also, the values of the properties not supported by the server are not displayed.

For example, enter the following command when you would like to confirm the information of memory1 (CPU1_DIMM1).

```
show memory1
```

The example of displaying information in this case is shown below.

```
ufip=/admin1/system1/memory1
Properties:
  enabledstate=2
  oemnec_slotname=CPU1_DIMM1
  oemnec_clocksize=1024MB 1066MHz

Verbs:
  cd
  exit
  help
  show
  version
```

SPECIAL EXTENDED COMMANDS

This section describes the special extended command which can do state acquisition (powerstate, lampstate) and interrupt generation for OS dump (nmidump). The special extended commands use the syntaxes different from the basic command's ones.

State Acquisition

You can acquire the state of the system at the command prompt:



Commands to acquire the state are executable in all user levels.

Power State acquisition

Power state acquisition command (powerstate) is executable only when current default target is "/admin1" or "/admin1/system1".

Enter the following command, if the current default target is not "/admin1" and "/admin1/system1".

```
cd /admin1
or
cd /admin1/system1
```

Enter the following command at the command prompt:

```
powerstate
```

One of the following responses is returned according to the power state.

```
power on
System power is on.
```

```
power off
System power is off.
```

Lamp State acquisition

Lamp state acquisition command (lampstate) is executable only when current default target is "/admin1", "/admin1/system1" or "/admin1/system1/led1".

Enter the following command, if the current default target is not "/admin1", "/admin1/system1" or "/admin1/system1/led1".

```
cd /admin1
or
cd /admin1/system1
or
cd /admin1/system1/led1
```

System Fault LED state acquisition

Enter the following command at the command prompt:

```
lampstate -statuslamp
```

One of the following responses is returned according to the System Fault LED state.

off

System Fault LED is turned off.

amber on

System Fault LED lights in amber.

amber blink

System Fault LED is blinking in amber.

UID LED State acquisition

Enter the following command at the command prompt:

```
lampstate -uidlamp
```

One of the following responses is returned according to actual display state of the UID LED.

off

UID LED is turned off.

on

UID LED is turned on (lights).

blink

UID LED is blinking (flashing).

Interrupt Generation for OS Dump

You can execute OS dump by entering following command at the command prompt.

```
nmidump /admin1/system1
```



The user must have an account as administrator for executing the nmidump command.



The above command behavior is equivalent to pressing the DUMP switch on the server.

7. WS-Management (Web Service for Management)

OVERVIEW

With the WS-Management Protocol, you can control the server and check the sensor of host system.



Tips

EXPRESSSCOPE Engine 3 implementation of WS-Management complies with the specification, DTMF Web Services for Management 1.0.0.



Tips

EXPRESSSCOPE Engine 3 is confirmed the WS-Management operation with the following tools that support the WS-Management protocol.

- **Windows Remote Management (WinRM) 2.0**



Notice

To use WS-Management, you need to configure HTTPS connection to be enabled. Refer to the “Management LAN Settings” in the “Chapter 2: Configuring the ”.

POWER CONTROL

You can perform power control of the server.



Tips

The user must have an account as operator or administrator for power control.



Notice

Performing power control when the operating system is running may cause the loss of data in the server.

Power ON

Create the file input-RequestPowerStateChange2.xml and enter the following command, if you use WinRM.

```
winrm invoke RequestPowerStateChange
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_PowerManagementService?__cimnamespace=root/cimv2+Name=IPMI%Power%Service+CreationClassName=CIM_PowerManagementService+SystemName=Unknown.IPMI%_BMC%_DeviceID.32+SystemCreationClassName=Host_ComputerSystem
-r:https://IP_ADDRESS/wsman -username:USERNAME -password:PASSWORD
-auth:basic -encoding:utf-8 -format:xml -file:input-RequestPowerStateChange2.xml
-skipCAcheck -skipCNcheck -skipRevocationcheck
```

input-RequestPowerStateChange2.xml

```
<n1:RequestPowerStateChange_INPUT
xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_Power
ManagementService"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
<n1:PowerState>2</n1:PowerState>
<n1:ManagedElement>
<wsa:ReferenceParameters>
<wsman:ResourceURI>http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/
Host_ComputerSystem</wsman:ResourceURI>
<wsman:SelectorSet>
<wsman:Selector Name='__cimnamespace'>root/cimv2</wsman:Selector>
<wsman:Selector
Name='CreationClassName'>Host_ComputerSystem</wsman:Selector>
<wsman:Selector Name='Name'>Unknown.IPMI BMC
DeviceID.32</wsman:Selector>
</wsman:SelectorSet>
</wsa:ReferenceParameters>
</n1:ManagedElement>
</n1:RequestPowerStateChange_INPUT>
```



Tips

Please change according to your environment.

“IP_ADDRESS” : IP address of EXPRESSSCOPE Engine 3.

“USERNAME/PASSWORD”: username/password of EXPRESSSCOPE Engine 3.

Forced Power OFF

Create the file input-RequestPowerStateChange6.xml and enter the following command, if you use WinRM.

```
winrm invoke RequestPowerStateChange
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_PowerManagementService?__cimnamespace=root/cimv2+Name=IPMI%Power%Service+CreationClassName=CIM_PowerManagementService+SystemName=Unknown.IPMI%_BMC%_DeviceID.32+SystemCreationClassName=Host_ComputerSystem
-r:https://IP_ADDRESS/wsman -username:USERNAME -password:PASSWORD
-auth:basic -encoding:utf-8 -format:xml -file:input-RequestPowerStateChange6.xml
-skipCAcheck -skipCNcheck -skipRevocationcheck
```

D.32+SystemCreationClassName=Host_ComputerSystem
-r:https://IP_ADDRESS/wsman -username:USERNAME -password:PASSWORD
-auth:basic -encoding:utf-8 -format:xml -file:input-RequestPowerStateChange6.xml
-skipCNcheck -skipCAcheck -skipRevocationcheck

input-RequestPowerStateChange6.xml

```
<n1:RequestPowerStateChange_INPUT
xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_Power
ManagementService"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
<n1:PowerState>6</n1:PowerState>
<n1:ManagedElement>
<wsa:ReferenceParameters>
<wsman:ResourceURI>http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/
Host_ComputerSystem</wsman:ResourceURI>
<wsman:SelectorSet>
<wsman:Selector Name='__cimnamespace'>root/cimv2</wsman:Selector>
<wsman:Selector
Name='CreationClassName'>Host_ComputerSystem</wsman:Selector>
<wsman:Selector Name='Name'>Unknown.IPMI BMC
DeviceID.32</wsman:Selector>
</wsman:SelectorSet>
</wsa:ReferenceParameters>
</n1:ManagedElement>
</n1:RequestPowerStateChange_INPUT>
```



Tips

Please change according to your environment.

“IP_ADDRESS” : IP address of EXPRESSSCOPE Engine 3.

“USERNAME/PASSWORD”: username/password of EXPRESSSCOPE Engine 3.

OS Shutdown

Create the file `input-RequestPowerStateChange8.xml` and enter the following command, if you use WinRM.

```
winrm invoke RequestPowerStateChange
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_PowerManagementService?__cimnamespace=root/cimv2+Name=IPMI%_Power%_Service+CreationClassName=CIM_PowerManagementService+SystemName=Unknown.IPMI%_BMC%_DeviceID.32+SystemCreationClassName=Host_ComputerSystem
-r:https://IP_ADDRESS/wsman -username:USERNAME -password:PASSWORD
-auth:basic -encoding:utf-8 -format:xml -file:input-RequestPowerStateChange8.xml
-skipCAcheck -skipCNcheck -skipRevocationcheck
```

input-RequestPowerStateChange8.xml

```
<n1:RequestPowerStateChange_INPUT
xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_Power
ManagementService"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
<n1:PowerState>8</n1:PowerState>
<n1:ManagedElement>
<wsa:ReferenceParameters>
<wsman:ResourceURI>http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/
Host_ComputerSystem</wsman:ResourceURI>
<wsman:SelectorSet>
<wsman:Selector Name='__cimnamespace'>root/cimv2</wsman:Selector>
<wsman:Selector
Name='CreationClassName'>Host_ComputerSystem</wsman:Selector>
<wsman:Selector Name='Name'>Unknown.IPMI BMC
DeviceID.32</wsman:Selector>
</wsman:SelectorSet>
</wsa:ReferenceParameters>
</n1:ManagedElement>
</n1:RequestPowerStateChange_INPUT>
```



Tips

The above OS shutdown is equivalent to pressing the **POWER** switch when the power of the server is on. Your operating system must be set to shut down when you power off the system.



Tips

Please change according to your environment.
“IP_ADDRESS” : IP address of EXPRESSSCOPE Engine 3.
“USERNAME/PASSWORD”: username/password of EXPRESSSCOPE Engine 3.

System Reset

Create the file `input-RequestPowerStateChange10.xml` and enter the following command, if you use WinRM.

```
winrm invoke RequestPowerStateChange
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_PowerManagementService?__cimnamespace=root/cimv2+Name=IPMI%_Power%_Service+CreationClassName=CIM_PowerManagementService+SystemName=Unknown.IPMI%_BMC%_DeviceID.32+SystemCreationClassName=Host_ComputerSystem
-r:https://IP_ADDRESS/wsman -username:USERNAME -password:PASSWORD
-auth:basic -encoding:utf-8 -format:xml
-file:input-RequestPowerStateChange10.xml -skipCAcheck -skipCNcheck
-skipRevocationcheck
```

input-RequestPowerStateChange10.xml

```
<n1:RequestPowerStateChange_INPUT
xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_Power
ManagementService"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
<n1:PowerState>10</n1:PowerState>
<n1:ManagedElement>
<wsa:ReferenceParameters>
<wsman:ResourceURI>http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/
Host_ComputerSystem</wsman:ResourceURI>
<wsman:SelectorSet>
<wsman:Selector Name='__cimnamespace'>root/cimv2</wsman:Selector>
<wsman:Selector
Name='CreationClassName'>Host_ComputerSystem</wsman:Selector>
<wsman:Selector Name='Name'>Unknown.IPMI BMC
DeviceID.32</wsman:Selector>
</wsman:SelectorSet>
</wsa:ReferenceParameters>
</n1:ManagedElement>
</n1:RequestPowerStateChange_INPUT>
```



Please change according to your environment.

“IP_ADDRESS” : IP address of EXPRESSSCOPE Engine 3.

“USERNAME/PASSWORD”: username/password of EXPRESSSCOPE Engine 3.

Interrupt Generation for OS Dump

Create the file `input-RequestPowerStateChange11.xml` and enter the following command, if you use WinRM.

```
winrm invoke RequestPowerStateChange
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_PowerManagementService?__cimnamespace=root/cimv2+Name=IPMI%_Power%_Service+CreationClassName=CIM_PowerManagementService+SystemName=Unknown.IPMI%_BMC%_DeviceID.32+SystemCreationClassName=Host_ComputerSystem
-r:https://IP_ADDRESS/wsman -username:USERNAME -password:PASSWORD
-auth:basic -encoding:utf-8 -format:xml
-file:input-RequestPowerStateChange11.xml -skipCAcheck -skipCNcheck
-skipRevocationcheck
```

input-RequestPowerStateChange11.xml

```
<n1:RequestPowerStateChange_INPUT
xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_Power
ManagementService"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
<n1:PowerState>11</n1:PowerState>
<n1:ManagedElement>
<wsa:ReferenceParameters>
<wsman:ResourceURI>http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/
Host_ComputerSystem</wsman:ResourceURI>
<wsman:SelectorSet>
<wsman:Selector Name='__cimnamespace'>root/cimv2</wsman:Selector>
<wsman:Selector
Name='CreationClassName'>Host_ComputerSystem</wsman:Selector>
<wsman:Selector Name='Name'>Unknown.IPMI BMC
DeviceID.32</wsman:Selector>
</wsman:SelectorSet>
</wsa:ReferenceParameters>
</n1:ManagedElement>
</n1:RequestPowerStateChange_INPUT>
```



Tips

The above command behavior is equivalent to pressing the DUMP switch on the server.



Tips

Change according to your environment.

“IP_ADDRESS” : IP address of EXPRESSSCOPE Engine 3.

“USERNAME/PASSWORD”: username/password of EXPRESSSCOPE Engine 3.



Notice

Performing interrupt generation for OS dump when the operating system is running may cause the loss of data in the server.

SENSOR INFORMATION

You can get sensor information either by enumeration of all sensors or by retrieving specified sensor.

Enumeration of All Sensors

Enter the following command, if you enumerate numeric sensors (e.g.: temperature, voltage) with WinRM.

```
winrm enumerate
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_NumericSensor
-username:USERNAME -password:PASSWORD -r:https://IP_ADDRESS/wsman
-auth:basic -encoding:utf-8 -skipCAcheck -skipCNcheck -skipRevocationcheck
```

Enter the following command, if you enumerate non-numeric sensors (e.g.: PSU, HDD) with WinRM.

```
winrm enumerate
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_Sensor
-username:USERNAME -password:PASSWORD -r:https://IP_ADDRESS/wsman
-auth:basic -encoding:utf-8 -skipCAcheck -skipCNcheck -skipRevocationcheck
```



Tips

Change according to your environment.

“IP_ADDRESS” : IP address of EXPRESSSCOPE Engine 3.

“USERNAME/PASSWORD”: username/password of EXPRESSSCOPE Engine 3.

Retrieving Specified Sensor

You can retrieve the sensor by specifying sensor number.

Enter the following command, if you retrieve the sensor of sensor number 48 with the WinRM.

```
winrm get
"http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_NumericSensor?SystemCreationClassName=CIM_ComputerSystem+CreationClassName=CIM_NumericSensor+SystemName=Unknown.IPMI BMC DeviceID.32+DeviceID=1.48.0.32.1.99"
-r:https://IP_ADDRESS/wsman -username:USERNAME -password:PASSWORD
-auth:basic -encoding:utf-8 -skipCAcheck -skipCNcheck -skipRevocationcheck
```



Tips

Change according to your environment.

“IP_ADDRESS” : IP address of EXPRESSSCOPE Engine 3.

“USERNAME/PASSWORD”: username/password of EXPRESSSCOPE Engine 3.



Tips

Specify the “Device ID” returned in the response of enumerating all sensors.

8. Troubleshooting

ERROR MESSAGES

Abnormality occurs while using remote management, and the error dialog might be displayed in management PC. Please refer to the list of the message of the online help for the main message and the coping process.

OTHERS TIPS

Should you have troubles while using the BMC for remote control, monitoring, and management of the server, please first check the system according to the online help to troubleshoot your issue prior to sending it for repair.

For the issues regarding your system operation, please refer to the User's Guide attached to your system.

If your issue is not described below, or should the provided instructions do not resolve your issue, please contact your service center.

License Notes

This product includes open source software programs described below.

GNU General Public License

- Busybox
- Linux Kernel
- U-Boot
- stunnel

GNU GENERAL PUBLIC LICENSE Version 2, June 1991

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Preamble

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* @author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>
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```
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 *
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 *
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```
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```
*/
```

SHA1

```
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* FIPS 180-2 SHA-224/256/384/512 implementation
* Last update: 02/02/2007
* Issue date: 04/30/2005
*
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HMAC-SHA1

```
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* HMAC-SHA-224/256/384/512 implementation
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* Issue date: 06/15/2005
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HMAC-SHA2

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