



**NEC Express5800 Server Series**  
**NEC Scalable Modular Server**

---

# **EXPRESSSCOPE Engine 3**

## **Scripting Guide**

**April 21th, 2016**

**Rev3.2**

**© NEC Corporation 2016**

## Table of contents

<u>Table of contents</u> .....	i
■ <b>Trademarks</b> .....	v
■ <b>Notes</b> .....	v
■ <b>About This Document</b> .....	vi
■ <b>Terminology</b> .....	v
■ <b>Revision History</b> .....	viii
■ <b>Symbols in this document</b> .....	viii
1. <b>Overview</b> .....	- 1 -
2. <b>Preparation</b> .....	- 2 -
2.1. <b>Operation Environment</b> .....	- 2 -
2.2. <b>Perl Module</b> .....	- 3 -
3. <b>ServerProfile.pm</b> .....	- 4 -
3.1. <b>Overview</b> .....	- 4 -
3.2. <b>Method</b> .....	- 4 -
3.2.1. <b>new</b> .....	- 4 -
3.2.1.1. <b>Parameters</b> .....	- 4 -
3.2.1.2. <b>Return value</b> .....	- 6 -
3.2.1.3. <b>Execution example</b> .....	- 6 -
3.2.2. <b>getBmcProfile</b> .....	- 7 -
3.2.2.1. <b>Parameters</b> .....	- 7 -
3.2.2.2. <b>Return value</b> .....	- 7 -
3.2.2.3. <b>Execution example</b> .....	- 8 -
3.2.3. <b>setBmcProfile</b> .....	- 8 -
3.2.3.1. <b>Parameters</b> .....	- 8 -
3.2.3.2. <b>Return value</b> .....	- 8 -
3.2.3.3. <b>Execution example</b> .....	- 9 -

# EXPRESSSCOPE Engine 3 Scripting Guide

3.2.4.	getServerProfile.....	- 9 -
3.2.4.1.	Parameters .....	- 9 -
3.2.4.2.	Return value .....	- 9 -
3.2.4.3.	Execution example .....	- 10 -
3.2.5.	setServerProfile.....	- 10 -
3.2.5.1.	Parameters .....	- 10 -
3.2.5.2.	Return value .....	- 10 -
3.2.5.3.	Execution example .....	- 11 -
3.3.	Usage Example.....	- 11 -
3.4.	Error message.....	- 11 -
4.	BmcConfig.pm.....	- 14 -
4.1.	Overview .....	- 14 -
4.2.	Method.....	- 14 -
4.3.	Error message.....	- 14 -
4.4.	Usage Example.....	- 14 -
5.	JSON.....	- 16 -
5.1.	Overview .....	- 16 -
5.2.	Basic settings (basic).....	- 18 -
5.3.	User account settings (useraccount) .....	- 24 -
5.4.	Network settings.....	- 33 -
5.5.	Alert settings (alert).....	- 44 -
5.6.	Operation settings (operation) .....	- 57 -
5.7.	ECO settings (eco).....	- 63 -
5.8.	BIOS settings (bios).....	- 67 -
5.9.	Battery settings (battery) .....	- 73 -
5.10.	JSON file sample.....	- 75 -
5.10.1.	When enabling the access log;.....	- 75 -

## EXPRESSSCOPE Engine 3 Scripting Guide

5.10.2.	When setting AC LINK to LAST STATE and the delay time to 60 seconds;....	- 75 -
5.10.3.	When enabling the serial console redirection of serial port B; .....	- 76 -
5.10.4.	About PASSWORD field and ENCRYPTEDPASSWORD field. ....	- 77 -
6.	XML.....	- 79 -
6.1.	Overview .....	- 79 -
6.2.	Common elements.....	- 79 -
6.3.	BIOS settings .....	- 83 -
6.3.1.	BIOS setting elements .....	- 83 -
6.3.2.	How to check BIOS settings .....	- 85 -
6.3.2.1.	Case of the field whose parent element does not have <xsl:if> element .....	- 85 -
6.3.2.2.	Case of the field whose parent element has <xsl:if> element .....	- 89 -
6.3.2.3.	Case when checking the password.....	- 94 -
6.3.3.	How to change BIOS settings .....	- 96 -
6.3.3.1.	Case of the field whose parent element does not have <xsl:if> element .....	- 96 -
6.3.3.2.	Case of the field whose parent element has <xsl:if> element .....	- 101 -
6.3.3.3.	Case when configuring boot mode as Legacy. ....	- 106 -
6.3.3.4.	Case when changing the boot priority order of bootable UEFI device types	- 108 -
6.3.3.5.	Case when enabling the Console Redirection of serial port B and setting the baud rate to 57600.....	- 112 -
6.3.3.6.	Case when setting or changing the password .....	- 115 -
6.3.3.7.	Case when diverting the password set at SETUP. ....	- 118 -
6.3.3.8.	Case when clearing the password.....	- 120 -
6.3.4.	Other notes .....	- 122 -
7.	Sample Code .....	- 123 -
7.1.	getBmcProfile.pl .....	- 123 -
7.2.	setBmcProfile.pl.....	- 123 -
7.3.	modifyBmcProfile.pl.....	- 123 -
7.4.	getServerProfile.pl .....	- 123 -

# EXPRESSSCOPE Engine 3 Scripting Guide

7.5.	<code>setServerProfile.pl</code> .....	- 124 -
7.6.	<b>Case when changing BIOS settings by using sample codes.</b> .....	- 124 -
■	<b>Appendix</b> .....	- 126 -

### ■ Trademarks

Active Directory is a trademark or registered trademark of Microsoft Corporation in the United States and other countries.

Cent OS is a trademark or registered trademark of CentOS Ltd.

Intel is a trademark or registered trademark of Intel Corporation in the United States and other countries.

Javascript is a trademark or registered trademark of Oracle Corporation and/or its subsidiaries, affiliates in the United States and other countries.

Linux is a trademark or registered trademark of Linus Torvalds in the United States and other countries.

NFS is a trademark or registered trademark of Sun Microsystems, Inc. in the United States and other countries.

OpenLDAP is a registered trademark of OpenLDAP Foundation.

Perl is a trademark or registered trademark of Yet Another Society in the United States and other countries.

SSH is a trademark or registered trademark of SSH Communications Security Corp in the United States and other countries.

Ubuntu is a trademark or registered trademark of Canonical Ltd.

Windows is a trademark or registered trademark of Microsoft Corporation in the United States and other countries.

ESMPRO, EXPRESSSCOPE is a registered trademark of NEC Corporation.

All other company, product or brand names described in this document are registered trademarks or trademarks of their respective trademark owners.

### ■ Notes

1. No part of this document may be reproduced or reprinted in any form or by any means without the prior written permission of NEC Corporation.
2. The content of this document may be revised without prior notice.
3. The content of this document shall not be copied or altered without the prior written permission of NEC Corporation.
4. All efforts have been made to ensure the accuracy of all information in this document. However NEC is not liable for its any technical or editorial errors or omissions contained in this document.

## EXPRESSSCOPE Engine 3 Scripting Guide

5. NEC assumes no liability for damages arising from the use of this product, nor any liability for incidental or consequential damages arising from the use of this document regardless of the above 4.
6. All the sample values used in this document are fictitious.
7. This document was produced based on the information at the time of publication and setting fields or procedures, etc. may differ from their current state. If they were changed after the publication of this document, substitute them with appropriate information.

### ■ About This Document

This document explains the procedures to change and store the server setting for EXPRESSSCOPE Engine 3 or BIOS via a network using script languages as well as the usage examples of their sample codes. Please read this document when you manage many Express5800 Series or Scalable Modular Server or when you consider the operating measures to integrate server setting management.

This document is intended for persons who are familiar with the functions and operation methods of EXPRESSSCOPE Engine 3, BIOS and software. For operations or inquiries about them, refer to the user's guide or the online help information.

## ■ Terminology

Terminology	Description
AC Link	A function to control power supply condition after AC power is applied.
Access Log	A function to record the history of login/logout or of other operations on EXPRESSSCOPE Engine 3.
Active Directory	One of directory services.
Aggressive Mode	Function to suppress power consumption of the managed server below the specified maximum threshold.(Former name: Critical Power Capping)
Alert	A function to report events detected by EXPRESSSCOPE Engine 3 to the specified management PC via network.
BIOS	Basic Input/Output System. Firmware installed on the managed server which is executed when the server is turned on.
BMC	Baseboard Management Controller. Baseboard management controller installed on the managed server, which provides monitoring function on system hardware without depending on system states or OS, conforming to IPMI specification.
BIND Domain Name	Identification name of BIND user who performs searching operation in LDAP.
BIND password	Password for a BIND user.
BIOS setup utility (SETUP)	Software to set BIOS setting installed in the managed server. Can be started by pressing F2 key during POST.
Boot Time Setting	A function to suppress power consumption when starting the managed server or to alter the number of CPU cores.
CA	Certification Authority. Certification Authority to issue a public key certificate.
CIFS	One of file sharing protocols. Available on various OS including Windows.
CPU Throttling	A function to control CPU frequency.
Domain Controller	A server to control intensively the authentication information within the network. In this document, indicates Active Directory server.
ECO	Collective term of the functions to control power consumption.
NEC ESM PRO Manager	Server management software to be installed into the management PC.
EXPRESSSCOPE Engine 3	Management controller for Express5800 Series Scalable Modular Server started to be installed in the servers shipped since fiscal year 2011. Includes BMC function compliant to IPMI specification and provides various functions.



## EXPRESSSCOPE Engine 3 Scripting Guide

IPMI	Intelligent Platform Management Interface. Standard interface specification to monitor the server hardware without depending on system state or OS.
Image Redirection	EXPRESSSCOPE Engine 3's function to mount the specified file server and to make the image file located there recognized virtually as USB memory, CD/DVD ROM or FD on the managed server.
Intel Node Manager	Power management policy engine to monitor power consumption of the system and to control it in accordance with the set target on power consumption.
JSON	JavaScript Object Notation. Data format to represent the structuralized data in text format.
LDAP	Lightweight Directory Access Protocol. A protocol to connect to directory service.
Management PC	Terminal PC or equivalent which operates and manages the managed server via network from a distant place.
Memory Throttling	Function to limit the memory bandwidth.
NFS	One of file sharing protocols. Is used mainly when sharing files on Unix or Linux server.
Non-Aggressive Mode	A function to reduce power consumption while minimizing the degradation of the managed server's performance. (Former name: Non-Critical Power Capping)
OOB	Out Of Band. Indicates configuring and controlling the managed server via network.
PEM	One of the formats for certificate files. Certificate encoded by Base64 is recorded.
Perl	Interpreter programming language.
POST	Power On Self-Test. Self-diagnosis function performed by BIOS.
Remote KVM	Remote Keyboard Video Mouse. A function to virtually realize on managed PC the video output and keyboard/mouse input on the managed server.
Remote Media	Function to make the following various media virtually recognized on the managed server: USB memory, CD/DVD ROM and FD which are connected to the management PC.
Router Advertisement	One of the structures to automatically allocate IPv6 addresses.

## EXPRESSSCOPE Engine 3 Scripting Guide

Safe Power Capping	A function to force power control when power consumption of the managed server falls into unmeasurable state.
Search Base	A starting point of search on LDAP server. Specifies under which entry to search in the directory tree structure.
SEL	System Event Log. Hardware log information defined by IPMI specification.
SMTP	Simple Mail Transfer Protocol. A protocol to be used for sending e-mails.
SNMP	Simple Network Management Protocol. A protocol to monitor/control network devices or computers. On EXPRESSSCOPE Engine 3, only SNMP alert function compliant to IPMI specification is used.
SOL	Serial Over LAN. A function to realize the console redirection by serial I/O of managed server on the management PC connected with LAN.
SSH	Secure SHell. A secured command line protocol to encrypt communication.
Video Automatic Recording	A function to automatically record the screen output of OS stall (when Watchdog Timer times out) during POST.
VLAN	A structure to build multiple virtual networks on a physical LAN.
Web console	A structure to display the information of EXPRESSSCOPE engine 3 or to perform various settings by using Web browser.
X.509	Standard to define the standard format of public key certificate.
XML	Extensible Markup Language. Data format to represent structuralized data in text format.

## ■ Revision History

Rev. 3.2    April 21th, 2016            Initial publication

## ■ Symbols in this document



This symbol indicates tips or useful information.



This symbol indicates the matters users must follow in handling software or devices or the points users should pay special attention to.

## 1. Overview

Express5800 Series and Scalable Modular Server offers various functions. To utilize them for each purpose, settings before use are required.

One of the setting methods is setting up from management PC via network, using scripting languages. To change EXPRESSSCOPE Engine 3 settings, the user needs to download from EXPRESSSCOPE Engine 3 the JSON file with each setting described, store the file in management PC, change the descriptions according to the purposes and then upload the changed JSON file to EXPRESSSCOPE Engine 3. Also, to change settings of other modules, the user needs to download from EXPRESSSCOPE Engine 3 the XML files with each setting described, change the descriptions according to the purposes and then upload the changed XML file to EXPRESSSCOPE Engine 3.

To carry out the above procedures using Perl script, we provide Perl module, ServerProfile pm, which executes server setting by using JSON or XML file and offer sample Perl script, which uses ServerProfile pm. This document explains Perl script usage, the contents of JSON file where EXPRESSSCOPE Engine 3 settings are described, and of XML file to be used for other settings except for EXPRESSSCOPE Engine 3.

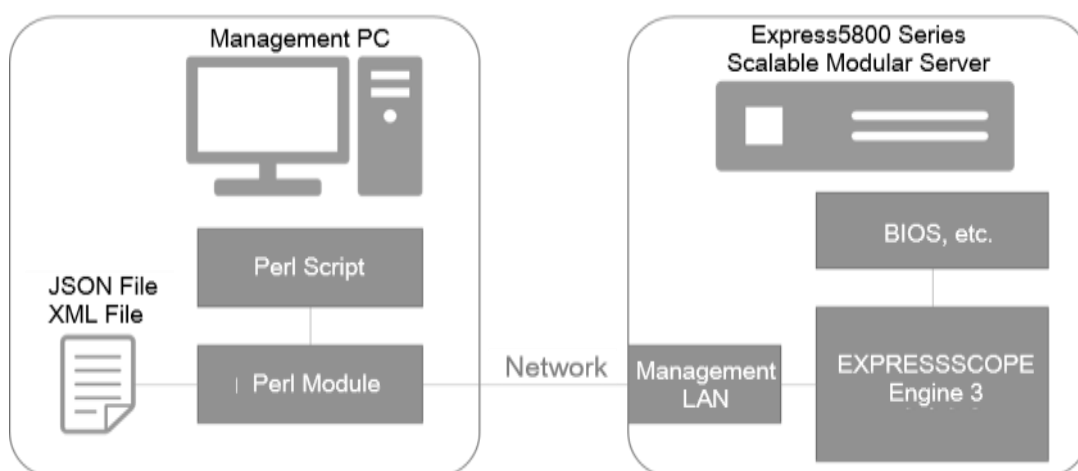


Fig. 1. Operation Outline

## 2. Preparation

This chapter explains the operation environment necessary for executing ServerProfile.pm that is Perl module to configure Express5800 Series, Scalable Modular Server.

### 2.1. Operation Environment

ServerProfile.pm operates in the following environment.

- Managed server: Express5800 Series with EXPRESSSCOPE Engine 3  
Scalable Modular Server with EXPRESSSCOPE Engine 3
- Management terminal OS: Various types of Linux (x86/x64)
- Management terminal Perl: Version 5



**At NEC, we perform operation check in the following environments.**

- |   |  |
|---|--|
| <b>Managed server:</b>                  | <b>Express5800 / T110h R120g-2M<br/>Scalable Modular Server / DX2000</b> |
| <b>Management terminal OS:</b>          | <b>Linux / CentOS 7.0- Ubuntu 14.04</b>                                  |
| <b>Management terminal Perl:</b>        | <b>Version 5.16 - 5.18</b>   |
| <b>Management terminal Perl module:</b> | <b>All modules are installed in package<br/>by yum or apt-get</b>        |



**NEC does not guarantee the operations of the functions described in this document, including the environment on which operation has been already verified. Please use all those functions with sufficient evaluation on them under your own responsibility.**



**Place CommonModule.pm in the same directory as that for ServerProfile.pm.**

### 2.2. Perl Module

ServerProfile.pm requires the following Perl modules.

#### ■ Digest::SHA

- A module to calculate hash value of SHA.
- Can be installed in “perl-Digest-SHA” package in Cent OS environment.
- Can be installed in “libdigest-sha-perl” package in Ubuntu environment.

#### ■ LWP::UserAgent

- A simplified HTTP client module.
- Can be installed in “perl-libwww-perl” package in Cent OS environment.
- Can be installed in “libdigest-perl” package in Ubuntu environment.

#### ■ LWP::Protocol::https

- Is a module to add HTTPS support to UserAgent.
- Can be installed in “perl-LWP-Protocol-https” package in Cent OS environment.
- Can be installed in “liblsp-rotocol-https-perl” package in Ubuntu environment.

#### ■ Crypt::SSLeay

- Is a module to perform communication by SSL.
- Can be installed in “perl-Crypt-SSLeay” package in Cent OS environment.
- Can be installed in “libcrypt-ssleay-perl” package in Ubuntu environment.

#### ■ JSON

- JSON parser for Perl.
- Can be installed in “perl-JSON” package in Cent OS environment.
- Can be installed in “libjson-perl” package in Ubuntu environment.

## 3. ServerProfile.pm

This chapter explains how to use ServerProfile.pm that is a Perl module to perform the settings of EXPRESSSCOPE Engine 3 or other servers in JSON or XML format.

### 3.1. Overview

ServerProfile.pm is a Perl module to acquire or reflect the settings of EXPRESSSCOPE Engine 3 or other various servers by using JSON or XML format files. ServerProfile.pm establishes communication with EXPRESSSCOPE Engine 3 by HTTP or HTTPS. Using method provided by this module simplifies the setting change of EXPRESSSCOPE Engine 3 or of other modules.

### 3.2. Method

ServerProfile.pm provides the methods as below.

- new
- getBmcProfile
- getBmcProfile
- getServerProfile
- setServerProfile

#### 3.2.1. new

This is a method to configure the connection to EXPRESSSCOPE Engine 3. Just invoking this method does not allow the connection to EXPRESSSCOPE Engine 3. Execute it once before invoking other methods. The following parameters are available.

##### 3.2.1.1. Parameters

The following explains the details and type (string or value) of each parameter and whether their settings are mandatory or optional.

- host
  - Specify the IP address of EXPRESSSCOPE Engine 3 or the host name.
  - Strings: Mandatory
- username
  - Specify the user set on EXPRESSSCOPE Engine 3.

## EXPRESSSCOPE Engine 3 Scripting Guide

- The user authorized as an administrator needs to be specified.
  - When specifying the user of LDAP or Active Directory, HTTPS connection is required.
  - String: Mandatory
- password
- Specify the password of the user specified in username.
  - When connected with HTTP, the specified password will be hashed and sent to EXPRESSSCOPE Engine 3. Even in HTTP connection, the password will not be sent in plain text. In HTTPS connection, it will not be hashed.
  - String: Mandatory
- ssl
- When connecting to EXPRESSSCOPE Engine 3 with HTTP, specify 0.
  - When connecting to EXPRESSSCOPE Engine 3 with HTTPS, specify 1.
  - When using the user of LDAP or Active Directory, HTTPS connection is required.
  - Value (0 or 1): Optional (default: 0)
- skipcertcheck
- When verifying SSL certificate, specify 0.
  - When not verifying SSL certificate, specify 1.
  - When 1 is specified, an error will not occur even if SSL certificate which is not trusted by EXPRESSSCOPE Engine 3 is used.
  - Value (0 or 1): Optional. (default: 0) Disabled in HTTP connection.
- certfile
- Specify the file name of CA certificate (PEM format file) by CA which was used to sign SSL certificate registered on EXPRESSSCOPE Engine 3.
  - If this parameter is specified, verify the certificate of EXPRESSSCOPE Engine 3 using the specified CA certificate.
  - For CA certificate, specify the BASE 64 encoded file.
  - Strings: Optional. (By default, EXPRESSSCOPE Engine 3 certificate will be verified by using CA certificate which management PC possesses.): In HTTP connection, disabled.





Password information is included in after-mentioned setting information of “Basic settings”, “User account settings”, “Alert settings” and “Operation settings”. When obtaining or configuring these information, HTTPS connection is recommended.



In default factory settings, SSL certificate signed by NEC’s CA as EXPRESSSCOPE Engine 3 certificate has been registered. When continuing to use this certificate, set not to verify the certificate by setting skipcertcheck to 0.

#### 3.2.1.2. Return value

Instance is returned by the method. Use this instance when executing other method.

#### 3.2.1.3. Execution example

- When the specified CA verifies the certificate via HTTPS connection;

```
$server = ServerProfile->new(host      => '172.16.200.2',  
                             username   => 'Administrator',  
                             password   => 'Administrator',  
                             ssl        => 1,  
                             certfile   => 'cacert.pem');
```

- When using HTTP connection;

```
$server = ServerProfile->new(host      => '172.16.200.2',  
                             username   => 'Administrator',  
                             password   => 'Administrator');
```

- When connecting via HTTPS and not verifying the certificate

(when using default SSL certificate of EXPRESSSCOPE Engine 3);

```
$server = ServerProfile->new(host      => '172.16.200.2',  
                             username   => 'Administrator',  
                             password   => 'Administrator',  
                             ssl        => 1,  
                             skipcertcheck => 1);
```

## EXPRESSSCOPE Engine 3 Scripting Guide

### 3.2.2. getBmcProfile

This is a method to connect to EXPRESSSCOPE Engine 3 and to obtain the EXPRESSSCOPE Engine 3 settings and then to disconnect from it. Execute the method using the instance obtained by *new* method (3.2.1. *new*).

#### 3.2.2.1. Parameters

The following explains the details and type (strings or value) of each parameter and whether their settings are mandatory or optional.

##### ■ First parameter

- Specify EXPRESSSCOPE Engine 3 settings to be obtained. (strings)
- One of the strings below can be specified.
  - basic
  - useraccount
  - network
  - alert
  - operation
  - eco
  - bios
  - battery (Supported models only)
- For details, see 5. JSON.

##### ■ Second parameter

- Specify the name of the file to which the setting information of obtained JSON format is written out. (String)
- This parameter is optional. When omitted, the setting information of the obtained JSON format is not written out to the file.

#### 3.2.2.2. Return value

The following explains about return values returned by the method.

The array is returned as return value.

##### ■ Array element 1

- Execution result (Value)
  - 0 : Normal termination
  - -1 : Abnormal termination (Parameter error)
  - -2 : Abnormal termination (Retry unnecessary)

## EXPRESSSCOPE Engine 3 Scripting Guide

- -3 : Abnormal termination (Retry may succeed)  
-If -3 is repeated, execute BMC reset and retry the method.

### ■ Array element 2

- The setting of the obtained JSON format is returned. (String)

### 3.2.2.3. Execution example

- When obtaining basic settings (basic) and writing them out as basic\_config.json;  
( \$ret , \$json ) = \$server->getBmcProfile('basic' , 'basic\_config.json');
- When obtaining network settings (network) (without writing them out to the file);  
( \$ret , \$json ) = \$server->getBmcProfile('network');

### 3.2.3. setBmcProfile

This is a method to connect to EXPRESSSCOPE Engine 3 and to obtain the EXPRESSSCOPE Engine 3 settings and then to disconnect from it. Execute the method using the instance obtained by the new method.

#### 3.2.3.1. Parameters

The following explains the details, type (strings or value) of each parameter and whether their settings are mandatory or optional.

##### ■ First parameter

- Specify the type of EXPRESSSCOPE Engine 3 setting (String).
- The available strings are the same as those for the first parameter of getServerProfile.
- For details, see 5. JSON.

##### ■ Second Parameter

- Specify the name of the setting file in JSON format. (String)

#### 3.2.3.2. Return value

The following explains about return value that is returned by the method.

The execution result (value) is returned as return value.

- 0 : Normal termination
- -1 : Abnormal termination (Parameter error)
- -2 : Abnormal termination (Retry unnecessary)

## EXPRESSSCOPE Engine 3 Scripting Guide

- -3 : Abnormal termination (Retry may succeed)

- If -3 is repeated, check the format of the specified JSON file.
- If the file format is normal, execute BMC reset and retry the method.

### 3.2.3.3. Execution example

- When reflecting basic\_ocnfig.json on the basic settings (basic);

```
$ret = $server->setBmcProfile('basic' , ' basic_config.json');
```

### 3.2.4. getServerProfile

This is a method to connect to EXPRESSSCOPE Engine 3, to obtain XML settings and to disconnectExecute the method using the instance obtained by the new method.

#### 3.2.4.1. Parameters

The following explains the details, type (strings or value) of each parameter, and whether their settings are mandatory or optional.

- First parameter

- Specify the name of the file to which the setting information of the obtained XML format is written out. (String)
- This parameter is optional. When omitted, the setting information of the obtained XML format is not written out to the file.

#### 3.2.4.2. Return value

The following explains about return value that is returned by the method.

The array is returned as return value.

- Array element 1

- Execution result (Value)
- 0 : Normal termination
- -1 : Abnormal termination (Parameter error)
- -2 : Abnormal termination (Retry unnecessary)
- -3 : Abnormal termination (Retry may succeed)
  - If -3 is repeated, execute BMC reset and retry the method.
  - Perform power ON/OFF for the server or system reset and then retry the method.

## EXPRESSSCOPE Engine 3 Scripting Guide

### ■ Array element 2

- The setting of the obtained XML format is returned. (String)

#### 3.2.4.3. Execution example

##### ■ When obtaining XML settings and storing them to variable \$xml;

```
( $ret , $xml ) = $server->getServerProfile ();
```

##### ■ When obtaining XML settings and writing them out to the file of get.xml;

```
( $ret , $xml ) = $server->getServerProfile ('get.xml');
```

#### 3.2.5. setServerProfile

This is a method to connect to EXPRESSSCOPE Engine 3, to obtain XML settings and then disconnect. Execute it using the instance obtained by new method.

##### 3.2.5.1. Parameters

The following explains the details, type (string or value) of each parameter, and whether their settings are mandatory or optional.

##### ■ First parameter

- Specify the name of the setting file in XML format. (String)

##### 3.2.5.2. Return value

The following explains about return value that is returned by the method.

The execution result (value) is returned as return value.

##### ■ 0 : Normal termination

##### ■ -1 : Abnormal termination (Parameter error)

##### ■ -2 : Abnormal termination (Retry unnecessary)

##### ■ -3 : Abnormal termination (Retry may succeed)

- If -3 is repeated, check the format of the specified XML file.
- If the file format is normal, execute BMC reset and retry the method.
- Perform power ON/OFF for the server or system reset and then retry the method.

## EXPRESSSCOPE Engine 3 Scripting Guide

### 3.2.5.3. Execution example

- When reflecting set.xml on the settings;

```
$ret = $server->setServerProfile('set.xml');
```

## 3.3. Usage Example

First, read the module with Perl script that invokes ServerProfile.pm module, as below.

```
use ServerProfile;
```

Next, execute the constructor and then obtain the instance (when not verifying the certificate).

```
$server = ServerProfile-> new( host      => '172.16.200.2',  
                             username   => 'Administrator',  
                             password   => 'Administrator',  
                             ssl        => 1 ,  
                             skipcertcheck => 1 );
```

Obtain or set the settings by using the obtained instance.

```
( $ret , $json ) = $server->getBmcProfile('basic');  
$ret = $server->setBmcProfile('basic', ' basic.json');  
( $ret , $xml ) = $server->getServerProfile ();  
$ret = $server->setServerProfile('set.xml' );
```

## 3.4. Error message

The major error messages output by ServerProfile.pm are as follows.

- Failed to login.
  - Indicates the login was failed.
  - If there is detailed information, the message will be displayed nearby.
- Invalid username or password.
  - Indicates the user name or password is incorrect.
- Invalid username or password. SSL is required for LDAP / Active Directory user.
  - Indicates the user name or password is incorrect.
  - When logging in by LDAP or as an Active Directory user, HTTPS connection is required. If LDAP or Active Directory user is used, change the settings to HTTPS connection and retry.
- Session slot is full. Please retry a few minutes later.
  - Indicates HTTP/HTTPS session is full.

## EXPRESSSCOPE Engine 3 Scripting Guide

- Session is being used by NEC ESM PRO Manager, Web console or etc. Wait until session becomes available or log out the session in use and retry.
- Failed to get CSRF token. Please retry a few minutes later.
  - Indicates the acquisition of CSRF token was failed. Please retry.
- certificate verify failed
  - Indicates verification of SSL certificate was failed.
  - Confirm if the correct certificate has been specified.
  - If the correctly signed certificate is not available, set skipcertcheck option to 1 and retry. In this case, an error will not occur even if SSL certificate which is not trusted by EXPRESSSCOPE Engine 3 is used.
- Can't connect to xxx.xxx.xxx.xxx:xx
  - Indicates the connection to EXPRESSSCOPE Engine 3 was failed
  - Confirm if the connection destination setting and network are properly set.
  - In the case of HTTPS connection, confirm if the correct certificate has been specified
- Failed to get JSON. Please retry a few minutes later.
  - Indicates the acquisition of JSON file was failed. Please wait for a moment and retry.
  - If this error is repeated, reset BMC and retry the method.
- Failed to set JSON. Please retry a few minutes later.
  - Indicates the reflection of the JSON file failed Confirm if the format of JSON file is normal.
  - If the format does not have any problems, wait for a moment and retry.
  - If this error is repeated, reset BMC and retry the method.
- Unsupported function.
  - Indicates this function is not supported on this server.
- XML file is invalid.
  - Indicates there is a problem with the format of specified XML file or with the setting value.
- Forbidden. Administrator privilege is required.
  - Indicates the authorization is not enough. Specify the user authorized as an Administrator.
- Upload conflict. Please retry a few minutes later.
  - Indicates other processing is running. Please retry a few minutes later.
- Processing other request. Please retry a few minutes later.

## EXPRESSSCOPE Engine 3 Scripting Guide

- Indicates other processing is running. Please retry a few minutes later.
- BIOS POST is running. Please retry a few minutes later.
  - Indicates POST of BIOS is running. During POST, the acquisition and setting of XML file cannot be performed.  
Please wait for a moment and retry.
- Processing XML. Please retry a few minutes later.
  - Indicates XML file input/output preparation is running. Please retry a few minutes later.
  - Preparation period may be differ depending on hardware.
  - Preparation period may be long when load of EXPRESSSCOPE Engine 3 is heavy. Please suspend Remote KVM, Remote Media and Image Redirection when this message displayed over 10 minutes during the connection. After that, Please retry a few minutes later.
  - XML file input/output preparation will re-execute by Power OFF or POST. After Power OFF, Power ON or System Reset, Please wait a few minutes later.
  - If this error is repeated, reset BMC and retry the method.



## 4. **BmcConfig.pm**

This chapter explains BmcConfig.pm, a Perl module to perform EXPRESSSCOPE Engine 3 setting in JSON format.

### 4.1. Overview

BmcConfig.pm provides the same API as the one provided by the BmcConfig.pm that had been attached with EXPRESSSCOPE Engine 3 Scripting Guide 2.0 version. When creating a new script, use the API of ServerProfile.pm. Only in the case the script is already used with the use of BmcConfig.pm and the compatibility needs to be maintained, use BmcConfig.pm. BmcConfig.pm is a Perl module that obtains and reflects EXPRESSSCOPE Engine 3 settings by using JSON file. BmcConfig.pm establishes communication with EXPRESSSCOPE Engine 3 via HTTP or HTTPS. Using the method provided by the module, simplifies the setting changes of the EXPRESSSCOPE Engine 3. No settings other than those on EXPRESSSCOPE Engine 3 can be altered.

### 4.2. Method

BmcConfig.pm provides the following three methods.

- new
- getConfig
- setConfig

For the usage of each method, see EXPRESSSCOPE Engine 3 Scripting Guide 2.0.

### 4.3. Error message

The error messages output by BmcConfig.pm are the same as those by ServerProfile.pm. See 3.4 Error message.

### 4.4. Usage Example

First, read the module in the following way in Perl script that invokes BmcConfig.pm module.

```
use BmcConfig;
```

Next, execute the constructor and then obtain the instance (when not verifying the certificate).

## EXPRESSSCOPE Engine 3 Scripting Guide

```
$bmc = BmcConfig-> new( host    => '192.168.2.33',  
                        username => 'Administrator',  
                        password => 'Administrator',  
                        ssl      => 1 ,  
                        skipcertcheck => 1 );
```

Obtain the settings or perform setting by using the obtained instance.

```
( $ret , $json ) = $bmc->getConfig('basic');  
$ret = $bmc->setConfig('basic' , 'basic.json');
```

## 5. JSON

This chapter explains JSON format used in ServerProfile.pm. Each setting on EXPRESSSCOPE Engine 3 is set in JSON format. For details on each of JSON fields, see also the online help information on the Web console.

### 5.1. Overview

With ServerProfile.pm, each setting of EXPRESSSCOPE Engine 3 can be obtained or set in JSON format. The JSON format used in such cases includes the following types.

- basic : Basic settings (Corresponds to “Miscellaneous” settings on the Web console.)
- useraccount : User account settings (Corresponds to “User management” settings on the Web console.)
- network : Network settings (Corresponds to “Network” settings on the Web console. )
- alert : Alert settings (Corresponds to “Alert” settings on the web console.)
- operation : Operation settings (Corresponds to “System operation” settings on the Web console.)
- eco : ECO settings (Corresponds to “ECO” settings on the Web console. )
- bios : BIOS settings (Corresponds to “System BIOS” settings on the Web console. )
- battery : Battery settings (Corresponds to “Battery Controller” settings on the Web console. )

**Fields or settable values may differ depending on the version of the server or of BMCFW. The function is not supported if its corresponding field does not exist. For some servers, unsupported functions exist even if the corresponding fields are provided. As for what the settable fields are, see the list of default setting values described in the user’s guide on EXPRESSSCOPE Engine 3 or refer to the Web console. Also, for the mandatory fields that need to be surely specified when changing the settings or for the settable values, see the setting screen of the Web console.**



When specifying a string in JSON, the string needs to be enclosed in " (double quotes). For values, true, or false, do not use " and describe them as they are.



Unless otherwise indicated, the following character codes cannot be used in the strings in JSON format files.

" : Double quotes (ASCII 0x22)

' : Single quotes (ASCII 0x27)

\ : Backslash/Yen (ASCII 0x5C)

# : Sharp (ASCII 0x23)



When not changing, the setting of JSON fields can be omitted. For details, see 5.10 JSON file sample.

## 5.2. Basic settings (basic)

The file format for basic settings is as follows.

```
{
  "BASICCONFIG" :
  {
    "VERSION" : (value) ,
    "SEL" :
    {
      "FULLBEHAVIOR" : (string:STOP/CLEAR/OVERWRITE)
    } ,
    "ACCESSLOG" :
    {
      "CONTROL" : (true/false) ,
      "HTTP" : (true/false) ,
      "HTTPS" : (true/false) ,
      "TELNET" : (this setting is not supported.) ,
      "SSH" : (true/false)
    } ,
    "POWEROPTION" :
    {
      "ACLINK" :(string: POWEROFF/LASTSTATE/POWERFON),
      "DELAYTIME" : (value 0: random)
    } ,
    "MANAGEMENT" :
    {
      "VALID" : (true/false) ,
      "PASSWORD" : (string) ,
      "ENCRYPTEDPASSWORD" : (string) ,
      "RCVALID" : (true/false) ,
      "REDIRVALID" : (true/false)
    } ,
    "RECORD" :
    {
```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
        "VALID" : (true/false)
    },
    "NMMODE" :
    {
        "VALID" : (true/false)
    }
}
```

## EXPRESSSCOPE Engine 3 Scripting Guide

The details on each field are as follows.

- "VERSION"  
This field describes the version of the file format for basic settings (basic). (Get Only).  
If the version is 1, this field is omitted. When editing JSON file, do not add or revise this field.
- "SEL"  
This field describes the extension settings regarding SEL function in IPMI specification.
  - FULLBEHAVIOR**: Specifies the operation for the case where the SEL field becomes full. If the setting in this field are changed, the SEL information which has been collected until then will be all cleared (string).
    - STOP**: Stops collecting SEL information once the SEL becomes full.
    - CLEAR**: Clears SEL information once the SEL becomes full.
    - OVERWRITE**: Overwrites old SEL information with new SEL information when the SEL becomes full.
- "ACCESSLOG":  
This field describes the settings regarding the function of access log recorded at the time when operating EXPRESSSCOPE Engine 3.
  - CONTROL**: Indicates whether collection of the access logs regarding operations such as power supply control or ID LED is enabled/disabled.  
When enabling this setting, one at least among HTTP, HTTPS and SSH needs to be enabled.
    - true**: Enabled
    - false**: Disabled
  - HTTP**: Indicates whether collection of the access logs such as login to/logout of HTTP is enabled/disabled.
    - true**: Enabled
    - false**: Disabled
  - HTTPS**: Indicates whether collection of the access logs such as login to/logout HTTPS is enabled/disabled.
    - true**: Enabled
    - false**: Disabled
  - TELNET**: This field is not supported. Set false.

**SSH:** Indicates whether collection of the access logs such as login to/logout of SSH is enabled/disabled.

**true:** Enabled

**false:** Disabled

- "POWEROPTION" :

This field describes the settings concerning the power supply control function at AC power on. The settings are reflected during POST. To reflect the settings on BIOS, restart the system after setting.

**ACLINK:** Controls power supply state after AC power on.

**POWEROFF:** Does not switch on the DC power after AC power on.

**LASTSTATE:** After AC power on, returns to the power supply state that was before AC power supply disconnection.

**POWERON:** Switches on DC power after AC power on.

**DELAYTIME:** Indicates the delay time after AC power on until DC power on (in seconds; 600 seconds at maximum).

The minimum settable value differs depending on the server. If 0 is specified, a random delay time will be set. If ACLINK is changed from POWEROFF to LASTSTATE or to POWERON, this DELAYTIME field also needs to be set at the same time.

- "MANAGEMENT" :

This field describes the settings regarding the cooperative function with NEC ESMPRO Manager.

**VALID:** Indicates whether the management function from NEC ESMPRO Manager is enabled/disabled.

When using the management controller management function of NEC ESMPRO Manager, this field setting needs to be enabled. If this setting is changed from disabled to enabled, the following PASSWORD or ENCRYPTEDPASSWORD also needs to be set at the same time.

**true:** Enabled

**false:** Disabled

**PASSWORD:** Indicates the plain text password of the user to communicate with NEC ESMPRO Manager (string, 16 characters at maximum). If



## EXPRESSSCOPE Engine 3 Scripting Guide

VALID is changed from disabled to enabled, this field or ENCRYPTEDPASSWORD needs to be set at the same time.

When the file format version is 1;

The same string as the authentication key set for the management controller management setting on NEC ESMPRO Manager is required. If JSON file is obtained from EXPRESSSCOPE Engine 3, the plain text password that has been set is described.

When the file format version is 2;

If JSON file is obtained from EXPRESSSCOPE Engine 3, this field will always be NULL. When setting a password by directly editing JSON file, enter the password (in plain text) in this field. For the password, it is necessary to set the same string as the authentication key for the management controller management setting set on NEC ESMPRO Manager. When changing the password by using this field, first delete "ENCRYPTEDPASSWORD" field and then reflect the setting.

**ENCRYPTEDPASSWORD:** Specifies the encrypted password of the user to communicate with NEC ESMPRO Manager (string). If VALID is changed from disabled to enabled, this field or PASSWORD needs to be set at the same time.

When the file format version is 1;

This field does not exist. Use PASSWORD field.

When the file format version is 2;

If JSON file is obtained from EXPRESSSCOPE Engine 3, this field describes the encrypted password. Do not change the encrypted password. To change the password by using "PASSWORD" field, delete this field.

**RCVALID:** Indicates whether the remote control from NEC ESMPRO Manager is enabled/disabled. When using the remote control on NEC ESMPRO Manager, this field setting needs to be enabled. If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**true:** Enabled

**false:** Disabled

**REDIRVALID:** Indicates whether the console redirection (SOL) is enabled/disabled. When using the remote control on NEC ESM PRO Manager, this field needs to be enabled. If VALID is changed from disabled to enabled, this field or ENCRYPTEDPASSWORD needs to be set at the same time.

**true:** Enabled

**false:** Disabled

- "RECORD" (supported models only)

This field describes the setting regarding the automatic video recording.

**VALID:** Indicates whether the automatic video recording function is enabled/disabled.

**true:** Enabled

**false:** Disabled

- "NM MODE" (supported models only)

This field setting is not supported. Do not change it.



**These setting information includes the password information. When obtaining or setting these information, HTTPS connection is recommended.**



**Use "PASSWORD" field when changing the password. Use "ENCRYPTEDPASSWORD" field when copying the password set on one EXPRESSSCOPE Engine 3 to another EXPRESSSCOPE Engine 3. For details, see 5.10 JSON file sample.**

## 5.3. User account settings (useraccount)

The file format for the user account settings (useraccount) is as follows.

```
{
  "USERACCOUNTCONFIG" :
  {
    "VERSION": (value) ,
    "USERINFO" :
    [
      {
        "USERID" : (value) ,
        "VALID" : (true/false) ,
        "USERNAME" : (string) ,
        "PASSWORD" : (string) ,
        "ENCRYPTEDPASSWORD" : (string) ,
        "PRIVILEGE" : (string: USER / OPERATOR /
                      ADMINISTRATOR) ,
        "USERKEY" : (string)
      } ,
      {
        "USERID" : (value) ,
        (An array format is described hereafter.)
      }
    ] ,
    "LDAP" :
    {
      "PROPERTY" :
      {
        "VALID" : (true/false) ,
        "ADDR" : (string) ,
        "PORT" : (value) ,
        "SEARCHBASE" : (string) ,
        "BINDDOMAIN" : (string) ,
        "BINDPASSWORD" : (string) ,

```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
        "ENCRYPTEDBINDPASSWORD" : (string)
    },
    "GROUP" :
    [
        {
            "GROUPID" : (value),
            "VALID" : (true/false) ,
            "GROUPNAME" : (string) ,
            "SEARCHBASE" : (string) ,
            "PRIVILEGE" : (string: USER / OPERATOR /
                          ADMINISTRATOR)
        },
        {
            "GROUPID" : (value)
            (An array format is described hereafter)
        }
    ]
},
"ACTIVEDIRECTORY" :
{
    "PROPERTY" :
    {
        "VALID" : (true/false) ,
        "USERDOMAIN" : (string) ,
        "USERNAME" : (string) ,
        "PASSWORD" : (string),
        "ENCRYPTEDPASSWORD" : (string) ,
        "TIMEOUT" : (value) ,
        "DOMAINCONTROLLER" :
        [
            {
                "ADDR" : (string)
            },
            {
                "ADDR" : (string)
            },
        ]
    }
}
```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
        {
            "ADDR" : (string)
        }
    ]
},
"GROUP" :
[
    {
        "GROUPID" : (value),
        "VALID" : (true/false) ,
        "GROUPNAME" : (string) ,
        "DOMAIN" : (string) ,
        "PRIVILEGE" : (string: USER / OPERATOR /
ADMINISTRATOR)
    },
    {
        "GROUPID" : (value) (An array format is
described hereafter.)
    }
]
}
}
```

## EXPRESSSCOPE Engine 3 Scripting Guide

The details on each field are as follows.

- "VERSION"

This field describes the version of the file format for user account settings (Get Only). If the version is 1, this field is omitted. When editing JSON file, do not add or revise this field.

- "USERINFO"

This field describes the user settings to login to EXPRESSSCOPE Engine 3.

**USERID:** Indicates the user ID to be changed (a value between 5 to 16.). This field cannot be omitted.

**VALID:** Indicates whether the user is enabled/disabled. If this field setting is changed from disabled to enabled, USERNAME, PASSWORD or ENCRYPTEDPASSWORD, and PRIVILEGE need to be set at the same time.

**true:** Enabled

**false:** Disabled

**USERNAME:** Indicates the user name (string, 15 characters at maximum). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The usable characters are half-width alphanumerics, "-" and "\_".

**PASSWORD:** Indicates the user password in plain text (string, 19 characters at maximum). If VALID is changed from disabled to enabled, this field or ENCRYPTEDPASSWORD needs to be set at the same time. The usable characters are ASCII characters except "(blank)", " ", " ", " ", "&", "?", "=", "\", and "#".

When the file format version is 1;

If JSON file is obtained from EXPRESSSCOPE Engine 3, the plain text password that has been set is described.

When the file format version is 2;

If JSON file is obtained from EXPRESSSCOPE Engine 3, this field will always be NULL. When directly editing JSON file and setting a password, enter the plain text password in this field. When changing the password by using this field, first delete "ENCRYPTEDPASSWORD" field and then reflect the setting.

**ENCRYPTEDPASSWORD:** Indicates the encrypted password of the user (string). If VALID is changed from disabled to enabled, this field or PASSWORD needs to be set at the same time.

When the file format version is 1;

This field does not exist. Use PASSWORD field.

When the file format version is 2;

If JSON file is obtained from EXPRESSSCOPE Engine 3, the encrypted password will be described in this field. Do not change the encrypted password. When changing the password by using "PASSWORD" field, delete this field.

**PRIVILEGE:** Indicates the user privilege. (The privilege conforms to IPMI specification.) If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**USER:** Indicates the user privilege. This privilege enables mainly the display of the server state and of the settings.

**OPERATOR:** Indicates the operator privilege. This privilege enables mainly manipulating the server state in addition to the user privilege.

**ADMINISTRATOR:** Indicates the administrator privilege. This privilege enables mainly the alteration of the settings in addition to the operator privilege.

**USERKEY:** Indicates whether or not the SSH public key has been registered. When Setting, set the value obtained through Get without changing it, or omit the field. When Setting the JSON file obtained from the Get operation to the EXPRESSSCOPE Engine 3 on another server, omit this field or set false. If VALID is changed from disabled to enabled, specify false in this field.

**true:** Registered

**false:** Not registered

- "LDAP"

This field describes the settings regarding authentication function linked with LDAP server.

**PROPERTY:**

**VALID:** Indicates whether LDAP is enabled/disabled.

**true:** Enabled

**false:** Disabled

**ADDR:** Indicates the IP address of LDAP server (string, e.g.: 192.168.1.1).

## EXPRESSSCOPE Engine 3 Scripting Guide

If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**PORT:** Indicates the port number of LDAP (value, e.g.: 624). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable value ranges from 1 to 65535.

**SEARCHBASE:** Indicates the search base. If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

(string, e.g.: dc=example,dc=com)

The settable characters are half-width alphanumerics, “-”, “\_”, “.”, “,” and “=” and are up to 62 characters at maximum.

**BINDDOMAIN :** Indicates BIND domain name. If VALID is changed from disabled to enabled, this field also needs to be set at the same time. (string, e.g.: cn=root,dc=example,dc=com)

The settable characters are half-width alphanumerics, “-”, “\_”, “.”, “,” and “=” and are up to 62 characters at maximum.

**BINDPASSWORD:** Indicates the BIND password in plain text (string). If VALID is changed from disabled to enabled, this field or

ENCRYPTEDPASSWORD also needs to be set at the same time.

The settable characters are ASCII characters except “ ” ‘ “ ” #” and “\” and are up to 31 characters at maximum.

When the file format version is 1;

If JSON file is obtained from EXPRESSSCOPE Engine 3, the plain text password that have been set is described.

When the file format version is 2;

If JSON file is obtained from EXPRESSSCOPE Engine 3, this field will always be NULL. When directly editing JSON file and setting a password, enter the plain text password in this field. If you change the password using this field, first delete the “ENCRYPTEDPASSWORD” field and then reflect the setting.

**ENCRYPTEDBINDPASSWORD:** Indicates the encrypted bind password (string).

If VALID is changed from disabled to enabled, this field or BINDPASSWORD also needs to be set at the same time.

When the file format version is 1;

This field does not exist. Use “BINDPASSWORD” field.



When the file format version is 2;

If JSON file is obtained from EXPRESSSCOPE Engine 3, the encrypted password will be described in this field. Do not change the encrypted password. If you change the password using "BINDPASSWORD" field, delete this field.

**GROUP:** (supported models only)

**GROUPID:** Indicates the group ID (a value between 0 and 4).**VALID:** Indicates whether the group is enabled/disabled.

**true:** Enabled

**false:** Disabled

**GROUPNAME:** Indicates the group name (string). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable characters are half-width alphanumerics, "-" and "\_".

**SEARCHBASE:** Indicates the search base (string). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable characters are half-width alphanumerics, "-", "\_", ".", ",", and "=" and are up to 62 characters at maximum.

**PRIVILEGE:** Indicates the privilege (The privilege conforms to IPMI specification). If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**USER:** User privilege

**OPERATOR:** Operator privilege

**ADMINISTRATOR:** Administrator privilege

- "ACTIVEDIRECTORY"

This field describes the settings regarding the authentication function linked with Active Directory server.

**PROPERTY:**

**VALID:** Indicates whether Active Directory is enabled/disabled.

**true :** Enabled

**false :** Disabled

**USERDOMAIN:** Indicates the user domain name (string, e.g.: example.com). If VALID is changed from disabled to

enabled, this field also needs to be set at the same time. The settable characters are half-width alphanumerics, “-”, “\_” and “.”.

**USERNAME:** Specify the user name to be used to connect to the domain controller. The user who is specified here needs to be the member of the appropriate groups such as Domain Admins of Active Directory. The settable characters are ASCII characters except “(blank)”, “,”, “;”, “\*”, “[”, “=”, “+”, “?”, “<”, “>”, “@”, “ ”, “ ’ ”, “/”, “(backslash)”, “[”, “]” and “#” and are up to 64 characters at maximum.

**PASSWORD:** Indicates the user password in plain text to be used to connect to the domain controller (string). If JSON file is obtained from EXPRESSSCOPE Engine 3, this field will always be NULL. When directly editing JSON file and setting a password, enter the plain text password in this field. To change the password by using this field, first delete the “ENCRYPTEDPASSWORD” field and then reflect the setting. The settable characters are ASCII characters except “(blank)”, “ ”, “ ’ ”, “\” and “#” and are up to 127 characters at maximum.

**ENCRYPTEDPASSWORD:** Indicates the encrypted password of the user to be used to connect to the domain controller (string). If JSON file is obtained from EXPRESSSCOPE Engine 3, the encrypted password will be described in this field. Do not change the encrypted password. To change the password by using “PASSWORD” field, delete this field.

**TIMEOUT:** Indicates the number of seconds of the time-out period (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable value ranges from 15 to 300.

**DOMAINCONTROLLER:** Indicates the information on the domain controller.

**ADDR:** Indicates the IP address of the domain controller. At maximum, up to three IP addresses can be set. If you make it

not set, specify NULL. If VALID is enabled, specify one IP address at least (string).

### **GROUP:**

**GROUPID:** Indicates the group ID. (It will be a value between from 0 to 4)

**VALID:** Enables or disable the group.

**true:** Enabled

**false:** Disabled

**GROUPNAME:** Indicates the group name (string). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable characters are half-width alphanumeric, “-” and “\_” and are up to 255 characters at maximum.

**DOMAIN:** Indicates the domain name (string). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable characters are half-width alphanumeric, “-”, “\_” and “.” and are up to 255 characters at maximum.

**PRIVILEGE:** Indicates the privilege (The privilege conforms to IPMI specification). If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**USER:** User privilege

**OPERATOR:** Operator privilege

**ADMINISTRATOR:** Administrator privilege



These setting information includes the password information. When obtaining or setting these information, HTTPS connection is recommended.



Use “PASSWORD” field when you want to change the password.  
Use “ENCRYPTEDPASSWORD” field when copying the password set on one EXPRESSSCOPE Engine 3 to another EXPRESSSCOPE Engine 3.  
For details, see 5.10 JSON file sample.

## 5.4. Network settings

The file format for the network settings (network) is as follows.

```

{
    "NETWORKCONFIG" :
    {
        "NETWORK" :
        {
            "LANTYPE" :
            {
                "SHAREDLAN" : (true/false),
                "DUPLICATION" : (true/false)
            },
            "SUPPORTCONFIG":
            {
                "MANAGEMENTLANCONTYPE":
                [
                    {
                        "CONTYPE": (string:AUTO / 10GFULL
                        / 10GHALF / 1GFULL / 1GHALF /
                        100MFULL / 100MHALF / 10MFULL
                        / 10MHALF )
                    }
                    (After ..., the array format.)
                ],
                "SHAREDLANCONTYPE":
                [
                    {
                        "CONTYPE": (string:AUTO / 10GFULL
                        / 10GHALF / 1GFULL / 1GHALF /
                        100MFULL / 100MHALF / 10MFULL /
                        10MHALF )
                    }
                    (An array format is described hereafter)
                ]
            }
        }
    }
}

```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
},
"DEFAULTVALUE":
{
    "SHAREDLANCONTYPE":(string:AUTO / 10GFULL /
    10GHALF / 1GFULL / 1GHALF / 100MFULL /
    100MHALF / 10MFULL / 10MHALF ) ,
    "IPV4DHCP": (true/false)
}
"BASIC" :
{
    "DHCP" : (true/false) ,
    "IPADDR" : (string),
    "SUBNETMASK" : (string) ,
    "GATEWAYADDR" : (string) ,
    "DNSADDR" : (string) ,
    "HOSTNAME" : (string) ,
    "DOMAINNAME" : (string) ,
    "DDNS" : (true/false) ,
    "MACADDR" : (string) ,
    "CONTYPE": (string:AUTO / 10GFULL / 10GHALF /
    1GFULL / 1GHALF /
    100MFULL / 100MHALF /
    10MFULL / 10MHALF )
},
"IPV6" :
{
    "VALID" : (true/false) ,
    "ADVERTISE":(true/false),
    "STATICADDR" : (string),
    "PREFIXLEN" : (string),
    "GATEWAYADDR" : (string),
    "LINKLOCALADDR": (string),
    "GLOBALADDR":(string),
    "DNSADDR" : (string)
},
"ADDRFILTER" :
```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
{
    "TYPE" : (string:ALLOW/DENY/DISABLE) ,
    "ADDRLIST" : (string)
},
"TIME" :
{
    "CURTIME": (This setting is not supported. Omit it
                when setting.) ,
    "NTP" : (not supported)
    {
        "VALID" : false , (not supported)
        "NTPADDR" : "" , (not supported)
        "TIMEZONE" : "UTC" , (not supported)
        "INTERVAL" : "DAY" (not supported)
    }
},
"VLAN" :
{
    "VALID" : (true/false) ,
    "VLAN ID" : (value),
    "PRIORITY" : (value)
}
},
"SERVICE" :
{
    "HTTP" : ,
    {
        "VALID" : (true/false) ,
        "PORT" : (value)
    },
    "HTTPS" :
    {
        "VALID" : (true/false) ,
        "PORT" : (value)
    },
    "SSH" :
```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
    {  
        "VALID" : (true/false) ,  
        "PORT" : (value)  
    }  
}  
}
```

## EXPRESSSCOPE Engine 3 Scripting Guide

The details on each field is as follows.

- "NETWORK"

This field describes the network settings on EXPRESSSCOPE Engine 3.

**LANTYPE:**

**SHAREDLAN:** Specifies which EXPRESSSCOPE Engine 3 uses between the dedicated LAN for management or the operation LAN for the server (on-board LAN). If this setting is enabled, EXPRESSSCOPE Engine 3 also will share the operation LAN for the host server (on-board LAN). For details, see the user's guide on the host server. If this setting is changed, set CONTYPE also at the same time.

**true:** Enabled (Shares the operation LAN for the host server.)

**false:** Disabled (Uses the dedicated LAN for management)

**DUPLICATION:** When EXPRESSSCOPE Engine 3 is set to share the operation LAN for the host server (on-board LAN), the duplication is executed by using the operation LAN for the host server (on-board LAN) 1 and 2. (supported models only) When EXPRESSSCOPE Engine 3 detects the link-down of the shared LAN port, it automatically switch that port to another to share.

**true:** Enabled (Executes duplication) .

**false:** Disabled (Does not execute duplication)

**SUPPORTCONFIG:** Indicates the list of the settable values for the parameters for which the settable values differ depending on the server configuration, etc. (Get Only).

**DEFAULTVALUE:** Indicates the list of the default setting values for parameters for which the default values differ depending on the server models. (Get Only)

**BASIC:** Network basic settings

**DHCP:** Indicates whether DHCP is enabled/disabled.

If this setting is changed from enabled to disabled, IPADDR and SUBNETMASK also needs to be set at the same time.

**true:** Enabled

**false:** Disabled



**IPADDR:** Indicates IPv4 address (string).

If IPv4 address is obtained through Get when DHCP is enabled, the setting value allocated by DHCP server is returned. If DHCP is changed from enabled to disabled, this field also needs to be set at the same time. Otherwise the communication may become unavailable.

**SUBNETMASK:** Indicates the subnet mask (string).

If subnet mask is obtained through Get when DHCP is enabled, the setting value allocated by DHCP server is returned. If DHCP is changed from enabled to disabled, this field also needs to be set at the same time. If the setting is not done at the same time, the communication may become unavailable.

**GATEWAYADDR:** Indicates the IP address of gateway (string).

If you Get gateway's IP address when DHCP is enabled, the setting value which has been allocated by DHCP server is returned.

**DNSADDR:** Indicates the IP address of DNS server (string).

**HOSTNAME:** Indicates the host name (string).

The settable characters are half-width alphanumerics, "-" and "\_" and are up to 63 characters at maximum.

**DOMAINNAME:** Indicates the domain name (string). The settable characters are half-width alphanumeric, "-", "\_", and "." and are up to 255 characters at maximum.

**DDNS:** Indicates whether Dynamic DNS is enabled/disabled.

The Dynamic DNS function cannot be set to Enabled only when DHCP setting is enabled.

true: Enabled

false: Disabled

**MACADDR:** Indicates the MAC address of BMC. (Get Only string)

(When you Set, set the value which you Get as it is or omit setting.)

**CONTYPE:** Indicates the type of connection.

Needs to conform to the port setting of the switch to connect. The settable values to this field differ depending on the server configuration. The list of the settable values are described in SUPPORTCONFIG. **If SHAREDLAN is switched between enabled and disabled, set this field at the same time. If the**

**setting is not done at the same time, the communication may become unavailable.**(string)

**IPV6:** IPv6 setting (supported models only)

**VALID:** Indicates whether IPv6 is enabled/disabled. The link-local address becomes enabled also when the IPv6 is set to disabled.

**true:** Enabled

**false:** Disabled

**ADVERTISE:** Indicates whether the allocation of dynamic IPv6 address by the Router Advertisement is enabled/disabled. **If VALID is changed from disabled to enabled, this field also needs to be set at the same time.** Moreover, if this setting is changed from enabled to disabled, STATICADDR and PREFIXLEN also need to be set at the same time.

**true:** Enable

**false:** Disabled

**STATICADDR:** Indicates static IPv6 address.

Can be set only when the allocation of dynamic IPv6 address by Router Advertisement is disabled. If ADVERTISE is changed from enabled to disabled, this field also needs to be set at the same time. If the setting was not done at the same time, the communication may become unavailable (string).

**PREFIXLEN:** Indicates the prefix length of static IPv6 address (string). If you Get that prefix length when the allocation of dynamic IPv6 address is enabled, the setting value allocated by the Router Advertisement is returned. **If ADVERTISE is changed from enabled to disabled, this field also needs to be set at the same time. If the setting is not done at the same time, the communication may become unavailable.**

**GATEWAYADDR:** Indicates the IPv6 address of gateway (string).

If the IPv6 address is obtained through Get when allocation of dynamic IPv6 address is enabled, the setting value allocated by the Router Advertisement is returned. A blank cannot be set to this field. If gateway is not set, specify “:”.

**LINKLOCALADDR:** Indicates the link-local address (string for Get Only).

**GLOBALADDR:** Indicates the IPv6 address allocated by Router Advertisement (String for Get Only).

**DNSADDR:** Indicates the address of DNS server (string). A blank cannot be set to this field.If DNS server is not set, specify “:.” .

**ADDRFILTER:** Sets IP address filtering setting.

This setting can limit the addresses that can communicate with EXPRESSSCOPE Engine 3. IPv6 address cannot be specified.

**TYPE:** Indicates the type of the setting (string).

**ALLOW:** Permits only addresses that are specified and rejects all communication from other addresses than those.

**DENY:** Rejects only addresses that are specified and permits all communication from other addresses than those.

**DISABLED:** Disables the filter and permits all communication.

**ADDRLIST:** Indicates the list of IP addresses to permit or reject (string). If TYPE is changed to ALLOW or to DENY, this field also needs to be set at the same time. Otherwise the communication may become unavailable. Wild card can be specified. Separate addresses by comma. The number of characters are allowed up to 255 at maximum.

e.g.: case when permitting only 192.168.1.\*, 192.168.2.1 and 192.168.2.254;

"TYPE": ALLOW

"ADDRLIST": 192.168.1.\*,192.168.2.1,192.168.2.254

**TIME:** (This setting is not supported. Do not change it.)

**CURTIME:** (This setting is not supported. Omit it when setting. )

**NTP:** (This setting is not supported. Do not change it.)

**VALID:** (This setting is not supported. Do not change it.)

**NTPADDR:** (This setting is not supported. Do not change it.)

**TIMEZONE:** (This setting is not supported. Do not change it.)

**INTERVAL:** (This setting is not supported. Do not change it.)



Be sure to omit “CURTIME” when setting.

**VLAN:** Sets VLAN setting of the operation LAN for the host server (on-board LAN). (Supported models only)

VLAN can be used only when EXPRESSSCOPE Engine 3 is set to share the operation LAN (on-board LAN) system LAN on supported models.

When using the dedicated LAN for management, the following settings will be ignored.

**VALID:** Indicates whether VLAN is enabled/disabled. If this setting is changed from disabled to enabled, VLANID and PRIORITY also needs to be set at the same time.

**true:** Enabled

**false:** Disabled

**VLANID:** Indicates VLAN ID (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. If the setting is not done at the same time, the communication may become unavailable.

**PRIORITY:** Indicates the priority level defined by IEEE 802.1Q. If VALID is changed from disabled to enabled, this field also needs to be set at the same time. If the setting is not done at the same time, the communication may become unavailable.

- "SERVICE"

This field describes the settings regarding the service functions of EXPRESSSCOPE Engine 3.

**HTTP:** Sets HTTP setting.

**VALID:** Indicates whether HTTP connection is enabled/disabled. To ensure the safety at login to the Web console, if HTTP is enabled, make sure to enable HTTPS as well.

**true:** Enabled

**false:** Disabled

**PORT:** Indicates the port number of HTTP (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable value ranges from 1 to 65535.

**HTTPS:** Sets HTTPS setting.

**VALID:** Indicates whether HTTPS connection is enabled/disabled.

**true:** Enabled

**false:** Disabled

**PORT:** Indicates the port number of HTTPS (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable value ranges from 1 to 65535.

**SSH:** Sets SSH setting.

**VALID:** Indicates whether SSH connection is enabled/disabled.

**true:** Enabled

**false:** Disabled

**PORT:** Indicates the port number of SSH (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable value ranges from 1 to 65535.



The network setting requires about a minute to be reflected. Wait about a minute after changing the settings. When performing setting with JSON file consecutively, wait more than a minute after the network setting is changed.



When the network setting is being reflected, Web console and remote KVM/media suspend. Also note that all the connected sessions will be disconnected at the same time.



“PREFIXLEN” of IPv6 needs to be set as a string. Specify the setting value by enclosing it with “ (double quotes).

## 5.5. Alert settings (alert)

The file format for the alert settings (alert) is as follows.

```
{
  "ALERTCONFIG" :
  {
    "VERSION" : (value) ,
    "SUPPORTCONFIG":
    {
      "SMTPADDRIPV6": (true/false)
    } ,
    "SMTP" :
    {
      "VALID" : (true/false) ,
      "TIMEOUT" : (value) ,
      "HEADER" :
      {
        "TO" :
        [
          {
            "VALID" : (true/false) ,
            "ADDR" : (string)
          } ,
          {
            "VALID" : (true/false) ,
            "ADDR" : (string)
          } ,
          {
            "VALID" : (true/false) ,
            "ADDR" : (string)
          }
        ] ,
        "FROM": (string) ,
        "REPLYTO" : (string) ,
        "SUBJECT" : (string) ,
        "SUBJECTSEVERITY" : (true/false) ,
```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
        "XPRIORITY": (true/false) ,
        "DATEFORMAT":
            (string: MMDDYYYY / DDMMYYYY / YYYYMMDD)
    } ,
    "SERVER" :
    {
        "ADDR" : (string) ,
        "PORT" : (value) ,
        "SMTPAUTH" : (true/false) ,
        "AUTHMD5VALID" : (true/false) ,
        "AUTHLOGINVALID" : (true/false) ,
        "AUTHLOGINVALID" : (true/false) ,
        "USERNAME" : (string) ,
        "PASSWORD" : (string) ,
        "ENCRYPTEDPASSWORD" : (string)
    } ,
    "POLICY" :
    {
        "TYPE" : (string:INFO / NONCRITICAL / CRITICAL /
            INDIVIDUAL) ,
        "INDIVIDUALENTRY" :
        [
            {
                "POLICY": (string:
                    [SensorType]_[EventType]_[enable
                    d/disabled setting])
            } ,
            {
                "POLICY" : (string:
                    [SensorType]_[EventType]_[enabled
                    /disabled setting])
            }
            (An array format is described hereafter.)
        ]
    }
} ,
```



## EXPRESSSCOPE Engine 3 Scripting Guide

```
"SNMP" :
{
    "VALID" : (true/false) ,
    "NAME" : (string) ,
    "COMMUNITY" : (string) ,
    "ACKNOWLEDGE" : (true/false) ,
    "PROCESS" : (string:ONE/ALL) ,
    "RETRY" : (value) ,
    "TIMEOUT" : (value) ,
    "DST" :
    [
        {
            "VALID" : (true/false) ,
            "ADDR" : (string)
        } ,
        {
            "VALID" : (true/false) ,
            "ADDR" : (string)
        }
        After ..., the array format.
    ] ,
    "POLICY" :
    {
        "TYPE" : (string:INFO / NONCRITICAL / CRITICAL /
            INDIVIDUAL) ,
        "INDIVIDUALENTRY" :
        [
            {
                "POLICY" : (string:
                [SensorType]_[EventType]_[enabled /
                disabled setting])
            } ,
            {
                "POLICY" : (string:
                [SensorType]_[EventType]_[enable
                d/disabled setting])
            }
        ]
    }
}
```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
    }  
  }  
} (An array format is described hereafter.)  
  ]  
  }  
  }  
}
```

The details on each field are as follows.

- "VERSION"

This field describes the version of the file format for alert settings (alert) (Get Only). If the version is 1, this field is omitted. When editing JSON file, do not add or revise this field.

- "SUPPORTCONFIG"

This field describes the settable value for the parameter for which the settable value differ depending on the server (Get Only).

**SMTPADDRIPV6:** Indicates whether IPV6 address can be specified as SMTP server address or not.

**true:** Indicates that IPV6 address can be specified as SMTP server address.

**false:** Indicates that IPV6 address cannot be specified as SMTP server address.

- "SMTP" :

This field describes the settings regarding the e-mail alert functions.

**VALID:** Indicates whether e-mail alert notification is enabled/disabled.

true: Enabled

false: Disabled

**TIMEOUT:** Indicates the number of seconds of the time-out period (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable value ranges from 30 to 600.

**HEADER:** Sets the mail header setting.

**TO:** Sets alert destinations. Up to three alert destinations can be specified at maximum and one needs to be specified at least.

**VALID:** Indicates whether the alert destinations is enabled/disabled.

**true:** Enabled

**false:** Disabled

**ADDR:** Indicates the mail address of the alert destination (string, 255 characters at maximum). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable values are half-width alphanumerics, "-", "\_", "@" and "." and are up to 255 characters at maximum.

**FROM:** Indicates "From" field of the mail header (string, 255 characters at maximum). The settable values are half-width alphanumerics, "-", "\_", "@" and "." and are up to 255 characters at maximum.

**REPLYTO:** Indicates the "Reply-to" field of the mail header (string, 255 characters at maximum). The settable values are half-width alphanumerics, "-", "\_", "@" and "." and are up to 255 characters at maximum.

**SUBJECT:** Indicates "Subject" field of the mail header (string, 255 characters at maximum). The settable values are ASCII characters except "+", " ", ":", "?", "=", "<", ">", "\" and #".

**SUBJECTSEVERITY:** Switches the Severity description on the mail subject.

**true:** Add a severity information of the alert to mail subject.

**false:** Don't add a severity information of the alert to mail subject.

**XPRIORITY:** Switches the "X-Priority" field of the mail header (Supported models only). If true is set, the "X-Priority" field corresponding to the severity level of the event that is a cause will be added to the mail header. If false is set, the "X-Priority" field will not be added to the mail header.

Severity of the event	"X-Priority" field to be added
Critical(Error)	X-Priority: 1
Non-critical(Warning)	X-Priority: 3
Information	X-Priority: 5

**true:** Adds "X-Priority" field to the mail header.

**false:** Does not add "X-Priority" field to the mail header.

**DATEFORMAT:** Indicates the date format to be described in the mail body.  
(Supported models only)

**MMDDYYYY:** Describes the date with the "month/day/year" format.

e.g.: "Timestamp: 04/30/2015 12:34:56"

**DDMMYYYY:** describes the date with the "day/month/year" format.

e.g.: "Timestamp: 30/04/2015 12:34:56"

**YYYYMMDD:** Describes the date with the "year/month/day" format.

e.g.: "Timestamp: 2015/04/30 12:34:56"

**SERVER:** Sets the mail server settings.

**ADDR:** Indicates the address of SMTP server (string, 255 characters at maximum). If VALID is changed from disabled to enabled, this field also

needs to be set at the same time. If SMTPADDRIPv6 is true, IPv6 address can be set to this field.

**PORT:** Indicates the port number of SMTP server (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable value ranges from 1 to 65535.

**SMTPAUTH:** Indicates whether SMTP authentication is enabled/disabled. If VALID is changed from disabled to enabled, this field also needs to be set at the same time. Also, if this field setting is set to enabled, at least one among AUTHMD5VALID, AUTHLOGININVALID and AUTHPLAININVALID needs to be set to Enabled.

**true:** Enabled

**false:** Disabled

**AUTHMD5VALID:** Indicates whether CRAM\_MD5 authentication is enabled/disabled. If SMTPAUTH is changed from disabled to enabled, this field also needs to be set at the same time.

**true:** Enabled

**false:** Disabled

**AUTHLOGININVALID:** Indicates whether Login authentication is enabled/disabled. If SMTPAUTH is changed from disabled to enabled, this field also needs to be set at the same time.

**true:** Enabled

**false:** Disabled

**AUTHPLAININVALID:** Indicates whether Plain authentication is enabled/disabled. If SMTPAUTH is changed from disabled to enabled, this field also needs to be set at the same time.

**true:** Enabled

**false:** Disabled

**USERNAME:** Indicates the user name of SMTP (string, 64 characters at maximum). If SMTPAUTH is changed from disabled to enabled, this field also needs to be set at the same time. The settable characters are ASCII characters except "-", " ", "'", "?", "=", "<", ">", "\" and "#" and are up to 64 characters at maximum.

**PASSWORD:** Indicates the plain text password for SMTP (string, 20 characters at maximum). If SMTPAUTH is changed from disabled to enabled, this field or ENCRYPTEDPASSWORD also needs to be set at the same time. The settable characters are ASCII characters except "-", " ", "' ", "?", "=", "<", ">", "\" and "#".

When the file format version is 1;

If JSON file is obtained from EXPRESSSCOPE Engine 3, the plain text password that have been set is described.

When the file format version is 2;

If JSON file is obtained from EXPRESSSCOPE Engine 3, this filed will always be NULL. When directly editing JSON file and setting a password, enter the plain text password in this field.

To change the password using this field, first delete the "ENCRYPTEDPASSWORD" field and then reflect the setting.

**ENCRYPTEDPASSWORD:** Indicates the encrypted password for SMTP (string). If SMTPAUTH is changed from disabled to enabled, this field or PASSWORD also needs to be set at the same time.

When the file format version is 1;

This field does not exist. Use PASSWORD field.

When the file format version is 2;

If JSON file is obtained from EXPRESSSCOPE Engine 3, the encrypted password will be described in this filed. Do not change the encrypted password. To change the password using "PASSWORD" field, delete this field.

**POLICY:** Sets the action policy of the e-mail alert notification.

**TYPE:** Indicates the type of the alert policy (string).

**INFO:** Reports the Information, Non Critical and Critical level events.

**NONCRITICAL:** Reports the Non Critical and Critical level events.

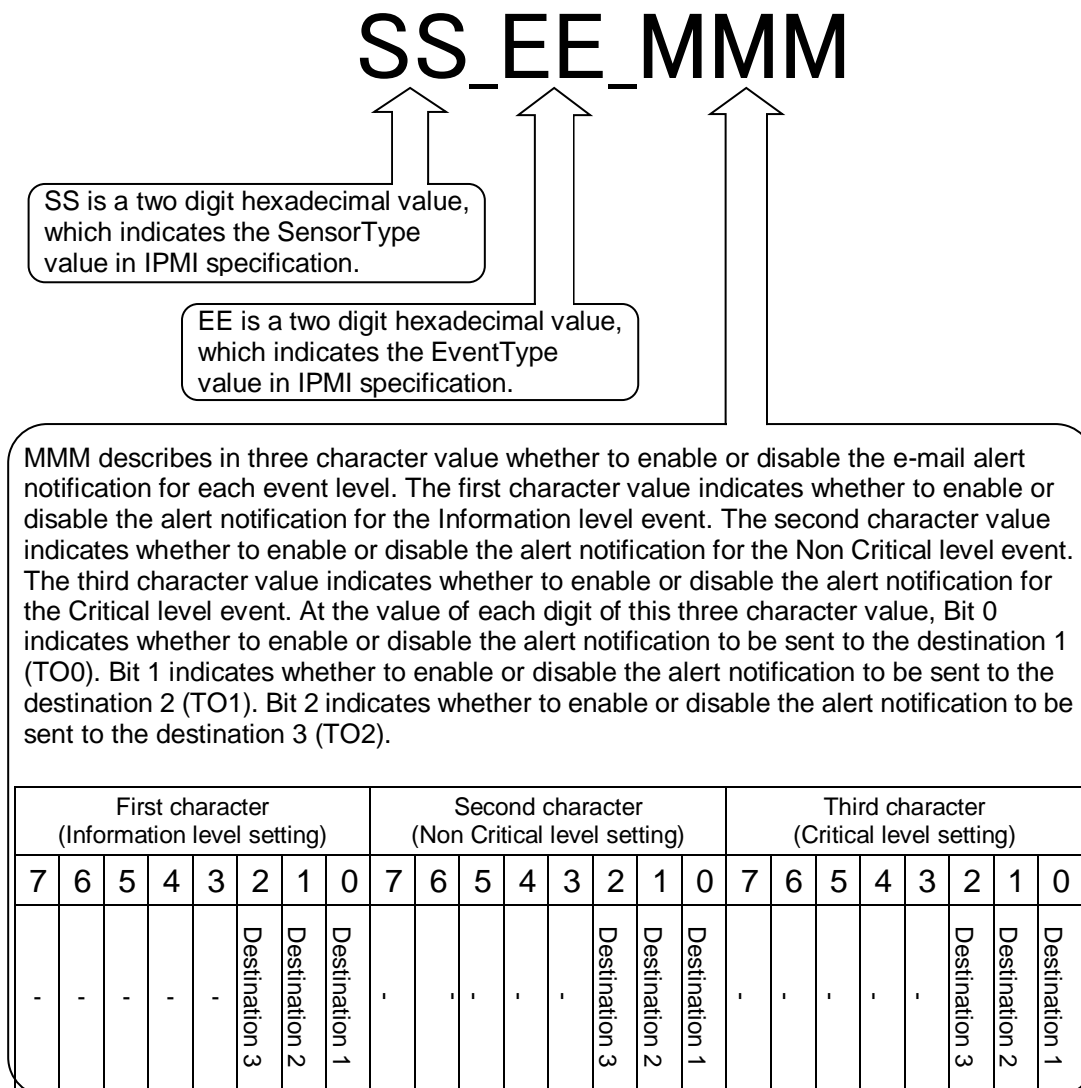
**CRITICAL:** Reports the Critical level event.

**INDIVIDUAL:** Sets separate setting for each type of the events.

**INDIVIDUALENTRY:** Indicates the separate setting on the e-mail alert notification.

**POLICY:** Indicates the separate setting for each type of the event (string).

This is indicated in "SS\_EE\_MMM" format.



e.g. "POLICY": "04\_01\_751"

Regarding FAN sensor (SensorType=0x04) of the Threshold type (EventType=0x01), the Information level events are reported to the destination 1, 2 and 3, the Non Critical level events to the

destination 1 and 3 and the Critical level events to the destination 1.

- "SNMP" :

This field describes the settings regarding the alert notification using SNMP. If "VALID" of "NMMODE" is set to true at basic settings (basic), this field content cannot be obtained or changed.

**VALID:** Indicates whether SNMP alert notification is enabled/disabled.

**true:** Enabled

**false:** Disabled

**NAME:** Indicates the name of the computer (string). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable values are half-width alphanumeric characters and are up to 16 characters at maximum.

**COMMUNITY:** Indicates the name of the community (string). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. The settable values are half-width alphanumeric characters and are up to 16 characters at maximum.

**ACKNOWLEDGE:** Indicates whether to require the response to SNMP alert notification or not. **If NEC ESMPRO Manager has been set as the alert destination, true needs to be specified.** If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**true:** Requires a response.

**false:** Does not require a response.

**PROCESS:** Indicates the alert action. If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**ONE:** Sends an alert notification to one alert destination. If the alert to the alert destination 1 fails, sends an alert notification to the alert destination 2 and if the alert to the alert destination 2 fails, sends an alert notification to the alert destination 3.

**ALL:** Sends alert notifications to all alert destinations all at once.

**RETRY:** Indicates the number of retry (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. If "ACKNOWLEDGE" is false, it is disabled. The settable value ranges from 0 to 7.



**TIMEOUT:** Indicates the number of the seconds of the time-out period (value). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. If "ACKNOWLEDGE" is false, it is disabled. The settable value ranges from 3 to 30.

**DST:** Indicates alert destinations (among the alert destinations 1, 2 and 3). If VALID is changed from disabled to enabled, this field also needs to be set at the same time. Up to three alert destinations at maximum can be specified and at least one needs to be specified.

**VALID:** Indicates whether the alert destinations is enabled/disabled.

**true:** Enabled

**false:** Disabled

**ADDR:** Indicates the IP addresses of the alert destinations (string). If

VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**POLICY:** Indicates the action policy of SNMP alert notification.

**TYPE:** Indicates the type of the alert policy (string).

**INFO:** Reports the Information, Non Critical and Critical level events.

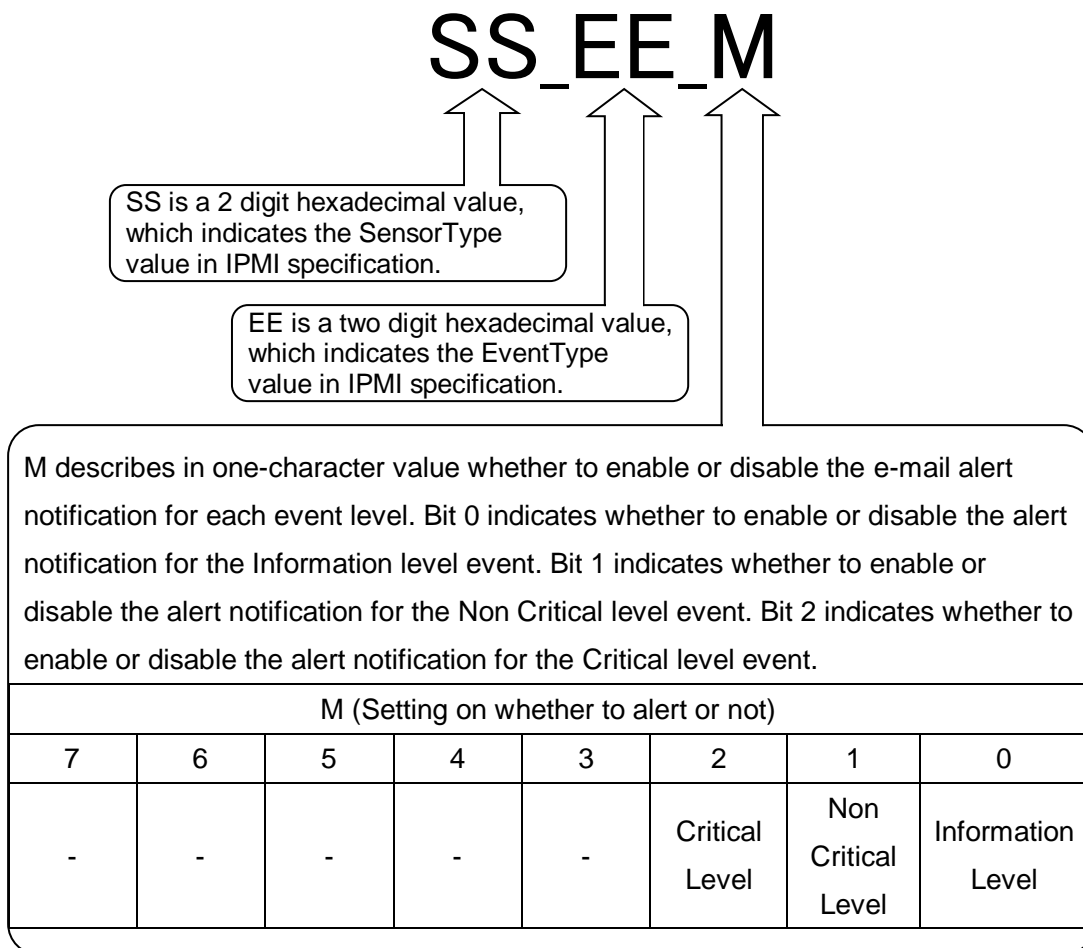
**NONCRITICAL:** Reports the Non Critical and Critical level events.

**CRITICAL:** Reports the Critical level events.

**INDIVIDUAL:** Sets the separate setting for each type of the events.

**INDIVIDUALENTRY:** Indicates the separate setting on SNMP alert.

**POLICY:** Indicates the individual setting for each type of the event (string). This is indicated in "SS\_EE\_M" format.



e.g.: "POLICY": "04\_01\_6"

Regarding FAN sensor (SensorType=0x04) of Threshold type (EventType = 0x01), the Non Critical and Critical level events are reported.



**Note**

These setting information includes the password information. When obtaining or configuring these information, HTTPS connection is recommended.



**Tip**

Use "PASSWORD" field when you want to change the password.  
Use "ENCRYPTEDPASSWORD" field when duplicating the password set on one EXPRESSSCOPE Engine 3 to another EXPRESSSCOPE Engine 3.  
For details, see 5.10 JSON file sample.

## 5.6. Operation settings (operation)

The file format for the operation settings is as follows.

```
{
  "OPERATIONCONFIG" :
  {
    "VERSION" : (value),
    "REMOTEKVM" :
    {
      "ENCRYPT" : (true/false) ,
      "PORT" : (value) ,
      "PORTENC" : (value),
      "CURSORMODE" : (string:SINGLE/DOUBLE) ,
      "COORDINATEMODE" : (string:RELATIVE/ABSOLUTE) ,
      "KBTYPE" : (string:EN/JP/FR/DE)
    } ,
    "REMOTEMEDIA" :
    {
      "ENCRYPT" : (true/false) ,
      "PORT" : (value) ,
      "PORTENC" : (value),
      "EMULATIONMODE" : (not supported)
    } ,
    "IMAGEREDIRECTION" :
    {
      "FILE" :
      {
        "CD" : (string) ,
        "FD" : (string) ,
        "HD" : (string)
      } ,
      "SERVER" :
      {
        "VALID" : (true/false) ,
        "ADDR" : (string),
        "PATH" : (string),

```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
"TYPE" : (string : nfs/cifs),  
"USERNAME" : (string) ,  
"PASSWORD" : (string) ,  
"ENCRYPTEDPASSWORD" : (string),  
"DOMAIN" : (string)  
}  
}  
}
```

## EXPRESSSCOPE Engine 3 Scripting Guide

The details on each field is as follows.

- "VERSION"

This field describes the version of the file format for operation settings (Get Only). If the version is 1, this field is omitted. When editing JSON file, do not add or revise this field.

- "REMOTEKVM"

This field describes the settings regarding the remote KVM function.

To use this function, the remote management extension license (N8115-04) needs to be installed separately.

**ENCRYPT:** Indicates whether the encryption of remote KVM is enabled/disabled.

**true:** Enabled

**false:** Disabled

**PORT:** Indicates the port number for remote KVM at the time when the encryption is disabled (value). The settable value ranges from 1024 to 65535.

**PORTENC:** Indicates the port number for remote KVM at the time when the encryption is enabled. The settable value ranges from 1024 to 65535.

**CURSORMODE:** Indicates the cursor mode (string).

**SINGLE:** Single mode

**DOUBLE:** Double mode

**COORDINATEMODE:** Indicates the coordinate mode of the mouse cursor.  
(string)

**RELATIVE:** Relative coordinate mode

**ABSOLUTE:** Absolute coordinate mode

**KBTYPE:** Indicates the keyboard language (string).

**EN:** English

**JP:** Japanese

**FR:** French

**DE:** German

- "REMOTEMEDIA"

This field describes the settings regarding the remote media function.

## EXPRESSSCOPE Engine 3 Scripting Guide

To use this function, the remote management extension license (N8115-04) needs to be installed separately.

**ENCRYPT:** Indicates whether the encryption of the remote media is enabled/disabled.

**true:** Enabled

**false:** Disabled

**PORT:** Indicates the server port number for remote media at the time when the encryption is disabled (value). The settable value ranges from 1024 to 65532.

**PORTENC:** Indicates the server port number for the remote media at the time when the encryption is enabled (value). The settable value ranges from 1024 to 65532.

**EMULATIONMODE:** (This setting is not supported. Do not change it.)

- "IMAGEREDIRECTION" (Supported models only)

This field describes the settings regarding the image redirection function.

To use this function, the remote management extension license (N8115-04) needs to be installed separately.

**FILE:** Indicates the file name (path) of the image file to be used for image redirection.

**CD:** Specifies the image file name (.iso) up to 255 characters (string).

A path can be specified by using "/". (e.g.: /dir/img/cd.iso)

**FD:** Specifies the image file name (.img) up to 255 characters (string).

A path can be specified by using "/". (e.g.: /dir/img/floppy.img)

**HD:** Specifies the image file name (.img) up to 255 characters (string).

A path can be specified by using "/". (e.g.: /dir/img/usb\_mem.img)

**SERVER:** Indicates the settings of the server to be used for the image redirection.

**VALID:** Indicates whether the image redirection function is enabled/disabled.

**true:** Enabled

**false:** Disabled

**ADDR:** Indicates the IPv4 address up to 62 characters or indicates in FQDN format the destination server address (string). If VALID is

## EXPRESSSCOPE Engine 3 Scripting Guide

changed from disabled to enabled, this field also needs to be set at the same time.

**PATH:** Indicates the source path up to 255 characters. (string) When configuring CIFS, specify the shared name. When configuring NFS, specify the path to mount. (e.g.: /tmp/img/) If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**TYPE:** Indicates the file sharing method. (string) If VALID is changed from disabled to enabled, this field also needs to be set at the same time.

**nfs:** Connects to the server via NFS.

**cifs:** connects to the server via CIFS.

**USERNAME:** Indicates the user name to be used when connecting to the server via CIFS (string, 64 characters at maximum). If VALID is changed from disabled to Enabled and cifs is specified to TYPE, this field also needs to be set at the same time. When connecting via NFS, this field does not need to be set.

**PASSWORD:** Indicates the plain text password to be used when connecting to the server via CIFS (string, 31 characters at maximum). If VALID is changed from disabled to Enabled and cifs is specified to TYPE, this field also needs to be set at the same time. When connection via NFS, this field does not need to be set. If JSON file is obtained from EXPRESSSCOPE Engine 3, this field will always be NULL. If you directly edit JSON file and set a password, enter the plain text password in this field. When changing the password using this field, first delete the "ENCRYPTEDPASSWORD" field and then reflect the setting.

**ENCRYPTEDPASSWORD:** Indicates the encrypted password to be used when connecting to the server via CIFS (string). When connecting via NFS, this field does not need to be set. If JSON file is obtained from EXPRESSSCOPE Engine 3, the encrypted password will be described in this field. Do not change the encrypted password. When changing the password using "PASSWORD" field, delete this field.



**DOMAIN:** Indicates the domain name or the work group to be used when connecting to the server via CIFS (string, 255 characters at maximum). If VALID is changed from disabled to Enabled and cifs is specified to TYPE, this field also needs to be set at the same time. When connecting via NFS, this field does not need to be set.



**These setting information includes the password information. When obtaining or configuring these information, HTTPS connection is recommended.**



**Use “PASSWORD” field when you want to change the password.  
Use “ENCRYPTEDPASSWORD” field when duplicating the password set on one EXPRESSSCOPE Engine 3 to another EXPRESSSCOPE Engine 3.  
For details, see 5.10 JSON file sample.**

## 5.7. ECO settings (eco)

The file format for ECO settings (eco) is as follows. If "VALID" of "NMMODE" is set to true at basic settings (basic), make sure never to obtain or change these ECO settings. These ECO settings are not supported on the Blade server.

```

{
    "ECOCONFIG" :
    {
        "CRITICALPOWERCAPPING" :
        {
            "VALID" : (true/false) ,
            "POWERCAPVALUE" : (value) ,
            "CORRECTIONTIMELIMIT" : (value) ,
            "EXCEPTIONSHUTDOWN" : (true/false)
        } ,
        "NONCRITICALPOWERCAPPING" :
        {
            "VALID" : (true/false) ,
            "POWERCAPVALUE" : (value) ,
            "CORRECTIONTIMELIMIT" : (value)
        } ,
        "SAFEPOWERCAPPING" :
        {
            "VALID" : (true/false)
        } ,
        "BOOTTIMECONFIG" :
        {
            "VALID" : (true/false) ,
            "BOOTINGMODE" : (string:PERFORMANCE/POWER) ,
            "PROCESSORCOREDISABLE" : (string)
        }
    }
}

```

The details on each field is as follows.

- "CRITICALPOWERCAPPING"

This field describes the settings regarding the power control function (Aggressive Mode) to hold the power consumption of the host server below the specified maximum threshold. This Aggressive Mode enables stronger power control than aftermentioned Non Aggressive Mode.

**VALID:** Indicates whether the power control is enabled/disabled.

**true:** Enabled

**false:** Disabled

**POWERCAPVALUE:** Sets the power value at which the power control (Aggressive Mode) is started. If VALID is changed from disabled to enabled, this field also needs to be set at the same time(value). If the power consumption amount exceeds this value and does not fall below it within the time set for "CORRECTIONTIMELIMIT", register SEL. Then the operation specified for "EXCEPTIONSHUTDOWN" will be executed. The settable value range differs depending on the server configuration. Check it on the host server.

**CORRECTIONTIMELIMIT:** Sets the window time in seconds after the power consumption amount exceeds the start value to start power control before SEL is registered and the operation specified for "EXCEPTIONSHURDOWN" begins to be executed. If VALID is changed from disabled to enabled, this field also needs to be set at the same time (value).

**EXCEPTIONSHUTDOWN:** Indicates whether the shutdown after "CORRECTIONTIMELIMIT" elapses is enabled/disabled. If VALID is changed from disabled to enabled, this field also needs to be set at the same time (value).

**true:** Enabled

**false:** Disabled

- "NONCRITICALPOWERCAPPING"

This field describes the settings regarding the power control function (Non-Aggressive Mode) to reduce power consumption while minimizing the

degradation of the system performance. This Non-Aggressive-Mode can cut down the power consumption while suppressing the performance degradation although its effect is inferior to the aforementioned Aggressive Mode.

**VALID:** Indicates whether the power control is enabled/disabled.

**true:** Enabled

**false:** Disabled

**POWERCAPVALUE:** Sets the power value at which the power control (Non Aggressive Mode) is started. If VALID is changed from disabled to enabled, this field also needs to be set at the same time(value). If the power consumption amount exceeds this value and does not fall below it within the time set for "CORRECTIONTIMELIMIT", register SEL. The settable value range differs depending on the server configuration. Check it on the host server.

**CORRECTIONTIMELIMIT:** Sets the window time in seconds after the power consumption amount exceeds the start value to start power control before SEL is registered. If VALID is changed from disabled to enabled, this field also needs to be set at the same time (value).

- "SAFEPOWERCAPPING"

This field describes the settings to force the power control function operate in case where power cannot be obtained from the power supply unit.

**VALID:** Indicates whether the forced power control is enabled/disabled at the time when power is not available.

**true:** Enabled

**false:** Disabled

- "BOOTTIMECONFIG"

This field describes the settings regarding the power control at the time of server startup.

**VALID:** Indicates whether the power control at the server startup is enabled/disabled.

**true:** Enabled

**false:** Disabled

**BOOTINGMODE:** Sets which to prioritize between performance and power consumption. If VALID is changed from disabled to enabled, this field also needs to be set at the same time (string).

**PERFORMANCE:** Prioritizes performance and operation.

**POWER:** Optimizes the power consumption amount.

**PROCESSORCOREDISABLE:** Sets the number of CPU core to be disabled at the time of server startup. If VALID is changed from disabled to enabled, this field also needs to be set at the same time (value).

## 5.8. BIOS settings (bios)

The file format for the BIOS settings is as follows. BIOS settings are reflected at POST. To reflect the settings on BIOS, the system needs to be restarted after the setting. The BIOS setting field is part of the setting field of the BIOS setup utility (SETUP). To obtain or reflect all of the BIOS settings including this setting, XML format file needs to be used. For details, see 6.3 BIOS settings.

```

{
    "BIOSCONFIG" :
    {
        "OOBSETUP" :
        [
            {
                "PARAMETER" : "CURRENT" ,
                "SIGNATURE" : (true/false) ,
                "VERSION" (value),
                "OOBVALID" : (true/false) ,
                "INPROGRESS" : (true/false) ,
                "SERIALA" :
                {
                    "VALID" : (true/false) ,
                    "BASEIO" : (string:3F8H/2F8H/3E8H/2E8H) ,
                    "INT" : (string:IRQ3/IRQ4)
                } ,
                "SERIALB" :
                {
                    "VALID" : (true/false) ,
                    "BASEIO" : (string:3F8H/2F8H/3E8H/2E8H) ,
                    "INT" : (string:IRQ3/IRQ4)
                } ,
                "REDIRECTION" :
                {
                    "PORT" : (string: DISABLED / PORTA /
                    PORTB) ,

```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
        "TERMINAL" : (string:VT100+ / VT-UTF8 /
        ANSI) ,
        "BAUDRATE" : (string:9600 / 19200 / 57600 /
        115200) ,
        "DATABITS" : (string:7/8) ,
        "PARITY" : (string:NONE/EVEN/ODD) ,
        "STOPBITS" : (string:1/2) ,
        "FLOWCONTROL" : (string:NONE /
        HWRTSCTS) ,
        "CONTINUEAFTERPOST" : (true/false)
    } ,
    "POSTERRORPAUSE" : (true/false) ,
    "MEMORYERROR" : (string:HALT/BOOT) ,
    "CLISETUP" : (true/false) ,
    "STANDBYPOWERSAVE" : (true/false) ,
    "ADVANCEDFANCONTROL" : (true/false)
} ,
{
    "PARAMETER" : "EXPECTED" ,
    (The same format as CURRENT hereafter.)
} ,
{
    "PARAMETER" : "DEFAULT" ,
    (The same format as CURRENT hereafter.)
}
]
}
}
```

The details on each field is as follows.

- "OOBSETUP"

This field describes the part of settings at BIOS setup menu.

**PARAMETER:** Indicates the parameter type. (Cannot be omitted during performing Set.)

**CURRENT:** Indicates the current setting (Get Only). This setting is just for reference. Do not change it.

**EXPECTED:** Indicates the setting to be reflected after next restart. After changing this setting, restart the system. Then the changed setting will be reflected on the BIOS setup menu.

**DEFAULT:** Indicates the default setting (Get Only)  
This setting is just for reference. Do not change it.

**SIGNATURE:** Indicates whether or not this OOBSETUP is supported by the server.

Be sure to specify true at the time of Set. (Or omit specifying it.)

**true:** Indicates OOBSETUP is supported by the server.

**false:** Indicates OOBSET UP is not supported by the server.

**VERSION:** Indicates the version of the OutOfBand domain (value).At the time of Set, be sure to use the value that has been preliminarily read out.  
(Or omit it)

**OOBVALID:** Indicates whether this OOBSETUP function is enabled/disabled.

At the time of Set, be sure to specify true. (Or omit specifying it.)

**true:** Enabled

**false:** Disabled

**INPROGRESS:** Indicates whether or not the OOBSetup domain is being changed.

If this value has been set to true when obtaining the settings, other module may be changing the OOBSetup domain and the domain data may be being changed. Repeat repossessing the OOBSetup domain data until this value becomes false. Specify false at the time of Set. (Or omit it)

**true:** Indicates the OOBSetup domain is being changed.



## EXPRESSSCOPE Engine 3 Scripting Guide

**false:** Indicates the OOBSetup domain is not being changed.

**SERIALA:** Configures the serial port A

Note: Make sure to configure the base I/O address of serial port A and IRQ number not the same as the setting of serial port B.

**VALID:** Indicates whether the serial port is enabled/disabled.

**true:** Enabled

**false:** Disabled

**BASEIO:** Indicates the base I/O address (string).

**3F8H:** Indicates 3F8h.

**2F8H:** Indicates 2F8h.

**3E8H:** Indicates 3E8h.

**2E8H:** Indicates 2E8h.

**INT:** Indicates the interruption (string).

**IRQ3:** Indicates IRQ3.

**IRQ4:** Indicates IRQ4.

**SERIALB:** Configures the serial port B. Note: Make sure to configure the base I/O address of serial port B and IRQ number not the same as the setting of serial port A.

**VALID:** Indicates whether the serial port.

**true:** Enabled

**false:** Disabled

**BASEIO:** Indicates the base I/O address (string) is enabled/disabled.

**3F8H:** Indicates 3F8h.

**2F8H:** Indicates 2F8h.

**3E8H:** Indicates 3E8h.

**2E8H:** Indicates 2E8h.

**INT:** Indicates interruption (string).

**IRQ3:** Indicates IRQ3.

**IRQ4:** Indicates IRQ4.

**REDIRECTION:** Sets the serial console redirection.

**PORT:** Indicates the serial port to be used (string).

**DISABLED:** Disables serial console redirection.

**PORTA:** Uses serial port A.

**PORTB:** Uses serial port B.

**TERMINAL:** Indicates the type of the terminal (string).

**VT100+:** Indicates VT100+.

**VT-UTF8:** Indicates VT-UTF8.

**ANSI:** Indicates ANSI.

**BAUDRATE:** Indicates the setting of the baud rate to be used for the interface with the hardware console to connect (string).

**9600:** Indicates 9600bps.

**19200:** Indicates 19200bps.

**57600:** Indicates 57600bps.

**115200:** Indicates 115200bps.

**DATABITS:** Indicates the setting of the data bit width (string).

**7:** Indicates data bit 7.

**8:** Indicates data bit 8.

**PARITY:** Indicates the parity bit setting (string).

**NONE:** Indicates no parity.

**EVEN:** Indicates even parity.

**ODD:** Indicates odd parity.

**STOPBITS:** Indicates the stop bit setting (string).

**1:** Indicates stop bit 1.

**2:** Indicates stop bit 2.

**FLOWCONTROL:** Indicates the flow controlling method (string).

**NONE:** Indicates no flow control.

**HWRTSCTS:** Indicates the hardware flow control.

**CONTINUEAFTERPOST:** Indicates whether to continue the console redirection function or not even after POST terminates.

**true:** Continues the console redirection function.

**false:** Does not continue the console redirection function.

**POSTERRORPAUSE:** Indicates whether or not to halt server boot at the end of POST if an error occurs during POST.

**true:** Suspends BIOS.

**false:** Does not suspend BIOS.

**MEMORYERROR:** Indicates whether or not to halt server boot at the end of POST if degeneration error occurs on the memory source during POST (string).

**HALT:** Halts BIOS.

**BOOT:** Does not halt BIOS.

**CLIS SETUP:** Indicates whether the command line operation of BIOS setup menu is enabled/disabled.

**true:** Enabled

**false:** Disabled

**STANDBYPOWERSAVE:** Indicates whether the function to reduce standby electricity during the standby operation is enabled/disabled.

**true:** Enabled

**false:** Disabled

**ADVANCEDFANCONTROL:** Indicates whether the fan suspension function is enabled/disabled. If enabled, the fan circulation is suspended according to the environment state to reduce the power consumption (Supported server only).

**true:** Enabled

**false:** Disabled



**Baud rate, bid width, and stop bit need to be set in strings.  
Specify the setting values enclosing them with “ (double quotes).**

## 5.9. Battery settings (battery)

The file format for the Battery settings is as follows. (Supported models only)

```
{
  "BATTERYCONFIG" :
  {
    "BATTERY" :
    {
      "SHUTDOWN" : (true/false) ,
      "SHUTDOWNDELAYTIME" : (value),
      "TURNOFFDELAYTIME" : (value),
      "POWERRECOVERYBOOT" : (true/false) ,
      "BOOTTIMEOUT" : (value)
    }
  }
}
```

The details on each field are as follows.

- "BATTERY"

This field describes the battery controller settings (Supported models only).

**SHUTDOWN:** Indicates whether the shutdown function in the case of power supply malfunction is enabled/disabled.

**true:** Enabled

**false:** Disabled

**SHUTDOWNDELAYTIME:** Indicates the waiting time (in seconds) until the shutdown starts at the time of the power supply malfunction. The settable value ranges from 0 to 255. If SHUTDOWN is changed from disabled to enabled, this field also needs to be set at the same time.

**TURNOFFDELAYTIME:** Indicates the waiting time (in seconds) until the shutdown completes at the time of the power supply malfunction. The settable value ranges from 0 to 3600. If

SHUTDOWN is changed from disabled to enabled, this field also needs to be set at the same time.

**POWERRECOVERYBOOT:** Indicates whether the auto boot after the power recovery is enabled/disabled. If SHUTDOWN is changed from disabled to enabled, this field also needs to be set at the same time.

**true:** Enabled

**false:** Disabled

**BOOTTIMEOUT:** Indicates the waiting time (in seconds) until the boot completes after DC-ON. The settable value ranges from 0 to 3600. If SHUTDOWN is changed from disabled to enabled, this field also needs to be set at the same time.

### 5.10. JSON file sample

The following presents JSON file sample. The fields without any setting changes are omitted.

#### 5.10.1. When enabling the access log;

```
{
  "BASICCONFIG" :
  {
    "VERSION" : 2 ,
    "ACCESSLOG" :
    {
      "CONTROL" : true ,
      "HTTP" : true ,
      "HTTPS" : true ,
      "SSH" : true
    }
  }
}
```



**Adding extra, (commas) will cause an error at the time of setting.  
Be careful about the file format.**

#### 5.10.2. When setting AC LINK to LAST STATE and the delay time to 60 seconds;

```
{
  "BASICCONFIG" :
  {
    "VERSION" : 2 ,
    "POWEROPTION" :
    {
      "ACLINK" : "LASTSTATE",
      "DELAYTIME" : 60
    }
  }
}
```

```
    }  
  }  
}
```

5.10.3. When enabling the serial console redirection of serial port B;

```
{  
  "BIOSCONFIG" :  
  {  
    "OOBSETUP" :  
    [  
      {  
        "PARAMETER" : "EXPECTED" ,  
        "SERIALB" :  
        {  
          "VALID" : true  
        } ,  
        "REDIRECTION" :  
        {  
          "PORT" : "PORTB"  
        }  
      }  
    ]  
  }  
}
```



Mixing up [ ] and { } will cause an error at the time of setting.  
Be careful about the file format.



When actually using the serial console redirection, IPMI SOL setting  
needs to be enabled as well as BIOS setting.

## EXPRESSSCOPE Engine 3 Scripting Guide

### 5.10.4. About PASSWORD field and ENCRYPTEDPASSWORD field.

ENCRYPTEDPASSWORD field has been added to the file format version 2 of JSON file. If JSON file is obtained from EXPRESSSCOPE Engine 3, PASSWORD field always will be NULL and the password that has been set will be encrypted and stored in ENCRYPTEDPASSWORD field.

The sample (excerpt) of the user-established JSON file that is obtained from EXPRESSSCOPE Engine 3 is shown below.

```
{
  "USERACCOUNTCONFIG" :
  {
    "VERSION" : 2 ,
    "USERINFO" :
    [
      {
        "USERID" : 5 ,
        "VALID" : true ,
        "USERNAME" : "Administrator" ,
        "PASSWORD" : "" ,
        "ENCRYPTEDPASSWORD" :
          "2Z1w2A+5qISctyZCpivgZGnOmQCoSE8d" ,
        "PRIVILEGE" : "ADMINISTRATOR" ,
        "USERKEY" : false
      }
      Omitted
    ]
    Omitted
  }
}
```



## EXPRESSSCOPE Engine 3 Scripting Guide

When setting the user settings by using JSON file, enter a plain text password in the PASSWORD field. At the same time, delete the ENCRYPTEDPASSWORD field for the encrypted password.

The following is the sample to create a new user, TestUser. It can be used also when changing the password of TestUser.

```
{
  "USERACCOUNTCONFIG" :
  {
    "VERSION" : 2 ,
    "USERINFO" :
    [
      {
        "USERID" : 6 ,
        "VALID" : true ,
        "USERNAME" : "TestUser" ,
        "PASSWORD" : "TestPassword" ,
        "PRIVILEGE" : "ADMINISTRATOR" ,
        "USERKEY" : false
      }
    ]
  }
}
```

When copying the user settings to other servers, use the JSON file obtained from EXPRESSSCOPE Engine 3 without changing it. At this time, make sure PASSWORD field is NULL and ENCRYPTEDPASSWORD field is filled with the encrypted password.

## 6. XML

This chapter explains XML format to be used in ServerProfile.pm. For the details on each XML field, see also the User's Guide of the server.

### 6.1. Overview

By using ServerProfile.pm, the server settings can be obtained and set in XML format. The XML format to be used has the following component.

- BIOS : BIOS settings



**The setting fields may differ depending on the server, its configuration, BIOS, or software version.**

### 6.2. Common elements

The sample of XML file is shown below. The common elements and attributes in the component to be used in XML are explained in the Table 6-1.

## EXPRESSSCOPE Engine 3 Scripting Guide

```

<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name=" component name ">
    <target>Identification information of managed server </target>
    <request_id operation="Details of request information "/>
    <category name=" category name " id="identifier">
      <item name=" item name " use="specified information" current=" current value" id="identifier">
        <choice type="type">
          <value id="identifier">Detailed information of settable values </value>
        </choice>
      </item>
    </category>
  </component>
</root>

```

**Table 6-1 Common elements and attributes in the component**

Element Name	Attribute Name	Description
root	-	Root element of XML.
	xmlns: xsd	An attribute to indicate the namespace of XSD.
	xmlns: xsl	An attribute to indicate the namespace of XSL.
	version	An attribute to indicate the XML file format version.
component	-	An element to indicate the component of XML.
	name	An attribute to indicate the component name.
target	-	An element to identify the managed server
request_id	-	An element to indicate the XML request information.
	operation	An attribute to indicate the details of the request information. When obtaining XML, the attribute value is "response". When configuring XML, the attribute value is "request".

## EXPRESSSCOPE Engine 3 Scripting Guide

category	-	An element to indicate the category of the setting item for each component.
	name	An attribute to indicate the category name.
	id	An attribute to indicate the category identifier. A unique value in the <component> element.
item	-	An element to indicate the setting item.
	name	An attribute to indicate the name of the setting item.
	use	An attribute to indicate whether or not the setting item is optional. Its attribute value means the following. - "optional": Indicates that setting the current attribute value at the time of XML setting is not mandatory but optional.
	current	An attribute to indicate the value of the setting item. Indicates the current value when obtaining XML and indicates the setting value when configuring XML.
	encrypted	An attribute to indicate whether or not the setting item is encrypted. The attribute values mean the following. - "yes": Indicates the current value has been encrypted. - "no": Indicates the current value has not been encrypted. (When omitted, "no".)
	id	An attribute to indicate the setting item identifier. A unique value in <component> element.
choice	-	An element to indicate settable values. Has an child element of <value> or <xsd:any>.
	type	An attribute to indicate the type of settable value. This attribute value means the following. "enumeration": Choice type "boolean": Two value type. "other": Other than the above.
value	-	An element to indicate the detailed information on settable values. Appears when the type attribute of <choice> element is other than "other".
	id	An attribute to indicate the identifier of <value> element. A unique value in <component> element.
xsd:any	-	An element to indicate the detailed information of the

## EXPRESSSCOPE Engine 3 Scripting Guide

		settable values using XSD. Appears when the type attribute of <choice> element is "other".
xsl:if	-	A condition element of the setting item. Indicates conditional branch is one.
	test	An attribute to indicate the conditional expression. When test conditional expression is true, the child element is enabled. When test conditional expression is false, the child element is disabled.

### 6.3. BIOS settings

This section explains the XML file samples in the case when changing XML format and the fields regarding BIOS settings. The BIOS setting items not in the JSON's BIOS setting field can be changed by using XML.



**XML file includes the same fields as those for BIOS settings in JSON file. If XML file is set to the managed server and JSON file is configured before restarting the managed server (including the case of the reverse order), BIOS settings in XML file will be applied.**



**When not changing, the settings of the XML field can be omitted. For details, see 6.3.3 How to change BIOS settings.**

#### 6.3.1. BIOS setting elements

The XML elements and attributes to be used for BIOS settings are explained in the Table 6-2.

**Table 6-2 BIOS setting elements and attributes**

Element name	Attribute name	Description
target_option	-	An element to indicate identification information of the managed server.
	name	An attribute to indicate the hardware ID or BIOS version of the managed server. The hardware ID is a unique value for each model.
category	name	In BIOS settings, an attribute to indicate the submenu name to be displayed on BIOS setup utility (SETUP).
item	name	In BIOS settings, an attribute to indicate the item name to be displayed on BIOS setup utility (SETUP). When multiple <item> elements exist, those elements are executed from the top in the described order regardless of their id attribute values.

	current	<p>For the explanation on current attribute, see Table 6-1.</p> <p>When configuring XML, set the current attribute value as follows.</p> <ul style="list-style-type: none"> <li>• If an encrypted attribute does not exist;             <ul style="list-style-type: none"> <li>- If the type attribute of &lt;choice&gt; element is “enumeration” or “boolean”, set id attribute value of &lt;value&gt; element.</li> <li>- If the type attribute of &lt;choice&gt; element is “other”, set the settable value for &lt;xsd:any&gt; element.</li> </ul> </li> <li>• If the encrypted attribute value is “yes”, set an encrypted password of 40 characters. For details, see 6.3.3.7 Case when diverting the password set at SETUP.</li> <li>• If the encrypted attribute value is “no”, set a plain text password with up to 20 characters. For details, see 6.3.3.6 Case when setting or changing the password.</li> </ul>
value	-	In BIOS settings, an element to indicate the parameter name to be displayed on BIOS setup utility (SETUP).
xsd:restriction	-	An element to indicate the valid range of settable values.
	base	An attribute to indicate the data type.
xsd:minInclusive	value	An attribute to indicate the minimum settable values as a decimal.
xsd:maxInclusive	value	An attribute to indicate the maximum settable values as a decimal.
xsl:if	test	<p>For the explanation on the test attribute, see Table 6-1.</p> <p>In BIOS settings, when the test conditional expression is true, it indicates that the setting item of the child element can be changed.</p> <p>When the test conditional expression is false, it indicates that the setting item of the child element cannot be changed.</p>



**For the explanation on the submenus or field names to be displayed on BIOS setup utility (SETUP) or for settable values, see the server maintenance guide.**

### 6.3.2. How to check BIOS settings

The following is how to check BIOS settings.



**The XML field such as id attribute value may differ depending on the server, its configurations or BIOS version.**

#### 6.3.2.1. Case of the field whose parent element does not have <xsl:if> element

The field whose parent element does not have <xsl:if> element can be set without depending on other setting item values. This section explains how to check the setting content of each type of the following setting items.

- <choice type="enumeration"> Case of (choice type)
- <choice type="boolean"> Case of (boolean type)
- <choice type="other"> Case of (other types)



■ <choice type="enumeration"> Case of (choice type)

The XML example of "Memory Retest" on [Memory Configuration] submenu is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID </target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="response" />
    <category name="Memory Configuration" id="335">
      <item name="Memory Retest" use="optional" current="341" id="339">
        <choice type="enumeration">
          <value id="340">YES</value>
          <value id="341">NO</value>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following setting content.

Field (id)	Parameter (id)	Current value
Memory Retest (339)	YES (340)	NO (341)
	NO (341)	



The current value is [NO] where the current attribute value "341" of <item> element coincides with the id attribute value of <value> element, the parameter to be a candidate setting value.

■ <choice type="boolean"> Case of boolean type

The XML example of "Wake On LAN/PME" on [Advanced Chipset Configuration] submenu is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="response" />
    <category name="Advanced Chipset Configuration" id="550">
      <item name="Wake On LAN/PME" use="optional" current="564" id="562">
        <choice type="boolean">
          <value id="563">Disabled</value>
          <value id="564">Enabled</value>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following setting content.

Field (id)	Parameter (id)	Current value
Wake On LAN/PME (562)	Disabled (563)	Enabled (564)
	Enabled (564)	



The current value is [Enabled] where the current attribute value "564" of <item> element coincides with the id attribute value of <value> element, the parameter to be a candidate setting value.

■ <choice type="other"> Case of (other types)

The XML example of “Active Processor Cores” on [Processor Configuration] submenu is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="response" />
    <category name="Processor Configuration" id="214">
      <item name="Active Processor Cores" use="optional" current="16" id="233">
        <choice type="other">
          <xsd:restriction base="xsd:unsignedByte">
            <xsd:minInclusive value="1"/>
            <xsd:maxInclusive value="24"/>
          </xsd:restriction>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following setting content.

Filed (id)	Parameter	Current value
Active Processor Cores (233)	1-24	16



The settable values for current attribute value of <item> element ranges from value attribute value “1” of <xsd:minInclusive> element to value attribute value “24” of <xsd:maxInclusive> element. The current attribute value is expressed as a decimal.

### 6.3.2.2. Case of the field whose parent element has <xsl:if> element

The field whose parent element has <xsl:if> element depends on the setting item that is included in the test condition. The test conditional expression of <xsl:if> element represents the conditions of the setting items that become grey out or hidden depending on the value of other setting items on BIOS setup utility (SETUP).

This section explains how to check the following conditional expressions.

- Case that the test conditional expression of <xsl:if> element becomes true and the setting item becomes enabled.
- Case that the test conditional expression of <xsl:if> element becomes false and the setting item becomes disabled.



**The conditional expressions of the setting items may differ depending on the server, its configuration or BIOS version. For details, see the explanation on the setting items in the server maintenance guide.**

## EXPRESSSCOPE Engine 3 Scripting Guide

- Case that the test conditional expression of <xsl:if> element becomes true and the setting item becomes enabled

The XML example of "Boot Mode" on [Boot] submenu and of "Network Stack" on [Network Stack Configuration] submenu is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="response" />
    <category name="Network Stack Configuration" id="677">
      <xsl:if test="not(//component[@name='BIOS']///item[@id='1312']/@current='1313')">
        <item name="Network Stack" use="optional" current="680" id="678">
          <choice type="enumeration">
            <value id="679">Disabled</value>
            <value id="680">Enabled</value>
          </choice>
        </item>
      </xsl:if>
    </category>
    <category name="Boot" id="1293">
      <item name="Boot Mode" use="optional" current="1314" id="1312">
        <choice type="enumeration">
          <value id="1313">Legacy</value>
          <value id="1314">UEFI</value>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML examples represent the following conditional expression and setting content.

■ Conditional expression

The condition to change “Network Stack” is that “Boot Mode” is not [Legacy].

Field (id)	Parameter (id)	Current value (id)
Network Stack (678)	Disabled (679)	Enabled (680)
	Enabled (680)	*Enabled (changeable)
Boot Mode (1312)	Legacy (1313)	UEFI (1314)
	UEFI (1314)	



The test condition of <xsl:if> element that becomes the parent element of “Network Stack” is “the case where the current attribute value of the id attribute value, “1312” of <item> element is not “1313”.” Since the id attribute value, “1312” of <item> element indicates “Boot Mode” and its corresponding current attribute value is “1314” that is [UEFI], the test conditional expression is true.

Therefore, “Network Stack” item is enabled (changeable).

## EXPRESSSCOPE Engine 3 Scripting Guide

- Case that the test conditional expression of <xsl:if> element becomes false and the setting item becomes disabled

The XML example of "Boot Mode" on [Boot] submenu and of "Network Stack" on [Network Stack Configuration] submenu is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="response"/>
    <category name="Network Stack Configuration" id="677">
      <xsl:if test="not(//component[@name='BIOS']///item[@id='1312']/@current='1313')">
        <item name="Network Stack" use="optional" current="680" id="678">
          <choice type="enumeration">
            <value id="679">Disabled</value>
            <value id="680">Enabled</value>
          </choice>
        </item>
      </xsl:if>
    </category>
    <category name="Boot" id="1293">
      <item name="Boot Mode" use="optional" current="1313" id="1312">
        <choice type="enumeration">
          <value id="1313">Legacy</value>
          <value id="1314">UEFI</value>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following conditional expression and setting content.

■ Conditional expression

The condition to change “Network Stack” is that “Bood Mode” is not [Legacy].

Field (id)	Parameter (id)	Current value (id)
Network Stack (678)	Disabled (679)	-
	Enabled (680)	*Disabled (unchangeable)
Boot Mode (1312)	Legacy (1313)	Legacy (1313)
	UEFI (1314)	



The test condition of <xsl:if> element that becomes the parent element of “Network Stack” is “the case where the current attribute value of the id attribute value, “1312” of <item> element is not “1313”.” Since the id attribute value, “1312” of <item> element indicates “Boot Mode” and its corresponding current attribute value is “1313” that is [Legacy], test conditional expression is false.

Therefore, "Network Stack" item is disabled (unchangeable).



6.3.2.3. Case when checking the password

If the password has been set, it can be obtained in encrypted form.

The XML example of the encrypted password is as follows.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="response"/>
    <category name="Security" id="1216">
      <item name="Administrator Password" use="optional" encrypted="yes"
current="0011223344556677889900AABBCCDDEEFF001122" id="1217">
        <choice type="other">
          <xsd:restriction base="xsd:string"></xsd:restriction>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following setting content.

Field (id)	Parameter	Current value
Administrator Password (1217)	- *String entry	0011223344556677889900AABBCCDD EEFF001122 *40 characters



The encrypted password has encrypted attribute value of “yes” and current attribute value of 40 characters in the alphanumerics (excluding symbols).



When checking or setting the password, HTTPS connection is recommended.

### 6.3.3. How to change BIOS settings

This section explains how to change BIOS settings. The XML whose setting items are not changed are omitted.



**Set the operation attribute value of <request\_id> element to “request”.**

**The XML field such as id attribute value may differ depending on the server, its configuration or BIOS version.**

**Never to change the following fields of the obtained XML. Otherwise BIOS settings may not be reflected correctly.**

- **<target\_option> element**
- **id attribute value of <item> element**

#### 6.3.3.1. Case of the field whose parent element does not have <xsl:if> element

The field whose parent element does not have <xsl:if> element can be set without depending on other setting item values. This section explains how to change each setting content of the following types of setting item.

- **<choice type="enumeration"> Case of (choice type)**
- **<choice type="boolean"> Case of (boolean type)**
- **<choice type="other"> Case of (other types)**

## EXPRESSSCOPE Engine 3 Scripting Guide

### ■ <choice type="enumeration"> Case of (choice type)

The following is the XML example where “Memory Retest” setting on [Memory Configuration] submenu is changed from [NO] to [YES]. The places to change are underlined as below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Memory Configuration" id="335">
      <item name="Memory Retest" use="optional" current="340" id="339">
        <choice type="enumeration">
          <value id="340">YES</value>
          <value id="341">NO</value>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents following setting content.

Field (id)	Parameter (id)	Value at acquisition	Setting value (id)
Memory Retest (339)	YES (340)	NO (341)	YES (340)
	NO (341)		



To set “Memory Retest” field to [YES], the current attribute value needs to be set to the id attribute value, “340” indicating [YES] in <value> element to be a candidate setting value.

## EXPRESSSCOPE Engine 3 Scripting Guide

### ■ <choice type="boolean"> Case of (boolean type)

The following is the XML example where “Wake On LAN/PME” on [Advanced Chipset Configuration] submenu is changed from [Enabled] to [Disabled]. The places to change are underlined as below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Advanced Chipset Configuration" id="550">
      <item name="Wake On LAN/PME" use="optional" current="563" id="562">
        <choice type="boolean">
          <value id="563">Disabled</value>
          <value id="564">Enabled</value>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following setting content.

Field (id)	Parameter (id)	Value at acquisition	Setting value (id)
Wake On LAN/PME (562)	Disabled (563) Enabled (564)	Enabled (564)	Disabled (563)



To set “Wake On LAN/PME” field to [Disabled], the current attribute value needs to be set to the id attribute value, “563” indicating [Disabled] in the <value> element to be a candidate setting value.

■ <choice type="other"> Case of (other types)

The following is the XML example where “Active Processor Cores” setting on [Processor Configuration] submenu is changed from [16] to [10]. The places to change are underlined as below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Processor Configuration" id="214">
      <item name="Active Processor Cores" use="optional" current="10" id="233">
        <choice type="other">
          <xsd:restriction base="xsd:unsignedByte">
            <xsd:minInclusive value="1"/>
            <xsd:maxInclusive value="24"/>
          </xsd:restriction>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following setting content.

Field (id)	Parameter	Value at acquisition	Setting value
Active Processor Cores (233)	1-24	16	10



The settable values for the current attribute value of <item> element ranges from the value attribute value, “1” of <xsd:minInclusive> element to the value attribute value, “24” of <xsd:maxInclusive> element. Set the current attribute value as a decimal. For the above XML, set “10”.

### 6.3.3.2. Case of the field whose parent element has <xsl:if> element

The field whose parent element has <xsl:if> element depends on the fields that are included in the test condition. The test conditional expression of <xsl:if> element represents the conditions of the fields which will be greyed out or hidden on the BIOS setup utility (SETUP), depending on the value of other fields. This section explains how to set the following conditional expressions.

- Case that the test conditional expression of <xsl:if> element becomes true and the field becomes enabled
- Case that the test conditional expression of <xsl:if> element becomes false and the field becomes disabled



**Conditional expressions of the fields may differ depending on the server, its configuration or BIOS version. For details, see the explanation on the fields in the server maintenance guide.**



## EXPRESSSCOPE Engine 3 Scripting Guide

- Case that the test conditional expression of <xsl:if> element is true

The following is the XML example where when “Boot Mode” on [Boot] submenu has been set as [UEFI], “Network Stack” on [Network Stack Configuration] submenu is changed from [Enabled] to [Disabled]. The places to change are underlined as below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Network Stack Configuration" id="677">
      <xsl:if test="not(//component[@name='BIOS']//item[@id='1312']/@current='1313')">
        <item name="Network Stack" use="optional" current="679" id="678">
          <choice type="enumeration">
            <value id="679">Disabled</value>
            <value id="680">Enabled</value>
          </choice>
        </item>
      </xsl:if>
    </category>
    <category name="Boot" id="1293">
      <item name="Boot Mode" use="optional" current="1314" id="1312">
        <choice type="enumeration">
          <value id="1313">Legacy</value>
          <value id="1314">UEFI</value>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following conditional expression and setting content.

■ Conditional expression

The condition to change "Network Stack" is that "Boot Mode" is not [Legacy].

Field (id)	Parameter (id)	Value at acquisition	Setting value (id)
Network Stack (678)	Disabled (679) Enabled (680)	Enabled (680) *Enabled (changeable)	Disabled (679) *Enabled (changeable)
Boot Mode (1312)	Legacy (1313) UEFI (1314)	UEFI (1314)	UEFI (1314)



As the value at the time of XML acquisition, "Network Stack" field is enabled (changeable).

To set "Network Stack" field to [Disabled], the current attribute value needs to be set to the id attribute value, "679" indicating [Disabled] in <value> element that will to be a candidate setting value.

\*For the checking method of the values at the time of XML acquisition, see 6.3.2.2 Case of the field whose parent element has <xsl:if> element.

## EXPRESSSCOPE Engine 3 Scripting Guide

- Case that the test conditional expression of <xsl:if> element is false

The following is the XML example to set “Network Stack” on [Network Stack Configuration] submenu from [Enabled] to [Disabled] when “Boot Mode” on [Boot] submenu is set to [Legacy]. The places to change are underlined as below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Network Stack Configuration" id="677">
      <xsl:if test="not(//component[@name='BIOS']//item[@id='1312']/@current='1313')">
        <item name="Network Stack" use="optional" current="679" id="678">
          <choice type="enumeration">
            <value id="679">Disabled</value>
            <value id="680">Enabled</value>
          </choice>
        </item>
      </xsl:if>
    </category>
    <category name="Boot" id="1293">
      <item name="Boot Mode" use="optional" current="1314" id="1312">
        <choice type="enumeration">
          <value id="1313">Legacy</value>
          <value id="1314">UEFI</value>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following conditional expression and setting content.

■ Conditional expression

The condition to change "Network Stack" is that "Boot Mode" is not [Legacy].

Field (id)	Parameter (id)	Value at acquisition	Setting value (id)
Network Stack (678)	Disabled (679) Enabled (680)	Enabled (680) *Disabled (unchangeable)	Disabled (679) *Enabled (unchangeable)
Boot Mode (1312)	Legacy (1313) UEFI (1314)	Legacy (1313)	UEFI (1314)



As the value at the time of XML acquisition, "Network Stack" field is disabled (unchangeable).

To enable the change of "Network Stack" field setting, the current attribute value of "Boot Mode" needs to be changed to "1314" for [UEFI] so that the test conditional expression becomes true. Then change the current attribute value of "Network Stack" to [Disabled].

\*For the the checking method of the values at the time of XML acquisition, see 6.3.2.2 Case of the field whose parent element has <xsl:if> element.



To set "Network Stack" field to [Disabled], the current attribute value needs to be set to the id attribute value, "679" indicating [Disabled] in <value> element to be a candidate setting value.

## EXPRESSSCOPE Engine 3 Scripting Guide

### 6.3.3.3. Case when configuring boot mode as Legacy.

The following is the XML example to set “Boot Mode” on [Boot] submenu from [UEFI] to [Legacy] when “Secure Boot” on [Secure Boot Configuration] submenu is set to [Disabled]. The places to change are underlined as below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Secure Boot Configuration" id="1277">
      <item name="Secure Boot" use="optional" current="1281" id="1280">
        <choice type="enumeration">
          <value id="1281">Disabled</value>
          <value id="1282">Enabled</value>
        </choice>
      </item>
    </category>
    <category name="Boot" id="1293">
      <xsl:if test="not(//component[@name='BIOS']//item[@id='1280']/@current='1282')">
        <item name="Boot Mode" use="optional" current="1313" id="1312">
          <choice type="enumeration">
            <value id="1313">Legacy</value>
            <value id="1314">UEFI</value>
          </choice>
        </item>
      </xsl:if>
    </category>
  </component>
</root>
```

The above XML example represents the following conditional expression and setting content.

■ Conditional expression

The condition to change "Boot Mode" is that "Secure Boot" is not [Enabled].

Field (id)	Parameter (id)	Value at acquisition	Setting value (id)
Secure Boot (1280)	Disabled (1281) Enabled (1282)	Disabled (1281)	Disabled (1281)
Boot Mode (1312)	Legacy (1313) UEFI (1314)	UEFI (1314) *Enabled (changeable)	Legacy (1313) *Enabled (changeable)



As the value at the time of XML acquisition, "Boot Mode" field is enabled (changeable).

To set "Boot Mode" field to [Legacy], the current attribute value needs to be set to the id attribute value, "1313" indicating [Legacy] in <value> element that will be a candidate setting value.

\*For the checking method of the values at the time of XML acquisition, see 6.3.2.2 Case of the field whose parent element has <xsl:if> element.

## 6.3.3.4. Case when changing the boot priority order of bootable UEFI device types

The following is the XML example where when “Boot Mode” on [Boot] submenu has been set to [UEFI], “Boot Option #1-#4” that correspond to the bootable UEFI device types on [Boot] submenu are set as below. The places to change are underlined as below.

■ Example to set the boot priority order on each device type.

1. Boot Option #1 : CD/DVD -> Network
2. Boot Option #2 : Removable -> CD/DVD
3. Boot Option #3 : HDD -> Removable
4. Boot Option #4 : Network -> HDD

```
<?xml version="1.0" encoding="UTF-8"?>
<root
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
version="1.0">
<component name="BIOS">
<target>
<target_option name="HWID">Hardware ID</target_option>
<target_option name="BIOS Version">BIOS Version </target_option>
</target>
<request_id operation="request"/>
<category name="Boot" id="1293">
<item name="Boot Mode" use="optional" current="1314" id="1312">
<choice type="enumeration">
<value id="1313">Legacy</value>
<value id="1314">UEFI</value>
</choice>
</item>
<xsl:if test="not(//component[@name='BIOS']/item[@id='1312']/@current='1313')">
<item name="Boot Option #1" use="optional" current="1345" id="1341">
<choice type="enumeration">
<value id="1342">CD/DVD: Primary CD device</value>
<value id="1343">Removable: Primary Removable Device</value>
<value id="1344">HDD: Primary HDD Device</value>
```

## EXPRESSSCOPE Engine 3 Scripting Guide

```
<value id="1345">Network: Primary Network Device</value>
<value id="1346">Disabled</value>
</choice>
</item>
<item name="Boot Option #2" use="optional" current="1348" id="1347">
<choice type="enumeration">
<value id="1348">CD/DVD: Primary CD Device</value>
<value id="1349">Removable: Primary RemovableDevice</value>
<value id="1350">HDD: Primary HDD Device</value>
<value id="1351">Network: Primary Network Device</value>
<value id="1352">Disabled</value>
</choice>
</item>
<item name="Boot Option #3" use="optional" current="1355" id="1353">
<choice type="enumeration">
<value id="1354">CD/DVD: Primary CD Device</value>
<value id="1355">Removable: Primary Removable Device</value>
<value id="1356">HDD: Primary HDD Device</value>
<value id="1357">Network: Primary NetworkDevice</value>
<value id="1358">Disabled</value>
</choice>
</item>
<item name="Boot Option #4" use="optional" current="1362" id="1359">
<choice type="enumeration">
<value id="1360">CD/DVD: Primary CD Device</value>
<value id="1361">Removable: Primary Removable Device</value>
<value id="1362">HDD: Primary HDD Device</value>
<value id="1363">Network: Primary Network Device</value>
<value id="1364">Disabled</value>
</choice>
</item>
</xsl:if>
</category>
</component>
</root>
```



## EXPRESSSCOPE Engine 3 Scripting Guide

The above XML example represents the following conditional expression and setting content.

### ■ Conditional expression

The condition to change “Boot Option #1-#4” is that “Boot Mode” is not [Legacy].

Field (id)	Parameter (id)	Value at acquisition	Setting value (id)
Boot Mode (1312)	Legacy (1313) UEFI (1314)	UEFI (1314)	UEFI (1314)
Boot Option #1 (1341)	CD/DVD (1342) Removable (1343) HDD (1344) Network (1345) Disabled (1346)	CD/DVD (1342) *Enabled (changeable)	Network (1345) *Enabled (changeable)
Boot Option #2 (1347)	CD/DVD (1348) Removable (1349) HDD (1350) Network (1351) Disabled (1352)	Removable (1349) *Enabled (changeable)	CD/DVD (1348) *Enabled (changeable)
Boot Option #3 (1353)	CD/DVD (1354) Removable (1355) HDD (1356) Network (1357) Disabled (1358)	HDD (1356) *Enabled (changeable)	Removable (1355) *Enabled (changeable)
Boot Option #4 (1359)	CD/DVD (1360) Removable (1361) HDD (1362) Network (1363) Disabled (1364)	Network (1363) *Enabled (changeable)	HDD (1362) *Enabled (changeable)



As the value at the time of XML acquisition, “Boot Option #1-#4” field is enabled (changeable).

\*For the checking method of the values at the time of XML acquisition, see 6.3.2.2 Case of the field whose parent element has <xsl:if> element.



**Tip**

To set “Boot Option #1” field to [Network], the current attribute value needs to be set to the id attribute value, “1345” indicating [Network] in <value> element to be a candidate setting value.

Same for each of “Boot Option #2-#4” fields, set the current attribute value to id attribute value in <value> element indicating the device type to be set.



**Note**

Set each of the current attribute value of “Boot Option #1-#4” to a unique device type. For example, if “Boot Option #1” is set to [HDD], set “Boot Option #2-#4” to device types other than [HDD]. Setting the different “Boot Option” fields to the same device type except [Disabled] will cause the error saying “XML file is invalid” at the time of XML setting. These above rules are not applied to the XML acquisition and setting on the boot priority order within each of the device types such as [CD/DVD Priorities].

### 6.3.3.5. Case when enabling the Console Redirection of serial port B and setting the baud rate to 57600

The following is the XML example where "BIOS Redirection Port" on [Serial Port Configuration] submenu is changed from [Disabled] to [Serial Port B] and "Baud Rate" is changed from [115200] to [57600]. The places to change are underlined below.

## EXPRESSSCOPE Engine 3 Scripting Guide

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Serial Port Configuration" id="602">
      <item name="BIOS Redirection Port" use="optional" current="631" id="628">
        <choice type="enumeration">
          <value id="629">Disabled</value>
          <value id="630">Serial Port A</value>
          <value id="631">Serial Port B</value>
        </choice>
      </item>
      <xsl:if test="not(//component[@name='BIOS']//item[@id='628']/@current='629')">
        <item name="Baud Rate" use="optional" current="647" id="644">
          <choice type="enumeration">
            <value id="645">9600</value>
            <value id="646">19200</value>
            <value id="647">57600</value>
            <value id="648">115200</value>
          </choice>
        </item>
      </xsl:if>
    </category>
  </component>
</root>
```

The above XML example represents the following conditional expression and setting content.

■ Conditional expression

The condition to change "Baud Rate" is that "BIOS Redirection Port" is not [Disabled].

Field (id)	Parameter (id)	Value at acquisition	Setting value (id)
BIOS Redirection Port (628)	Disabled (629) Serial Port A (630) Serial Port B (631)	Disabled (629)	Serial Port B (631)
Baud Rate (644)	9600 (645) 19200 (646) 57600 (647) 115200 (648)	115200 (648) *Disabled (unchangeable)	57600 (647) *Enabled (changeable)



As the value at the time of XML acquisition, "Baud Rate" field is disabled (unchangeable).



To enable the change of "Baud Rate" field setting, the current attribute value of "BIOS Redirection Port" needs to be changed to "631" for [Serial Port B] so that the test conditional expression becomes true. Then change the current attribute value of "Baud Rate" to [57600].

\*For the way to check the values at the time of XML acquisition, see 6.3.2.2 Case of the field whose parent element has <xsl:if> element.



To set "Baud Rate" field to [57600], the current attribute value needs to be set to the id attribute value, "647" indicating [57600] in the <value> element that will be a candidate setting value.

6.3.3.6. Case when setting or changing the password

The following is the XML example to set "Administrator" as a password string while "Administrator Password" on [Security] submenu is unset. The places to change are underlined below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Security" id="1216">
      <item name="Administrator Password" use="optional" encrypted="no" current="Administrator"
id="1217">
        <choice type="other">
          <xsd:restriction base="xsd:string"></xsd:restriction>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following setting content.

Field (id)	Parameter	Value at acquisition	Setting value
Administrator Password (1217)	- *String entry	- *Null character	Administrator *13 characters



**Set the password string as the current attribute value.**

**Set the encrypted attribute value to “no”.**

**If the password has already been set, setting a new password in XML will overwrite the password.**

**When checking or setting the password, HTTPS connection is recommended.**

The setting condition of a plain text password is the followings.

- The password needs to be between 0 to 20 half-width alphanumeric characters (including symbols).
- Entering null password will clear the already registered password. For details, see 6.3.3.8 Case when clearing the password.
- It is case-sensitive.
- Available characters for a password string are as below.

0123456789

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

!"#\$%&'()\*+,-./:;<>?@[\\]^\_`{|}~

␣ (Half width space)

- The string notation by character reference is not supported.
- The string notation by entity reference is supported. When using the following strings, use the entity reference. For example, when setting a password string of Entity&Pass&, describe: current="Entity&Pass&".

String	Entity reference
< (ASCII 0x3C)	&lt;
> (ASCII 0x3E)	&gt;
& (ASCII 0x26)	&amp;
' (ASCII 0x27)	&apos;
" (ASCII 0x22)	&quot;



Each of entity references is counted as one character.  
For example, current="Entity&Pass&" is 12 characters.



At BIOS setup utility (SETUP), "\ (ASCII 0x5C) may not be entered from an English keyboard.  
When using an English keyboard, do not use "\ for a password. If using "\ for a password, attach the keyboard capable of "\ input and then set a password.



6.3.3.7. Case when diverting the password set at SETUP.

The following is XML example where when "Administrator Password" on [Security] submenu has not been set, the encrypted password of "Administrator Password" set on BIOS setup utility (SETUP) is diverted. The places to change are underlined below.

For the encrypted password, describe the string obtained at 6.3.2.3 Case when checking the password.

```

<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Security" id="1216">
      <item name="Administrator Password" use="optional" encrypted="yes"
current="0011223344556677889900AABBCCDDEEFF001122" id="1217">
        <choice type="other">
          <xsd:restriction base="xsd:string"></xsd:restriction>
        </choice>
      </item>
    </category>
  </component>
</root>

```

The above XML example represents the following setting content.

Field (id)	Parameter	Value at acquisition	Setting value
Administrator Password (1217)	- *String entry	- *Null Character	0011223344556677889900 AABBCCDDEEFF001122 *40 characters



**Set the encrypted attribute value to “yes”.**

**Set the current attribute value to the encrypted password of 40 characters.**

**If the password has already been set, setting a new password in XML will overwrite the password.**

**When checking or setting the password, HTTPS connection is recommended.**

6.3.3.8. Case when clearing the password

The following is the XML example to clear the password string "Administrator" of "Administrator Password" on [Security] submenu. The places to change are underlined as below.

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      <target_option name="HWID">Hardware ID</target_option>
      <target_option name="BIOS Version">BIOS Version</target_option>
    </target>
    <request_id operation="request"/>
    <category name="Security" id="1216">
      <item name="Administrator Password" use="optional" encrypted="no" current="" id="1217">
        <choice type="other">
          <xsd:restriction base="xsd:string"></xsd:restriction>
        </choice>
      </item>
    </category>
  </component>
</root>
```

The above XML example represents the following setting content.

Field (id)	Parameter	Value at acquisition	Setting value
Administrator Password (1217)	- *String entry	Administrator *13 characters	- *Null Character



**Set the encrypted attribute value to "no".**  
**Set the current attribute value to null.**  
**When clearing "User Password", just as above, set the encrypted and current attribute values.**



**Note**

If "Administrator Password" is cleared, "User Password" will also be cleared.

When checking or setting the password, HTTPS connection is recommended.

### 6.3.4. Other notes

- For the following setting fields, XML cannot be obtained or configured.
  - [Main] - [System Language]
  - [Main] - [System Date]
  - [Main] - [System Time]
  - iSCSI Configuration submenu
  - UEFI Driver Configuration submenu
  - The boot priority order within each of the device types ([Boot] – [CD/DVD Priorities], [Removable Priorities], [HDD Priorities], or [Network Priorities]).
- For the menus only for display (such as Status or Revision), XML cannot be obtained or set.
- When ID for each model or BIOS version does not match, acquisition/setting of XML is not available. Make sure that identification information in <target\_option> element corresponds to the server's.
- Be sure never to change the following fields of the obtained XML. Changing those may cause BIOS settings to be reflected wrongly.
  - <target\_option> element
  - id attribute value of <item> element
- XML cannot be obtained or set during POST. Obtain or configure XML after POST is completed or the managed server is turned off.
- After the hardware configuration is changed, if you set the XML that has been obtained before that change, some of the BIOS settings may not be reflected. Again obtain and set XML after the hardware configuration is changed and then POST is completed.
  - e.g.: If the XML obtained by using the standard riser card setting is changed to optional riser card setting and then that XML is set, the setting of "PCIXX Slot Option ROM" obtained by using the standard riser card cannot be changed.
- After configuring the XML, to reflect it to BIOS, POST needs to be executed. If the managed server has been switched off, switch it on. Alternatively, if OS is being operated, restart it. After POST is completed (after OS boot up), obtain XML again and confirm that the settings have been reflected in it.

## 7. **Sample Code**

The following explains the sample codes using ServerProfile.pm. Refer to these when creating scripts.



**NEC does not guarantee your operation with the use of these sample codes in your environment. Use these under your responsibility as the sample when creating scripts.**

### 7.1. getBmcProfile.pl

- Connects to EXPRESSSCOPE Engine 3 of 172.16.200.2 via HTTP.
- Logs in to EXPRESSSCOPE Engine 3 as the user 'Administrator'.
- Obtains basic settings (basic) and outputs JSON to the standard output.
- Obtains network settings (network) and writes them out to network.json.

### 7.2. setBmcProfile.pl

- Connects to EXPRESSSCOPE Engine 3 of 172.16.200.2 via HTTPS.
- Logs in to EXPRESSSCOPE Engine 3 as the user 'Administrator'.
- Verifies the SSL certificate of EXPRESSSCOPE Engine 3 by using ca.pem.  
Configures network.json as network setting (network).

### 7.3. modifyBmcProfile.pl

- Connects to EXPRESSSCOPE Engine 3 of 172.16.200.2 via HTTPS.
- Logs in to EXPRESSSCOPE Engine 3 as the user 'Administrator'.
- Does not verify the SSL certificate of EXPRESSSCOPE Engine 3.
- Obtains basic settings (basic), increments the DELAYTIME and then sets those settings to EXPRESSSCOPE Engine 3.

### 7.4. getServerProfile.pl

- Connects to EXPRESSSCOPE Engine 3 of 172.16.200.2 via HTTPS.
- Logs in to EXPRESSSCOPE Engine 3 as the user 'Administrator'.
- Does not verify the SSL certificate of EXPRESSSCOPE Engine 3.

## EXPRESSSCOPE Engine 3 Scripting Guide

- Obtains XML and outputs it to the standard output.
- Obtains XML and write it out to get.xml.

### 7.5. setServerProfile.pl

- Connects to EXPRESSSCOPE Engine 3 of 172.16.200.2 via HTTPS.
- Logs in to EXPRESSSCOPE Engine 3 as the user 'Administrator'.
- Verifies the SSL certificate of EXPRESSSCOPE Engine 3 by using ca.pem.
- Configures set.xml.

### 7.6. Case when changing BIOS settings by using sample codes.

The following explains how to change BIOS settings by using the sample codes of getServerProfile.pl and setServerProfile.pl. Execute the change after confirming 6.3.4 Other notes.

First, switch OFF the managed server or make OS in startup-completed state.

Next, follow the procedures below on the managed PC to change BIOS settings.

1. Prepare the environment necessary for the management PC. For details, see 2. Preparation.
2. Open the getServerProfile.pl file and then change the connection destination to the IP address or the host name of EXPRESSSCOPE Engine 3 of the managed server. For details, see 3.2.1 new.
3. Execute getServerProfile.pl.
  - Execution example  
# perl getServerProfile.pl
4. get.xml is created in the directory which stores getServerProfile.pl.
5. Copy the obtained get.xml with the name of set.xml as the file for changing BIOS settings.
  - Execution example  
# cp get.xml set.xml
6. Open set.xml file and then change the operation attribute value of <request> element from "response" to "request". For details, see 6.3.3 How to change BIOS settings.
7. Change the current attribute value of <item> element. For details, see 6.3.3 How to change BIOS settings.

## EXPRESSSCOPE Engine 3 Scripting Guide

8. Same as procedure 2, open setServerProfile.pl file and then change the connection destination to the IP address or the host name of EXPRESSSCOPE Engine 3 of the managed server.
9. Execute setServerProfile.pl.
  - Execution example

```
# perl getServerProfile.pl
```
10. The following message will be output on the terminal screen.

```
"set.xml is successfully registered."
```

If the power of the managed server is off, turn it on. If OS is in operation, restart it. During POST, the message to notify BIOS setting change will appear. Then the managed server will restart again automatically.

Lastly, after POST of the managed server completes, execute getServerProfile.pl like procedure 3. Refer to the obtained get.xml to confirm if the value set in procedure 7 has been established.



## ■ Appendix

### References

- ◆ Express5800 Series  
<http://www.nec.com/en/global/prod/express/>
- ◆ IPMI  
<http://www.intel.com/content/www/us/en/servers/ipmi/ipmi-home.html>
- ◆ JSON  
<http://www.json.org/>
- ◆ XML  
<http://www.w3.org/standards/xml/>
- ◆ Perl  
<http://www.perl.org/>