Intel® System Configuration Utility

User Guide – For Intel® Server System M70KLP only

Reference for using the Intel® System Configuration Utility (Syscfg).

Rev 1.00

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Delivering Breakthrough Datacenter System Innovation – Experience What's Inside!

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Document Revision History

Date	Revision	Changes
March 2021	1.00	First version for Server System M70KLP platform

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1. Introduction

1.1 Purpose of the Document

This document describes the functionality of the Intel® System Configuration Utility, also referred to as "syscfg". This command-line utility is used to:

- Save selective BIOS and/or firmware settings to a file
- Write BIOS and Firmware settings from a file to a server
- Configure selected firmware settings
- Configure selected BIOS settings
- Configure selected system settings
- Display selected firmware settings
- Display selected BIOS settings

1.2 Platforms and Operating System Support

This utility is designed exclusively for use with Intel® Server System M70KLP. Using this revision of the utility on any other Intel® server product is not supported. For details, refer to Release Notes in each release package.

There are two ways to identify the M70KLP version of the utility:

- Check the utility zip pkg name string
  The M70KLP Utility zip pkg string contains '**klp**' keyword.
  Ex:
  Syscfg_V14_2**klp**_Buildx_AllOS.zip

- Check the utility header after launching the tool
  The M70KLP utility header contains the '**klp**' keyword. Check the header string after launching the tool.
  Ex:

```
[root@localhost yliu152]# syscfg -h

        System Configuration Utility Version 14.2klp Build 3
        Copyright (c) 2020 Intel Corporation


Save/Restore system configuration switches
Save system configuration: -save or -s
arg 1: filename.  Name of the file to save the settings.
       the file must have .INI extension.
       If any other or no extension is provided
       the file name extension will be changed to .INI
'/f' option will save only firmware settings to the configuration file, and
'/b' option will save only BIOS CMOS settings to the configuration file.
Combination of '/f' and '/b' options will save both the firmware and BIOS CMOS
settings to the configuration file.
```

Figure 1. M70KLP Utility Header

1.3 Intended Audience

This document is intended for:

- Users of the utility who desire a more detailed understanding of its operation.

1.4 Document overview

This document is organized as follows:

Section 1: Introduction
Describes the purpose of the document.

Section 2: Product Overview
Provides an overview of the architectural components that comprise the system configuration save/restore utility.

Section 3: Functional Specification
Describes the operation, how to use the utility, and a description of the input files.

Section 4: Installation and Un-installation
Describes the procedure to install and uninstall the syscfg utility in Linux* and Windows*.

2. Product Overview

The System Configuration Utility (syscfg) is a command-line utility that provides the ability to save, restore, display and set selected system firmware and BIOS settings. The firmware configuration parameters on which this utility operates, as fully described in the IPMI and BMC specifications.

This version of the System Configuration Utility is designed for use only with the Intel® Server System M70KLP product family. When using the System Configuration Utility for other Intel® server product families, check the product family documentation for the applicable System Configuration Utility version.

Syscfg requires Windows* administrative or Linux* root permissions.

Note: In order to clone an existing firmware and/or BIOS configuration from one system to another, each system must have identical versions of firmware and BIOS on them. This is required because the configurable settings in firmware or BIOS may vary from version to version.

To copy the Firmware and BIOS configuration from one system to another, the following process is used:

1. The user runs the utility on the system they want to duplicate, specifying the save option. This saves a subset of firmware and BIOS settings to a file.

2. The user runs the utility on the target system, specifying the restore option and the file created on the master system to restore those settings to the target system.

3. The user runs the syscfg utility to make changes to any of the parameters that cannot be duplicated on the two systems. For example, the host IP address stored in the firmware cannot be the same for two servers.

The utility supports configuration of individual parameters of the firmware and BIOS. Some options group the parameters to identify settings that are dependent on each other for proper functionality of the firmware.

Note: BIOS variable(s) meant for preliminary BMC configuration cannot be saved or restored using Syscfg utility.

2.1 Save Process Overview

The Save process saves the following BIOS and Firmware settings also into an editable (.INI) file format. This is typically a text file and will be dynamically generated depending on the user choice from the command line.

This is to be noted that Save/Restore process following the INI file is not a way for exact cloning between the servers. Rather it is a way to clone a subset of BIOS/Firmware configurable settings and a means of duplicating those settings in the deployed servers.

- **BIOS Settings**
  The BIOS variables, which are neither exposed by BIOS API, nor relevant to the end user, cannot be saved or restore. BIOS variables like password, time, etc., are those that will not be saved in INI file. Almost all the BIOS Setup variables except those as mentioned above could be saved and restored back.

- **Server Management Firmware Settings**
  A subset of the server management firmware configurable items will be saved into the INI files. Refer to Appendix A for the lists of firmware settings saved in the INI file.

An example of a typical INI file has been included in Appendix C.

2.2 Restore Process Overview

The utility restores BIOS and Firmware settings from a text file, known as INI file. The advantage of using INI file is that user can modify and change the values of any of the settings available in the INI file. In this scenario, the INI file does not serve a means of cloning servers. Rather, it provides a mechanism of configuring same items with different values as per end user will.

Server-specific settings can be modified using the command-line arguments described in Section 3.1. These settings can be specified as options on the same command line as the restore (/r) command-line option, or by executing the utility with the appropriate options after a restore operation is done.

Note: The information contained in the INI file header must match the system information of the server.

While restoring the configuration, the system information of INI file should match with the system information. The utility aborts the restore operation with the error message if any of the above does not match.

3. Functional specification

3.1 Command-line Interface

This utility parses the command-line options and sets internal flags to control operation. Any invalid options or option arguments will result in the display of a “usage” message. If a command is entered with options or arguments that are not supported by the server management controller, an error message will indicate that the command is not valid for the controller.

The command-line options and arguments are not case-sensitive. They are described in the following sections. The basic command-line format is:

```
syscfg [/option(s) [arguments]]
```

Options can also be specified with a dash (‘-’) as well as a forward slash (‘/’). If no options are specified, version information is displayed.

Throughout the document, all command-line options are preceded by a “/”. Optional arguments for a given command-line option are shown in square brackets (‘[’and ‘]’). Required arguments are shown in angle brackets (‘<’ and ‘>’). Arguments that are required under certain circumstances are enclosed by angle brackets and the dependency is indicated in parentheses within the angle brackets.

Command-line length is dependent on the limitations imposed by the shell. Multiple options can be specified on the same command-line as long as the length restriction is observed. Multiple options are processed so that all options and corresponding arguments are validated first. If any illegal values are detected, an error message is displayed. Next, data is written to the correct destination (BIOS or firmware). If an error occurs during a write operation, command processing stops at that point and an error message is displayed. This makes it possible that some data on a command line will be written to the hardware, but other data will not. If the command line is greater than 127 characters in length, the utility will give an error message and will not process any part of the command. When multiple options are used only the status message for the last option is displayed. ‘bbo’, help and display commands are meant to be used as standalone.

3.1.1 String Input

Some syscfg options require arguments input as strings, such as a community string for LAN alerts. Restrictions regarding the valid characters are listed in this document with the description of the arguments. Double quote marks are used to signify the beginning and end of each string. A blank string must also be enclosed in double quotes. Double quote marks are not allowed within any string for any other purpose.

3.1.2 Numeric Input

Restrictions regarding the values accepted for each numeric argument are listed in this document with the description of the arguments. Numeric argument values may be required in hex or in decimal depending on the argument. In general, input is in decimal.

3.1.3 Command Consistency

All binaries of utility targeted for different OSs/EFI have consistent command behavior on the respective shells.

3.1.4 Channel Numbers in Examples

Unless otherwise specified, examples in this chapter assume IPMI channel 4 is a serial channel, and IPMI channels 1, 2 and 3 are LAN channels. Actual channel numbers may vary depending on the platform BMC types.

Note: Refer to respective BMC Firmware EPS for more detailed information on the channel number assignments and their types**.**

3.2 Saving/Restoring Settings

When saving the settings to a file, the user has the option to supply the file name on the command line. If the file name provided is the name of an existing file, the utility prompts the user to confirm that the existing file should be overwritten. If the user agrees, the utility saves the settings. If the user does not agree, the utility prompts for a file name and the file name check is repeated on the new file name.

If the save or restore file name supplied on the command-line does not have a file extension, the utility automatically appends the extension. If the file name has an extension other than INI, the utility displays an error message to indicate the file name is invalid. The utility then exits.

The utility also allows saving the configurations both in binary and in text mode. When saving the settings to a file, the user has the option to supply the file type (*ini*). The default file name will be syscfg with extension according to the given type. Also utility allows user mentioned file name. In absence of file type, the default type would be INI.

So if neither file type nor file name is provided by the user, the default file name will be syscfg.INI.

Notes: BIOS variables with leading/tailed space can be restored successfully.

3.3 General Interface

The utility supports configuring the following categories of server management configuration options:

- LAN Channel
- Serial/Modem Channel (if supported by the platform)
- Platform Event Filtering (PEF)
- Serial Over LAN (SOL)
- Users
- Power Restore Policy

3.3.1 Help Interface (/h, /?)

The “/h” and “/?” options display help for the utility. Pressing the <ESC> key will exit from help and return to a command-line. Also pressing <ESC> key will exit from any help component being displayed and return to a command-line.

Table 1: Command-line Option for Help Information

Option and Arguments	Description
`/h [component]` or `/? [component]`	Displays help for the utility. The `[component]` argument is used to display a subset of the help for a specified area. Valid values for `[component]` are: `lan, user, pef, sol, power,cr,channel, system and bios`. If no component is specified, all help is displayed. When using /? In Linux* enclose within double quotes ("/?")

Example:

The command below displays help for LAN configuration options:

```
syscfg /h lan
```

Help is displayed in text format, one page at a time. ENTER key can be pressed to display the next help page and ESC key can be pressed to exit.

3.3.2 Runtime Variable Access - AMISetupNVLock

This command is a must-have command before any bios settings, it is used in unlock Boot Services accessible variables for runtime access by providing the BIOS Admin password.

```
syscfg /bsnvlock "BIOS Admin password"
```

It will return 0xF for EFI_ACCESS_DENIED on invalid password input. If the system does not have an Admin password set, it will return 0x6 for EFI_NOT_READY. After 3 failed attempts, the unlock interface will be locked until the next system reboot. Once unlocked, writing the same variable with an invalid or empty password will re-lock AMISetupNVLock.

Example:

The example enables the runtime variable access in a system with admin password set to admin@123

```
syscfg /bsnvlock "admin@123"
```

3.3.3 Save/Restore Interface (/s, /r)

The commands listed in the table below are used to save and restore the BIOS and Firmware settings to and from the system using a binary file as the storage mechanism. The file type for the saved binary file is System Configuration File (INI).

The options for saving and restoring the settings do not require the user to identify the file name with an extension. If no extension is given, the utility automatically appends the .ini extension. If an extension other than .ini is given, the utility will change the extension to .ini. If the specified file name is the name of a file that already exists, the user will be given the option of changing the file name or overwriting the existing file of the same name.

Table 2: Save/Restore Configuration Command-line Options and Arguments

Options and Arguments	Description
`/s [file name] [options]`	Writes the current system BIOS and Firmware configuration to the specified file. If no file name is specified, the default name syscfg.INI is used. No other command-line options except /f and /b can be used with this option. If file name is specified, it must come immediately after the /s switch. This switch can be used with "/f" or "/b" option, to save just one of the component settings instead of all of them. The "/f" option will save only firmware settings to the configuration file and "/b" option will save BIOS settings to the configuration file. Combination of "/f" and "/b" will save all settings in to the file. **Note:** /f option is used in conjunction with /s and the switches /s and /f can be swapped and used. It is mandatory that filename should be followed after /s switch. eg: syscfg /f /s filename.INI successfully saves the files.
`/r [file name] <options> [command line options]`	Loads the BIOS or firmware settings from the specified file and writes them to the system. The default file name is syscfg.INI. If a file name is specified, it must come immediately after the /r option. It is required to specify option such as "/f" and "/b to selectively restore firmware settings or BIOS settings to the system respectively. If no option is specified then the utility displays an error message and exits with an error code. Combination of "/f" and "/b" will restore all settings from the file. If other command-line options are specified, the utility will first write the contents of the file into the system and then process the command line options to overwrite any specified settings. If a BIOS administrator password is set, that password must be supplied using the "/bap" option along with the /r option. If the supplied password does not match the stored password, the restore operation is aborted and the utility will display an error message. **Note:** /f option is used in conjunction with /r and the switches /r and /f can be swapped and used. It is mandatory that file name should be followed by /r switch. g: syscfg /f /r filename.INI successfully restores the files.
/f	This option is used in conjunction with /s or /r to save or restore the Firmware settings only. When restoring the Firmware settings, the input binary file must also contain the Firmware settings in order for this utility to restore them; otherwise, this utility displays an error message and exits with an error code.
/b	This option is used in conjunction with /s or /r to save or restore the BIOS settings only. When restoring the BIOS settings, the input binary file must also contain the BIOS settings in order for this utility to restore them; otherwise, this utility displays an error message and exits with an error code.
/nobo	This option is used in conjunction with /r to skip restoring boot order.

Note:

- For restoring purpose non editable Fields, Section name Headers and Key names should not be edited or deleted from the INI file. If done so, the utility behavior and error messages can be unpredictable.
- Save and restore of Host IP, Subnet Mask and Default Gateway IP is not supported.
- In Linux*, user is restricted to save a file in '/' root path as well as user is restricted to restore any file from '/' path.
- As some BIOS settings have dependencies, using syscfg INI file to save/restore BIOS settings only once may not be able to achieve the goal. The solution is to use command line or INI file to change/restore twice. For example, if you want to restore "ATS Support", you have to restore "Intel(R) VT for Directed I/O" from "Disable" to "Enable" first in order to make "ATS Support" visible, then to do second restore to change "ATS Support" value. Upon system reboot, the new BIOS settings will take effect.

Examples:

1. Save BIOS and Firmware settings to a file named svr1cfg.ini.

```
syscfg /s svr1cfg.ini
```

2. Save only BIOS settings to file named bioscfg.ini.

```
syscfg /s bioscfg.ini /b
```

3. Save only firmware settings to configuration file with default file name syscfg.ini.

```
syscfg /s INI /f
```

4. Save firmware and BIOS settings in to the configuration file with file name syscfg.ini.

```
syscfg /s INI /f /b
```

5. Restore only the BIOS settings from the file bioscfg.ini when no BIOS administrator password exists in the system.

```
syscfg /r bioscfg.ini /b
```

6. Restore both BIOS and Firmware settings from the file with the name syscfg.ini.

```
syscfg /r INI /b /f
```

7. Restore both BIOS and Firmware settings but skip boot order from the file with the name syscfg.ini.

```
syscfg /r INI /b /f /nobo
```

3.3.4 Information Interface (/i)

The "`/i`" option displays the BIOS version, the firmware boot code version, the firmware operational code version, and the firmware PIA version. If a file name is specified as an argument, the information displayed is from the file. If no file name is given, the information comes from the system.

Table 3: Information Option

Options and Arguments	Description
/i [file name]	Displays BIOS and Firmware version information from the system or a file.

Examples:

The example below displays version information for data in the file.

```
syscfg /i svr1cfg.ini
```

The next example displays version information from the system.

```
syscfg /i
```

3.3.5 Display Interface (/d)

The /d option displays the firmware and BIOS settings from the system. These are settings, which can be configured from the command line interface.

Table 4: Display Option

Options and Arguments	Description
/d <Configuration Module> [Options]	Displays the configuration corresponding to the module specified in <configuration module>. The configuration module can be either "BIOSSETTINGS", "LAN", "POWER", "PEF", "SOL", "USER" Parameters like channel number and user ID can be specified in the field "[options]". No other command-line options can be used with this option. Cascaded /d switches are allowed.

3.3.1.1 Displaying Channel Configuration (/d channel)

This option will display the IPMI channel settings for a particular channel. This option has the following format.

```
syscfg /d channel <channel ID>
```

Example:

The example below will display the channel settings for the channel number 1.

```
syscfg /d channel 1
```

Refer to Table 5: Channel Configuration Parameters and Settings for sample display.

3.3.1.2 Displaying LAN Configuration (/d lan)

This option will display the current settings for a particular LAN channel. This option has the following format.

```
syscfg /d lan <channel ID> [< LAN Alert Destination Index>]
```

Example:

This example will display the LAN Configuration where the LAN channel number is 1.

```
syscfg /d lan 1 2
```

Refer to Table 6: LAN Enable Configuration Arguments sample display.

3.3.1.3 Displaying PEF Configuration (/d pef)

This option will display the PEF configuration for a particular "filter table index - policy table entry" combination. This option can be used with filter table index alone as well. In that case, only a subset of PEF configuration will be displayed. This option has the following format.

```
syscfg /d pef <filter table index> [<policy table index>]
```

Examples:

The example below will display the PEF Filter and Policy configurations corresponding to the filter table index 2 and policy table index 1.

```
syscfg /d pef 2 1
```

The next example will display only the PEF Filter configuration.

```
syscfg /d pef 2
```

Refer to Table 9: Global PEF Configuration Arguments sample display.

3.3.1.4 Displaying SOL Configuration (/d sol)

This option will display the SOL configuration for a particular LAN channel. This option has the following format.

```
syscfg /d sol <channel ID>
```

Example:

This example will display the current SOL settings for the LAN channel 1.

```
syscfg /d sol 1
```

Refer to Table 12: SOL Enable Configuration Arguments sample display.

3.3.1.5 Displaying User Configuration (/d user)

This option will display the current user settings for a particular user. This option can be used either with user ID alone or with user ID – Channel number combination. This option has the following format.

```
syscfg /d user <User ID> [<Channel ID>]
```

Examples:

This example will display the current user settings for the user ID 1.

```
syscfg /d user 1
```

The next example will display the user configuration for user 1 on channel 1.

```
syscfg /d user 1 1
```

Refer to Table 13: User Access Arguments**Error! Reference source not found.** sample display.

3.3.1.6 Displaying Power Configuration (/d power)

This option will display the current power settings in the system. This option has the following format.

```
syscfg /d power
```

Example:

This example will display the current power settings present in the system.

```
syscfg /d power
```

Refer to Table 16: Power Configuration Command-line Arguments for sample display.

3.3.1.7 Displaying BIOS settings (/d biossettings)

The following advanced option can be used to display an individual BIOS setting and the possible values it can take. This can be used for all the possible BIOS settings, which can be configured through syscfg. All the BIOS settings having spaces in between should be enclosed in double quotes (“”).

Settings, which have duplicate names, are not supported through this option. However, in such scenarios syscfg will display the first occurrence.

syscfg /d biossettings <bios setting name>

Note: “biossettings” is an advanced option to display the BIOS settings. The BIOS setting name should be identical to the name “BIOS Setup” displays. Refer to BIOS EPS for more information on the Setup support.

3.3.1.8 Displaying EFI Secure Boot status (/d secureboot)

This option will display the current EFI secure boot status. This option has the following format.

```
syscfg /d secureboot
```

Example:

This example will display the current EFI secure boot status.

```
syscfg /d secureboot
```

3.3.6 BIOS Configuration Interface (/bspwd, /bcs, /bldfs and /bvar)

The options and arguments listed in the table below are used to configure BIOS parameters. These options are prefixed with the letter ‘b’ to indicate BIOS configuration.

Table 4: BIOS Command-line Options and Arguments

Options and Arguments	Description
`/bspwd admin [new_password]`	Sets the BIOS administrator password. This action can only be done after /bsnvlock is successfully set. [new_password] cannot be null. Password length is defined in BIOS EPS.
`/bspwd user [new_password]`	Set the BIOS user password. This action can only be done after /bsnvlock is successfully set. [new_password] cannot be null. Password length is defined in BIOS EPS.
`/bcs “” bios_setting_name value`	Sets the value for a BIOS Setting. This action can only be done after /bsnvlock is successfully set. The value should be determined with the command “**syscfg /d biossettings** bios_setting_name”. The numeric value can be selected from the list of possible values displayed by the above display command
`/bldfs “”`	Load the factory default settings for the BIOS.

Notes:

- “bcs” is an advanced option to change the BIOS settings. The BIOS setting name should be identical to the name “BIOS Setup” displays or as in the BIOS EPS.
- “bcs” switch can be used for setting the Rapid Boot Path on the platforms where the Rapid Boot is supported in BIOS. The variable for the Intel Rapid Boot Path is defined as “Intel Rapid Boot”. Caution should be taken before setting this variable, since this command will switch the normal boot path to rapid boot path and vice versa and once set to rapid boot path the prompt console cannot be seen.

- Most of the settings under server management are saved in BMC, so for some settings under server management, after a reboot the values from BMC will override the values set through "bcs" switch.
- User should be completely aware of the purpose of the BIOS setting he/she is going to change by using "bcs" switch. Failure on the same can result in system malfunction.
- Utility does not support configuring "BMC Configuration" under BIOS "Server Management" settings by using the switches "/bcs" and "/d biossettings".
- Bios Admin Password should be installed before any set operation to biossettings
- "bcs" switch can only be used after Runtime Variable Access - AMISetupNVLock is set successfully.

Examples:

The example below changes the BIOS administrator/user password as explained below:

```
syscfg /bspwd admin "admin@123"
syscfg /bspwd user "user@123"
```

The next example shows an example in which BIOS setting "Quiet Boot" can be displayed:

```
syscfg /d biossettings "Quiet Boot"
Quiet Boot
==========
Current Value: Enable
Possible Values
---------------
0: Disable
1: Enable
```

The next couple examples show ways of how the /bcs switch can be used for setting different BIOS settings.

1. An example to set a single BIOS setup variable such as "Quiet Boot"

```
syscfg /bcs "Quiet Boot" 00 (to disable, 01 to enable)
```

2. An example for setting Rapid Boot Path is

```
syscfg /bcs "Intel Rapid Boot" 01 (to enable, 00 to boot to normal
boot path)
```

The SysCfg utility provides additional BIOS switch to create, modify or delete a new EFI variable of user choice. The command line option of each of these commands is depicted in the following table. The command is supported for Linux*, Windows* and UEFI environment.

Command	Description
`/bvar "" create`	This command creates a new EFI variable. The parameters that "create" command takes are as follows – ▪ Name: name of the EFI variable that to be created ▪ GUID: GUID of the EFI variables ▪ Data: Data for the variable ▪ Attributes: Attribute is optional while creating, if not provided it will take an attribute value of 7 The command will be successful when the command is executed successfully and the variable is created. However if a variable with the same name and GUID is already existing, utility will provide appropriate message.
`/bvar "" overwrite`	This command will overwrite the data value of an existing EFI variable. Following are the parameters passed to this command – Name: Name of the existing variable

Command	Description
	GUID: Optional, however if the name is not unique then the utility will provide message for providing GUID as an additional parameter. Data: Data that are to be overwritten
`/bvar "" delete`	This command will delete an existing EFI variable. The parameters passed are as follows – Name: Name of variable GUID: Optional and needed if name is not unique

Notes:

- Caution should be taken before deleting any EFI variable or rewrite the data of an existing variable. If done wrongly this may lead to the system be unstable.
- The attributes 0, 1, 2, 4 5 and 6 are not supported with this switch.
- The supported attributes are 3 and 7

Attributes	Description
3	Non-Volatile(NV) + Boot Service Access(BS)
7	Non-Volatile(NV) + Boot Service Access(BS) + Real Time(RT)

The below example creates a user defined EFI variable with default attribute (7)

```
syscfg /bvar "" create testvar 33838512-0BC7-4ba4-98C0-0219C2B61BF9
testvardata
```

The below example creates a user defined variable with attribute (3)

```
syscfg /bvar "" create testvar 33838512-0BC7-4ba4-98C0-0219C2B61BF9
testvardata 3
```

The below example overwrites the data of existing EFI variable, here the GUID is optional

```
syscfg /bvar "" overwrite testvar testvarnewdata
```

The below example deletes the data of existing EFI variable, here the GUID is optional

```
syscfg /bvar "" delete testvar
```

3.4 Basic IPMI Configuration Interface

The IPMI interface is used to configure the server management settings maintained by the server management controller of the server, usually the Baseboard Management Controller (BMC).

To support this interface, version 1.5 or 2.0 of the Intelligent Platform Management Interface (IPMI) are required. Most settings described in this section exist only in the firmware's non-volatile memory. However, if a setting also exists in volatile memory, both the volatile and non-volatile versions will be set to the same specified value.

3.4.1 Channel Configuration Interface (/c)

The /channel, or /c, option is used to configure or display IPMI channel settings. These options have the following formats:

```
syscfg /channel [<channel ID> <parameter#> <value>]
syscfg /c [<channel ID> <parameter#> <value>]
```

If no arguments are specified, the valid IPMI serial and LAN channels available for out-of-band access are displayed. The channel numbers displayed are needed in many of the syscfg commands. The channel display will look similar to the following:

```
Channel #       Channel    Access       Channel          Supported
                 Type       Mode        Privilege         Features
==========================================================================
   1             LAN       Always         Admin          LAN-SNMP-SMTP



   8             LAN       Always         Admin          LAN-SNMP-SMTP
```

In other forms of the syscfg command using the `/channel` option, users specify a parameter number and the value for that parameter. The valid `<parameter#>` and `<value>` values are shown in the table below.

Table 5: Channel Configuration Parameters and Settings

Parameter #	Valid Values	Description
1–4	Straight, MD5	Authentication types setting, NOT valid for RMCP+ **Note**: Parameter 1–4 are Not Supported.
5	Enable, Disable	Per Message Authentication
6	Enable, Disable	User Level Authentication Enable **Note**: Disable is not supported.
7	Disabled, PreBoot, Always, Shared	Access Mode. Values of “preboot” and “shared” are only valid for serial channels. Refer to the respective platforms Firmware EPS for the available supported options.
8	Callback, User, Operator, Admin	Privilege Level Limit for the channel
9	Enable, Disable	Enable/disable for PEF on the specified channel. This argument is not supported on PC87431M-based systems.

Note: Serial channel configuration is not supported.

Examples:

The example enables per message authentication but disables user-level message authentication:

```
syscfg /c 1 5 enable /c 1 6 enable
```

The next example makes the LAN channel always available for out-of-band access and sets the privilege level to user:

```
syscfg /c 1 7 always /c 1 8 User
```

3.4.2 LAN Channel Configuration Interface

The following command-line options are used to configure LAN channel settings.

- `/lanEnable or /le`
- `/lanAlertEnable or /lae`
- `/lanConf or /lc`
- `Lanfailover or lfo`

3.4.1.1 LanEnable Option (/le)

The /**l**an**E**nable option is used to enable a LAN channel. If the IP address source (refer to argument 2) is configured as DHCP or BIOS, the IP and subnet arguments are ignored. This option has the following formats:

```
syscfg /lanenable <channel ID> <IP address source> <host IP address (static
IP only)> <subnet mask (static IP only)>

syscfg /le <channel ID> <IP address source> <host IP address (static IP
only)> < subnet mask (static IP only)>
```

The table below describes the arguments for this option.

Table 6: LAN Enable Configuration Arguments

Argument #	Possible Values	Description
1	Decimal value of LAN channel number to configure.	LAN Channel ID
2	Static, DHCP	IP address source: • static = static IP address supplied by user (Use 0.0.0.0 if "host IP address" and "subnet mask" are empty) • DHCP = address obtained by BMC running DHCP
3	Valid IP address	IP address (static only)
4	Valid IP address	Subnet Mask (static only)

Note:

- Some of the LAN settings like Default Gateway IP, Backup Gateway IP, etc., can be configured only after configuring Host IP and Subnet Mask IP.
- The Gateway IP is set to 0.0.0.0 when user changes the IP Address from one Subnet to other.
- For enabling DHCP for any particular LAN channel follows the specified rule of setting DHCP as describes in RFC. Unless the DHCP server is in the domain the DHCP setting may not have the effect of the desired LAN configuration.

Examples:

The example below assumes channel 1 is a LAN channel. The command enables the channel and sets it to get its IP address via a DHCP server:

```
syscfg /le 1 dhcp
```

The next example enables channel 1 and assigns it IP address 10.78.211.43:

```
syscfg /le 1 static 10.78.211.43 255.255.255.0
```

3.4.1.2 LanAlertEnable Option (/lae)

The /**l**an**A**lert**E**nable option is used to enable LAN alerts on a channel. This option has the following formats:

```
syscfg /lanalertenable <channel ID> <gateway IP address> <gateway MAC
address> <community string> <backup gateway IP address (required only if a
```

```
backup gateway MAC address is also specified)> [backup gateway MAC address]

syscfg /lae <channel ID> <gateway IP address> <gateway MAC address>
<community string> <backup gateway IP address (required only if a backup
gateway MAC address is specified)> [backup gateway MAC address]
```

The table below describes the arguments for this option.

Table 7: LAN Alert Enable Configuration Arguments

Argument #	Possible Values	Description
1	Decimal value, must be a valid IPMI channel number.	LAN Channel ID
2	Valid IP address	Gateway IP
3	Valid MAC address (format=xx-xx-xx-xx-xx-xx or xx:xx:xx:xx:xx:xx, where each "xx" is a two-digit hex value), Resolve.	Gateway MAC
4	ASCII string of up to 18 bytes	Community String. If any spaces are included, the entire string must be enclosed in double quotes
5	Valid IP address	Backup Gateway IP [1]
6	Valid MAC address (format=xx-xx-xx-xx-xx-xx or xx:xx:xx:xx:xx:xx, where each "xx" is a two-digit hex value), Resolve.	Backup Gateway MAC [2]

For argument 3 and 6, if "resolve" is chosen as the argument value, before any values are written to the firmware, the utility attempts to auto-resolve the MAC address of the destination IP address. If the MAC address can be resolved, it and all the other settings are written to the firmware. If it cannot be resolved, an error message is displayed, and no data is written to the firmware.

Note:

- Argument 5 is required only if Backup Gateway MAC address is supplied (argument 6).
- Argument 6 is optional, but the Backup Gateway IP (argument 5) is required if this argument is supplied.
- Use of resolve command is not encouraged
- Default gateway MAC address is set to read-only in Kelton Pass platform and can only be obtained by ARP
- Make sure IP address source is set to static before using these commands

Examples:

The command below sets up a gateway and backup IP address for sending LAN alerts, and also configures a community string that is part of the alert packet:

```
syscfg /lae 1 10.239.59.242 00-30-FC-8F-90-BB public 10.239.59.243 0F-34-32-
AA-A8-9B
```

The command below is the same as the preceding command except the community string is set to a null string:

```
syscfg /lae 1 10.239.59.242 00-30-FC-8F-90-BB "" 10.239.59.243 0F-34-32-AA-
A8-9B
```

3.4.1.3 LanConf Option (/lc)

In addition to IPv4, S1400/S1600/S2400/S2600/S4600 platform supports IPv6 for manageability channels. Configuration of IPv6 is provided by extensions to the IPMI Set & Get LAN Configuration Parameters commands.

The BMC supports IPv4 and IPv6 simultaneously. They are both configured separately and completely independently. For example, IPv4 can be DHCP configured while IPv6 is statically configured or vice versa. The parameters for IPv6 are similar to the parameters for IPv4 with the following differences:

- An IPv6 address is 16 bytes vs. 4 bytes for IPv4.
- An IPv6 prefix is 0–128 bits whereas IPv4 has a 4 byte subnet mask.
- The IPv6 Enable parameter must be set before any IPv6 packets will be sent or received on that channel.
- There are two variants of automatic IP Address Source configuration vs. just DHCP for IPv4.

The three possible IPv6 IP Address Sources for configuring the BMC are:

Static (Manual): The IP, Prefix, and Gateway parameters are manually configured by the user. The BMC ignores any Router Advertisement messages received over the network.

DHCPv6: The IP comes from running a DHCPv6 client on the BMC and receiving the IP from a DHCPv6 server somewhere on the network. The Prefix and Gateway are configured by Router Advertisements from the local router. The IP, Prefix, and Gateway are read-only parameters to the BMC user in this mode.

Stateless auto-config: The Prefix and Gateway are configured by the router through Router Advertisements. The BMC derives its IP in two parts: the upper network portion comes from the router and the lower unique portion comes from the BMC's channel MAC address. The 6-byte MAC address is converted into an 8-byte value per the EUI-64* standard.

The `/lanConf` option provides another way to configure most of the settings previously discussed, but it allows only one setting to be specified at a time. The `/lanconf` option has the following formats:

```
syscfg /lanconf <channel_ID> <parameter#> <value>
syscfg /lc <channel_ID> <parameter#> <value>
```

The table below shows the valid values for <parameter#> and <value>. The values in the parameter# column below correspond to parameter numbers for the Get/Set LAN Configuration commands in the IPMI specification and OEM commands specified by the platform Firmware EPS.

Table 8: LAN Configuration Parameters and Settings

Parameter#	Valid Values	Description
2a, 2b, 2c, 2d	Straight, MD5	Authentication type enables for different privilege level Not valid for RMCP+ **Note:** Not supported.
3	Valid IP address	IP Address
4	Static, DHCP	IP address source: static = static IP address supplied by user; DHCP = address obtained by BMC running DHCP (only available with Advanced server management capabilities)
6	Valid IP address	Subnet Mask

Parameter#	Valid Values	Description
10	Enable, Disable	Gratuitous ARP enable (This option is only supported for ESB2 LAN channels)
10b	Enable, Disable	BMC-generated ARP responses
11	Decimal value between 0–255; input value to BMC is rounded down to the nearest lower (floor value) 500ms value (e.g. if 3450 is input, the value stored is for an interval of 3000 ms.)	Gratuitous ARP interval in milliseconds (This option is not supported in dedicated LAN channel)
12	Valid IP address	Gateway IP address
13	Valid MAC Address	Gateway MAC address **Note:** Default gateway MAC address is set to read-only in Kelton Pass platform and can only be obtained by ARP
14	Valid IP address	Backup Gateway IP address
15	Valid MAC Address	Backup Gateway MAC address
16	Up to an 18 byte ASCII string	Community String. If any spaces are included, the entire string must be enclosed in double quotes
102	Enable, Disable	IPv6 Enable
103	Static, DHCPV6 and Auto	IPv6 IP Address source **Note:** Mke sure there is already valid IPv6 IP address set by default
104	16 bytes of valid IPv6 address Supported format: xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	IPv6 IP Address **Note:** Make sure there is already valid IPv6 IP address set by default
105	Prefix length should be from 0 to 128 as per IPv6 spec	IPv6 Prefix Length **Note:** Make sure there is already valid IPv6 IP address set by default
106	16 bytes of valid IPv6 address This is the address of the gateway (router) used when the BMC sends a message or alert to a party on a different subnet than the one the BMC is on Supported format: xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	IPv6 Default Gateway **Note:** Make sure there is already valid IPv6 IP address set by default

Note: The Host IP, Subnet Mask and Default Gateway IP cannot be set when DHCP is enabled for the LAN channel.

Example:

The example below sets the authentication type enables for user-level users of channel 1 to enable straight password, MD5, or no authentication:

```
syscfg /lc 1 15 00-00-5E-00-02-02
syscfg /lc 1 10b Enable
syscfg /lc 1 104 FE80:0000:0000:0000:0000:0000:0000:0012
syscfg /lc 1 106 0000:0000:0000:0000:0000:0000:C0A0:0101
```

3.4.1.4 Lan Failover (/lfo)

BMC Firmware provides a LAN failover capability such that the failure of the system HW associated with one LAN link will result in traffic being rerouted to an alternate link. SysCfg utility provides the switch "lfo", allowing user to specify the physical LAN links constitute the redundant network paths or physical LAN links constitute different network paths. If BMC supports LAN failover on specific NIC, it bonds two or three NIC. If not, the BMC will support only all or nothing" approach – that is, all interfaces bonded together, or none are bonded together.

The LAN Failover feature applies only to BMC LAN traffic. It bonds all available Ethernet devices but only one is active at a time. When enabled, if the active connection's leash is lost, one of the secondary connections is automatically configured so that it has the same IP address. Traffic immediately resumes on the new active connection.

The `/lanfailover` option has the following formats to Enable or Disable LAN failover feature.

```
syscfg /lfo <mode> <NIC1> <NIC2> <NIC3> <primary NIC>
```

The table below describes the arguments for this option.

LAN failover Configuration Arguments

Argument #	Possible Values	Description
1	Enable, Disable	Enable or disable LAN failover.
2	Enable, Disable	If NIC1 is bonded for failover. Optional, needs BMC supports LAN failover on specific NIC.
3	Enable, Disable	If NIC2 is bonded for failover. Optional, needs BMC supports LAN failover on specific NIC.
4	Enable, Disable	If NIC3 is bonded for failover. Optional, needs BMC supports LAN failover on specific NIC.
5	Decimal value of NIC number from 1 to 3	Primary NIC for LAN failover. Optional, needs BMC supports LAN failover on specific NIC.

Example:

The example below bonds all interfaces for failover when BMC does not support LAN failover on specific NIC.

```
syscfg /lfo Enable
```

The example below bonds specific NIC for failover and indicates primary NIC when BMC supports it.

```
syscfg /lfo Enable Enable Enable Disable 1
```

The example below bonds none of interfaces for failover

```
syscfg /lfo Disable
```

3.4.3 Platform Event Filtering (PEF) Configuration Interface

The following options are used to configure PEF settings. This includes event filter configuration and alert policy configuration.

- /pefConfig or /pefc
- /pefFilter or /peff
- /pefPolicy or /pefp

Note: Although transparent, the usage of the PEF commands across the platforms, the behavior of filter configurations and alert policies are dependent on the platform Firmware. See the Platform Firmware EPS for detailed information.

3.4.1.5 PefConfig Option (/pefc)

The /pefconfig option is used to set the PEF global enable/disable setting and to globally enable/disable the various PEF power actions. This option is not supported on PC87431M-based systems. This option has the following formats:

```
syscfg /pefconfig <global PEF state> <global control>

syscfg /pefc <global PEF state> <global control>
```

The table below describes the arguments for this option.

Table 9: Global PEF Configuration Arguments

Argument #	Possible Values	Description
1	Enable, Disable	Global PEF state. PEF can be enabled or disabled globally with this setting.
2	NONE, ALERT, PDOWN, RESET, PCYCLE, DIAGINT, OEM_ACTION, where PDOWN = power down and PCYCLE = power cycle	Globally enables or disables the various actions associated with events. Multiple actions can be enabled by separating them with a plus sign ('+'). Any actions not specified are disabled. Specifying NONE will disable all actions. NONE cannot be specified with any other actions.

Example:

The example below globally enables PEF and enables alert, power down, reset, and power cycle actions for events (diagnostic interrupts will be disabled):

```
syscfg /pefc enable alert+pdown+reset+pcycle
```

The example below globally disables PEF and all power actions:

syscfg /pefc disable none

3.4.1.6 PefFilter Option (/peff)

The /pefFilter option is used to configure the PEF filters. Commands using this option have the following formats:

```
syscfg /peffilter <filter table index> <filter state> <action> <policy #>

syscfg /peff <filter table index> <filter state> <action> <policy #>
```

The table below describes the arguments for this option.

Table 10: PEF Filter Configuration Arguments

Argument #	Possible Values	Description
1	Decimal value indicating the index of an event filter; acceptable values are in the range 1 to n, where n is the number of event filters supported by the platform.	Filter Table Index. Refer to the platform EPS for information on filters and associated filter numbers.
2	Enable, disable	Indicates whether specified filter is enabled or disabled
3	PCYCLE | RESET | PDOWN | ALERT | NONE, where PCYCLE = power cycle and PDOWN = power down	Actions; if NONE is specified, any currently set action will be disabled.
4	Decimal value in the range from 1 to 15.	Policy number (will map to entries with the corresponding policy number in the alert policy table).

Example:

The example below associates a chassis action of power off and a policy number of 1 with the event filters in locations 3 and 4 of the event filter table and enables them:

```
syscfg /peff 3 enable pdown 1 /peff 4 enable pdown 1
```

3.4.1.7 PefPolicy Option (/pefp)

The `/pefPolicy` option is used to configure the PEF policy table entries, which govern actions taken when events defined by the event filters occur. Commands using this option have the following formats:

```
syscfg /pefpolicy  <policy table index> <policy table index state> <policy
#>  <policy>  <destination channel ID>  <destination table index>

syscfg /pefp  <policy table index> <policy table index state> <policy #>
<policy>  <destination channel ID>  <destination table index>
```

The table below describes the arguments for this option.

Depending on the platforms Firmware, the alert policy could either be pre-populated or not. For the non pre-populated alert policies, the entire alert policy table should be formed.

Table 11: PEF Policy Configuration Arguments

Argument #	Possible Values	Description
1	Decimal value indicating a location in the policy table; acceptable values are in the range 1 to n, where n is the number of policy table entries supported by the platform.	Policy Table Index
2	Enable, disable	Indicates whether the entry in the policy table specified with argument 1 is enabled or disabled.
3	Decimal value indicating a policy number to be associated with the policy table entry specified by argument 1; valid values are in the range 1–15	Policy number.

Argument #	Possible Values	Description
4	ALWAYS, NEXT_E, STOP, NEXT_C, NEXT_T • ALWAYS = always send an alert to the destination indicated in the policy table entry specified by argument 1 • NEXT_E = if an alert was successfully sent to the previous destination attempted, then do not send an alert to the destination indicated in the policy table entry specified in argument 1, but go to the next policy table entry with the same policy number instead • STOP=if an alert was successfully sent to the previous destination attempted, then do not send an alert to the destination indicated in the policy table entry specified in argument 1, and do not process any more policy table entries • NEXT_C = if an alert was successfully sent to the previous destination attempted, do not send an alert to the destination indicated in the policy table entry specified in argument 1, but go to the next policy table entry with the same policy number but that will send an alert on a different channel • NEXT_T = if an alert was successfully sent to the previous destination attempted, do not send an alert to the destination indicated in the policy table entry specified in argument 1, but go to the next policy table entry with the same policy number but a different destination type.	Policy.
5	Decimal value indicating a valid IPMI channel.	Channel Number of IPMI channel on which to send alert out on.
6	Decimal value in the range from 1 to n, where n varies based on number of destinations for the channel indicated by argument 4 (such as, if a LAN channel is indicated in argument 4, then n is the number of LAN alert destinations supported by the platform).	Destination Table Index; for example, the index of a specific LAN alert destination in the table of LAN alert destinations.

Example:

The example below sets up policy table entry 1. Assuming that IPMI channel 1 is a LAN channel, the entry is set up so that it is associated with policy number 3. A LAN alert is always sent out when an event associated with policy number 3 occurs, and the destination is the first LAN alert destination defined in the set of LAN alert destinations.

```
syscfg /pefp 1 enable 3 ALWAYS 1 1
```

The next example sets up policy table entry 2. Again assuming that IPMI channel 1 is a LAN channel, this policy table entry is set up identically to the first policy table entry (see previous example) except that the LAN alert destination is the second one defined in the set of LAN alert destinations.

```
syscfg /pefp 2 enable 3 ALWAYS 1 2
```

The next example sets up policy table entry 3. It is set up to be associated with the same policy number as the first two policy table entries, but specifies a page destination instead of a LAN alert destination. The destination is the first page destination in the list of page destinations. This example assumes IPMI channel 4 is a serial channel.

```
syscfg /pefp 3 enable 3 ALWAYS 4 1
```

3.4.4 Serial Over LAN (SOL) Configuration Interface (/sole)

The following option is used to configure the Serial Over LAN (SOL) settings. Note that the first argument is a channel number; this argument is disregarded on IPMI 1.5 systems.

```
/solEnable or /sole
```

Commands with this option can have the following formats:

```
syscfg /solEnable <channel ID> <SOL state> <privilege level limit> <baud
rate> <retry count> <retry interval>

syscfg /sole <channel ID> <SOL state> <privilege level limit> <baud rate>
<retry count> <retry interval>
```

The table below describes the arguments used to configure SOL.

Table 12: SOL Enable Configuration Arguments

Argument #	Possible Values	Description
1	Decimal value; must be a valid IPMI channel number.	Channel ID of LAN channel used for SOL
2	Enable, Disable	SOL Enable
3	User, Operator, Admin	Privilege Level Limit
4	9600, 19200, 38400, 57600, 115200	BAUD rate in bits per second
5	Decimal value in the range 0–7	Retry Count
6	Decimal value in the range 0–2559, rounded down to the nearest unit of 10 (e.g. 1449 would be rounded down to 1440)	Retry interval in milliseconds

Note:

1. SOL configuration settings #3 to #6 should only be entered only if parameter #2 SOL state is 'Enable'
2. For M70KLP platform the BAUD rate is not supported hence the command should be:

```
syscfg /sole <channel ID> <SOL state> <privilege level limit> <retry count>
  <retry interval>
```

Example:

The example below enables SOL so that only administrator-level users can use it:

```
syscfg /sole 1 enable admin 0 10
```

3.4.5 User Configuration Interface

The following options are used to configure the user settings. This includes setting the user name, password, and privilege level.

- /user or /u
- /userprivilege or /up
- /userenable or /ue

3.4.1.8 User Access Option (/u)

The /**u**ser option is used to configure the user settings. Along with setting user name and password, Global User Status is Enabled. Commands using this option can have the following formats:

```
syscfg /user <user ID> <user name> <password>
```

```
syscfg /u <user ID> <user name> <password>
```

The table below describes the arguments for this option.

Table 13: User Access Arguments

Argument #	Possible Values	Description
1	2 to n (decimal), the maximum value for n is 3 i.e only three users are supported irrespective of the platforms; 1 is typically the anonymous which is NOT allowed to be modified for security purpose.	User ID.
2	Can be any ASCII-printable characters in the range 0x21 to 0x7e except '[' and ']'; up to 16 bytes, or "" to leave the user name as anonymous.	User name.
3	ASCII string of at lease 6 bytes and up to 20 bytes	Password

Notes:

1. The User ID 1 both name and password cannot be modified.
2. The User ID 2 (Root) names cannot be modified.
3. The User ID 2 (Root) privilege level will always be Admin, and this cannot be changed.
4. Duplicate UserNames are not supported.
5. The Username cannot have the below mentioned characters in Linux* environment as these characters are shell specific.

   " Double quote hex value 22
   & Ampersand hex value 26
   ' Single quote hex value 27
   (Left parenthesis hex value 28
) Right parenthesis hex value 29
   : Colon hex value 3A
   ; Semi colon hex value 3B
   < Less than hex value 3c
   \ Back slash hex value 5C
   ` Hex value 60
   > Greater than hex value 3E
   | Vertical bar hex value 7c and
   ~ hex value 7Eh

Examples:

The example below sets the username for user 3 to BobT and the password for user 3 to "gofpsw"

```
syscfg /user 3 BobT gofpsw
```

The example below sets the user password for user 2 to user02

```
syscfg /user 2 root user02
```

3.4.1.9 UserPrivilege Option (/up)

The /**u**ser**p**rivilege option is used to configure the user access settings per channel. Note that the channel privilege level overrides user privilege levels. Commands using this option can have the following formats:

```
syscfg /userprivilege <user ID> <channel ID> <privilege level limit>
[<payload enables>]
```

```
syscfg /up <user ID> <channel ID> <privilege level limit> [<payload
enables>]
```

The table below describes the arguments for this option.

Table 14: User Privilege Arguments

Argument #	Possible Values	Description
1	2 to n (decimal), where n is the number of users the platform supports; 1 is typically the anonymous user which is NOT allowed to be modified for security purpose.	User ID number.
2	Channel number (decimal)	Channel ID
3	Callback, User, Operator, Admin, None	Privilege Level Limit; none indicates the channel is unavailable to the selected user.
4	SOL, Disable	Optional argument to enable the specified user to send SOL packets on the specified channel.

Examples:

The example below sets the privilege level on IPMI channel 1 to administrator for user 2:

```
syscfg /up 2 1 ADMIN
```

The example below sets the privilege level on IPMI channel 3 to user for user 3:

```
syscfg /up 3 3 user
```

The next example sets the privilege level to administrator for user 2 on channel 1 and enables user 2 to send SOL packets on channel 1:

```
syscfg /up 2 1 admin sol
```

3.4.1.10 UserEnable Option (/ue)

The `/UserEnable` option is used to enable or disable a user on a particular channel. Also Global User Status is Enabled. Commands using this option can have the following formats:

```
syscfg /userenable <user ID> <user state> <channel ID>

syscfg /ue <user ID> <user state> <channel ID>
```

The table below describes the arguments for this option.

Table 15: User Enable/Disable Arguments

Argument #	Possible Values	Description
1	2 to n (decimal), where n is the number of users the platform supports; 1 is typically the anonymous user which is NOT allowed to be modified for security purpose.	User ID number.
2	Enable, Disable	User status (enabled or disabled)
3	Decimal value; must be a valid IPMI channel number.	Channel ID of IPMI channel on which access for the specified user is to be enabled or disabled

Examples:

The example below disables user 2 for channel 1:

```
syscfg /ue 2 disable 1
```

The example below enables user 2 for channel 1.

```
syscfg /ue 2 enable 1
```

Notes:

1. To support IPMI 2.0 errata, the command functionality for User Enable/Disable status has been changed. The user enable/disable option is now globally applicable irrespective of the channels. The usage of this command for any one channel will set the user enable/disable for all the channels.
2. only run this command for configured users.
   AMI BMC sends proper response for “Get User Payload access” command only for configured users.

3.4.6 Power Configuration Interface (/prp)

The following option is used to configure power settings in the server management firmware.

```
/prp
```

Commands using this option can have the following format:

```
syscfg /prp <power restore policy>
```

The table below describes the arguments for this option.

Table 16: Power Configuration Command-line Arguments

Argument #	Possible Values	Description
1	Off, On, Restore	Power restore policy: • off = chassis stays powered off when power is reapplied after being lost • on = chassis powers up when power is restored • restore = power is restored to the state that was in effect when power was lost

Example:

The example below sets the powers restore policy so the server stays powered off when power is reapplied to the system after being lost.

```
syscfg /prp OFF
```

3.5 System Configuration Interface

3.5.1 Clear SEL (/csel)

The following options are used to clear the SEL (System Event Log) of the BMC.

/csel

The following example illustrates the usage of the feature.

Example:

```
syscfg /csel
```

3.5.2 Time Of Day (/dt)

The following options can be used to set the date and time of the system.

/timeofday or /dt

```
syscfg /dt "" <time> <date>
```

Table 17: Date time command argument format

Argument #	Possible Values	Description
1	""	Admin password, Keep as ""
2	Time	The time of day in hr:min:sec format.
3	Date	The date in mm/dd/yyyy format.

The following example illustrates the usage of the time of day function.

Example:

```
syscfg /dt "" 10:12:23 01/20/2021.
```

3.5.3 Restore Firmware Settings (/rfs)

The following options are used to restore the firmware settings. This will set the factory default configuration of the BMC firmware.

/restorefirmwaresettings or /rfs

This command should be accompanied by a "Reset BMC" command or AC Power cycle. Failure to do so can result in unpredictable behavior from BMC.

The following example illustrates the usage of the Restore Firmware Settings feature.

Example:

```
syscfg /rfs
```

3.5.4 Reset BMC (/rbmc)

The following options are used to reset the BMC.

/resetBMC or /rbmc

This command should be used standalone. Firmware may take a few minutes to reset and come to a steady state. So, it is recommended not to issue any SYSCFG commands immediately after “Reset BMC” command. Otherwise, there would be unexpected result occurred.

The following example illustrates the usage of the Reset BMC feature.

Example:

```
syscfg /rbmc
```

3.5.5 Saving BMC debug log to a file

SysCfg utility provides an option to save BMC debug log to a ZIP file for system diagnostics purpose.

The switch used to save BMC debug log to a ZIP file is:

/savebmcdebuglog or /sbmcdl

Argument #	Possible Values	Description
1	Public	Regular System Diagnostics(Public) Public
2	File name	Name of the file to save the BMC diagnostics data, the extension should be .zip or .ZIP

Example:

The below command saves Regular System Diagnostics data to Public.zip file

```
syscfg /sbmcdl Public Public.zip
```

3.5.6 Saving BMC SOL log to a file

SysCfg utility provides an option to save BMC SOL log to a *.log file for dumping system serial output.

The switch used to save BMC SOL log to a *.log file is:

/sbmcsol

Argument #	Possible Values	Description
1	File name	Name of the file to save the BMC SOL data, the extension should be .log or .LOG

4. Installation and Un-installation

Refer to Release note in each release package

- For all Linux* OS version, the executables can be executed directly.
- Support for Open IPMI / Intel IPMI drivers
- SysCfg uses Open IPMI / Intel IPMI drivers for communicating with BMC.
- If Open IPMI driver is installed SysCfg uses the device file interfaces published by the Open IPMI driver.
- If Open IPMI driver is not present SysCfg uses interfaces published by Intel IPMI driver for communicating with BMC.
- If Intel IPMI driver is not present SysCfg uses a proprietary user mode mechanism to communicate with the BMC.
- If SysCfg does not find an instance of Intel IPMI driver installed and Microsoft* IPMI driver is present, it will use Microsoft* IPMI driver.
- If SysCfg does not find an instance of Microsoft* IPMI driver installed and Intel IPMI driver is present, it will upgrade the Intel IPMI driver and uses it.
- If both Intel IPMI and Microsoft* IPMI driver are installed, then utility will use Intel IPMI driver.
- The process enabling Microsoft* IPMI driver after installing Windows* server 2003 R2 SP2 Operating system can be located at:

  http://technet.microsoft.com/en-us/library/cc781099.aspx

4.1 Microsoft Windows* Installation

4.1.1 Installation

The System Configuration utility can be installed on Windows* using the following method:

1. Unzip zip package and copy the contents to external media.
2. Connect the external media to SUT (System Under Test).
3. Go to the Drivers\Win folder, choose x86 or x64 (depending on the operating system).
4. Run install.cmd to install the drivers.
5. Go to win_x86 or win_x64 folder.
6. Now run syscfg.exe.

4.1.2 Uninstallation

1. Run uninstall.cmd to uninstall all the drivers.
2. Remove the syscfg folder structure.
3. Reboot the system for the changes to take effect.

4.2 Linux* Installation

Refer to the supported operation system listed in release note.

4.2.1 Installation

4.2.1.1 RPM Installation

1. Copy syscfg rpm from corresponding folder to local folder.
   -> for RHEL older than 8.0, copy from Linux_x64\RHEL
   -> for RHEL8.0 and above, copy from Linux_x64\RHEL\RHEL8
   -> for SLES older than 15, copy from Linux_x64\SLES
   -> for SLES15 and above, copy from Linux_x64\SLES\SLES15

2. If there is another version already installed, uninstall that version first before installing the new version.
3. Install syscfg utility by using "rpm -ivh syscfgxxx.rpm". This will install the utility in "/usr/bin/syscfg/".
4. On RHEL/SLES, after installing the rpm, close the terminal from which rpm was installed and then execute utility from a new terminal.

4.2.1.2 Regular Installation:

1. Copy the zip package (for RHEL or SLES) to local folder.
2. Unzip to local folder (example: .\syscfg). Go to syscfg folder (cd syscfg).
3. # chmod 755 install.sh
4. Install the utility using the command: "#./install.sh"
5. Go to the RHEL or SLES directory (based on operating systems)
6. Unzip the file syscfg.zip to get syscfg executable for Linux* OS
7. Now you can run command with options (example: "# ./ syscfg -i")

4.2.2 Uninstall

To uninstall the syscfg utility, remove the syscfg folder structure.

For RPM uninstallation, run command #rpm -e syscfg for RPM uninstallation.

4.3 UEFI Installation

Refer to the supported operation system listed in release note.

4.3.1 Installation

The System Configuration utility can be installed on UEFI using the following method:

1. Unzip the package and copy the contents to external media.
2. Connect the external media to SUT (System Under Test)
3. Go to UEFI_x64 folder.
4. Now run Syscfg.efi.

4.3.2 Uninstall

To uninstall the Syscfg utility, remove the syscfg folder structure.

5. Exit Error Codes

When the utility exits, an error code related to the last error message will be returned, which, if desired, can be retrieved by the user. If successful, the error code is zero. If an error occurs, then the exit code will be some positive number above zero.
The messages shown below are interpretations of various error codes returned by the utility. The actual error message could vary depending on the scenario at which the error occurs.

Table 18: Exit Error Codes

Value	Interpretation	Suggested Actions
0	Successful Completed.	
1	Invalid invocation	Check 'syscfg -?' for usage information.
2	Invalid command line argument	Check 'syscfg -?' for usage information. Check BIOS or BMC specification for specific option usage.
3	File I/O error.	Check whether file exists. Check whether file name and its upper and lower case are correct. Check whether current user has the privilege to read or write file.
4	Platform mismatch	Check whether the operation supports current platform. For example, RESTORE ini file platform information should match current platform.
5	BMC interface error	Check whether IPMI driver is installed correctly in Windows* (Reboot is required after installation) Check whether OpenIPMI driver is started (if needed) in Linux*. Refer to release notes "Pre-requisites". Check whether BMC is in normal operation mode Check whether other CSW utilities are running at the same time. Only one utility is allowed at one time.
6	Reserved	Reserved for future
7	Password mismatch	Check whether admin or user password are correct
8	Reserved error	General error, need further investigation

Appendix A. BIOS and Firmware Configuration Settings Saved/Restored by this Utility

The utility saves all BOOT variables that BIOS provides an interface to read and write. These variables may differ from platform to platform so are not listed in this document.

The save and restore of firmware settings can be done by using /s and /r command line options. The server management firmware settings that are saved to a file or restored to a system from a file for each of the supported server management controllers are listed in the tables below.

Table 19: Power Configuration Settings

Value	IPMI 2.0
Power Restore Policy	Yes

Table 20: LAN Channel Settings

Value	IPMI 2.0
Alert Enable	Yes
Access Mode	Yes
Privilege Level Limit	Yes
Community String	Yes
ARP enable	Yes
ARP interval	Yes
DHCP enabled	Yes
Host IP	No
Subnet Mask	Yes
Gateway IP	Yes
Backup Gateway IP	Yes
Backup Gateway MAC	Yes
IPV6 Status	Yes
IPV6 Source	Yes
IPV6 Prefix Length	Yes
IPV6 IP address	Yes
IPV6 Gateway IP address	Yes

Note: Save and Restore of Host IP, Subnet Mask, Default Gateway IP, Default Gateway MAC, Backup Gateway IP, IPV6 IP address and IPV6 Gateway IP is not supported.

Table 21: LAN Alert Settings

Value	IPMI 2.0
Alert Acknowledge Enabled	Yes
Alert IP	Yes
Alert MAC	Yes
Gateway Selector	Yes
Retry Count	Yes
Retry Interval	Yes

Table 22: User Settings

Value	IPMI 2.0
User Name	Yes
User Password	Yes
Privilege Level Limit	Yes
Callback Status	Yes
Link Authentication Enable	Yes
IPMI messaging enabled	Yes

Table 23: Platform Event Filter Settings

Value	IPMI 2.0
PEF Enable	Yes
Event Message for PEF Action	No
Startup Delay	Yes
Alert Startup Delay	Yes
Global Control Actions	Yes
Event Filters	Yes
Alert Policies	Yes

Table 24: Serial Over LAN Settings

Value	IPMI 2.0
SOL Enable	Yes
SOL Privilege Level	Yes
SOL Retry Count	Yes
SOL Retry Interval	Yes
SOL Baud Rate	Yes
SOL Authentication Enable	Yes

Note: On M70KLP platform the Save and Restore of SOL Baud Rate is not supported.

Appendix B. Glossary

Table 25: Glossary

Term	Definition
BIOS	Basic Input/Output System.
BMC	Baseboard Management Controller. The primary microcontroller that controls the operation of the Intel® Server Management subsystem.
CR	Carriage return
EAS	External Architecture Specification
EPS	External Product Specification
IPS	Internal Product Specification
IPMI	Intelligent Platform Management Interface
LF	Line Feed
NULL	Means that no characters are output by the management controller when used in the context of terminal mode settings.
SM	Server Management
SMU	System Maintenance Utility
SW	Software
FW	Firmware
WinPE	Windows* Preinstallation Environment

Appendix C. An example of INI file

Instructions for using INI file:

- Section Header – must not be edited – could lead unpredictable behavior.
- Un-editable fields have specific instructions
- Options for the fields are clearly called out – no other options allowed
- Not all IPMI/BIOS settings under a section will be available – only those that are required for the user to configure
- The section headers are generated automatically depending on the platform and few sections and fields may not be available depending on the platform firmware and BIOS

```
; Warning!!! Warning!!! Warning!!!
; --------------------------------
; This file has been generated in a system with the BIOS/Firmware
; specifications as mentioned under [SYSTEM] section. Please do not
; modify or edit any information in this section. Attempt to restore
; these information in incompatible systems could cause serious
; problems to the systems and could lead the system non-functional.
; Note: The file is best seen using wordpad.


[SYSTEM]
BIOSVersion=SE5C620.86B.01.02.0009.010320210939       ; This field should not be edited
FWOpcodeVersion=2.00.87868596                         ; This field should not be edited

[POWER]
PowerRestorePolicy=ON                                 ; Options: On, Off or Restore

[USERS]
NumberOfUsers=3                                       ; This field should not be edited

[USERS::USER1]
GlobalUserStatus=DISABLE                              ; Options: Enable or Disable
PrivilegeCh11=ADMIN                                   ; Options: User, Operator, Admin,
Callback, NoAccess
UserAccessCh1=DISABLE                                 ; Options: Enable or Disable
SOLEnableCh1=ENABLE                                   ; Options: Enable or Disable
PrivilegeCh18=ADMIN                                   ; Options: User, Operator, Admin,
Callback, NoAccess
UserAccessCh8=DISABLE                                 ; Options: Enable or Disable
SOLEnableCh8=ENABLE                                   ; Options: Enable or Disable

[USERS::USER2]
UserName=admin                                        ; ASCII printable characters in the
range of 0x21 to 0x7E. Max length 16 bytes
GlobalUserStatus=ENABLE                               ; Options: Enable or Disable
PrivilegeCh11=ADMIN                                   ; Options: User, Operator, Admin,
Callback, NoAccess
UserAccessCh1=DISABLE                                 ; Options: Enable or Disable
SOLEnableCh1=ENABLE                                   ; Options: Enable or Disable
PrivilegeCh18=ADMIN                                   ; Options: User, Operator, Admin,
Callback, NoAccess
UserAccessCh8=DISABLE                                 ; Options: Enable or Disable
SOLEnableCh8=ENABLE                                   ; Options: Enable or Disable

[USERS::USER3]
UserName=Administrator                                ; ASCII printable characters in the
range of 0x21 to 0x7E. Max length 16 bytes
GlobalUserStatus=ENABLE                               ; Options: Enable or Disable
```

```
PrivilegeCh11=ADMIN                                    ; Options: User, Operator, Admin,
Callback, NoAccess
UserAccessCh1=ENABLE                                   ; Options: Enable or Disable
SOLEnableCh1=DISABLE                                   ; Options: Enable or Disable
PrivilegeCh18=NOACCESS                                 ; Options: User, Operator, Admin,
Callback, NoAccess
UserAccessCh8=DISABLE                                  ; Options: Enable or Disable

[PEF]
PEFEnable=ENABLE                                       ; Options: Enable, Disable

[PEF::FILTERS]
Filter1=DISABLE                                        ; Options: Enable, Disable
Filter2=DISABLE                                        ; Options: Enable, Disable
Filter3=DISABLE                                        ; Options: Enable, Disable
Filter4=DISABLE                                        ; Options: Enable, Disable
Filter5=DISABLE                                        ; Options: Enable, Disable
Filter6=DISABLE                                        ; Options: Enable, Disable
Filter7=DISABLE                                        ; Options: Enable, Disable
Filter8=DISABLE                                        ; Options: Enable, Disable
Filter9=DISABLE                                        ; Options: Enable, Disable
Filter10=DISABLE                                       ; Options: Enable, Disable
Filter11=DISABLE                                       ; Options: Enable, Disable
Filter12=DISABLE                                       ; Options: Enable, Disable

[LANCHANNELS]
NumberOfLANChannels=2                                  ; This field should not be edited
LANFailOver=DISABLE                                    ; Options: Enable or Disable
NIC1=DISABLE                                           ; Options: Enable or Disable
NIC2=DISABLE                                           ; Options: Enable or Disable
NIC3=DISABLE                                           ; Options: Enable or Disable
PrimaryNIC=0                                           ; Decimal value in the range 1-3

[CHANNEL::LAN1]
AlertEnable=ENABLE                                     ; Options: Enable, Disable
PerMessageAuthentication=DISABLE                       ; Options: Enable, Disable
UserLevelAuthentication=ENABLE                         ; Options: Enable, Disable
AccessMode=ALWAYS                                      ; Options: Disabled, Always, shared
PrivilegeLevelLimit=ADMIN                              ; Options: User, Operator, Admin
CommunityString=AMI                                    ; Up to 16 bytes, no space allowed
ARPEnable=DISABLE                                      ; Options: Enable, Disable
ARPResponse=ENABLE                                     ; Options: Enable, Disable
ARPInterval=2                                          ; Decimal value between 0 & 255.
This values is in milliseconds. Input value rounded down to the nearest 500ms value
DHCPEnable=ENABLE                                      ; Options: Enable or Disable. If
'Disable' static IP will be used
HostIP=0.0.0.0                                         ; This field should not be edited
SubnetMask=0.0.0.0                                     ; This field should not be edited
GatewayIP=0.0.0.0                                      ; This field should not be edited
GatewayMAC=00-00-00-00-00-00                           ; This field should not be edited
BackupGatewayIP=0.0.0.0                                ; This field should not be edited
BackupGatewayMAC=00-00-00-00-00-00                     ; This field should not be edited
IPV6Status=ENABLE                                      ; Options: Enable or Disable
IPV6Source=DHCPV6                                      ; Options: STATIC, DHCPV6 or AUTO
IPV6PrefixLength=0                                     ; This field should not be edited
IPV6=0000:0000:0000:0000:0000:0000:0000:0000           ; This field should not be edited
IPV6GatewayIP=DYNAMIC                                  ; This field should not be edited
AlertIP0=0.0.0.0                                       ; In xxx.xxx.xxx.xxx form
AlertMAC0=00-00-00-00-00-00                            ; In xx-xx-xx-xx-xx-xx form
AlertIP1=0.0.0.0                                       ; In xxx.xxx.xxx.xxx form
AlertMAC1=00-00-00-00-00-00                            ; In xx-xx-xx-xx-xx-xx form

[CHANNEL::LAN8]
```

```
AlertEnable=ENABLE                                  ; Options: Enable, Disable
PerMessageAuthentication=DISABLE                    ; Options: Enable, Disable
UserLevelAuthentication=ENABLE                      ; Options: Enable, Disable
AccessMode=ALWAYS                                   ; Options: Disabled, Always, shared
PrivilegeLevelLimit=ADMIN                           ; Options: User, Operator, Admin
CommunityString=AMI                                 ; Up to 16 bytes, no space allowed
ARPEnable=DISABLE                                   ; Options: Enable, Disable
ARPResponse=ENABLE                                  ; Options: Enable, Disable
ARPInterval=2                                       ; Decimal value between 0 & 255.
This values is in milliseconds. Input value rounded down to the nearest 500ms value
DHCPEnable=ENABLE                                   ; Options: Enable or Disable. If
'Disable' static IP will be used
HostIP=10.239.56.79                                 ; This field should not be edited
SubnetMask=255.255.255.0                            ; This field should not be edited
GatewayIP=10.239.56.241                             ; This field should not be edited
GatewayMAC=00-00-5E-00-01-01                        ; This field should not be edited
BackupGatewayIP=0.0.0.0                             ; This field should not be edited
BackupGatewayMAC=00-00-00-00-00-00                  ; This field should not be edited
IPV6Status=ENABLE                                   ; Options: Enable or Disable
IPV6Source=DHCPV6                                   ; Options: STATIC, DHCPV6 or AUTO
IPV6PrefixLength=0                                  ; This field should not be edited
IPV6=0000:0000:0000:0000:0000:0000:0000:0000        ; This field should not be edited
IPV6GatewayIP=DYNAMIC                               ; This field should not be edited
AlertIP0=0.0.0.0                                    ; In xxx.xxx.xxx.xxx form
AlertMAC0=00-00-00-00-00-00                         ; In xx-xx-xx-xx-xx-xx form
AlertIP1=0.0.0.0                                    ; In xxx.xxx.xxx.xxx form
AlertMAC1=00-00-00-00-00-00                         ; In xx-xx-xx-xx-xx-xx form

[CHANNEL::LAN1::SOL]
SOLEnable=ENABLE                                    ; Options: Enable, Disable
PrivilegeLevelLimit=USER                            ; Options: Admin, User, Operator
SolNumberOfRetries=7                                ; Decimal value in the range 0-7
SolRetryInterval=500                                ; Decimal value in the range of 0-
2559 rounded down to the nearest unit of 10. In milliseconds

[CHANNEL::LAN8::SOL]
SOLEnable=ENABLE                                    ; Options: Enable, Disable
PrivilegeLevelLimit=USER                            ; Options: Admin, User, Operator
SolNumberOfRetries=7                                ; Decimal value in the range 0-7
SolRetryInterval=500                                ; Decimal value in the range of 0-
2559 rounded down to the nearest unit of 10. In milliseconds

[BIOS::Platform Configuration]

[BIOS::Platform Configuration::PCH Configuration]

[BIOS::Platform Configuration::PCH Configuration::PCH DWR Configuration]
Dirty Warm Reset=Disable                            ;Options: Disable=00: Enable=01

[BIOS::Platform Configuration::PCH Configuration::PCH DFX Configuration]
Reveal PCH P2SB device=Disable                      ;Options: Disable=00: Enable=01
Unlock PCH P2SB=Disable                             ;Options: Disable=00: Enable=01

[BIOS::Platform Configuration::PCH Configuration::ADR Configuration]
Enable/Disable ADR=Platform-POR                     ;Options: Platform-POR=00: Enable=01:
Disable=02
ADR GPIO=GPIO B                                     ;Options: GPIO B=00: GPIO C=01
Host Partition Reset ADR Enable=Platform-POR        ;Options: Platform-POR=00: Enable=01:
Disable=02
Enable/Disable ADR Timer=Platform-POR               ;Options: Platform-POR=00: Enable=01:
Held-off=02
ADR timer expire time=Platform-POR                  ;Options: 25 uS=00: 50 uS=01: 100
uS=02: 0 uS=03: Platform-POR=04
```

```
ADR timer multiplier=Platform-POR                  ;Options: x1=00: x8=01: x24=02:
x40=03: x56=04: x64=05: x72=06: x80=07: x88=08: x96=09: Platform-POR=63

[BIOS::Platform Configuration::PCH Configuration::Platform Thermal Configuration]
PCH Thermal Device=Auto                            ;Options: Disable=00: Enable in PCI
mode=01: Enable in ACPI mode=02: Auto=03

[BIOS::Platform Configuration::PCH Configuration::Azalia Configuration]
Azalia=Auto                                        ;Options: Disable=00: Enable=01:
Auto=02
 HDA-Link Codec Select=Platform Onboard            ;Options: Platform Onboard=00:
External Kit=01
  Azalia PME Enable=Disable                        ;Options: Disable=00: Enable=01
Virtual Channel for HD Audio=VC 0                  ;Options: VC 0=00: VC 1=01

[BIOS::Setup::Advanced::USB Configuration]
Legacy USB Support=Enabled                         ;Options: Enabled=00: Disabled=01:
Auto=02
Port 60/64 Emulation=Enabled                       ;Options: Disabled=00: Enabled=01

[BIOS::Setup::Advanced::PCI Configuration]
Above 4G Decoding=Enabled                          ;Options: Disabled=00: Enabled=01
SR-IOV Support=Enabled                             ;Options: Disabled=00: Enabled=01
BME DMA Mitigation=Disabled                        ;Options: Disabled=00: Enabled=01

[BIOS::Setup::Advanced::PCI Configuration::Network Stack Configuration]
Network Stack=Enabled                              ;Options: Disabled=00: Enabled=01
IPv4 PXE Support=Enabled                           ;Options: Disabled=00: Enabled=01
IPv4 HTTP Support=Disabled                         ;Options: Disabled=00: Enabled=01
IPv6 PXE Support=Enabled                           ;Options: Disabled=00: Enabled=01
IPv6 HTTP Support=Disabled                         ;Options: Disabled=00: Enabled=01
PXE boot wait time=0                               ;Options: 5=Max: 0=Min: 1=Step
Media detect count=1                               ;Options: 50=Max: 1=Min: 1=Step

[BIOS::Setup::Advanced::SIO Common Setting]
Lock Legacy Resources=Disabled                     ;Options: Disabled=00: Enabled=01

[BIOS::Setup::Advanced::Serial Port Console Redirection]
Console Redirection EMS=Enabled                    ;Options: Disabled=00: Enabled=01

[BIOS::Setup::Advanced::Serial Port Console Redirection::Console Redirection Settings]
Out-of-Band Mgmt Port=COM0                         ;Options: COM0=00: COM1(Pci
Bus0,Dev0,Func0) (Disabled)=01
Terminal Type EMS=VT-UTF8                          ;Options: VT100=00: VT100+=01: VT-
UTF8=02: ANSI=03
Bits per second EMS=115200                         ;Options: 9600=03: 19200=04: 57600=06:
115200=07
Flow Control EMS=None                              ;Options: None=00: Hardware
RTS/CTS=01: Software Xon/Xoff=02

[BIOS::Setup::Advanced::UEFI Variables Protection]
Password protection of Runtime Variables=Enable    ;Options: Disable=00: Enable=01

[BIOS::Setup::Advanced::Redfish Host Interface Settings]
Redfish=Enabled                                    ;Options: Disabled=00: Enabled=01
Authentication mode=Basic Authentication           ;Options: Basic Authentication=01:
Session Authentication=02
IP Port=443                                        ;Options: 65535=Max: 0=Min: 1=Step

[BIOS::Setup::Advanced::ACPI Settings]
Enable ACPI Auto Configuration=Disabled            ;Options: Disabled=00: Enabled=01
Enable Hibernation=Enabled                         ;Options: Disabled=00: Enabled=01
```

```
[BIOS::Setup::Security]
Power On Password=Disabled                          ;Options: Disabled=00: Enabled=01

[BIOS::Setup::Security::Trusted Computing]
  Security Device Support=Enable                    ;Options: Disable=00: Enable=01
  SHA-1 PCR Bank=Enabled                            ;Options: Disabled=00: Enabled=01
  SHA256 PCR Bank=Enabled                           ;Options: Disabled=00: Enabled=02
  Pending operation=None                            ;Options: None=00: TPM Clear=01
  Platform Hierarchy=Enabled                        ;Options: Disabled=00: Enabled=01
  Storage Hierarchy=Enabled                         ;Options: Disabled=00: Enabled=01
  Endorsement Hierarchy=Enabled                     ;Options: Disabled=00: Enabled=01
  TPM 2.0 UEFI Spec Version=TCG_2                   ;Options: TCG_1_2=01: TCG_2=02
  Physical Presence Spec Version=1.3                ;Options: 1.2=00: 1.3=01
  Device Select=Auto                                ;Options: TPM 1.2=00: TPM 2.0=01:
Auto=02

[BIOS::Setup::Boot]
Setup Prompt Timeout=1                              ;Options: 65535=Max: 1=Min: 1=Step
Bootup NumLock State=On                             ;Options: Off=00: On=01
Quiet Boot=Enabled                                  ;Options: Disabled=00: Enabled=01
Optimized Boot=Disabled                             ;Options: Disabled=00: Enabled=01

[BIOS::BootOrder]
RedHat Boot Manager=1
Windows Boot Manager=2
UEFI: KingstonDataTraveler 3.0, Partition 1=3
UEFI: PXE IPv4 American Megatrends Inc.=4
UEFI: PXE IPv6 American Megatrends Inc.=5
UEFI: Built-in EFI Shell=6
```