



System Logging Guide, Cisco IOS XE 16 (NCS 4200 Series)

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CHAPTER 1

Configuration of Onboard Failure Logging

This chapter describes how to configure Onboard Failure Logging (OBFL).

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Restrictions for OBFL

- **Software Restrictions**—If a device (router or switch) intends to use *linear* flash memory as its OBFL storage media, Cisco IOS software must reserve a minimum of two physical sectors (or physical blocks) for the OBFL feature. Because an erase operation for a linear flash device is done on per-sector (or per-block) basis, one extra physical sector is needed. Otherwise, the minimum amount of space reserved for the OBFL feature on any device must be at least 8 KB.
- **Hardware Restrictions**—To support the OBFL feature, a device must have at least 8 KB of nonvolatile memory space reserved for OBFL data logging.

Overview of OBFL

The Onboard Failure Logging (OBFL) feature collects data such as operating temperatures, hardware uptime, interrupts, and other important events and messages from system hardware installed in a Cisco router or switch. The data is stored in nonvolatile memory and helps technical personnel diagnose hardware problems.

Data Collected by OBFL

The OBFL feature records operating temperatures, hardware uptime, interrupts, and other important events and messages that can assist with diagnosing problems with hardware cards (or modules) installed in a Cisco router or switch. Data is logged to files stored in nonvolatile memory. When the onboard hardware is started up, a first record is made for each area monitored and becomes a base value for subsequent records. The OBFL feature provides a circular updating scheme for collecting continuous records and archiving older (historical) records, ensuring accurate data about the system. Data is recorded in one of two formats: continuous information

that displays a snapshot of measurements and samples in a continuous file, and summary information that provides details about the data being collected. The data is displayed using the show logging onboard command. The message “No historical data to display” is seen when historical data is not available.

The following sections describe the type of data collected:

Temperature

Temperatures surrounding hardware modules can exceed recommended safe operating ranges and cause system problems such as packet drops. Higher than recommended operating temperatures can also accelerate component degradation and affect device reliability. Monitoring temperatures is important for maintaining environmental control and system reliability. Once a temperature sample is logged, the sample becomes the base value for the next record. From that point on, temperatures are recorded either when there are changes from the previous record or if the maximum storage time is exceeded. Temperatures are measured and recorded in degrees Celsius.

Example for Temperature

```
Router# show logging onboard slot <R0/R1> temperature
Name          Id      Data (C)  Poll  Last Update
-----
Temp: FC PWM1  80      24  1      01/31/12 14:36:30
Temp: FC PWM1  80      25  1      01/31/12 14:37:30
Temp: FC PWM1  80      23  1      01/31/12 14:38:30
Temp: FC PWM1  80      25  1      01/31/12 14:40:30
Temp: FC PWM1  80      24  1      01/31/12 14:41:30
Temp: FC PWM1  80      25  1      01/31/12 14:43:31
Temp: FC PWM1  80      23  1      01/31/12 14:46:31
Temp: FC PWM1  80      25  1      01/31/12 14:50:31
Temp: FC PWM1  80      24  1      01/31/12 14:54:31
Temp: FC PWM1  80      26  1      01/31/12 14:56:31
Temp: FC PWM1  80      24  1      01/31/12 14:57:31
Temp: FC PWM1  80      26  1      01/31/12 15:00:31
Temp: FC PWM1  80      24  1      01/31/12 15:02:31
Temp: FC PWM1  80      25  1      01/31/12 15:03:31
Temp: FC PWM1  80      24  1      01/31/12 15:04:32
Temp: FC PWM1  80      26  1      01/31/12 15:08:32
Temp: FC PWM1  80      24  1      01/31/12 15:11:32
```

To interpret this data:

- A column for each sensor is displayed with temperatures listed under the number of each sensor, as available.
- The ID column lists an assigned identifier for the sensor.
- Temp indicates a recorded temperature in degrees Celsius in the historical record. Columns following show the total time each sensor has recorded that temperature.
- Sensor ID is an assigned number, so that temperatures for the same sensor can be stored together.
- Poll indicates the number of times a given sensor has been polled.
- The Last Update column provides the most recent time that the data was updated.

Voltage

OBFL allows you to track the voltage of system components, as shown in the following example.

Example for Voltage

```

Router# show logging onboard slot R1 voltage
Name                               Id      Data (mV)  Poll    Last Update
-----
VNILE: VX1                         20      1002      1       01/30/12 03:45:46
VNILE: VX2                         21      1009      1       01/30/12 03:45:46
VNILE: VX3                         22      1492      1       01/30/12 03:45:46
VNILE: VX4                         23      1203      1       01/30/12 03:45:46
VNILE: VP1                         24      1790      1       01/30/12 03:45:46
VNILE: VP2                         25      2528      1       01/30/12 03:45:47
VNILE: VP3                         26      3305      1       01/30/12 03:45:47
VNILE: VH                          27      12076     1       01/30/12 03:45:47
VCPU : VX1                         32       997      1       01/30/12 03:45:47
VCPU : VX2                         33      1054      1       01/30/12 03:45:47
VCPU : VX3                         34      1217      1       01/30/12 03:45:47
VCPU : VX4                         35      1526      1       01/30/12 03:45:47
VCPU : VP1                         36      4992      1       01/30/12 03:45:47
VCPU : VP2                         37      3368      1       01/30/12 03:45:47
VCPU : VP3                         38      2490      1       01/30/12 03:45:47
VCPU : VP4                         39      1803      1       01/30/12 03:45:48
VCPU : VH                          40     12034     1       01/30/12 03:45:48
VNILE: VX1                         20      1001      1       01/30/12 03:48:11
VNILE: VX2                         21      1008      1       01/30/12 03:48:11
VNILE: VX3                         22      1492      1       01/30/12 03:48:11
VNILE: VX4                         23      1200      1       01/30/12 03:48:11
VNILE: VP1                         24      1790      1       01/30/12 03:48:11
VNILE: VP2                         25      2530      1       01/30/12 03:48:11
VNILE: VP3                         26      3305      1       01/30/12 03:48:11
VNILE: VH                          27     12066     1       01/30/12 03:48:11
VCPU : VX1                         32       997      1       01/30/12 03:48:11
VCPU : VX2                         33      1054      1       01/30/12 03:48:11
VCPU : VX3                         34      1218      1       01/30/12 03:48:11
VCPU : VX4                         35      1526      1       01/30/12 03:48:11

```

To interpret this data:

- The Name and ID fields identify the system component.
- The Data (mV) indicates the component voltage
- The poll field indicates the number of times the component voltage has been polled.
- A timestamp shows the date and time the message was logged.

Message Logging

The OBFL feature logs standard system messages. Instead of displaying the message to a terminal, the message is written to and stored in a file, so the message can be accessed and read at a later time.

Example for Error Message Log

```

-----
ERROR MESSAGE SUMMARY INFORMATION
-----
Facility-Sev-Name          | Count | Persistence Flag
MM/DD/YYYY HH:MM:SS
-----
No historical data to display
-----
ERROR MESSAGE CONTINUOUS INFORMATION

```

```

-----
MM/DD/YYYY HH:MM:SS Facility-Sev-Name
-----
03/06/2007 22:33:35 %GOLD_OBFL-3-GOLD : Diagnostic OBFL: Diagnostic OBFL testing

```

To interpret this data:

- A timestamp shows the date and time the message was logged.
- Facility-Sev-Name is a coded naming scheme for a system message, as follows:
 - The Facility code consists of two or more uppercase letters that indicate the hardware device (facility) to which the message refers.
 - Sev is a single-digit code from 1 to 7 that reflects the severity of the message.
 - Name is one or two code names separated by a hyphen that describe the part of the system from where the message is coming.
- The error message follows the Facility-Sev-Name codes. For more information about system messages, see the [Cisco System Messages](#).
- Count indicates the number of instances of this message that is allowed in the history file. Once that number of instances has been recorded, the oldest instance will be removed from the history file to make room for new ones.
- The Persistence Flag gives a message priority over others that do not have the flag set.

Enabling OBFL



Note The OBFL feature is enabled by default. Because of the valuable information this feature offers technical personnel, it should not be disabled. If you find the feature has been disabled, use the following steps to reenable it.

SUMMARY STEPS

1. Router# **enable**
2. Router# **configure terminal**
3. Router(config)# **hw-module slot {R0 | R1} logging onboard enable**
4. Router(config)# **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Router# enable	Enables privileged EXEC mode (enter your password if prompted).
Step 2	Router# configure terminal	Enters global configuration mode.
Step 3	Router(config)# hw-module slot {R0 R1} logging onboard enable Example:	Enables OBFL on the specified hardware module.

	Command or Action	Purpose
	<code>hw-module slot R0 logging onboard enable</code>	
Step 4	Router(config)# end	Ends global configuration mode.

Disabling OBFL

SUMMARY STEPS

1. Router# **enable**
2. Router# **configure terminal**
3. Router(config)# **hw-module slot {R0 | R1} logging onboard disable**
4. Router(config)# **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Router# enable	Enables privileged EXEC mode (enter your password if prompted).
Step 2	Router# configure terminal	Enters global configuration mode.
Step 3	Router(config)# hw-module slot {R0 R1} logging onboard disable Example: <code>hw-module slot R0 logging onboard disable</code>	Enables OBFL on the specified hardware module.
Step 4	Router(config)# end	Ends global configuration mode.

Displaying OBFL Information

You can use the following commands to display OBFL information:

- show logging onboard slot status—To display the slot status.
- show logging onboard slot temperature—To display the slot temperature.
- show logging onboard slot voltage—To display the slot voltage.
- show logging onboard hw_errors—To display any hardware error in the setup.

Clearing OBFL Information

You can use the **clear logging onboard slot {R0 | R1} {temperature | voltage}** command to clear OBFL data:

```
Router#clear logging onboard slot R1 voltage
```

You can use the **show logging onboard temperature** or **show logging onboard voltage** command to verify that the OBFL data is cleared.