



Alarm Profiling

The router software can monitor the status of the chassis, card or interface module, and ports. It generates alarm messages that are based on the alarm conditions set. To save time and effort, you can change the alarm severity in the alarm configuration using the alarm profiling feature.

The alarm profiling feature enables you to create a unique alarm profile for chassis, card or interface module, and port. Each alarm profile, for example, the chassis alarm profile, is defined with an alarm name. Each alarm profile is classified based on controller types. For each controller type, there is a set of alarms defined with a default severity. You can overwrite the default severity using the alarm profile and suppress the syslog facility based on their preferences. By default, the syslog facility is enabled for an alarm profile.

You can also enable Auto In Service (AINS) through the Alarm Profile. By default, AINS is not enabled for an alarm profile. You must configure it using the **ains** command.

To configure alarm profiles, create profiles for either chassis, card, or port, then define severities for each alarm, and finally, attach the profile at the corresponding chassis, card, or port.

The highest precedence is maintained at the port level and the lowest precedence is maintained at the chassis level. For example, if the chassis profile is already attached and if you want to have a separate profile for a port, you can still create a port profile and attach it to that port. The port inherits the properties of the port profile.

After the alarm profile is attached, these behaviors are shown about the entity:

- Chassis alarm profile—When a chassis alarm profile is attached, by default, the profile is attached to all the interface modules available in the chassis. All these interfaces configured under the chassis are applied with the new alarm severity and AINS.
- Card alarm profile—When a card profile is attached, by default, the profile, along with AINS is attached to all ports that are enabled on the interface module.
- Port alarm profile—When a port profile is attached, the profile, along with the AINS is applied only to that port.



Note Card and port alarm profiles with the same name can be attached to multiple cards and ports, respectively.

The alarm profile attached to the chassis, card or interface module, and port can be detached, if the profile is no longer required. Before deleting the alarm profile, ensure that you detach the alarm profile from entity; for example, card or port.

To log the alarms, you need to enable the **logging alarm [critical | major | minor | informational]** command at the global configuration mode. Only then are the alarms that are configured for the alarm profile are system logged.

For example, if you have enabled the logging alarm using the **logging alarm critical** command, then for the alarm profile, the alarms with critical severity get system logged only when the syslog is enabled in the alarm profile.


Note

- If a port is created on the subslot after configuring the alarm profile, that port starts with default secondary admin state as "auto-in-service". The port moves to "in-service" secondary admin state after completing the default soak-timer.
- If ports are already created before the alarm profile is enabled, the ports move to "in-service" secondary admin state.

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Limitations of Alarm Profiles

- The alarm profile name must not exceed 32 characters.
- For various alarms, the alarm profiles are not supported for service affecting and non-service affecting classification.
- For various alarms, the alarm severities such as "Not Reported" and "Not Alarmed" are not supported.
- The alarm profile created for chassis, card, or port should be attached to the respective entity. The attaching of the alarm profile of one entity to another entity is not supported. For example, the card alarm profile cannot be attached to the chassis alarm profile, or vice versa.
- The attaching of alarm profile to entities such as, PSU, FAN, and RSP is not supported.
- AINS States is not supported on the PSU, FAN, and RSP in Cisco IOS XE Release 16.6.1vS.
- Maximum of one hundred alarm profiles can be created for the system or node (chassis).
- When a port having line alarm such as SLOS, SLOF, LAIS, and LRDI is shutdown, then after performing the no shutdown operation, the **show facility-alarm status** does not display the asserted line alarm. Only LINK DOWN alarm is displayed.
- Clearing an alarm requires more than 10 seconds.

Alarm Profile Classification

Alarm Profile Types

The chassis, card or interface module, and port alarm profiles are classified based on the controller type.

Controller types supported for each alarm profile:

- 48 X T1/E1 CEM Interface Module
- 48 X T3/E3 CEM Interface Module
- 1 x OC-192 Interface module or 8-port Low Rate Interface Module
- 8-port 10 Gigabit Ethernet Interface Module (8X10GE)
- 2-port 40 Gigabit Ethernet QSFP Interface Module (2X40GE)
- 1-port 100 Gigabit Ethernet Interface Module (1X100GE)
- SFP Combo IM-8-port Gigabit Ethernet (8X1GE) + 1-port 10 Gigabit Ethernet Interface Module (1X10GE)
- 8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module

Alarm Severity

Alarms are filtered based on the severity level. Depending on a requirement, you can override the default severity to a new severity.

The following are severity of alarms supported for each alarm profile associated with the controller type:

- critical
- major
- minor
- informational

Alarm Profiling Hierarchy

Based on the alarm profile applied to the chassis, card or interface module, or port, the corresponding alarms and their severity levels are applied in the following order of priority:

Table 1: Alarm Profile with Alarm Priority

Alarm Profile	Alarm Priority
port profile	1
card profile	2
chassis profile	3

Default Alarm Profiles

The default alarm profiles are used when user-created alarm profiles are not configured. The default alarm profile contains the whole set of required alarms with severities as defined in the GR-253 standard with syslog enabled.

When the alarm profile of types such as chassis, card, or port is created, the alarm profile inherits configurations such as severity and syslog of the default profile. You can suppress the alarm with default severity and the alarm that is suppressed is not displayed under the **show alarm profile** command.

You can also change the severity and syslog for a specific alarm, for example, SLOS alarm, and the severity and syslog remain intact for the remaining alarms set for the default profile.

How to Configure Alarm Profile

This section provides information about configuring alarm profile for chassis, card, or port.

Creating Alarm Profile

You can create an alarm profile for chassis, card or interface module, and port. The alarm profile name should be a string with alpha numeric characters. The alarm profile is associated with an alarm with controller types such as T1 or E1. You can suppress syslog and provide a new severity for the alarm.



Note Before including syslog for the alarm, ensure that you enable the **logging alarm** command at the global level. To enable the logging alarms, use the **logging alarm [critical | major | minor | informational]** command.



Note You cannot provide the same profile name for chassis, card, or port.

Creating Alarm Profile for Chassis

To create the alarm profile *CHASSIS*, use the following commands:

```
router(config)#alarm profile CHASSIS chassis
router(config-alarm-profile)#alarm ds1
router(config-alarm-properties)#DS1_LOS suppress
router(config-alarm-properties)#DS1_LOS severity critical
router(config-alarm-properties)# ains
```

The command **ains** enables Auto In-Service (AINS) on the chassis.



Note When the alarm profile is attached to the chassis, all cards and ports on the chassis inherit the severity from the chassis profile.

Creating Alarm Profile for Card

To create the alarm profile *CARD*, use the following commands:

```
router(config)#alarm profile CARD card
router(config-alarm-profile)#alarm ds1
router(config-alarm-properties)#DS1_LOS suppress
router(config-alarm-properties)#DS1_LOS severity major
router(config-alarm-properties)# ains
```

The command **ains** enables AINS on the card.



Note When the alarm profile is attached to a card, all ports on the card inherit the severity from the card profile.



Note If a chassis profile is already attached and if you want to have a separate profile for a card, you can still create a card profile and attach it to that card. The card and all its ports inherit the properties of the card profile.

Creating Alarm Profile for Port

To create the alarm profile *PORT*, use the following commands:

```
router(config)#alarm profile PORT port
router(config-alarm-profile)#alarm ds1
router(config-alarm-properties)#DS1_LOS suppress
router(config-alarm-properties)#DS1_LOS severity major
router(config-alarm-properties)# ains
```

The command **ains** enables AINS on the port.



Note When the alarm profile attached to a port, only the port inherits the severity from the port profile.



Note If the chassis profile is already attached and if you want to have a separate profile for a port, you can still create a port profile and attach it to that port. The port inherits the properties of the port profile.

Use Case 1

The following example explains default alarm profile having DS1_TX_AIS alarm with severity as MINOR and syslog is enabled, and when the alarm is configured as suppressed with default severity, the alarm is not displayed under the **show alarm profile** command.

Use the following steps to suppress the default alarm profile:

1. Create a chassis profile, for example, *chassis* and verify that the DS1_TX_AIS alarm is listed under the **show alarm profile chassis** command.
2. Set the alarm DS1_TX_AIS as suppressed.

The alarm DS1_TX_AIS is not displayed under the **show alarm profile chassis** command.

Create chassis profile

```
Router#configure terminal
Router(config)#alarm-profile chassis chassis
Router(config-alarm-profile)#end
```

```
Router#show alarm profile chassis
Alarm profile chassis:
DS1:
Alarm Name
      Severity  Syslog
Transmitter is sending AIS
      MINOR     Enabled
Receiver has loss of signal
      CRITICAL  Enabled
Receiver has loss of frame
      INFO      Enabled
Receiver has remote alarm INFO
      INFO      Enabled
```

Set the alarm DS1_TX_AIS as suppressed

```
Router(config)#alarm-profile chassis chassis
Router(config-alarm-profile)#alarm ds1
Router(config-alarm-properties)#DS1_TX_AIS suppress
Router(config-alarm-properties)#end
```

Note that the DS1_TX_AIS alarm is not displayed under the show alarm profile chassis command.

```
Router#show alarm profile chassis
Alarm profile chassis:
DS1:
Alarm Name
      Severity  Syslog
Receiver has loss of signal
      CRITICAL  Enabled
Receiver has loss of frame
      INFO      Enabled
Receiver has remote alarm
      INFO      Enabled
```

Use Case 2

The following example displays default profile having DS1_TX_AIS alarm with severity as MINOR and syslog enabled, and when the alarm is configured as suppressed with severity set to INFO, the alarm is displayed under the **show alarm profile** command.

Use the following steps to change the DS1_TX_AIS alarm severity:

1. Create a chassis profile, for example, *chassis*.
2. Set the alarm DS1_TX_AIS as suppressed and alarm DS1_TX_AIS severity to INFO.

The alarm DS1_TX_AIS is displayed under the **show alarm profile chassis** command.

Create chassis profile

```
Router#configure terminal
Router(config)#alarm-profile chassis chassis
Router(config-alarm-profile)#end
```

Set the alarm DS1_TX_AIS as suppressed and severity to INFO

```
Router(config)#alarm-profile chassis chassis
```

```
Router(config-alarm-profile)#alarm ds1
Router(config-alarm-properties)#DS1_TX_AIS suppress
Router(config-alarm-properties)#DS1_TX_AIS severity INFO
Router(config-alarm-properties)#end
```

Note that the DS1_TX_AIS alarm is displayed under the show alarm profile chassis command.

```
Router#show alarm profile chassis
Alarm profile chassis:
  DS1:
  Alarm Name
      Severity  Syslog
  Transmitter is sending AIS
      MINOR      Enabled
  Receiver has loss of signal
      CRITICAL   Enabled
  Receiver has loss of frame
      INFO       Enabled
  Receiver has remote alarm
      INFO       Enabled
```

Use Case 3

The following example displays default profile having DS1_LOF and DS1_RX_RAI alarms with severities as CRITICAL and MINOR respectively. Using the chassis profile, you can set the DS1_LOF alarm severity to INFO and verify using the **show alarm profile** command. The show output displays the DS1_LOF as INFO and DS1_RX_RAI as MINOR.

Use the following steps to change the DS1_LOF alarm severity:

1. Create a chassis profile, for example, *chassis*.
2. Set the alarm DS1_LOF severity to INFO.

The alarm DS1_LOF is displayed under the **show alarm profile chassis** command.

Create a chassis profile

```
Router#configure terminal
Router(config)#alarm-profile chassis chassis
Router(config-alarm-profile)#end
```

Set the alarm DS1_LOF severity to INFO

```
Router(config)#alarm-profile chassis chassis
Router(config-alarm-profile)#alarm t1
Router(config-alarm-properties)#DS1_LOF severity INFO
Router(config-alarm-properties)#end
```

Note that the DS1_LOF alarm is displayed under the show alarm profile chassis command.

```
Router#show alarm profile chassis
Alarm profile chassis:
  T1:
  Alarm Name
      Severity  Syslog
  Transmitter is sending AIS
      MINOR      Enabled
```

```
Receiver has loss of signal
      CRITICAL      Enabled
Receiver has loss of frame
      INFO          Enabled
Receiver has remote alarm
      MINOR         Enabled
```

Use Case 4

The following example displays default profile having DS1_LOF and DS1_RX_RAI alarms with severities as CRITICAL and MINOR respectively. Using the card profile, you can set the DS1_LOF alarm severity to MAJOR and verify using the **show alarm profile** command. The show output displays the DS1_LOF as MAJOR and DS1_RX_RAI as MINOR.

Use the following steps to change the DS1_LOF alarm severity:

1. Create a card profile, for example, *card*.
2. Set the alarm DS1_LOF severity to MAJOR.

The alarm DS1_LOF with severity MAJOR is displayed under the **show alarm profile** command.

Create a card profile and set the alarm DS1_LOF severity to MAJOR

```
Router#configure terminal
Router(config)#alarm-profile card card
Router(config-alarm-profile)#alarm ds1
Router(config-alarm-properties)#DS1_LOF severity MAJOR
Router(config-alarm-properties)#end
```

Note that the DS1_LOF with severity MAJOR and DS1_RX_RAI with severity MINOR are displayed under the show alarm profile command.

```
Router#show alarm profile
Alarm profile card:
  DS1:
Alarm Name
      Severity  Syslog
Transmitter is sending AIS
      MINOR      Enabled
Receiver has loss of signal
      CRITICAL   Enabled
Receiver has loss of frame
      MAJOR      Enabled
Receiver has remote alarm
      MINOR      Enabled
```

Use Case 5

The following example displays default profile having DS1_LOF and DS1_RX_RAI alarms with severities as CRITICAL and MINOR respectively. Using the port profile, you can set the DS1_LOF alarm severity to MAJOR and DS1_RX_RAI alarm severity to INFO. Verify using the **show alarm profile** command. The show output displays the DS1_LOF as MAJOR and DS1_RX_RAI as INFO.

Use the following steps to change the DS1_LOF and DS1_RX_RAI alarm severities:

1. Create a port profile, for example, *port*.

2. Set the alarm severities DS1_LOF to MAJOR and DS1_RX_RAI to INFO.

The alarm DS1_LOF with severity MAJOR and DS1_RX_RAI with severity INFO are displayed under the **show alarm profile** command.

Create a port profile and set the alarm severities of DS1_LOF to MAJOR and DS1_RX_RAI to INFO

```
Router#configure terminal
Router(config)#alarm-profile port port
Router(config-alarm-profile)#alarm dsl
Router(config-alarm-properties)#DS1_LOF severity MAJOR
Router(config-alarm-properties)#DS1_RX_RAI severity MINOR
Router(config-alarm-properties)#end
```

Note that the DS1_LOF with severity MAJOR and DS1_RX_RAI with severity INFO are displayed under the show alarm profile command.

```
Router#show alarm profile
Alarm profile port:
  DS1:
Alarm Name
  Severity  Syslog
Transmitter is sending AIS
  MINOR     Enabled
Receiver has loss of signal
  CRITICAL  Enabled
Receiver has loss of frame
  MAJOR     Enabled
Receiver has remote alarm
  INFO      Enabled
```

Attaching Alarm Profile to Entity

After the alarm profile is created for chassis, card, or port, you need to attach the alarm profile to chassis, card, or port. Only after attaching the alarm profile, the alarm severity and other alarm functionalities are applied to the chassis, card, or port.

Attaching Alarm Profile to Chassis

To attach the alarm profile to chassis, use the following commands:

```
router>enable
router#configure terminal
router(config)#alarm-profile chassis attach chassis
router(config)#end
```



Note When an alarm profile is attached to chassis, the profile is applicable to all the cards available on the node but not to cards that are inserted after the profile attach is performed. To attach alarm profile to cards, you need to reattach the alarm profile to the chassis.

Attaching Alarm Profile to Card

To attach an alarm profile to the card, use the following commands:

```
router>enable
router#configure terminal
router(config)#alarm-profile card attach card slot/bay
router(config)#end
```



Note The alarm profile cannot be attached to a slot when there is no card available in the slot.

Attaching Alarm Profile to Port

Depending on the controller type, the alarm profile is attached to the port. Supported controller types are T1 and E1. You need to select the controller and the port, and then attach the profile

To attach the alarm profile to port, use the following commands:

```
router>enable
router#configure terminal
router(config)#controller {t1 | e1} slot/bay/port
router(config-controller)# attach profile port
router(config-controller)#end
```

To attach the port profile to Ethernet interface, use the following commands:

```
router>enable
router#configure terminal
router(config)#interface gigabitethernet 0/7/0
router(config-controller)# attach profile port
router(config-controller)#end
```



Note The following restrictions apply to the 8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module:

- Only the following three AINS modes are supported:
 - 8x1G + 1x10G (default mode) Fully Subscribed
 - 16x1G+1x10G – Over Subscribed
 - 18x1G – Over Subscribed
 - If you change any of the above modes, the chassis and card profiles stay unaffected; however, port profile is disabled and requires to be reattached.
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Modifying Alarm Profile

You can modify the existing alarm profile associated with chassis, port, or card. The options that you can modify are the alarm severity and suppress syslog facility. The alarm severity that you can modify are critical, major, minor, and informational.

Modifying Chassis Alarm Profile

To modify the existing alarm configured for chassis, use the following commands:

```
router(config)#alarm profile CHASSIS chassis
router(config-alarm-profile)#alarm ds1
router(config-alarm-properties)#DS1_LOS suppress
router(config-alarm-properties)#DS1_LOS severity minor
```

Modifying Card Alarm Profile

To modify the existing alarm configured for card, use the following commands:

```
router(config)#alarm profile CARD card
router(config-alarm-profile)#alarm ds1
router(config-alarm-properties)#DS1_LOS suppress
router(config-alarm-properties)#DS1_LOS severity minor
```

Modifying Port Alarm Profile

To modify the existing alarm configured for port, use the following commands:

```
router(config)#alarm profile PORT port
router(config-alarm-profile)#alarm ds1
router(config-alarm-properties)#DS1_LOS suppress
router(config-alarm-properties)#DS1_LOS severity minor
```

Detaching Alarm Profile

You can detach the existing alarm profile from chassis, card, or port and attach a new profile. If a new alarm profile is not attached, then the default profile is attached.

Detaching Alarm Profile from Chassis

When the alarm profile associated with chassis is detached, the profile is removed from all the interfaces that are available in the chassis. The alarms configured for the profile have no effect on these interfaces even when alarm conditions occur.

To detach the alarm profile associated with chassis, use the following command:

```
Router(config)#no alarm-profile attach CHASSIS chassis
```

Detaching Alarm Profile from Card

For the alarm profile associated with card, when detached, the profile is removed from all the ports and the interfaces. While detaching the alarm profile, you need to specify the slot and subslot.

To detach the alarm profile associated with card, use the following command:

```
Router(config)#no alarm-profile attach CARD 0/3
```

Detaching Alarm Profile from Port

You need to access specific controller and interface to detach the alarm profile associated with the port. The alarm profile is detached from specific interface for the controller.

To detach the alarm profile associated with port, use the following commands:

```
router(config)#controller t1 0/4/0
router(config-controller)#no attach profile port
```

```
router(config)#controller e1 0/3/2
router(config-controller)#no attach profile port
```

Deleting Alarm Profile



Note Before deleting the alarm profile, detach the profile from chassis, card, or port. Alarm profiles cannot be deleted when profiles are attached.

If the alarm profile is not required anymore, you can delete the alarm profile.

Deleting Alarm Profile for Chassis

To delete the alarm profile associated with chassis, use the following command:

```
Router(config)#no alarm-profile CHASSIS chassis
```

Deleting Alarm Profile for Card

To delete the alarm profile associated with card, use the following command:

```
Router(config)#no alarm-profile CARD card
```

Deleting Alarm Profile for Port

To delete the alarm profile associated with port, use the following command:

```
Router(config)#no alarm-profile PORT port
```

Verifying Alarm Profile

Use the following commands to verify the alarm profile configuration:

- **show alarm profile**—Displays the alarm profile configured for chassis.
- **show facility-alarm status**—Displays the alarms status attached to a specific profile.
- **show controller**—Displays the alarm profiles configured for a specific port.
- **show logging**—Displays the alarms reporting in syslog.

To display the alarm profile configured for chassis, use the **show alarm profile** command:

```
Router# show alarm profile
Alarm profile CHASSIS:
  DS1:
  Alarm Name                               Severity  Syslog
  Receiver has loss of signal              CRITICAL Enabled
  Receiver has loss of frame               INFO     Enabled
  Receiver has remote alarm                INFO     Enabled
```

To display the alarm status attached to a specific profile, use the **show alarm profile** command:

```
Router# show facility-alarm status | inc 0/3/0
t1 0/3/0 Feb 01 2018 19:23:10 CRITICAL Section Receiver has loss of signal [1]
```

Verifying Alarm Profile for Severity Change for T1 or E1 Alarms

The following example verifies when the severity of the T1 or E1 alarms are modified for a Chassis profile. The alarm severity changes are verified using the **show alarm profile** command:

Create a CHASSIS alarm profile for the DS1 alarms:

```
Router(config)#alarm-profile CHASSIS chassis
Router(config-alarm-properties)#alarm ds1
Router(config-alarm-properties)#DS1_LOF severity critical
Router(config-alarm-properties)#DS1_LOF suppress
Router(config-alarm-properties)#alarm ds1
Router(config-alarm-properties)#DS1_RX_RAI severity info
Router(config-alarm-properties)#DS1_RX_RAI suppress
```

Verify the CHASSIS alarm profile using the **show alarm profile** command:

```
Router#show alarm profile
Alarm profile CHASSIS:
  Alarm Name                               Severity  Syslog
  Receiver has loss of signal              CRITICAL Enabled
  Receiver has remote alarm                MINOR    Enabled
```

Attach the CHASSIS alarm profile to chassis:

```
router>enable
router#configure terminal
router(config)#alarm-profile CHASSIS attach chassis
router(config)#end
```

Modify the severity of the CHASSIS alarm profile for the DS1 alarms:

```
Router(config)#alarm-profile CHASSIS chassis
Router(config-alarm-properties)#alarm ds1
Router(config-alarm-properties)#DS1_LOF severity major
Router(config-alarm-properties)#DS1_LOF suppress
Router(config-alarm-properties)#alarm ds1
Router(config-alarm-properties)#DS1_RX_RAI severity info
Router(config-alarm-properties)#DS1_RX_RAI suppress
```

Verify the CHASSIS alarm profile with modified severity:

```
Router#show alarm profile
Alarm profile CHASSIS:
DS1:
  Alarm Name          Severity          Syslog
  Receiver has loss of signal  MAJOR            Enabled
  Receiver has remote alarm   INFO             Enabled
```