



Troubleshooting ISA with Session Monitoring and Distributed Conditional Debugging

The Intelligent Service Architecture (ISA) is a core set of Cisco IOS components that provide a structured framework in which edge access devices can deliver flexible and scalable services to subscribers. A Cisco device that is running a Cisco IOS image with ISA is called an Intelligent Service Gateway (ISG). This document describes ISA session monitoring and distributed conditional debugging. ISA session monitoring uses the **show interface monitor** and **show processes cpu monitor** commands, which display statistics that are updated at specified intervals. Conditional debugging facilitates debug filtering for ISA and is available as distributed conditional debugging.

Module History

This module was first published on April 28, 2005, and was last updated April 28, 2005.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all features. To find information about feature support and configuration, use the [“Feature Information for Distributed Conditional Debugging”](#) section on [page 209](#).

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Prerequisites for Distributed Conditional Debugging

Before using the information in this module, it is recommended that you be familiar with the use of Cisco IOS **debug** commands and conditional debugging. See the “[Additional References](#)” section on [page 208](#) to find information about these topics.

Restrictions for Distributed Conditional Debugging

Conditions that are set for an active session take effect only when the session is terminated and reestablished.



Caution

Because debugging output is assigned high priority in the CPU process, it can render the system unusable. For this reason, use the Cisco IOS **debug** commands only to troubleshoot specific problems or during troubleshooting sessions with Cisco technical support staff. Moreover, it is best to use **debug** commands during periods of lower network traffic and fewer users, or on a debug chassis with a single active session. Debugging during these periods decreases the likelihood that increased **debug** command processing overhead will affect system use.

Information About ISA Session Monitoring and Distributed Conditional Debugging

Before you enable session monitoring or distributed conditional debugging, you should understand the following concepts:

- [ISA Session and Flow Monitoring, page 200](#)
- [ISA Distributed Conditional Debugging, page 200](#)

ISA Session and Flow Monitoring

ISA introduces a mechanism that allows an administrator to monitor ISA sessions and flows continuously. The **show interface monitor** command, which displays interface statistics, and the **show process cpu monitor** command, which displays information about CPU usage, both update the information in their displays at specified intervals. These commands also provide the ability to freeze or clear the information in the display.

ISA Distributed Conditional Debugging

This section contains the following concepts:

- [Benefits of Enhanced Conditional Debugging for the ISA Platforms, page 201](#)
- [Cisco IOS Software Components Supported by Distributed Conditional Debugging, page 201](#)

Benefits of Enhanced Conditional Debugging for the ISA Platforms

Because literally thousands of user sessions run on the ISA platforms, it is not practical to troubleshoot a problem with a session by enabling the various component **debug** commands that are available and trace through the messages for a single session or user. Instead, it is more practical to filter debugging messages for a single session or call across the various Cisco IOS components that a session traverses. For this reason, the conditional debugging previously offered in the Cisco IOS software has been enhanced to facilitate debug filtering for ISA and is available as distributed conditional debugging.

Cisco IOS Software Components Supported by Distributed Conditional Debugging

The following components are supported for ISA distributed conditional debugging:

- Authentication, authorization, and accounting (AAA) and RADIUS
- ATM components
- Feature Manager
- Policy Manager
- PPP
- PPP over Ethernet (PPPoE)
- Session Manager
- Virtual Private Dialup Network (VPDN)

See [Table 20](#) and [Table 21](#) for specific commands that are supported for distributed conditional debugging.

How to Enable ISA Session Monitoring and Distributed Conditional Debugging

This section contains the following tasks:

- [Monitoring ISA Sessions and Flows, page 201](#)
- [Configuring Distributed Conditional Debugging, page 202](#)

Monitoring ISA Sessions and Flows

Perform this task to monitor interface and CPU statistics.

DETAILED STEPS

| | Command or Action | Purpose |
|---------------|--|---|
| Step 1 | <p>enable</p> <p>Example: Router> enable</p> | <p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> Enter your password if prompted. |
| Step 2 | <p>show interface type number monitor [interval seconds]</p> <p>Example: Router# show interface ethernet 3/0 monitor interval 10</p> | <p>Displays interface statistics and updates the display at specified intervals.</p> |
| Step 3 | <p>show processes cpu monitor [interval seconds]</p> <p>Example: Router# show processes cpu monitor</p> | <p>Displays detailed CPU utilization statistics and updates the display at specified intervals.</p> |

Configuring Distributed Conditional Debugging

Two main tasks are required for configuring distributed conditional debugging: enabling conditional debugging, and issuing one or more supported **debug** command. These required tasks are described in the following sections:

- [ISA Debug Condition Commands, page 202](#)
- [Debug Commands That Are Supported by ISA Conditional Debug, page 203](#)
- [Enabling Distributed Conditional Debugging, page 205](#)
- [Restrictions, page 205](#)
- [Enabling Distributed Conditional Debugging, page 205](#)
- [Displaying Debugging Conditions, page 206](#)
- [Troubleshooting Tips, page 206](#)

ISA Debug Condition Commands

Table 20 lists the **debug condition** commands that you can issue at the EXEC prompt to enable distributed conditional debugging. You can set more than one condition.

Table 20 Supported Conditional Debug Commands

| Command | Purpose |
|---|--|
| debug condition domain domain-name | Filters messages on the specified domain name. |
| debug condition interface atm ATM-interface vc {vci/vpi vci} | Filters messages on the specified virtual circuit. |
| debug condition interface atm ATM-interface vc {vci/vpi vci} vlan-id ID | Filters messages on the specified VLAN identifier. |
| debug condition interface {Ethernet Fast Ethernet Gigabit Ethernet} vlan-id ID | |

Table 20 Supported Conditional Debug Commands

| Command | Purpose |
|---|---|
| debug condition mac-address <i>hexadecimal-MAC-address</i> | Filters messages on the specified MAC address. |
| debug condition portbundle ip <i>IP-address</i> bundle <i>bundle-number</i> | Filters messages on the specified Port-Bundle Host Key (PBHK). |
| debug condition session-id <i>session-ID</i> | Filters messages on the specified session identifier. Note The session identifier can be obtained by entering the show subscriber session command. |
| debug condition username <i>email-address</i> | Filters messages on the specified Internet username. |

Debug Commands That Are Supported by ISA Conditional Debug

Following is a list of the Cisco IOS debug commands that are supported for distributed conditional debugging. The commands are listed by component. One or more of these commands can be issued after enabling one of the **debug condition** commands listed in [Table 20](#)

Table 21 Debug Commands Supported by ISA Distributed Conditional Debugging

| |
|----------------------------------|
| AAA Debug Commands |
| debug aaa accounting |
| debug aaa authentication |
| debug aaa authorization |
| debug aaa id |
| ATM Debug Commands |
| debug atm arp |
| debug atm error |
| debug atm event |
| debug atm oam |
| debug atm packet |
| debug atm state |
| PPP Debug Commands |
| debug ppp authentication |
| debug ppp bap error |
| debug ppp bap events |
| debug ppp bap negotiation |
| debug ppp cbcp |
| debug ppp error |
| debug ppp mppe detailed |
| debug ppp mppe events |
| debug ppp mppe pack |
| debug ppp multi data |

Table 21 *Debug Commands Supported by ISA Distributed Conditional Debugging (continued)*

| |
|--|
| debug ppp multi events |
| debug ppp multi frag |
| debug ppp negotiation |
| debug ppp pack |
| debug ppp subscriber |
| PPPoE Debug Commands |
| debug pppoe data |
| debug pppoe error |
| debug pppoe event |
| debug pppoe packet |
| Session Manager Debug Commands |
| debug subscriber aaa authorization event |
| debug subscriber aaa authorization fsm |
| debug subscriber error |
| debug subscriber event |
| Feature Manager Debug Commands |
| debug subscriber feature access-list error |
| debug subscriber feature access-list event |
| debug subscriber feature compression detail |
| debug subscriber feature compression error |
| debug subscriber feature compression event |
| debug subscriber feature detail |
| debug subscriber feature error |
| debug subscriber feature event |
| debug subscriber feature interface-config error |
| debug subscriber feature interface-config event |
| debug subscriber feature modem-on-hold detail |
| debug subscriber feature modem-on-hold error |
| debug subscriber feature modem-on-hold event |
| debug subscriber feature portbundle error |
| debug subscriber feature portbundle event |
| debug subscriber feature portbundle packet |
| debug subscriber feature qos-policy error |
| debug subscriber feature qos-policy event |
| debug subscriber feature static-routes error |
| debug subscriber feature static-routes event |
| debug subscriber feature traffic-classification detail |

Table 21 *Debug Commands Supported by ISA Distributed Conditional Debugging (continued)*

| |
|--|
| <code>debug subscriber feature traffic-classification error</code> |
| <code>debug subscriber feature traffic-classification event</code> |
| Policy Manager Debug Commands |
| <code>debug subscriber fsm</code> |
| <code>debug subscriber policy condition</code> |
| <code>debug subscriber policy detail</code> |
| <code>debug subscriber policy error</code> |
| <code>debug subscriber policy event</code> |
| <code>debug subscriber policy fsm</code> |
| <code>debug subscriber policy rule</code> |
| <code>debug subscriber session error</code> |
| <code>debug subscriber session event</code> |
| VPDN Debug Commands |
| <code>debug vpdn call event</code> |
| <code>debug vpdn call fsm</code> |
| <code>debug vpdn error</code> |
| <code>debug vpdn event</code> |
| <code>debug vpdn event disconnect</code> |

Restrictions

The **debug condition session-id** command filters a session only after the session has been established. The session identifier is a unique dynamic number generated internally by the Cisco IOS software and assigned to each session when the session is established.

In VPDN, the **debug** commands and messages associated with tunnels cannot be filtered because they are not associated with a session, but are displayed during the tunnel-establishment phase. The debugging messages will be displayed even if filtering is enabled by one of the conditions.

If multiple conditions are set, the debugging messages corresponding to all the sessions that meet any of the conditions will be displayed. Some conditions, such as domain name, will trigger debugging messages for all the sessions that belong to the particular domain.

Enabling Distributed Conditional Debugging

Perform this task to enable distributed conditional debugging for ISA.

SUMMARY STEPS

1. `enable`
2. `debug condition command`
3. `debug command`

DETAILED STEPS

| | Command or Action | Purpose |
|--------|--|--|
| Step 1 | <code>enable</code> Example: Router> enable | Enables privileged EXEC mode. <ul style="list-style-type: none">Enter your password if prompted. |
| Step 2 | <code>debug condition command</code> Example: Router# debug condition username user@cisco.com | Enter one or more of the debug condition commands listed in Table 20 to enable distributed conditional debugging. |
| Step 3 | <code>debug command</code> Example: Router# debug subscriber aaa authorization fsm | Enter one or more of the supported debug commands from Table 21 . |

Displaying Debugging Conditions

To display the debugging conditions that have been set, perform the following task:

SUMMARY STEPS

1. `enable`
2. `show debug condition`

DETAILED STEPS

| | Command or Action | Purpose |
|--------|--|---|
| Step 1 | <code>enable</code> Example: Router> enable | Enables privileged EXEC mode. <ul style="list-style-type: none">Enter your password if prompted. |
| Step 2 | <code>show debug condition</code> Example: Router# show debug condition | Displays conditions that have been set for debugging. |

Troubleshooting Tips

The Cisco IOS software displays messages as you set the conditions for filtering the debugging.

When a condition is set, it is assigned a number, as follows:

```
Condition 1 set
```

If a condition has already been set, the following message is displayed :

```
% Condition already set
```


The following messages and prompt are displayed when you attempt to disable the last condition using the **no** form of a **debug condition** command:

```
This condition is the last interface condition set.
Removing all conditions may cause a flood of debugging messages
to result, unless specific debugging flags are first removed.
```

```
Proceed with removal? [yes/no]: yes
Condition 1 has been removed
```



Tip

Use the **no** forms of the commands to disable all **debug** commands before disabling all of the debugging conditions that have been set.

Configuration Examples for ISA Distributed Conditional Debugging

This section contains the following examples:

- [Enabling ISA Distributed Conditional Debugging: Example, page 208](#)
- [Displaying Debugging Conditions: Example, page 208](#)

Monitoring Interface Statistics: Example

The following example shows sample output for the **show interface monitor** command. The display will be updated every 10 seconds.

```
Router> show interface ethernet 0/0 monitor interval 10
```

```
Router Name:  Scale3-Router8          Update Secs: 10
Interface Name:  Ethernet 0/0          Interface Status: UP, line is up
```

| Line Statistics: | Total: | Rate(/s) | Delta |
|------------------|--------|----------|-------|
| Input Bytes: | 123456 | 123 | 7890 |
| Input Packets: | 3456 | 56 | 560 |
| Broadcast: | 1333 | 6 | 60 |
| OutputBytes: | 75717 | 123 | 1230 |
| Output Packets: | 733 | 44 | 440 |

| Error Statistics: | Total: | Delta: |
|-------------------|--------|--------|
| Input Errors: | 0 | 0 |
| CRC Errors: | 0 | 0 |
| Frame Errors: | 0 | 0 |
| Ignored: | 0 | 0 |
| Output Errors: | 0 | 0 |
| Collisions: | 0 | 0 |

```
No. Interface Resets: 2
End = e          Clear = c          Freeze = f
Enter Command:
```

Monitoring CPU Statistics: Example

The following example shows sample output for the **show processes cpu monitor** command:

```
Router> show processes cpu monitor

CPU utilization for five seconds: 0%/0%; one minute: 0%; five minutes: 0%
  PID Runtime(ms)   Invoked    uSecs   5Sec   1Min   5Min   TY Process
    3     772         712     1084   0.08%  0.04%  0.02%  0   Exec
   67     276        4151        66   0.08%  0.03%  0.01%  0 L2TP mgmt daemon
  116    604        2263        66   0.16%  0.05%  0.01%  0 IDMGR CORE

End = e      Freeze = f
Enter Command:
```

Enabling ISA Distributed Conditional Debugging: Example

The following example shows how to filter PPP, PPPoE, and Session Manager debugs for a PPPoE session with username “user@cisco.com.” Only debugging messages for the defined user are displayed on the console. Any other debugging messages associated with other users will not be displayed.

```
Router# debug condition username user@cisco.com
Condition 1 set

Router# debug ppp negotiation
Router# debug pppoe event
Router# debug subscriber session event
```

Displaying Debugging Conditions: Example

The following example shows how to display debugging conditions that have been set.

```
Router# show debug condition

Condition 1: domain cisco.com (0 flags triggered)
Condition 2: username user@cisco.com (0 flags triggered)
Condition 3: ip 172.19.200.10 (0 flags triggered)
```

Additional References

The following sections provide references related to ISA session monitoring and distributed conditional debugging.

Related Documents

| Related Topic | Document Title |
|---------------------------------|--|
| ISA commands | Cisco IOS Intelligent Service Architecture Command Reference |
| Cisco IOS debug commands | Cisco IOS Debug Command Reference , Release 12.3 T |
| Conditional debugging | “ Conditionally Triggered Debugging ” chapter in the <i>Cisco IOS Debug Command Reference</i> , Release 12.3 T |

Technical Assistance

| Description | Link |
|--|---|
| Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content. | http://www.cisco.com/public/support/tac/home.shtml |

Feature Information for Distributed Conditional Debugging

Table 22 lists the features in this module and provides links to specific configuration information. Only features that were introduced or modified in Cisco IOS Release 12.2(27)SBA or later releases appear in the table.

Not all commands may be available in your Cisco IOS software release. For details on when support for specific commands was introduced, see the command reference documents.

If you are looking for information on a feature in this technology that is not documented here, see the “[Intelligent Service Architecture Features Roadmap](#).”

Cisco IOS software images are specific to a Cisco IOS software release, a feature set, and a platform. Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.



Note

Table 22 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 22 Feature Information for ISA Session Monitoring and Distributed Conditional Debugging

| Feature Name | Releases | Feature Configuration Information |
|---|-------------|--|
| ISA:Instrumentation: Session and Flow Monitoring | 12.2(27)SBA | <p>ISA provides a mechanism for continuously monitoring interface and CPU statistics. This feature introduces the show interface monitor and show processes cpu monitor commands, which display statistics that are updated at specified intervals.</p> <p>The following sections provide information about this feature:</p> <ul style="list-style-type: none"> • ISA Session and Flow Monitoring, page 200 • Monitoring ISA Sessions and Flows, page 201 |
| ISA:Instrumentation: Advanced Conditional Debugging | 12.2(27)SBA | <p>ISA provides the ability to define various conditions for filtering debug output. Conditional debugging generates very specific and relevant information that can be used for session, flow, subscriber, and service diagnostics.</p> <p>The following sections provide information about this feature:</p> <ul style="list-style-type: none"> • ISA Distributed Conditional Debugging, page 200 • Configuring Distributed Conditional Debugging, page 202 |

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 This module first published April 28, 2005. Last updated April 28, 2005.