



Distributed Time-Based Access Lists

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History for the Distributed Time-Based Access Lists Feature

Release	Modification
12.2(2)T	This feature was introduced.
12.2(28)SB	This feature was integrated into Cisco IOS Release 12.2(28)SB.

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Corporate Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

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Feature Overview

Cisco IOS allows implementation of access lists based on the time of day. To do so, you create a time range that defines specific times of the day and week. The time range is identified by a name and then referenced by a function, so that those time restrictions are imposed on the function itself.

Currently, IP and IPX named or numbered extended access lists are the only functions that can use time ranges. The time range allows the network administrator to define when the **permit** or **deny** statements in the access list are in effect.

Before the introduction of the Distributed Time-Based Access Lists feature, time-based access lists were not supported on line cards for the Cisco 7500 series routers. If time-based access lists were configured, they behaved as normal access lists. If an interface on a line card was configured with time-based access lists, the packets switched into the interface were not distributed switched through the line card but forwarded to the Route Processor for processing.

The Distributed Time-Based Access Lists feature allows packets destined for an interface configured with time-based access lists to be distributed switched through the line card.

For this functionality to work, the software clock must remain synchronized between the Route Processor and the line card. This synchronization occurs through an exchange of interprocess communications (IPC) messages from the Route Processor to the line card. When a time range or a time-range entry is changed, added, or deleted, an IPC message is sent by the Route Processor to the line card.

Benefits

The Distributed Time-Based Access Lists feature gives network administrators more control over permitting or denying a user access to resources. Customers can now take advantage of the performance benefits of distributed switching and the flexibility given by time-based access lists.

Configuration Tasks

See the following sections for configuration tasks for the Distributed Time-Based Access Lists feature. Each task in the list is identified as either optional or required.

- [Defining a Time Range, page 3](#) (required)
- [Referencing the Time Range, page 3](#) (required)
- [Verifying Distributed Time-Based Access Lists, page 3](#) (optional)
- [Monitoring and Maintaining Distributed Time-Based Access Lists, page 4](#) (optional)

Defining a Time Range



Note

The time range relies on the software clock of the routing device. For the time range feature to work the way you intend, you need a reliable clock source. We recommend that you use Network Time Protocol (NTP) to synchronize the software clock of the routing device.

To define a time range, use the following commands beginning in global configuration mode.

	Command	Purpose
Step 1	Router(config)# time-range <i>time-range-name</i>	Assigns a name to the time-range to be configured and enters time range configuration mode.
Step 2	Router(config-time-range)# absolute [<i>start time date</i>] [<i>end time date</i>]	Specifies when the time range will be in effect.

Repeat these tasks if you have multiple items you want in effect at different times. For example, repeat the steps to include multiple **permit** or **deny** statements in an access list in effect at different times. For further details on the commands described, see the corresponding chapter in the *Cisco IOS Configuration Fundamentals Command Reference*, Release 12.2.

Referencing the Time Range

In order for a time range to be applied, you must reference it by name in a feature that can implement time ranges. To reference the time range, perform one of the following tasks:

- Create an IP extended access list: refer to the “Configuring IP Services” chapter in the *Cisco IOS IP Configuration Guide*, Release 12.2 for instructions and further details.
- Create an IPX Extended Access List: refer to the “Configuring Novell IPX” chapter of the *Cisco IOS Apple Talk and Novell IPX Configuration Guide*, Release 12.2 for instructions and further details.

Verifying Distributed Time-Based Access Lists

For the distributed time-based access list functionality to work, the software clock must remain synchronized between the Route Processor and the line card.

To verify that the time clocks remain synchronized and that IPC messages about time range statistics are being sent by the Route Processor to the line card, use the following command in EXEC mode:

Command	Purpose
Router# show time-range ipc	Displays the statistics about the time-range IPC messages between the Route Processor and line card.

Monitoring and Maintaining Distributed Time-Based Access Lists

To display information about the time-range IPC messages, use the following commands in EXEC mode, as needed:

Command	Purpose
Router# <code>debug time-range ipc</code>	Enables debugging output for monitoring the time-range IPC messages between the Route Processor and the line card.
Router# <code>show time-range ipc</code>	Displays the statistics about the time-range IPC messages between the Route Processor and line card.
Router# <code>clear time-range ipc</code>	Clears the time-range IPC message statistics and counters between the Route Processor and the line card for the time-range subsystem.

Configuration Examples

The Distributed Time-Based Access Lists feature is enabled automatically when time ranges are configured on access lists. For an example of a time range applied to an access list, refer to the “Configuring IP Services” chapter of the *Cisco IOS IP Configuration Guide*, Release 12.2.

Additional References

The following sections provide references related to Distributed Time-Based Access Lists.

Related Documents

Related Topic	Document Title
Cisco IOS configuration fundamentals	Cisco IOS Configuration Fundamentals Configuration Guide , Release 12.2
IP configuration tasks	Cisco IOS IP Configuration Guide , Release 12.2
Addressing and services	Cisco IOS IP Command Reference , Volume 1 of 3: Addressing and Services, Release 12.2

Standards

Standard	Title
None	—

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
None	—

Technical Assistance

Description	Link
The Cisco Technical Support & Documentation website contains thousands of 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/techsupport

Command Reference

This section documents the following modified commands only.

- [clear time-range ipc](#)
- [debug time-range ipc](#)
- [show time-range ipc](#)

clear time-range ipc

To clear the time-range interprocess communications (IPC) message statistics and counters between the Route Processor and the line card, use the **clear time-range ipc** command in privileged EXEC mode.

clear time-range ipc

Syntax Description This command has no argument or keywords.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(2)T	This command was introduced.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Examples The following example clears the time-range IPC statistics and counters:

```
Router# clear time-range ipc
```

Related Commands	Command	Description
	debug time-range ipc	Enables debugging output for monitoring the time-range IPC messages between the Route Processor and the line card.
	show time-range ipc	Displays the statistics about the time-range IPC messages between the Route Processor and line card.

debug time-range ipc

To enable debugging output for monitoring the time-range interprocess communications (IPC) messages between the Route Processor and the line card, use the **debug time-range ipc** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug time-range ipc

no debug time-range ipc

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(2)T	This command was introduced.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Examples The following is sample output from the **debug time-range ipc** command. In the following example, the time ranges sent to the line card are monitored:

```
Router# debug time-range ipc

00:14:19:TRANGE-IPC:Sent Time-range t1 ADD to all slots
00:15:22:TRANGE-IPC:Sent Time-range t1 ADD to all slots
```

In the following example, the time ranges deleted from the line card are monitored:

```
Router# debug time-range ipc

00:15:42:TRANGE-IPC:Sent Time-range t1 DEL to all slots
00:15:56:TRANGE-IPC:Sent Time-range t1 DEL to all slots
```

Related Commands	Command	Description
	show time-range ipc	Displays the statistics about the time-range IPC messages between the Route Processor and line card.

show time-range ipc

To display the statistics about the time-range interprocess communications (IPC) messages between the Route Processor and line card, use the **show time-range ipc** command in user EXEC or privileged EXEC mode.

show time-range ipc

Syntax Description This command has no argument or keywords.

Defaults No default behavior or values.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	12.2(2)T	This command was introduced.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Usage Guidelines The **debug time-range ipc** EXEC command must be enabled for the **show time-range ipc** command to display the time-range IPC message statistics.

Examples The following is sample output from the **show time-range ipc** command:

```
Router# show time-range ipc

RP Time range Updates Sent :3
RP Time range Deletes Sent :2
```

[Table 1](#) describes the significant fields shown in the display.

Table 1 *show time-range ipc* Field Descriptions

Field	Description
RP Time range Updates Sent	Number of time-range updates sent by the Route Processor.
RP Time range Deletes Sent	Number of time-range deletes sent by the Route Processor.

Related Commands	Command	Description
	clear time-range ipc	Clears the time-range IPC message statistics and counters between the Route Processor and the line card.
	debug time-range ipc	Enables debugging output for monitoring the time-range IPC messages between the Route Processor and the line card.

Glossary

IPC—interprocess communications. A system that lets threads and processes transfer data and messages among themselves; used to offer services to and receive services from other programs.

line card—Any I/O card that can be inserted in a modular chassis.

RP—Route Processor. Processor module in the Cisco 7000 series routers that contains the CPU, system software, and most of the memory components that are used in the router. Sometimes called a *supervisory processor*.

VIP—Versatile Interface Processor. Interface card used in Cisco 7000 and Cisco 7500 series routers. The VIP provides multilayer switching and runs Cisco IOS software.

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