



DistributedDirector Enhancements for Cisco IOS Release 11.1(28)IA

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Feature Overview

The DistributedDirector Enhancements for Cisco IOS Release 11.1(28)IA feature consists of the following three new features for the Cisco DistributedDirector:

- Enhanced Fault Tolerance with Multiple Resource Records
- Critical Event Recording with Syslog
- Enhanced Server Verification with Multiple Port Connect Test

Enhanced Fault Tolerance with Multiple Resource Records

Prior to this enhancement, DistributedDirector would return a single Resource Record (RR) in each DNS response. This was normally sufficient, but for some applications, server failover will occur more rapidly when applications are provided IP addresses of multiple servers.

The Enhanced Fault Tolerance with Multiple Resource Records feature enables DistributedDirector to return multiple RR. The number of RR returned in a single reply is configurable. The default number of RR returned is one.

Critical Event Recording with Syslog

The Critical Event Recording with Syslog feature enables DistributedDirector to log critical events by way of the the industry-standard syslog system. Server state is logged, providing a useful log of when servers are considered up or down. Additionally, the server selection process may be logged. In both cases, the logging priority level is "informational."

Enhanced Server Verification with Multiple Port Connect Test

Prior to this enhancement, DistributedDirector could evaluate server status by performing a TCP connect test to a single port. The Enhanced Server Verification with Multiple Port Connect Test feature allows multiple connect ports to be specified. If any one of the connect tests fail, the server is considered down.

Benefits

The new features provided in Cisco IOS Release 11.1(28)IA help make networks using DistributedDirector more robust. These features ensure that applications have more useful information, perform better server verification and allow administrators to better track DistributedDirector. In particular:

- The Enhanced Fault Tolerance with Multiple Resource Records feature provides better fault tolerance for clients.
- The Critical Event Recording with Syslog feature gives the ability to examine DNS traffic and how servers are chosen.
- The Enhanced Server Verification with Multiple Port Connect Test feature better reflects the reality that some services span several ports and require that all be up.

Restrictions

Enhanced Fault Tolerance with Multiple Resource Records

Configuring DistributedDirector to return a large number of records could reduce the benefit of using DistributedDirector to select the best server.

Critical Event Recording with Syslog

Extensive syslog output is provided when logging server selection. Therefore, this feature should not be used when a heavy request load is expected.

Related Documents

For more information on the Cisco DistributedDirector, see the following documents, which are located on CCO at <http://www.cisco.com/univercd/cc/td/doc/product/iaabu/distrdir/index.htm>:

- Cisco DistributedDirector 2500 Series Install and Config Guide
- Cisco DistributedDirector 4700-M Install and Config Guide
- Release Notes for Cisco DistributedDirector System Software
- Cisco DistributedDirector Enhancements for Release 11.1(18)IA
- Cisco DistributedDirector Enhancements for Release 11.1(25)IA

Supported Platforms

- DistributedDirector 2501
- DistributedDirector 2502
- DistributedDirector 4700-M

Supported Standards, MIBs, and RFCs

Standards

None

MIBs

None

For descriptions of supported MIBs and how to use MIBs, see the Cisco MIB web site on CCO at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

RFCs

None

Configuration Tasks

See the following sections for configuration tasks for the DistributedDirector Enhancements for Cisco IOS Release 11.1(28)IA feature. Each task in the list indicates if the task is optional or required.

- Configuring Enhanced Fault Tolerance with Multiple Resource Records
- Configuring Critical Event Recording with Syslog
- Configuring Enhanced Server Verification with Multiple Port Connect Tests

Configuring Enhanced Fault Tolerance with Multiple Resource Records

To configure Enhanced Fault Tolerance with Multiple Resource Records on the DistributedDirector for a host name, use the following command in global configuration mode:

Command	Purpose
Router(config)# <code>ip director host hostname [a mx] multiple integer</code>	Specifies how many RR the DistributedDirector will return for each DNS response.

Configuring Critical Event Recording with Syslog

To configure Critical Event Recording with Syslog on the DistributedDirector for a host name, use the following commands in global configuration mode:

Command	Purpose
Router(config)# ip director host <i>hostname</i> [a mx] logging	Configures the DistributedDirector to send to syslog the DNS request and response information, and the server selection process of this host. The logging priority level is “informational.”

Configuring Enhanced Server Verification with Multiple Port Connect Tests

To configure Enhanced Server Verification with Multiple Port Connect Tests on the DistributedDirector, use the following commands in global configuration mode:

Command	Purpose
Router(config)# ip director host <i>hostname</i> [a mx] connect <i>port-1</i> [interval] <i>connection-interval</i> Router(config)# ip director host <i>hostname</i> [a mx] connect <i>port-2</i> [interval] <i>connection-interval</i> ... Router(config)# ip director host <i>hostname</i> [a mx] connect <i>port-N</i> [interval] <i>connection-interval</i>	Specifies how often the DistributedDirector will verify that the remote servers are still active. When you configure multiple ip director host <i>hostname</i> connect commands for the same hostname but with different port numbers, the DistributedDirector will verify that all of the ports are accessible. If any of the ports are not accessible, the host will be considered down.

Command Reference

This section documents new and modified commands. All other commands used with this feature are documented in the Command Summary and Reference sections of the Cisco DistributedDirector Install and Config Guides.

- **ip director host connect**
- **ip director host logging**
- **ip director host multiple**

ip director host connect

To enable the DistributedDirector to verify that a server is available, use the **ip director host connect** global configuration command. The DistributedDirector redirects clients only to servers that respond. To turn off connection parameters, use the **no** form of this command.

ip director host *hostname* [**a** | **mx**] **connect** *port* [**interval**] *connection-interval*

no ip director host *hostname* [**a** | **mx**]

Syntax Description

<i>hostname</i>	The name of the host that maps to one or more IP addresses. Do not use an IP address.
a	(Optional) Indicates the configuration is for processing DNS address (A) queries for the specified host name. If no query type is specified, a is set by default.
mx	(Optional) Indicates the configuration is for processing Mail eXchange (MX) queries for the specified host name.
<i>port</i>	The port number to which the distributed servers are configured.
interval	(Optional) Configures the connection interval to be a time in seconds instead of minutes.
<i>connection-interval</i>	The time in minutes (or seconds, if the interval keyword is used) that elapses between availability checks.

Defaults

No connection parameter is set.
The default query type is **a**.

Command Modes

Global configuration

Command History

Release	Modification
11.1(1)IA	This command was introduced.
11.1(25)IA and 12.0(3)T	The a and mx keywords were added.
11.1(28)IA and 12.1(3)T	Enhanced Server Verification with Multiple Port Connect Test functionality was added.

Usage Guidelines

When this parameter is configured, the DistributedDirector will attempt to create a TCP connection to each of the distributed servers on a configured port (for example, port 80 for HTTP servers) over the configured time interval. Servers that yield unsuccessful TCP connection attempts will be marked as

unavailable. Following a failed TCP connection, the DistributedDirector uses a linear backoff algorithm to create subsequent TCP connections to the server to determine when it is again available. This algorithm is used to smoothly handle changes in server or network availability.

The initial connection trial to a server that is labeled as “up” is done three times in rapid succession. If no connection is successful, the percentage confidence that the server is down is set to 10 percent. The retry interval is calculated as the configured interval multiplied by the confidence percentage with a minimum of 1 minute. Each successive connection attempt is done once, and each time the attempt is unsuccessful the confidence percentage is incremented by 10 percent until it reaches 100 percent.

**Note**

Although TCP connection state information may take up to 4 minutes to be cleared, TCP connection timeouts usually occur within about 30 seconds. As a result, the minimum configurable TCP connection time interval on the DistributedDirector is 1 minute. The minimum retry interval in the linear-backoff algorithm of the DistributedDirector is also 1 minute.

Beginning with Cisco IOS Release 11.1(28)IA, the **ip director host *hostname* connect** command supports the Enhanced Server Verification with Multiple Port Connect Test feature. When you enter several **ip director host *hostname* connect** commands to the same host name but with different port numbers, the DistributedDirector verifies that all of the ports are accessible. The DistributedDirector will only consider the server accessible if all of the ports are accessible.

Examples

The following example sets the connect interval to 5 minutes to the distributed servers on port 80 and port 90. The distributed servers will only be considered accessible if both port 80 and port 90 are accessible:

```
ip director host www.sleet.com connect 80 5
ip director host www.sleet.com connect 90 5
```

Related Commands

Command	Description
ip director host multiple	Configures the order in which the DistributedDirector considers metrics when picking a server.

ip director host logging

To configure the DistributedDirector to log critical events to syslog, use the **ip director host logging** global configuration command. To turn off metric priorities, use the **no** form of this command.

ip director host [a | mx] hostname logging

no ip director host [a | mx] hostname logging

Syntax Description

<i>hostname</i>	The name of the host that maps to one or more IP addresses. Do not use an IP address.
a	(Optional) Indicates the configuration is for processing DNS address (A) queries for the specified host name. If no query type is specified, a is set by default.
mx	(Optional) Indicates the configuration is for processing Mail eXchange (MX) queries for the specified host name.
logging	Specifies to syslog the DNS request and response, and the server selection process of this host. The logging priority level is "informational."

Defaults

Disabled

Command Modes

Global configuration

Command History

Release	Modification
11.1(28)IA and 12.1(3)T	This command was introduced.

Usage Guidelines

The Critical Event Recording with Syslog feature gives the ability to examine DNS traffic and how servers are chosen. Server state is logged, providing a useful log of when servers are considered up or down. Additionally, the server selection process may be logged. In both cases, the logging priority level is "informational."



Caution

Extensive syslog output is provided when logging server selection. Therefore, this feature should not be used when a heavy request load is expected.

Examples

The following example configures the DistributedDirector to log critical events for the host www.sleet.com:

```
ip director host www.sleet.com logging
```

ip director host multiple

To configure the number of Resource Records (RR) that the DistributedDirector will return for each DNS response, use the **ip director host multiple** global configuration command. To configure the DistributedDirector to only return the best RR for each DNS response, use the **no** form of this command.

ip director host [**a** | **mx**] *hostname multiple integer*

no ip director host [**a** | **mx**] *hostname multiple*

Syntax Description

<i>hostname</i>	The name of the host that maps to one or more IP addresses. Do not use an IP address.
a	(Optional) Indicates the configuration is for processing DNS address (A) queries for the specified host name. If no query type is specified, a is set by default.
mx	(Optional) Indicates the configuration is for processing Mail eXchange (MX) queries for the specified host name.
multiple	Returns multiple A or MX servers, which are sorted according to the specified priorities of metrics.
<i>integer</i>	Number of servers that are returned.

Defaults

Disabled

Command Modes

Global configuration

Command History

Release	Modification
11.1(28)IA and 12.1(3)T	This command was introduced.

Usage Guidelines

Configuring DistributedDirector to return a large number of records could reduce the benefit of using DistributedDirector to select the best server.

Examples

The following example configures the DistributedDirector to return the 2 best servers:

```
ip director host www.sleet.com multiple 2
```