



DFP Agent Subsystem

Feature History

Release	Modification
12.1(8a)E	This feature was introduced.

This document describes the Dynamic Feedback Protocol (DFP) Agent Subsystem feature in Cisco IOS Release 12.1(8a)E. It includes the following sections:

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Feature Overview

The Dynamic Feedback Protocol (DFP) enables a *DFP agent* in a local load-balancing environment to collect status information from one or more real host servers, convert the information to relative weights, and report the weights to a *DFP manager*, such as an IOS Server Load Balancing (SLB) device. The DFP manager factors in the weights when load balancing the real servers. DFP also supports global load-balancing environments, with IOS SLB reporting weights to DistributedDirector. For more information about DFP, see the *IOS Server Load Balancing* feature module.

Prior to 12.1(8a)E, the DFP agent was implemented only in IOS SLB. The new DFP agent subsystem feature enables client subsystems other than IOS SLB to act as DFP agents. However, currently IOS SLB is the only supported subsystem. You can use multiple DFP agents from different client subsystems at the same time.

The DFP Agent Subsystem is bundled with the IOS SLB and GGSN products, it is not available separately.

Benefits

The DFP agent subsystem enables client subsystems other than IOS SLB to act as DFP agents, sending weights to a DFP manager.

Restrictions

The DFP agent subsystem has the following restrictions:

- The DFP agent requires a delay between hello messages of at least 3 seconds. Therefore, if your DFP manager provides a timeout specification, you must set the timeout to at least 3 seconds.
- The password specified in the DFP manager must match the password specified on the **password** command in the DFP agent.
- As part of the implementation of the DFP agent subsystem, the **manager** command has been removed. Its function is now provided by the **ip dfp agent** global configuration command, and by the following DFP agent configuration commands:
 - **inservice (DFP agent)**
 - **interval (DFP agent)**
 - **password**
 - **port (DFP agent)**

Related Features and Technologies

- IOS Server Load Balancing (IOS SLB)
- Dynamic Feedback Protocol (DFP)

Related Documents

- *Cisco IOS IP Configuration Guide, Release 12.2*
- *Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services, Release 12.2*
- *Dynamic Feedback Protocol Support in Distributed Director*
- *IOS Server Load Balancing* feature module

Supported Platforms

- Catalyst 6000 Family Switches
- Cisco 7100 Series Routers
- Cisco 7200 Series Routers

Supported Standards, MIBs, and RFCs

Standards

- No new or modified standards

MIBs

- No new or modified MIBs

RFCs

- No new or modified RFCs

Prerequisites

The DFP agent subsystem has no prerequisites.

Configuration Tasks

To define the port number to be used by the DFP manager to connect to the IOS SLB DFP agent to receive DFP reports, enter the following commands in order, beginning in global configuration mode:

	Command	Description
Step 1	Router(config)# ip dfp agent <i>subsystem-name</i>	Identifies a DFP agent subsystem and initiates DFP agent configuration mode. See the ip dfp agent command for more details.
Step 2	Router(config-dfp)# interval <i>seconds</i>	(Optional) Configures a DFP agent weight recalculation interval. See the interval (DFP agent) command for more details.
Step 3	Router(config-dfp)# password [0 7] <i>password</i> [<i>timeout</i>]	(Optional) Configures a DFP agent password for MD5 authentication. See the password command for more details.
Step 4	Router(config-dfp)# port <i>port-number</i>	Defines the port number to be used by the DFP manager to connect to the DFP agent. See the port (DFP agent) command for more details.
Step 5	Router(config-dfp)# inservice	Enables the DFP agent for communication with a DFP manager. A DFP agent is inactive until both of the following conditions are met: <ul style="list-style-type: none"> • The DFP agent has been enabled using the inservice (DFP agent) command. • The client subsystem has changed the DFP agent's state to ACTIVE. See the inservice (DFP agent) command for more details.

Monitoring and Maintaining the DFP Agent Subsystem Feature

To obtain and display runtime information about the DFP agent subsystem, use the following commands in EXEC mode:

Command	Purpose
Router# show ip dfp [agent <i>subsystem_name</i>] [detail]	Displays information about DFP agents. See the show ip dfp command for more details.
Router# show ip slb dfp [agent <i>agent_ip_address</i> <i>port-number</i> manager <i>manager_ip_address</i> detail weights]	Displays information about DFP and DFP agents, and about the weights assigned to real servers. See the show ip slb dfp command in the <i>Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services, Release 12.2</i> for more details.

Configuration Examples

The following example shows the commands used to configure the DFP agent subsystem. Use these commands to accomplish the following tasks:

- Identify DFP agent subsystem *slb* and change the CLI to DFP agent configuration mode.
- Set the DFP agent weight recalculation interval to *11* seconds.
- Set the unencrypted DFP agent password to *Cookies* (to match the DFP manager's password) and the timeout to *180* seconds.
- Set the DFP communication port number for to *2221*.
- Enable the DFP agent for communication with the DFP manager.

```
Router(config)# ip dfp agent slb
Router(config-dfp)# interval 11
Router(config-dfp)# password Cookies 180
Router(config-dfp)# port 2221
Router(config-dfp)# inservice
```

Command Reference

This section documents new or modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

- [debug ip dfp agent, page 5](#)
- [inservice \(DFP agent\), page 6](#)
- [interval \(DFP agent\), page 7](#)
- [ip dfp agent, page 8](#)
- [manager, page 9](#)
- [password, page 10](#)
- [port \(DFP agent\), page 12](#)
- [show ip dfp, page 13](#)

debug ip dfp agent

To display debug messages for the DFP agent subsystem, use the **debug ip dfp** EXEC command. To stop debug output, use the **no** form of this command.

debug ip dfp agent

no debug ip dfp agent

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes EXEC configuration

Command History	Release	Modification
	12.1(8a)E	This command was introduced.

Usage Guidelines See the following caution before using **debug** commands:



Caution

Because debugging output is assigned high priority in the CPU process, it can render the system unusable. For this reason, use **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 flows and fewer users. Debugging during these periods reduces the effect these commands have on other users on the system.

This command displays debug messages for the DFP agent subsystem.

Examples The following example configures a DFP agent debug session:

```
Router# debug ip dfp agent
DFP debugging is on
Router#
```

The following example stops all debugging:

```
Router# no debug all
All possible debugging has been turned off
Router#
```

in service (DFP agent)

To enable the DFP agent for communication with a DFP manager, use the **in service** DFP agent configuration command. To remove the DFP agent from service, use the **no** form of this command.

in service

no in service

Syntax Description This command has no arguments or keywords.

Defaults If the **in service** command is not specified, the DFP agent is inactive.

Command Modes DFP agent configuration

Command History	Release	Modification
	12.1(8a)E	This command was introduced.

Usage Guidelines A DFP agent is inactive until both of the following conditions are met:

- The DFP agent has been enabled using the **in service (DFP agent)** command.
- The client subsystem has changed the DFP agent’s state to **ACTIVE**.

When you use the **no** form of this command to remove a DFP agent from service, the DFP agent closes all open connections, and no new connections are assigned.

Examples In the following example, the DFP agent is enabled for communication with a DFP manager:

```
Router(config)# ip dfp agent slb
Router(config-dfp)# in service
```

Related Commands	Command	Description
	agent	Identifies a DFP agent to which IOS SLB can connect.
	ip dfp agent	Identifies a DFP agent subsystem and initiates DFP agent configuration mode.
	ip slb dfp	Configures DFP, supplies an optional password, and initiates DFP configuration mode.

interval (DFP agent)

To configure a DFP agent weight recalculation interval, use the **interval** DFP agent configuration command. To restore the default setting, use the **no** form of this command.

interval *seconds*

no interval *seconds*

Syntax Description	<i>seconds</i>	Specifies the number of seconds to wait before recalculating weights for the DFP manager. Valid values range from 5 to 65535 seconds. The default interval is 10 seconds.
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Defaults The default **interval** value is 10 seconds.

Command Modes DFP agent configuration

Command History	Release	Modification
	12.1(8a)E	This command was introduced.

Usage Guidelines The DFP agent sends the new weight to the DFP manager only if the new weight is different from the old weight. If the new weight is the same as the old weight, it is not sent to the DFP manager.

Examples The following example configures the DFP agent to recalculate weights every 11 seconds:

```
Router(config)# ip dfp agent slb
Router(config-dfp)# interval 11
```

Related Commands	Command	Description
		agent
	ip dfp agent	Identifies a DFP agent subsystem and initiates DFP agent configuration mode.
	ip slb dfp	Configures DFP, supplies an optional password, and initiates DFP configuration mode.

ip dfp agent

To identify a DFP agent subsystem and initiate DFP agent configuration mode, use the **ip dfp agent** global configuration command. To remove the DFP agent identification, use the **no** form of this command.

ip dfp agent *subsystem-name*

no ip dfp agent *subsystem-name*

Syntax Description

<i>subsystem-name</i>	Character string used to identify the DFP agent subsystem, such as slb for IOS SLB. The subsystem name enables the subsystem to send weights to a DFP manager. The subsystem name is limited to 15 characters.
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Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.1(8a)E	This command was introduced.

Usage Guidelines

To discover the subsystem names that are available in your environment, enter the following command:

ip dfp agent ?

Examples

The following example identifies a DFP agent subsystem named **slb**:

```
Router(config)# ip dfp agent slb
Router(config-dfp)#?
```

Related Commands

Command	Description
agent	Identifies a DFP agent to which IOS SLB can connect.
ip slb dfp	Configures DFP, supplies an optional password, and initiates DFP configuration mode.

manager

This command has been removed. Its function is now performed by the **ip dfp agent** global configuration command, and by the following DFP agent configuration commands:

- **inservice (DFP agent)**
- **interval (DFP agent)**
- **password**
- **port (DFP agent)**

password

To configure a DFP agent password for MD5 authentication, use the **password** DFP agent configuration command. To remove the DFP agent password, use the **no password** form of this command.

password [*0|7*] *password* [*timeout*]

no password

Syntax Description		
	0	(Optional) Specifies that the password is unencrypted. This is the default setting.
	7	(Optional) Specifies that the password is encrypted.
	<i>password</i>	(Optional) Password value for MD5 authentication. This password must match the password configured on the host agent.
	<i>timeout</i>	(Optional) Delay period, in seconds, during which both the old password and the new password are accepted. The valid range is 0 to 65535 seconds. The default value is 180 seconds.

Defaults

The password encryption default is 0 (unencrypted).

The password timeout default is 180 seconds.

Command Modes

DFP agent configuration

Command History

Release	Modification
12.1(8a)E	This command was introduced.

Usage Guidelines

The password specified on this command must match the password specified on the DFP manager.

The timeout option allows you to change the password without stopping messages between the DFP agent and its manager. The default value is 180 seconds.

During the timeout, the agent sends packets with the old password (or null, if there is no old password), and receives packets with either the old or new password. After the timeout expires, the agent sends and receives packets only with the new password; received packets that use the old password are discarded.

If you are changing the password for an entire load-balanced environment, set a longer timeout. This allows enough time for you to update the password on all agents and servers before the timeout expires. It also prevents mismatches between agents and servers that have begun running the new password and agents, and servers on which you have not yet changed the old password.

Examples

The following example sets the DFP agent password (unencrypted by default) to *Cookies* and the timeout to 360 seconds:

```
Router(config)# ip dfp agent slb
Router(config-dfp)# password Cookies 360
```

Related Commands

Command	Description
agent	Identifies a DFP agent to which IOS SLB can connect.
ip dfp agent	Identifies a DFP agent subsystem and initiates DFP agent configuration mode.
ip slb dfp	Configures DFP, supplies an optional password, and initiates DFP configuration mode.
replicate casa (firewall farm)	Configures a stateful backup of IOS SLB decision tables to a backup switch.
replicate casa (virtual server)	Configures a stateful backup of IOS SLB decision tables to a backup switch.

port (DFP agent)

To define the port number to be used by the DFP manager to connect to the DFP agent, use the **port (DFP agent)** DFP agent configuration command. To disable the port number definition and remove existing connections, use the **no** form of this command.

port *port-number*

no port *port-number*

Syntax Description	<i>port-number</i>	Port number used by the DFP manager to connect to the DFP agent. The valid range is 1 to 65535.
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Defaults	No default behavior or values.
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Command Modes	DFP agent configuration
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Command History	Release	Modification
	12.1(8a)E	This command was introduced.

Examples In the following example, the DFP manager is enabled to connect to the DFP agent using port number 2221:

```
Router(config)# ip dfp agent slb
Router(config-dfp)# port 2221
```

Related Commands	Command	Description
	agent	Identifies a DFP agent to which IOS SLB can connect.
	ip dfp agent	Identifies a DFP agent subsystem and initiates DFP agent configuration mode.
	ip slb dfp	Configures DFP, supplies an optional password, and initiates DFP configuration mode.

show ip dfp

To display information about DFP agents, use the **show ip dfp** privileged EXEC command.

show ip dfp [*agent subsystem-name*] [**detail**]

Syntax Description		
agent <i>subsystem-name</i>	(Optional) Displays information about the specified DFP agent, such as slb for IOS SLB.	
detail	(Optional) Displays detailed DFP agent information.	

Defaults If no options are specified, the command displays output for all DFP agents identified by **ip dfp agent** commands, regardless of whether those agents are currently in service (**Inservice: yes**) or active (**AppActive: yes**).

Command Modes Privileged EXEC

Command History	Release	Modification
	12.1(8a)E	This command was introduced.

Usage Guidelines Detailed output for **show ip dfp** includes information about all DFP agents identified by **ip slb agent** commands, regardless of whether those agents are currently in service (**Inservice: yes**) or active (**AppActive: yes**).

Examples The following example shows detailed information for DFP agent *slb*:

```
Router# show ip dfp agent slb detail

Unexpected errors: 0

DFP Agent for service: SLB
  Port: 666 Interval: 10
  Current passwd: <none> Pending passwd: <none>
  Passwd timeout: 0
  Inservice: yes AppActive: yes

  Manager IP Address  Timeout
  -----
  172.18.45.27        0

Weight Table Report for Agent SLB

  Weights for Port: 80 Protocol: TCP

  IP Address          Bind ID  Weight
  -----
  1.1.1.1              0        65535
```

Weights for Port: 0 (wildcard) Protocol: 0 (wildcard)

IP Address	Bind ID	Weight
0.0.0.0	65534	0

Bind ID Table Report for Agent SLB

Bind IDs for Port: 80 Protocol: TCP

Bind ID	Client IP	Client Mask
0	0.0.0.0	0.0.0.0

Table 1 show ip dfp Field Descriptions

Field	Description
Port	TCP port number of the agent.
Interval	Number of seconds to wait before recalculating weights.
Current passwd	Current DFP password for MD5 authentication.
Pending passwd	Pending new DFP password for MD5 authentication.
Passwd timeout	Delay period, in seconds, during which both the current password and the new password are accepted.
Inservice	Indicates whether the DFP agent is enabled for communication with a DFP manager.
AppActive	Indicates whether the DFP agent is active.
Manager IP Address	IP address of the manager to which weights are being sent.
Timeout	Time period, in seconds, during which the DFP manager must receive an update from the DFP agent. A value of 0 means there is no timeout.
Weights for Port	Port for which the following weights are reported. 0 indicates a wildcard value.
Protocol	Protocol used for the port. 0 indicates a wildcard value.
IP Address	IP address for which weight is reported.
Bind ID	Bind ID associated with the IP address.
Weight	Weight calculated for the IP address.
Bind IDs for Port	Port for which the following bind IDs are reported.
Protocol	Protocol used for the port.
Bind ID	Bind ID of this instance of the real server.
Client IP	IP address of client using the virtual server.
Client Mask	IP network mask of client using the virtual server.

Related Commands	Command	Description
	agent	Identifies a DFP agent to which IOS SLB can connect.
	ip dfp agent	Identifies a DFP agent subsystem and initiates DFP agent configuration mode.
	ip slb dfp	Configures DFP, supplies an optional password, and initiates DFP configuration mode.

Glossary

client subsystem—Users, such as IOS SLB, of the DFP agent function.

DFP—Dynamic Feedback Protocol. Allows host agents to dynamically report the change in status of the host systems providing a virtual service. The status reported is a relative weight that specifies a host server's capacity to perform work.

DFP agent—Object in a load-balanced environment that dynamically reports changes in status of the host systems that provide a virtual service. The status reported is a relative weight that specifies a host server's capacity to perform work. See also *DFP manager*.

DFP manager—Object in a load-balanced environment that collects status reports from DFP agents. See also *DFP agent*.

Dynamic Feedback Protocol—See *DFP*.

IOS SLB—IOS Server Load Balancing. Load-balancing function in which the network administrator defines a virtual server that represents a group of real servers in a cluster of network servers known as a server farm. When a client initiates a connection to the virtual server, IOS SLB chooses a real server for the connection based on a configured load-balancing algorithm.

Server Load Balancing—See *IOS SLB*.

services manager—Functionality built into IOS SLB that makes load-balancing decisions based on application availability, server capacity, and load distribution algorithms such as weighted round robin or weighted least connections, or the DFP. The services manager determines a real server for the packet flow using load balancing and server/application feedback.

SLB—See *IOS SLB*.

