



# Redundant Dial Shelf Controller

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This document describes Redundant Dial Shelf Controller (DSC) support for the Cisco AS5800 universal access server and contains the following sections:

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## Feature Overview

The Redundant Dial Shelf Controller feature consists of two DSC cards on the Cisco AS5800 dial shelf. The DSC cards provide clock and power control to the dial shelf cards. Each DSC card provides the following:

- Master clock for the dial shelf
- Fast Ethernet link to the router shelf
- Environmental monitoring of the feature boards
- Bootstrap images on start-up for the feature boards

The Redundant Dial Shelf Controller feature is automatically enabled when two DSC cards are installed. DSC redundancy is supported with Cisco AS5800 software at the Dial Shelf Interconnect Protocol (DSIP) level.

## DSC Redundancy

This feature enables a Cisco AS5800 dial shelf to use dual DSCs for full redundancy. A redundant configuration allows for one DSC to act as backup to the active card, should the active card fail. This increases system availability by preventing loss of service.

The redundant DSC functionality is robust under high loads and through DSC or software crashes and reloads.

The redundant DSC functionality is driven by the following events:

- User actions
- Control messages
- Timeouts
- Detection of component failures
- Error and warning messages

The following command enhancement is associated with this feature:

- Router shelf console start and stop DSC privileged EXEC commands via the **hw-module** command

## Benefits

DSC redundancy provides maximum system availability by preventing loss of service in the event of the failure of one of the DSCs.

## Restrictions

There is no load-sharing between the Broadband Inter-Carrier Interfaces (BICs). One BIC is used as a backup, carrying only control traffic, such as keepalives, until there is a switchover.

## Related Documents

- *Dial and System Management Commands for the Cisco AS5800*
- *Cisco AS5800 Access Server Software IOS Configuration Guide*
- *Cisco IOS 11.3 Dial Solutions Quick Configuration Guide*
- *Cisco IOS 11.3 Configuration Guides, Command References*

## Supported Platforms

- Cisco AS5800 universal access servers

## Supported Standards, MIBs, and RFCs

### Standards

No new or modified standards are supported by this feature.

### MIBs

No new or modified MIBs are supported by this feature.

For descriptions of MIBs and instructions on 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

No new or modified RFCs are supported by this feature.

## Prerequisites

- Your Cisco AS5800 router shelf and dial shelf must be fully installed, with two DSC cards installed on the dial shelf.
- Your Cisco AS5800 must be running Cisco IOS Release Cisco IOS Release 12.1(2)T.
- The external DSC clocking port must be configured identically on both router shelves and must be physically connected to both DSCs. This assures that if a DSC card needs replacing or if the backup DSC card becomes primary, clocking remains stable.

## Configuration Tasks

See the following sections for configuration tasks for the DSC feature. Each task in the list indicates if it is optional or required:

- Configuring the External Clocks (Required)
- Configuring the DSC (Required)

### Configuring the External Clocks (Required)

Configure the external clocks using the following commands from the router shelf login. One external clock is configured as the primary clock source, the other is configured as the backup clock source.

	Command	Purpose
Step 1	Router> <b>enable</b>	Enters the <b>enable</b> command mode (also called privileged EXEC).
Step 2	Router# <b>configure terminal</b>	Enters global configuration mode. The example shows the terminal configuration option.  Enter configuration commands, one per line.
Step 3	Router(config)# <b>dial-tdm-clock priority value</b>	Configures the trunk card clock priority. Priority range is a value between 1 and 50.
Step 4	Router(config)# [ <b>no</b> ] <b>dial-tdm-clock priority X</b> <b>{trunk-slot Y port Z}</b> <b>external {t1   e1} [120-ohm]</b>	Selects the T1/E1 trunk slot and port that is providing the clocking source. T1/E1 selection is based on the signal coming in. Select the impedance. The default impedance is 75-ohm.
Step 5	Router(config)# <b>dial-tdm-clock priority value</b> <b>external t1</b> [or] Router(config)# <b>dial-tdm-clock priority value external e1</b>	Configures the T1/E1 external clock on the dial shelf controller front panel. T1/E1 selection is based on the signal coming in. Priority range is a value between 1 and 50.

	Command	Purpose
Step 6	Router(config)# <b>Ctrl-Z</b> Router#	Verifies your command registers when you press the return key. Enter <b>Ctrl-Z</b> to return to privileged EXEC mode.
Step 7	Router# <b>copy running-config startup-config</b>	Saves your changes.

## Verifying External Clock Configuration

To verify that the primary clock is running, enter the **show dial-shelf clocks** privileged EXEC command:

```
5800# show dial-shelf <slot number> clocks
```

```
Slot 12:
System primary is 1/2/0 of priority 202
TDM Bus Master Clock Generator State = NORMAL
Backup clocks:
Source Slot Port Priority Status State
-----
Trunk 2 1 208 Good Default
Slot Type 11 10 9 8 7 6 5 4 3 2 1 0
2 T1 G G G G G G G G G G G G
```

For more information on configuring external clocks, refer to the Cisco document, *Managing Dial Shelves*.

## Configuring the DSC (Required)

To configure the redundant DSC feature, use the following commands from the router shelf login.

	Command	Purpose
Step 1	Router> <b>enable</b> Password: <password> Router#	Enters <b>enable</b> command mode (also called privileged EXEC).
Step 2	Router# <b>hw-module shelf/slot</b> { <b>start</b>   <b>stop</b> } 5800#	Stops the target DSC remotely from the router console. Restarts the DSC if it has been stopped.
Step 3	Router# <b>show redundancy</b> [ <b>history</b> ]	Displays the current or history status for redundant DSC.
Step 4	Router# <b>debug redundancy</b> { <b>all</b>   <b>ui</b>   <b>clk</b>   <b>hub</b> } Router#	Collects events for troubleshooting.
Step 5	Router# <b>show debugging</b>	Lists the debug commands that are turned on, including the debug command for the redundant DSC.

## Verifying DSC Configuration

To verify that you have started the redundant DSC feature, enter the **show redundancy** privileged EXEC command:

```
Router# show redundancy

DSC in slot 12:

Hub is in 'active' state.
Clock is in 'active' state.

DSC in slot 13:

Hub is in 'backup' state.
Clock is in 'backup' state.

Router#
```

## Troubleshooting Tips

If you are having trouble, check the following:

- Verify that the redundant DSCs are properly installed.
- Use the **show redundancy** command to display the current and past status of the feature.

## Configuration Examples

None

# Command Reference

This section documents the modified command related to the Redundant Dial Shelf Controller feature. All other commands used in this feature are documented in the Cisco IOS Release 12.1 command reference publications.

- **hw-module**

# hw-module

To enable the router shelf to stop a DSC or to restart a stopped DSC, use the **hw-module** privileged EXEC console command. The **no** form of this command does not exist.

**hw-module** *shelfslot* {**start** | **stop**}

## Syntax Description

<i>shelfslot</i>	The shelf number is the number of the dial shelf. The slot number is number of the slot in the shelf where the target DSC is installed. The slot number must be either 12 or 13, where the DSCs are installed. You must enter the forward slash (/) as part of the command.
<b>start</b>	You must start the specified DSC using the corresponding keyword.
<b>stop</b>	You must stop the specified DSC using the corresponding keyword.

## Defaults

The DSC is started by default.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
11.3(6)AA	This command was introduced.

## Usage Guidelines

The **stop** form of this command is issued from the router shelf console instead of pressing the attention (ATTN) button on the target DSC. Confirmation of when the start or stop took place is displayed. Warnings are issued and confirmation input is required if a **stop** command will result in a loss of service when backup functionality is not available.

When a DSC card is stopped, removed, then reinstalled, there is no need to restart the card (whether the card is the original or a replacement) since a freshly installed card reboots as the backup DSC automatically. However, if a DSC is stopped, either by using the ATTN button or by issuing the **hw-module stop** command, it must be restarted by using the **start** version of the same command, or the DSC must be removed and reinstalled in order to reboot.

Press the ATTN button on the DSCs to shutdown a card manually prior to removing the card. This is equivalent to issuing a **hw-module** privileged EXEC command for that card at the router command prompt. Use the ATTN button to shut down the card before it is swapped out or tested in place, or to restart it, if the card has not been removed after having been shut down.

## Examples

The following example starts one DSC and stops the other:

```
Router# hw-module 0/12 start
Router# hw-module 0/13 stop
```

## Related Commands

<b>Command</b>	<b>Description</b>
<b>show redundancy</b>	Displays current or historical status and related information on the redundant DSC.

# Glossary

The terms in this section are used in context with the redundant DSC feature. For additional terminology definitions, see the Cisco Systems publication *Internetworking Terms and Acronyms*.

**BIC**—(or BICI) Broadband Inter-Carrier Interface. ITU-T standard that defines the protocols and procedures needed for establishing, maintaining, and terminating broadband switched virtual connections between public networks.

**DSC**—The dial shelf controller card for the dial shelf provides a master clock for the dial shelf, and links the dial shelf to the router shelf via a cable running Fast Ethernet. Each dial shelf can have one or two DSCs.

**DSIP**—Dial Shelf Interconnect Protocol is a protocol/encapsulation providing communication between the dial shelf and router shelf.

**Feature boards**—Modular system cards that perform specific functionality, for example DSC cards or modem cards.

**IPC**—Inter-process control.

