Carrier Card and SPA Product Overview

This chapter provides an introduction to the modular services cards (MSCs) and shared port adapters (SPAs). It contains the following sections:

- Release History, page 2-1
- Introduction to MSCs and SPAs, page 2-2
- MSC and SPA Compatibility, page 2-4
- Modular Optics Compatibility, page 2-4
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For more hardware details about the specific carrier cards and SPAs supported that are supported on the Cisco 7304 router, refer to the *Cisco 7304 Router Modular Services Card and Shared Port Adapter Hardware Installation Guide*.

Release History

Table 2-1 provides the release and modification history for all MSC- and SPA- related features on the Cisco 7304 router.

Table 2-1f Release History

Release	Modification
Cisco IOS Release 12.2(25)S3	Support for the following SPAs was introduced on the Cisco 7304 router: • 2-Port OC-3c/STM-1 POS SPA (SPA-2XOC3-POS) • 4-Port OC-3c/STM-1 POS SPA (SPA-4XOC3-POS) • 1-Port OC-12c/STM-4 POS SPA (SPA-1OC12-POS) • 2-Port T3/E3 Serial SPA (SPA-2XT3/E3) • 4-Port T3/E3 Serial SPA (SPA-4XT3/E3) The following enhancements to the **hw-module subslot** command were introduced: • The **powered** and **unpowered** options were added to the **hw-module subslot** *slot*/*subslot* **shutdown** command. • The **reload** option was added to the **hw-module subslot** [**start** | **stop**] command. The following FPD-related changes were introduced: • By default, the router automatically reloaded after a manual FPD upgrade. This behavior was changed. By default, the router is no longer reloaded automatically after a manual FPD upgrade. • The **force** option was removed from the **hw-module subslot** *slot*/*subslot* **file** *file-url* **force** command and replaced by the **reload** option. With the **reload** option, the user now has the option of configuring the router to reload or to not reload after an FPD upgrade.
Cisco IOS Release 12.2(20)S6	The **show upgrade** commands used to monitor SPA FPD behavior (**show upgrade file**, **show upgrade package default**, **show upgrade progress**, and **show upgrade table**) have been changed to add the **fpd** keyword. The output previously generated with the aforementioned commands can now be generated by entering the appropriate **show upgrade fpd** command (**show upgrade fpd file**, **show upgrade fpd package default**, **show upgrade fpd progress**, and **show upgrade fpd table**).
Cisco IOS Release 12.2(20)S5	The **test hw-module subslot pause** command, which is useful for technical support purposes only, was introduced.
Cisco IOS Release 12.2(20)S3	The Stateful Switchover/Non-Stop Forwarding feature was introduced for the MSC-100 and the available SPAs.
Cisco IOS Release 12.2(20)S2	Support for the following hardware was introduced on the Cisco 7304 router: • Cisco 7304 Modular Services Card 100 (Cisco 7304 MSC-100) • 4-Port 10/100 Fast Ethernet SPA (SPA-4FE-7304) • 2-Port 10/100/1000 Gigabit Ethernet SPA (SPA-2GE-7304)

Introduction to MSCs and SPAs

MSCs and SPAs are a carrier card and port adapter architecture to increase modularity, flexibility, and density across Cisco System routers for network connectivity. This section describes the MSCs and SPAs and provides some guidelines for their use.

Modular Service Cards

The following lists describes some of the general characteristics of an MSC:

- An MSC is a carrier card that inserts into a router slot like a line card. It provides no network connectivity on its own.

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Note   The MSC-100 is the only carrier card currently available for SPAs on the Cisco 7304 router. However, SPAs can be inserted into other carrier cards on other router platforms. For information on carrier cards on other platforms, see the documentation for that platform.

- The only MSC currently available is the MSC-100, which contains two subslots used to house SPAs. The SPA provides interface ports for network connectivity.

Figure 2-1   SPA Sizes for the Cisco 7304 Router

Front of MSC

half-height SPA

129309
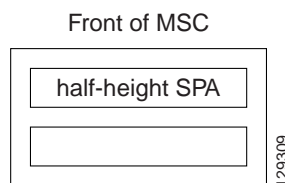
- During normal operation, the MSC should reside in the router fully populated either with functional SPAs in all subslots, or with a blank filler plate inserted in any empty subslots.

- An MSC supports online insertion and removal (OIR) with SPAs inserted in it's subslots.

Shared Port Adapters

The following list describes some of the general characteristics of a SPA:

- A SPA is a modular type of port adapter that inserts into a subslot of a compatible MSC carrier card to provide network connectivity and increased interface port density.

- Each SPA provides a certain number of connectors, or ports, that are the interfaces to one or more networks. These interfaces can be individually configured using the Cisco IOS command-line interface (CLI).

- Either a blank filler plate or a functional SPA should reside in every subslot of an MSC during normal operation.

- SPAs support online insertion and removal (OIR). They can be inserted or removed independently from the MSC. MSCs also support online insertion and removal (OIR) with SPAs inserted in their subslots.

MSC and SPA Compatibility

The MSCs that are supported on the Cisco 7304 router are shown in Table 2-2. This table also shows the shared port adapters (SPAs) that are supported on each MSC.

Table 2-2   MSC and SPA Compatibility on the Cisco 7304 Router

SPA	MSC-100
4-port 10/100 Fast Ethernet SPA (SPA-4FE-7304)	Yes
2-port 10/100/1000 Gigabit Ethernet SPA (SPA-2GE-7304)	Yes
2-Port OC-3c/STM-1 POS SPA (SPA-2XOC3-POS)	Yes
4-Port OC-3c/STM-1 POS SPA (SPA-4XOC3-POS)	Yes
1-Port OC-12c/STM-4 POS SPA (SPA-1XOC12-POS)	Yes
2-Port T3/E3 Serial SPA (SPA-2XT3/E3)	Yes
4-Port T3/E3 Serial SPA (SPA-4XT3/E3)	Yes

Modular Optics Compatibility

Some SPAs implement small form-factor pluggable (SFP) optical transceivers to provide network connectivity. An SFP module is a fiber optic receptacle device that mounts flush with the front panel to provide network connectivity.

Cisco Systems qualifies the SFP modules that can be used with SPAs.

Note   The SPAs will only accept the SFP modules listed as supported in this document. An SFP check is run every time an SFP module is inserted into a SPA and only SFP modules that pass this check will be usable.

Table 2-3 shows the types of optics modules that have been qualified for use with a SPA:

Table 2-3   SPA Optics Compatibility

SPA	Qualified Optics Modules
2-Port Gigabit Ethernet SPA	• SFP-FCGE-S • SFP-FCGE-L • SFP-GE-Z

Table 2-3   SPA Optics Compatibility

SPA	Qualified Optics Modules
2-Port and 4-Port OC-3c/STM-1 POS SPA	• SFP-OC3-MM • SFP-OC3-SR • SFP-OC3-IR1 • SFP-OC3-LR1 • SFP-OC3-LR2
1-Port OC-12c/STM-4 POS SPA	• SFP-OC12-MM • SFP-OC12-SR • SFP-OC12-IR1 • SFP-OC12-LR1 • SFP-OC12-LR2

MSC Summary

Summary descriptions of the MSCs that are supported on the Cisco 7304 router are shown in Table 2-4.

Table 2-4   MSC Summary

MSC	Product Number	Description	Number of SPAs	Minimum Cisco IOS Release
MSC-100	7304-MSC-100	Modular Services Card 100	2	Release 12.2(20)S2

Checking Hardware and Software Compatibility

To check the minimum software requirements of Cisco IOS software with the hardware installed on your router, Cisco maintains the Software Advisor tool on Cisco.com. This tool does not verify whether MSCs or SPAs within a system are compatible, but it does provide the minimum Cisco IOS requirements for individual hardware modules or components.

Note   Access to this tool is limited to users with Cisco.com login accounts.

To access Software Advisor, click **Login** at Cisco.com, type "Software Advisor" in the SEARCH box, and click **GO**. Click the link for the Software Advisor tool.

Choose a product family or enter a specific product number to search for the minimum supported software release needed for your hardware.