



Overview of the Serial SPAs

This chapter provides an overview of the release history, and feature and MIB support for the Cisco 7304 router with the 2 and 4-Port T3/E3 SPAs.

This chapter includes the following sections:

- [Release History, page 12-1](#)
- [Supported Features, page 12-1](#)
- [Supported MIBs, page 12-3](#)
- [Displaying the SPA Hardware Type, page 12-4](#)

Release History

Release	Modification
Cisco IOS Release 12.2(25)S3	Support for the following hardware was introduced on the Cisco 7304 router: • 2-Port T3/E3 SPA (SPA-2XT3/E3) • 4-Port T3/E3 SPA (SPA-4XT3/E3)

Supported Features

This section provides a list of some of the primary features supported by the MSC-100 and SPA hardware and software.

Serial SPA Features

The following is a list of some of the significant software features supported by the 2 and 4-Port T3/E3 SPA.

- Software selectable between E3 or T3 framing on each card
- Layer 2 encapsulation support:
 - Point-to-Point Protocol (PPP)
 - High-level Data Link Control (HDLC)
 - Frame Relay
- Internal or network clock (selectable per port)
- Online insertion and removal (OIR)
- Alarm reporting-24-hour history maintained, 15-minute intervals on all errors
- 16- and 32-bit cyclic redundancy checks (CRC) supported (16-bit default)
- Local and remote loopback
- Bit error rate testing (BERT) pattern generation and detection per port
- FPD (field programmable device upgrades)
- E3 Features
 - Full duplex connectivity at E3 rate (34.368 MHz)
 - Supports G.751 or G.832 framing (software selectable)
 - Hi-density bipolar with three zones (HD3B) line coding
 - Compliant with E3 pulse mask
 - Line build-out: configured for up to 450 feet (135 m) of type 728A or equivalent coaxial cable
 - Loopback modes: DTE, local, dual, and network
 - E3 alarm/event detection (once per second polling)
 - Alarm indication signal (AIS)
 - Loss of frame (LOF)
 - Remote alarm indication (RAI)
 - Subrate and scrambling features for these DSU vendors:
 - Digital Link
 - ADC Kentrox
- T3 Features
 - Binary 3-zero substitution (B3ZS) line coding
 - Compliant with DS3 pulse mask per ANSI T1.102-1993
 - DS3 far-end alarm and control (FEAC) channel support
 - Full duplex connectivity at DS-3 rate (44.736 MHz)
 - Loopback modes: DTE, local, dual, and network
 - C-bit or M23 framing (software selectable)
 - Line build-out: configured for up to 450 feet (135 m) of type 734A or equivalent coaxial cable

- DS-3 alarm/event detection (once per second polling)
 - Alarm indication signal (AIS)
 - Out of frame (OOF)
 - Far-end receive failure (FERF)
- Generation and termination of DS3 Maintenance Data Link (MDL) in C-bit framing
- Subrate and scrambling features for these DSU vendors:
 - Adtran
 - ADC Kentrox
 - Digital Link
 - Larscom
 - Verilink

Supported MIBs

The following MIBs are supported in Cisco IOS Release 12.2S for the serial SPAs on the Cisco 7304 router:

All serial SPAs:

- CISCO-ENTITY-ALARM-MIB
- CISCO-CLASS-BASED-QOS-MIB
- CISCO-ENVMON-MIB
- CISCO-ENTITY-ASSET-MIB
- CISCO-ENTITY-FRU-CONTROL-MIB
- CISCO-ENTITY-SENSOR-MIB
- ENTITY-MIB
- IF-MIB
- RMON-MIB
- MPLS-LDP-MIB
- MPLS-LSR-MIB
- MPLS-TE-MIB
- MPLS-VPN-MIB

2 and 4-Port T3/E3 SPAs:

- DS3/E3 MIB

To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:

<http://tools.cisco.com/ITDIT/MIBS/servlet/index>

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

<http://www.cisco.com/register>

Displaying the SPA Hardware Type

To verify the SPA hardware type that is installed in your Cisco 7304 router, you can use the **show interfaces** command. There are several other commands on the Cisco 7304 router that also provide SPA hardware information.

Table 12-1 shows the hardware description that appears in the **show** command output for each type of SPA that is supported on the Cisco 7304 router.

Table 12-1 SPA Hardware Descriptions in show Commands

SPA	Description in show interfaces and show controllers commands
4-Port T3/E3 SPA	“Hardware is SPA-4XT3/E3”
2-Port T3/E3 SPA	“Hardware is SPA-2XT3/E3”

Example of the show interface Command

The following example shows output from the **show interface serial 5/0/0** command on a Cisco 7304 router with a 4-Port T3/E3 SPA installed in slot 5:

```
Serial5/0/0 is up, line protocol is up
  Hardware is SPA-4XT3/E3
  Internet address is 3.0.0.2/24
  MTU 4470 bytes, BW 44210 Kbit, DLY 200 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, crc 16, loopback not set
  Keepalive not set
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts (0 IP multicast)
    0 runts, 0 giants, 0 throttles
      0 parity
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 applique, 1 interface resets
    0 output buffer failures, 0 output buffers swapped out
    0 carrier transitions
```

Example of the show controllers Command

The following example shows output from the **show controller serial details** command on a Cisco 7304 router with a 4-Port T3/E3 SPA installed in slot 5:

```
Router# show controllers serial 5/1/2 details
Interface Serial5/1/2 (DS3 port 2)
Hardware is SPA-4XT3/E3
Framing is c-bit, Clock Source is Internal
Bandwidth limit is 44210, DSU mode 0, Cable length is 10 feet
rx FEBE since last clear counter 0, since reset 0
Data in current interval (810 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Sev Err Secs
  0 Sev Err Framing Secs, 0 Unavailable Secs
  0 Line Errorred Secs, 0 C-bit Errorred Secs, 0 C-bit Sev Err Secs
  0 Severely Errorred Line Secs
  0 Far-End Errorred Secs, 0 Far-End Severely Errorred Secs
  0 CP-bit Far-end Unavailable Secs
  0 Near-end path failures, 0 Far-end path failures
  0 Far-end code violations, 0 FERF Defect Secs
  0 AIS Defect Secs, 0 LOS Defect Secs
Data in Interval 1:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Sev Err Secs
  0 Sev Err Framing Secs, 0 Unavailable Secs
  0 Line Errorred Secs, 0 C-bit Errorred Secs, 0 C-bit Sev Err Secs
  0 Severely Errorred Line Secs
  0 Far-End Errorred Secs, 0 Far-End Severely Errorred Secs
  0 CP-bit Far-end Unavailable Secs
  0 Near-end path failures, 0 Far-end path failures
  0 Far-end code violations, 0 FERF Defect Secs
  0 AIS Defect Secs, 0 LOS Defect Secs
Data in Interval 2:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Sev Err Secs
  0 Sev Err Framing Secs, 0 Unavailable Secs
  0 Line Errorred Secs, 0 C-bit Errorred Secs, 0 C-bit Sev Err Secs
  0 Severely Errorred Line Secs
  0 Far-End Errorred Secs, 0 Far-End Severely Errorred Secs
  0 CP-bit Far-end Unavailable Secs
  0 Near-end path failures, 0 Far-end path failures
  0 Far-end code violations, 0 FERF Defect Secs
  0 AIS Defect Secs, 0 LOS Defect Secs
[output omitted]
```

