Cisco 7600 Series Ethernet Services 20G Line Card Product Overview

This chapter provides an introduction to the Cisco 7600 Series Ethernet Services 20G (ES20) line card. It includes the following sections:

Introduction to the Cisco 7600 Series Ethernet Services 20G Line Card

The Cisco 7600 Series Ethernet Services 20G (ES20) line cards are a multiple-fabric, fixed-port Ethernet line card for the Cisco 7600 series routers that are capable of 20 Gbps of traffic forwarding using a fixed port interface design. The two versions of the Cisco 7600 Series Ethernet Services 20G line card are:

- 2-port version: 7600-ES20-10G
- 20-port version: 7600-ES20-GE

The difference between the two versions are the link interface daughter cards that accept small form-factor pluggable (SFP or XFP[1]) optical transceivers. Additionally, each of the two versions has a packet engine daughter card and a control processor daughter card.

The SFP and XFP modules allow the line cards to be configured for different media types (copper or fiber) and different optical requirements (single mode fiber or multimode fiber) as available.

The 7600-ES20-10G uses a 2-port 10GE fixed interface daughter card that accepts pluggable XFP modules.

The 7600-ES20-GE uses a 20-port GE fixed interface daughter card that accepts pluggable SFP modules.

Product Overview

The Cisco 7600 Series Ethernet Services 20G line cards have the following features:

1. SFP modules are optics modules with speeds lower than 10 Gbps; XFP modules are optics modules with speeds equal to or greater than 10 Gbps.

- Large output buffers to prevent spurious packet loss. These output buffers provide up to 200 milliseconds (ms) of round-trip time buffer at an aggregate bandwidth of 10 Gbps
- Up to 8,000 queues per port, 16,000 queues total, for combined input and output queueing and scheduling
- The PXF processor provides programmable ingress and egress feature processing capability.
- NT3PE-500 with 128MB reduced latency DRAM (RLDRAM) per column
- 40+ Mpps Layer3/Layer4 forwarding, 125 Mpps Layer 2 forwarding
- Dual fabric attachment providing an aggregate bandwidth of 40 GBs, full duplex (each fabric channel provides 20 GBs full duplex)

Cisco 7600 Series Ethernet Services 20G Line Card Product Numbers

Table 1-1 lists the Cisco product numbers for the line cards.

Table 1-1 Cisco 7600 ES20 Line Card Product Numbers

Description	Cisco Product Number	Field-Replaceable Unit (FRU) Product ID
Cisco 7600 ES20 line card, 20xGE SFP with DFC 3C	7600-ES20-GE3C	7600-ES20-GE3C=
Cisco 7600 ES20 line card, 20xGE SFP with DFC 3CXL	7600-ES20-GE3CXL	7600-ES20-GE3CXL=
Cisco 7600 ES20 line card, 2x10GE XFP with DFC 3C	7600-ES20-10G3C	7600-ES20-10G3C=
Cisco 7600 ES20 line card, 2x10GE XFP with DFC 3CXL	7600-ES20-10G3CXL	7600-ES20-10G3CXL=

Note The Distributed Forwarding Card (DFC) on a7600-ES20-GE will function at the lowest common denominator with the rest of the system. Therefore if a 7600-ES20-GE with a DFC 3CXL is configured in a system with the PFC3BXL present, then the system will function only at the 3BXL level.

Similarly, if a DFC 3CXL is configured on a different line card then the system would function at the 3BXL level regardless of other 3CXL ASICs installed in the system.

Supported Platforms

Table 1-2 lists the supported router platforms for Cisco 7600 ES20 line cards:

Table 1-2 Cisco 7600 ES20 Line Card Supported Router Platforms

Cisco 7600 ES20 Line Card	Supported Platform
7600-ES20-10G	All Cisco 7600 series routers except for the Cisco 7603 router
7600-ES20-GE	All Cisco 7600 series routers except for the Cisco 7603 router

Cisco IOS Software Release and Hardware Revision Requirements

The Cisco 7600 ES20 line cards have certain Cisco IOS software requirements. Also, to ensure compatibility with the software, your Cisco 7600 ES20 line card should have a specific hardware revision number. The number is printed on a label affixed to the component side of the card and is displayed by the **show diag** command.

Table 1-3 lists the hardware and software requirements for Cisco 7600 ES20 line cards.

Table 1-3 Cisco 7600 ES20 Line Card and Cisco IOS Release and Hardware Version Compatibility

Cisco 7600 ES20 Line Card	Cisco Product Number	Required Hardware Version	Minimum Cisco IOS Software Release
Cisco 7600 ES20 line card, 20xGE SFP with DFC 3C	7600-ES20-GE3C	68-2919-01	Cisco IOS Release 12.2SRB
Cisco 7600 ES20 line card, 2x10GE XFP with DFC 3C	7600-ES20-10G3C	68-2917-01	Cisco IOS Release 12.2SRB
Cisco 7600 ES20line card, 20xGE SFP with DFC 3CXL	7600-ES20-GE3CXL	68-2918-01	Cisco IOS Release 12.2SRB
Cisco 7600 ES20 line card, 2x10GE XFP with DFC 3CXL	7600-ES20-10G3CXL	68-2916-01	Cisco IOS Release 12.2SRB

The **show diag** *slot_number*, **show version**, and **show hardware** commands display the current hardware configuration of the router, including the system software version that is currently loaded and running, and the hardware revision number. For complete descriptions of **show** commands, refer to the *Cisco IOS Configuration Fundamentals Configuration Guide* and the *Cisco IOS Configuration Fundamentals Command Reference* for the installed Cisco IOS release.

If the command displays indicate that the Cisco IOS software is a version earlier than you need, check the contents of flash memory to determine if the required images are available on your system. The **dir** *devicename* command displays a list of all files stored in flash memory. If you do not have the correct software version, contact Cisco customer service.

For software configuration information, refer to the Cisco IOS software configuration and command reference publications for the installed Cisco IOS release. Also refer to the Cisco IOS software release notes for additional information.

Modular Optics Compatibility

The Cisco 7600 ES20 line cards use small form-factor pluggable (SFP or XFP) optical transceivers to provide network connectivity. Table 1-4 lists the supported modules.

Table 1-4 Supported Modules

Line Cards	Supported Modules (Cisco Part Numbers)
7600-ES20-10G	XFP-10GLR-OC192SR, XFP-10GER-OC192IR XFP-10GZR-OC192LR
7600-ES20-GE	SFP-GE-S, SFP-GE-L, SFP-GE-Z

Power Management

The Cisco ES20 line cards consume chassis power; you must make sure the chassis is within the power budget on Cisco 7600 series routers. See Table 1-5.

Table 1-5 Cisco 7600 ES20 Line Card Power Consumption

Cisco 7600 ES20 Line Cards	Power Consumption (Maximum in Watts)
7600-ES20-GE3C	489
7600-ES20-GE3CXL	489
7600-ES20-10G3C	494
7600-ES20-10G3CXL	494

If the power limit is exceeded, the Cisco ES20 line card is not powered up and an error message is displayed.

```
Router#%C7KPWR-SP-4-POWERDENIED:insufficient power, module in slot 3 power denied.
```

On a Cisco 7600 series router, use the **show power** command on the Route Processor to determine how much power you have available in the chassis and how much is being used or reserved by line cards, supervisor engines, and fan trays.

The following example shows the sample output for the **show power** command on a Cisco 7600 series router:

```
Router# show power
system power redundancy mode = redundant
system power redundancy operationally = non-redundant
system power total =     2669.10 Watts (63.55 Amps @ 42V)
system power used =      1530.90 Watts (36.45 Amps @ 42V)
system power available = 1138.20 Watts (27.10 Amps @ 42V)
                         Power-Capacity PS-Fan Output Oper
PS   Type                Watts   A @42V Status Status State
---- ------------------ ------- ------ ------ ------ -----
1    PWR-2700-AC        1319.22 31.41  -      -      off
2    PWR-2700-AC        2669.10 63.55  OK     OK     on
                         Pwr-Allocated  Oper
Fan  Type                Watts   A @42V State
---- ------------------ ------- ------ -----
1    FAN-MOD-6HS         180.18  4.29  OK
                         Pwr-Requested  Pwr-Allocated  Admin Oper
Slot Card-Type           Watts   A @42V Watts   A @42V State State
---- ------------------ ------- ------ ------- ------ ----- -----
2    7600-ES20-BASE      340.20  8.10   340.20  8.10  on    on
4    7600-ES20-BASE      340.20  8.10   340.20  8.10  on    on
5    7600-SIP-600        341.88  8.14   341.88  8.14  on    on
```

```
6    WS-SUP720-3BXL      328.44  7.82   328.44  7.82  on    on
Router#
```