# Understand ASR 9000 Series Line Card Types

## Contents


**Introduction**

**Differences Between Line Card Generations**

- Ethernet Line Cards
- Carrier Ethernet Line Cards
- High Density Ethernet Line Cards (3rd Generation)
- High Density Ethernet Line Cards (4th Generation)
- High Density Ethernet Line Cards (5th Generation)

**Additional Types of Line Cards**

- SPA Interface Processor Line Card (A9K-SIP-700)
- Service Module Line Cards
  - Integrated Service Module (A9K-ISM-100)
  - Virtualized Services Module (A9K-VSM-500)


## Introduction

This document describes how to differentiate between different generations of Cisco Aggregation Services Router (ASR) 9000 Series.

## Differences Between Line Card Generations

The terms Ethernet, Carrier Ethernet, High Density Ethernet 3rd Generation, High Density Ethernet 4th Generation, High Density Ethernet 5th Generation are often used in discussions about features, route-scale, architecture, and general troubleshooting of packet flows on an ASR 9000 Series router. This section describes the differences between these types of ASR line cards.

| Generation | Common Name |
|---|---|
| 1 | Ethernet |
| 2 | Carrier Ethernet |
| 3 | High Density Ethernet |
| 4 | High Density Ethernet |
| 5 | High Density Ethernet |

### Ethernet Line Cards

The first generation of the Cisco ASR 9000 Series Ethernet line cards all share the same type of Network Processors (NPs).

**Note**: The Cisco ASR 9000 Series Ethernet Line Cards data sheet provides a list of the first generation Ethernet line cards.

You can easily identify Ethernet line cards, because there are only three types:

- L - Low Queue
- B - Base (Medium) Queue
- E - Extended (High) Queue

These line cards are Ethernet line cards:

- A9K-40GE-L
- A9K-40GE-B
- A9K-40GE-E
- A9K-4T-L
- A9K-4T-B
- A9K-4T-E
- A9K-8T/4-L
- A9K-8T/4-B
- A9K-8T/4-E
- A9K-2T20GE-L
- A9K-2T20GE-B
- A9K-2T20GE-E
- A9K-8T-L
- A9K-8T-B
- A9K-8T-E
- A9K-16/8T-B

## Carrier Ethernet Line Cards

The second generation of the ASR 9000 Series Carrier Ethernet line cards all share the same type of Network Processors (NPs).

These data sheets provide additional information about Carrier Ethernet line cards:

- Cisco ASR 9000 Series Modular Line Cards
- Cisco ASR 9000 Series 24-Port 10 Gigabit Ethernet Line Cards
- Cisco ASR 9000 Series 36-Port 10 Gigabit Ethernet Line Cards
- Cisco ASR 9000 Series 2-Port 100 Gigabit Ethernet Line Cards
- Cisco ASR 9000 Series 1-Port 100 Gigabit Ethernet Line Cards
- Cisco ASR 9000 Series 40 and 56 Gigabit Ethernet Line Cards

Carrier Ethernet Line Cards are available in Service Edge Optimized and Packet Transport Optimized variants.

- Service Edge Optimized line cards are designed for deployments that require enhanced quality of service (QoS).
- Packet Transport Optimized line cards are designed for network deployments where basic QoS is required.

The Service Edge and Packet Transport Optimized variants are designated with SE or TR in the Part Number.

- SE - Services Edge Optimized
- TR - Packet Transport Optimized

These line cards are Carrier Ethernet:

- A9K-MOD80-SE
- A9K-MOD80-TR

- A9K-MOD160-SE
- A9K-MOD160-TR
- A9K-24X10GE-SE
- A9K-24X10GE-TR
- A9K-36X10GE-SE
- A9K-36X10GE-TR
- A9K-2X100GE-SE
- A9K-2X100GE-TR
- A9K-1X100GE-SE
- A9K-1X100GE-TR
- A9K-40GE-SE
- A9K-40GE-TR
- A9K-4T16GE-SE
- A9K-4T16GE-TR

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**Note**: The ASR-9001 and ASR-9001-S have Carrier Ethernet line cards built into the stand-alone chassis. Reference the Cisco ASR 9001 Router Data Sheet and Cisco ASR 9001-S Router Data Sheet articles for more details.

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## High Density Ethernet Line Cards (3rd Generation)

The third generation of the ASR 9000 Series High Density Ethernet line cards all share the same type of Network Processors (NPs).

These data sheets provide additional information about High Density 3rd generation line cards:

- Cisco ASR 9000 Series 4-Port and 8-Port 100 Gigabit Ethernet Line Cards
- Cisco ASR 9000 400-Gbps IPoDWDM Line Card
- Cisco ASR 9000 Series 400G and 200G Modular Line Cards
- Cisco ASR 9000 Series 12-Port 100-Gigabit Ethernet Line Cards
- Cisco ASR 9000 Series 24-Port and 48-Port Dual-Rate 10GE/1GE Line Cards
- Cisco ASR 9900 Series 8-Port 100 Gigabit Ethernet Line Cards with 7-Fabric Support

Similar to 2nd generation line cards, each 3rd generation line card is available as either a Service Edge Optimized (enhanced QoS) or Packet Transport Optimized (basic QoS) line card.

- SE - Services Edge Optimized
- TR - Packet Transport Optimized

The 4-Port and 8-Port 100 Gigabit Ethernet line card is available in two variants that support either LAN/WAN/OTN unified PHY CPAK ports or LAN PHY-only CPAK ports.

These line cards are High Density 3rd Generation:

- A9K-8X100G-LB-SE
- A9K-8X100G-LB-TR
- A9K-8X100GE-SE
- A9K-8X100GE-TR
- A9K-4X100GE-SE
- A9K-4X100GE-TR
- A9K-400G-DWDM-TR
- A9K-MOD400-SE
- A9K-MOD400-TR

- A9K-MOD200-SE
- A9K-MOD200-TR
- A9K-24X10GE-1G-SE
- A9K-24X10GE-1G-TR
- A9K-48X10GE-1G-SE
- A9K-48X10GE-1G-TR
- A99-12X100GE
- A99-8X100GE-SE
- A99-8X100GE-TR

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**Note**: High Density 3rd Generation line card part numbers that begin A99-X are compatible with the Cisco ASR 9904, Cisco ASR 9906, ASR 9910, ASR 9912, and ASR 9922 chassis. They are not compatible with the Cisco ASR 9006 and ASR 9010 Routers.

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**Note**: A99-12X100GE line cards are designed for transport integration in high-density 100G environments and deliver line-rate packet performance for IP and Multiprotocol Label Switching (MPLS) transport. There is not an SE or TR variant of this card. This line card has it's own unique features and restrictions different from other High Density 3rd Generation line cards.

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## High Density Ethernet Line Cards (4th Generation)

The fourth generation of the ASR 9000 Series High Density Ethernet line cards all share the same type of Network Processors (NPs).

These data sheets provide additional information about ASR 9000 Series High Density Ethernet 4th Generation line cards:

- Cisco ASR 9000 Series 16-Port 100 Gigabit Ethernet Packet Transport Line Card Data Sheet
- Cisco ASR 9900 Series 16-Port 100 Gigabit Ethernet Service Edge Line Card Data Sheet
- Cisco ASR 9000 Series 32-Port 100 Gigabit Ethernet Line Card Data Sheet

Similar to 3rd generation line cards, 4th generation line cards are available as either a Service Edge Optimized (enhanced QoS) or Packet Transport Optimized (basic QoS) line card. Unllike 3rd generation line cards, not every line card model is available in both -SE and -TR type.

- SE - Services Edge Optimized
- TR - Packet Transport Optimized

These line cards are High Density Ethernet 4th Generation:

- A9K-16X100GE-TR
- A99-16X100GE-X-SE
- A99-32X100GE-TR

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**Note**: 4th generation line card part numbers that begin A99-X are compatible with the Cisco ASR 9904, Cisco ASR 9906, ASR 9910, ASR 9912, and ASR 9922 chassis. They are not compatible with the Cisco ASR 9006 and ASR 9010 Routers.

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## High Density Ethernet Line Cards (5th Generation)

The fifth generation of the ASR 9000 Series High Density Ethernet line cards all share the same type of

Network Processors (NPs).

These data sheets provide additional information about High Density Ethernet 5th Generation line cards:

- Cisco ASR 9900 Series 5th Generation 32-Port 100 Gigabit Ethernet Line Card Data Sheet
- Cisco ASR 9000 Series 5th Generation High-Density Multi-Rate Line Cards: 2 Terabit and 0.8 Terabit Cards Data Sheet

Similar to 3rd generation line cards, 5th generation line card are available as either a Service Edge Optimized (enhanced QoS) or Packet Transport Optimized (basic QoS) line card.

These line cards are High Density Ethernet (5th Generation) line cards:

- A9K-4HG-FLEX-TR
- A9K-4HG-FLEX-SE
- A99-4HG-FLEX-TR
- A99-4HG-FLEX-SE
- A9K-8HG-FLEX-TR
- A9K-8HG-FLEX-SE
- A9K-20HG-FLEX-TR
- A9K-20HG-FLEX-SE
- A99-32X100GE-X-TR
- A99-32X100GE-X-SE
- A99-10X400GE-X-TR
- A99-10X400GE-X-SE

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**Note**: 5th Generation line card part numbers that begin A99-X are compatible with the Cisco ASR 9904, Cisco ASR 9906, ASR 9910, ASR 9912, and ASR 9922 chassis. They are not compatible with the Cisco ASR 9006 and ASR 9010 Routers.

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# Additional Types of Line Cards

This section describes other types of line cards for the ASR 9000.

## SPA Interface Processor Line Card (A9K-SIP-700)

This line card is based on the Cisco Packet Processor (CPP), and is not based on the type of Network Processors (NPs) used by the other generations of line cards. For more information, reference the Cisco ASR 9000 Series SPA Interface Processor 700 Cisco article.

## Service Module Line Cards

### Integrated Service Module (A9K-ISM-100)

This line card does not use Network Processors (NPs) used by the other generations of line cards. For additional information, reference the Cisco ASR 9000 Series Integrated Service Module Cisco article.

### Virtualized Services Module (A9K-VSM-500)

This line card includes a Service Infrastructure Module with NPs, Crossbar Fabric, and Fabric Interface ASIC (FIA) components that are also used on the the Carrier Ethernet 2nd generation line cards. For additional information, reference the Cisco ASR 9000 Series Virtualized Services Module Cisco article.