

Understand ASR 9000 Series Line Card Types

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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 Trident-based, Typhoon-based, Tomahawk-based, Lightspeed-based, Lightspeed-Plus-based 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	Codename
1	Trident
2	Typhoon
3	Tomahawk
4	Lightspeed (LSQ)
5	Lightspeed Plus (LSP)

Trident-Based Line Cards

The first generation of the Cisco ASR 9000 Series Ethernet line cards are often referred to as Trident-based (or Ethernet) line cards. The term comes from the Network Processors (NPs) that are used on these line cards.

 **Note:** The [Cisco ASR 9000 Series Ethernet Line Cards](#) data sheet provides a list of the first generation Trident-based line cards.

You can easily identify Trident-based line cards, because there are only three types:

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

These line cards are Trident-based:

- 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

Typhoon-Based Line Cards

The second generation of the ASR 9000 Series Ethernet line cards are often referred to as Typhoon-based (or Enhanced Ethernet) line cards. The term comes from the NPs that are used on these line cards.

These data sheets provide additional information about Typhoon-based 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](#)

Typhoon-based Gigabit 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 Typhoon-based:

- 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

 **Note:** The ASR-9001 and ASR-9001-S have Typhoon-based 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.

Tomahawk-Based Line Cards

The third generation of the ASR 9000 Series Ethernet line cards are often referred to as Tomahawk-based line cards. The term comes from the NPs that are used on these line cards.

These data sheets provide additional information about Tomahawk-based 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 Typhoon-based line cards, each Tomahawk-based 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 Tomahawk-based:

- 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

 **Note:** Tomahawk-based 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.

 **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 its own unique features and restrictions different from other Tomahawk-based line cards.

Lightspeed-Based Line Cards

The fourth generation of the ASR 9000 Series Ethernet line cards are often referred to as Lightspeed-based line cards. The term comes from the NPs that are used on these line cards. They are at times referred to as *LSQ*.

These data sheets provide additional information about Lightspeed-based 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 Tomahawk-based line cards, Lightspeed-based line card are available as either a Service Edge Optimized (enhanced QoS) or Packet Transport Optimized (basic QoS) line card. Unlike Tomahawk-based 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 Lightspeed-based:

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

 **Note:** Lightspeed-based 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.

Lightspeed-Plus-Based Line Cards

The fifth generation of the ASR 9000 Series Ethernet line cards are often referred to as Lightspeed-Plus-

based line cards. The term comes from the NPs that are used on these line cards. They are at times referred to as *LSP*.


These data sheets provide additional information about Lightspeed-Plus-based 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 Tomahawk-based line cards, Lightspeed-Plus-based line card are available as either a Service Edge Optimized (enhanced QoS) or Packet Transport Optimized (basic QoS) line card.

These line cards are Lightspeed-Plus-based:

- 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

 **Note:** Lightspeed-Plus-based 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.

Additional Types of Line Cards

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

A9K-SIP-700

This line card is based on the Cisco Packet Processor (CPP), and is neither Trident-based nor Typhoon-based. For more information, reference the [Cisco ASR 9000 Series SPA Interface Processor 700](#) Cisco article.

A9K-ISM-100

This line card does not use NPs, and is neither Trident-based nor Typhoon-based. For additional information, reference the [Cisco ASR 9000 Series Integrated Service Module](#) Cisco article.

A9K-VSM-500

This line card includes a Service Infrastructure Module with Typhoon-based NPs, Crossbar Fabric, and Fabric Interface ASIC (FIA) components that are also used on the Typhoon-based line cards. For additional information, reference the [Cisco ASR 9000 Series Virtualized Services Module](#) Cisco article.