Introduction

This document describes how to differentiate between Trident-based, Typhoon-based, and Tomahawk-based line cards on a Cisco Aggregation Services Router (ASR) 9000 Series, and describes some additional types of line cards.

Differences between Trident-Based, Typhoon-Based, and Tomahawk-Based Line Cards

The terms Trident-based, Typhoon-based, and Tomahawk-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.

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
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 customer 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 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
Note: The ASR-9001 and ASR-9001-S have Typhoon-based line cards built into the standalone 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 9000 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, 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.

### 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.