

Upgrade guide from Cisco Catalyst 3650/3850 Series to Catalyst 9300 Series

Purpose of this guide

This document is intended to help network planners and engineers who are familiar with the Cisco Catalyst 3650/3850 Series in deploying the Cisco Catalyst 9300 Series switches in the enterprise networking environment.



Cisco Catalyst 3650 Series



Cisco Catalyst 9300 Series
C9300L fixed uplink models



Cisco Catalyst 3850 Series



Cisco Catalyst 9300/9300X Series
C9300 modular uplink models



Cisco Catalyst 3650-Mini Series



Cisco Catalyst 9300LM Series
Fixed Uplinks Models

Introduction

The new Cisco® Catalyst® 9000 switching family is the next generation in the legendary Cisco Catalyst family of enterprise LAN access, aggregation, and core switches. Within the Cisco Catalyst 9000 family, the Cisco Catalyst 9300 Series switches are Cisco's leading fixed enterprise switching access platform, built for security, IoT, and cloud.

Contents

Introduction

Purpose of this guide

Why upgrade?

System hardware

System default behavior

High availability - StackWise-1T/480/320 and StackPower Plus

Operations

Interface reference

Management interface

Software features

Host tracking feature

Quality of service

Congestion avoidance

Conclusion

Appendix A

Why upgrade?

The Cisco Catalyst 9300 Series switches are Cisco's leading fixed enterprise switching access platform, built for security, mobility, IoT, and cloud. These switches form the foundational building block for Cisco Software-Defined Access (SD-Access), Cisco's lead enterprise architecture.

The Cisco Catalyst 9300 Series is the industry's first optimized platform for WiFi-6/WiFi-6E and 802.11ac Wave 2, with support for 2.5G, 5G and Multigigabit downlinks and 802.3 BT complaint up to 90W PoE (Cisco UPOE®+). It provides support for the highest density WiFi-6/WiFi-6E and 802.11ac Wave 2 (48 access points) in a single-Rack-Unit (RU) box. The Cisco Catalyst 9300 Series has the most flexible uplink architecture, with 9300X models supporting Multigigabit, 10Gbps, 25Gbps, 40Gbps and 100Gbps uplinks and C9300 modular uplink models supporting 1 Gbps, Multigigabit, 25Gbps, and 40 Gbps uplinks. The platform also offers flexible downlink architecture with fiber ports supporting 1G/10G/25G Fiber speeds and Multigigabit (1G/2.5G/5G/10G) copper ports with industry's highest 1Tbps stacking bandwidth. The Cisco StackWise®-1T architecture provides unparalleled scale (448 ports per stack) and flexibility of deployment for the platform, with support for the best Nonstop Forwarding (NSF)/Stateful Switchover (SSO) resiliency architecture for a stackable solution.

The Cisco Catalyst 9300 Series also has a highly resilient and efficient power architecture with Cisco StackPower® technology, which delivers a high density of Cisco UPOE+, UPOE and PoE+ ports. The switches provide unmatched PoE resiliency capabilities, such as Perpetual and Fast PoE, optimizing them for Smart Building deployments. They support the most efficient power supplies in the industry.

The Cisco Catalyst 9300 Series Switches are also built with the latest Cisco Unified Access® Data Plane 2.0 (UADP 2.0) Application-Specific Integrated Circuit (ASIC) for 9300 (Modular and Fixed uplink models) and Cisco UADP 2.0sec ASIC for 9300X models with an x86-based CPU running on open Cisco IOS® XE Software, a converged operating system. Together they deliver model-driven programmability, streaming telemetry, third-party container-based app hosting, application visibility, stronger security with 256-Bit MACsec link encryption, Hardware Layer 3 encryption (IPSEC) up to 100G and Encrypted Traffic Analytics (ETA), support for higher bandwidth uplinks, and a more advanced operating system than the Cisco Catalyst 3850 or 3650 Series switches.

System hardware

The Cisco Catalyst 9300 Series is based on Cisco's UADP ASIC architecture and an x86 CPU architecture. 9300X models have Cisco's UADP 2.0sec ASIC while 9300 modular uplinks and fixed uplinks models have UADP 2.0. It also provides options for additional internal and external storage upto 240GB SSD, which enables the device to host containers and run third-party applications and scripts natively within the switch. Tables 1 and 2 list some of the system hardware differences between the Cisco Catalyst 3850 Series and Catalyst 9300 Series.

Contents

Introduction

Purpose of this guide

Why upgrade?

System hardware

System default behavior

High availability - StackWise-1T/480/320 and StackPower Plus

Operations

Interface reference

Management interface

Software features

Host tracking feature

Quality of service

Congestion avoidance

Conclusion

Appendix A

Table 1. Comparison of the Cisco Catalyst 3650 Series and Catalyst 9300 - fixed uplink C9300L hardware

	Catalyst 3650 Series	Catalyst C9300-C9300L/C9300LM SKUs
CPU	Quad-core	x86 Quad-core
DRAM	4 GB	8 GB
Internal flash	2/4 GB	16 GB
External storage	16 GB	240 GB

Table 2. Comparison of the Cisco Catalyst 3850 Series and Catalyst 9300 Series - modular uplink C9300 hardware

	Catalyst 3850 Series	Catalyst 9300 - C9300 SKUs
CPU	Quad-core	x86 Quad-core
DRAM	4 GB	8 GB/16G (9300X models)
Internal flash	2/4/8 GB	16 GB
External storage	16 GB	240 GB

System default behavior

The system default behavior on the Cisco Catalyst 9300 Series is very much the same as that of the Cisco Catalyst 3650/3850 Series. For example, interfaces default to Layer 2 switch port mode, IP routing is disabled, the management interface is in a dedicated Virtual Routing and Forwarding (VRF) instance, and so on. However, there is one difference in the control plane policy when the Catalyst 3650/3850 Series is running Release 3.X.

- Control Plane Policing (CoPP): CoPP is enabled on the Cisco Catalyst 9300 Series with default policing rates for different classes of traffic. These policing rates are optimized for a typical campus environment. The policing rates can be changed or disabled for different application environments. On the Cisco Catalyst 3650/3850 Series, CoPP is not enabled by default, but the system provides a macro to create the different classes, and the user can specify the policing rate for different classes.

Contents

Introduction

Purpose of this guide

Why upgrade?

System hardware

System default behavior

High availability – StackWise-1T/480/320 and StackPower Plus

Operations

Interface reference

Management interface

Software features

Host tracking feature

Quality of service

Congestion avoidance

Conclusion

Appendix A

High availability – StackWise-1T/480/320 and StackPower Plus

The Cisco Catalyst 9300 Series provides robust high availability features as the Cisco Catalyst 3650/3850 Series with increased stack bandwidth. Catalyst 9300X models support Stackwise-1T, Catalyst 9300 Series switches with Modular uplinks support Stackwise 480 while switches with fixed uplinks (9300L/9300LM) support Stackwise-320. In StackWise-1T/480/320, eight switches can be stacked together to form a single logical switch, and both SSO and NSF mechanisms are supported during failovers. Catalyst 9300 supports Extended Fast Software Upgrade (xFSU) to decrease the traffic downtime to less than 30 secs. This capability does not exist on Catalyst 3850/3650 series. For customers migrating from 3850 Series stacks to Catalyst 9300 Series stacks, the same stacking cables can be used for stacking C9300 models. For customer migrating from Catalyst 3650 Series stacks to C9300L/C9300LM stacks, optional stack kit has to be ordered separately for Stackwise-320.

The Cisco Catalyst 9300 Modular uplink models support the Cisco StackPower feature and 9300X models support StackPower Plus for power redundancy, enabling four switches to be stacked together in either combined or redundant mode. In an eight-member stack, two power stacks of four switches each can be configured for power redundancy. Table 3 and 4 compares the power redundancy features of the Cisco Catalyst 3650/3850 Series and Catalyst 9300 Series. Catalyst 9300 Series switches with fixed uplinks (C9300L/C9300LM) do not support StackPower.

Table 3. Comparison of the Cisco Catalyst 3850 Series and 9300 Modular Uplinks power redundancy

	Catalyst 3850 Series	Catalyst 9300 Series - C9300 SKU's
Stackwise-1T	NA	8 (9300X models)
StackWise-480	8 or 9, depending on the model	8
StackPower	4	4
Number of power supply slots	2	2
Power supplies	<ul style="list-style-type: none"> • 350W AC • 715W AC • 1100W AC • 715W DC 	<ul style="list-style-type: none"> • 350W AC • 715W AC • 1100W AC • 715W DC • 1900W AC

Contents

Introduction

Purpose of this guide

Why upgrade?

System hardware

System default behavior

High availability - StackWise-1T/480/320 and StackPower Plus

Operations

Interface reference

Management interface

Software features

Host tracking feature

Quality of service

Congestion avoidance

Conclusion

Appendix A

	Catalyst 3850 Series	Catalyst 9300 Series - C9300 SKU's
System power and PoE power	Each power supply has a fixed amount of system power and a fixed amount for PoE	Each power supply has a fixed amount of system power and a fixed amount for PoE
Power redundancy	Combined redundant	Combined redundant

Table 4. Comparison of the Cisco Catalyst 3650 Series and 9300L Power Redundancy

	Catalyst 3650 Series	Catalyst 9300 - C9300L/ C9300LMSKU's
Stacking	StackWise-160	StackWise-320
StackPower	No	No
Number of power supply slots	2	2
Power supplies	<ul style="list-style-type: none"> • 250W AC • 640W AC • 1025W AC • 640W DC 	<ul style="list-style-type: none"> • 350W • 600W AC* • 715W AC • 1000W AC* • 1100W AC • 715W DC • 715W DC*
System power and PoE power	Each power supply has a fixed amount of system power and a fixed amount for PoE	Each power supply has a fixed amount of system power and a fixed amount for PoE
Power redundancy	Combined	Combined

*C9300LM only PSU

Contents

Introduction

Purpose of this guide

Why upgrade?

System hardware

System default behavior

High availability - StackWise-1T/480/320 and StackPower Plus

Operations

Interface reference

Management interface

Software features

Host tracking feature

Quality of service

Congestion avoidance

Conclusion

Appendix A

Operations

Interface reference

Cisco Catalyst 3650/3850 Series Multigigabit switches have Gigabit Ethernet and 10G Ethernet ports only. Cisco Catalyst 9300 Series Multigigabit switches have introduced support for 1G, 2.5G, 5G and 10G Ethernet on the 48-port Multigigabit switches (Table 5).

Table 5. Presence of 2 Gigabit Ethernet ports on the Cisco Catalyst 3850 Series and Catalyst 9300 Series

	Catalyst 3650/3850 Series	Catalyst 9300 Series
2.5 Gigabit Ethernet ports	None	Tw1/0/1

Management interface

The management interface on the Cisco Catalyst 9300 Series is Gigabit Ethernet, which is very similar to the Gigabit Ethernet interface on the Catalyst 3650/3850 Series. The management port on both platforms has its own VRF instance for separation of management traffic from normal data traffic.

Software features

For details on the features supported on the Cisco Catalyst 9300 Series, please use the feature navigator on cisco.com. For customers migrating from the Cisco Catalyst 3650/3850 Series to the Catalyst 9300 Series, the following are the only feature differences:

Host tracking feature

The Cisco Catalyst 3650/3850 Series supports IP Device Tracking (IPDT) in Release 3.X for keeping track of connected hosts (association of MAC and IP addresses). The Cisco Catalyst 9300 Series with the latest Cisco IOS XE Software release supports the new Switch Integrated Security Features (SISF)-based IP device-tracking feature, which acts as a container policy that enables snooping and device-tracking features available with First Hop Security (FHS), in both IPv4 and IPv6, using IP-agnostic Command-Line Interface (CLI) commands. See Appendix A for more information on migrating from the IPDT CLI configuration to the new SISF-based device-tracking CLI configuration.

Quality of service

The Cisco Catalyst 9300 Series supports new features and enhancements with the latest ASIC and operating system. The Catalyst 9300 Series supports a per-port egress queuing policy, in which each downlink or uplink port can have a different egress queuing policy. In the Cisco Catalyst 3650/3850 Series, all downlinks or uplinks share a common egress queuing policy.

Contents

Introduction

Purpose of this guide

Why upgrade?

System hardware

System default behavior

High availability - StackWise-1T/480/320 and StackPower Plus

Operations

Interface reference

Management interface

Software features

Host tracking feature

Quality of service

Congestion avoidance

Conclusion

Appendix A

Table 6. Quality of service policy in the Cisco Catalyst 3850 Series and Catalyst 9300 Series

	Catalyst 3650/3850 Series	Catalyst 9300 Series
Egress queuing policy	Supports only two policies (downlinks share one policy and uplinks share another policy)	Supports multiple queuing policies (each downlink or uplink can have its own policy)
Traffic classification	Supports “Match-any”	Supports “Match-any” and “Match-all”

Congestion avoidance

The Cisco Catalyst 3650/3850 Series supports only Weighted Tail Drop (WTD), which discards packets based on configured thresholds. The Cisco Catalyst 9300 Series uses both WTD and Weighted Random Early Detection (WRED), which randomly discards packets at specified queue thresholds based on IP precedence; Differentiated Services Code Point (DSCP); or Class of Service (CoS), giving the network architect much more control over the drop behavior. The following is an example of WRED configuration on the Catalyst 9300 Series.

```

policy-map 2P6Q3T
  class PRIORITY-QUEUE
    priority level 1
  class VIDEO-PRIORITY-QUEUE
    priority level 2
  class DATA-QUEUE
    bandwidth remaining percent <number>
    queue-buffers ratio <number>
    random-detect dscp-based
    random-detect dscp 10 percent 60 80
  
```

Table 7 lists other QoS specifications in the Cisco Catalyst 3850 Series and Catalyst 9300 Series.

Table 7. QoS specifications in the Cisco Catalyst 3850 Series and Catalyst 9300 Series

	Catalyst 3650/3850 Series	Catalyst 9300 Series
Buffer	12 MB	16 MB
Buffer sharing	Buffer sharing is within the ASIC	Buffer sharing is within the ASIC
Number of priority queues	0 to 2	0 to 2

Contents

Introduction

Purpose of this guide

Why upgrade?

System hardware

System default behavior

High availability - StackWise-1T/480/320 and StackPower Plus

Operations

Interface reference

Management interface

Software features

Host tracking feature

Quality of service

Congestion avoidance

Conclusion

Appendix A

Conclusion

The Cisco Catalyst 9300 Series is Cisco's leading fixed enterprise switching access platform. It is the new generation of the access platform, with many additional capabilities, and is well suited for enterprises looking to upgrade from their existing Cisco Catalyst 3650/3850 Series deployment.

Appendix A

If your device has no legacy IP device-tracking or IPv6 snooping configurations, you can use only the new SISF-based **device-tracking** commands for all your future configurations. The legacy IPDT commands and IPv6 snooping commands are not available.

Table 8 displays the new SISF-based device-tracking commands and the corresponding IPDT and IPv6 snooping commands.

Table 8. IPDT, IPv6 snooping, and device-tracking CLI compatibility

IP device tracking	IPv6 snooping	SISF-based device tracking
ip device tracking probe count	Not supported	Not supported
ip device tracking probe delay	ipv6 neighbor binding reachable-lifetime	device-tracking policy reachable-lifetime
ip device tracking probe interval	ipv6 snooping tracking retry-interval	device-tracking policy retry-interval
ip device tracking probe use-svi	Accepted and interpreted as ip device tracking probe auto-source override	Accepted and interpreted as ip device tracking probe auto-source override
ip device tracking probe auto-source fallback	Not supported	Not supported
ip device tracking probe auto-source override	Not supported	Not supported
ip device tracking trace buffer	Not supported	Not supported
ip device tracking maximum	ipv6 snooping policy <name> limit	device-tracking snooping policy <name> limit
ip device tracking probe count	Not supported	Not supported
ip device tracking probe interval	Not supported	Not supported
clear ip device tracking all	Not supported	Not supported