

The Next Generation of the Industry's Most Widely Deployed Stackable Switching Platform

The Cisco Catalyst 9300 Series switches are the next generation of enterprise-class stackable access-layer switches that are part of the Catalyst 9000 switching family. These switches support [full PoE+](#), [Cisco UPOE](#), and [field-replaceable redundant fans and power supplies](#).

In addition, Cisco Catalyst 9300 Series models also support [a variety of fixed and modular uplink options](#) for both copper and fiber uplink support as well as dense 1GE fiber connectivity for FTTX and 1GE aggregation.



Highlights

- x86 CPU complex with 8 GB memory, 16 GB of flash, and external USB 3.0 SSD pluggable storage slot (delivering 120 GB of storage with an option SSD drive) to host containers
- 1GE copper, fiber, or 1/2.5/5/10GE (mGig) ports
- Fixed uplinks (Catalyst 9300L) with 4 × 1GE SFP, 4 × 10GE SFP+, or 2 × 40GE QSFP+ **NEW**
- Optional uplink modules (Catalyst 9300) with 4 × 1GE SFP, 4 × Multigigabit, 8 × 10GE SFP+, 2 × 25GE SFP28, or 2 × 40GE QSFP+
- Leading PoE capabilities with up to 384 ports of PoE per stack, full PoE+, and 60W Cisco UPOE
- Resiliency with field-replaceable redundant power supplies and fans
- Operational efficiency with optional backplane stacking, supporting stacking bandwidth up to 320 Gbps with Cisco StackWise-320 (Catalyst 9300L) or up to 480 Gbps with Cisco StackWise-480 (Catalyst 9300)
- Cisco IOS XE: A modern operating system for the enterprise with support for model-driven programmability including NETCONF, RESTCONF, YANG, on-box Python scripting, streaming telemetry, container-based application hosting, and patching for critical bug fixes
- Advanced security:
 - Encrypted Traffic Analytics (ETA): You benefit from the power of machine learning to identify and take actions toward threats or anomalies in your network, including malware detection in encrypted traffic (without decryption) and distributed anomaly detection
 - Enhanced security with AES-256 MACsec encryption, policy-based segmentation, and trustworthy systems
- Line-rate, hardware-based Flexible NetFlow, delivering flow collection of up to 64,000 flows
- Cisco Software-Defined Access (SD-Access):
 - Simplified operations and deployment with policy-based automation from edge to cloud managed with Cisco Identity Services Engine (ISE)
 - Network assurance and improved resolution time through Cisco DNA Center
- Plug and Play (PnP) enabled: A simple, secure, unified, and integrated offering to ease new branch or campus device rollouts or updates to an existing network
- Cisco UADP 2.0 ASIC with programmable pipeline and micro-engine capabilities, along with template-based, configurable allocation of Layer 2 and Layer 3 forwarding, Access Control Lists (ACLs), and Quality of Service (QoS) entries

Cisco Catalyst 9300 Series



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Cisco Catalyst 9300 Series (Fixed Uplink Models) NEW

Product SKU	Service SKU SNTC 8x5xNBD	Software Package	Downlinks				Uplinks					PoE				Power Supply		Stack- Wise	Rack Mount
			1GE RJ45	mGig RJ45			1GE SFP	1GE SFP	10GE SFP+	40GE QSFP+	Network Module Slot	Ports	UPOE	Power Budget		Slots	Default		
				2.5GE	5GE	10GE								Default	Max				
C9300L-24T-4G-E	CON-SNT-C930024G	Essentials	24				4									2	1 x 350 W AC	320	1 RU
C9300L-24T-4G-A	CON-SNT-C9300LA2	Advantage	24				4									2	1 x 350 W AC	320	1 RU
C9300L-24P-4G-E	CON-SNT-C9300L2E	Essentials	24				4				24		505 W	720 W		2	1 x 715 W AC	320	1 RU
C9300L-24P-4G-A	CON-SNT-C93004G4P	Advantage	24				4				24		505 W	720 W		2	1 x 715 W AC	320	1 RU
C9300L-24T-4X-E	CON-SNT-C92TXEL0	Essentials	24					4								2	1 x 350 W AC	320	1 RU
C9300L-24T-4X-A	CON-SNT-C00L2XAL	Advantage	24					4								2	1 x 350 W AC	320	1 RU
C9300L-24P-4X-E	CON-SNT-C9300L2X	Essentials	24					4			24		505 W	720 W		2	1 x 715 W AC	320	1 RU
C9300L-24P-4X-A	CON-SNT-C93024PX	Advantage	24					4			24		505 W	720 W		2	1 x 715 W AC	320	1 RU
C9300L-24UXG-4X-E	CON-SNT-C9300LGX	Essentials	16			8			4		24	✓	880 W	1,440 W		2	1 x 1,100 W AC	320	1 RU
C9300L-24UXG-4X-A	CON-SNT-C93024GA	Advantage	16			8			4		24	✓	880 W	1,440 W		2	1 x 1,100 W AC	320	1 RU
C9300L-24UXG-2Q-E	CON-SNT-C9300L2Q	Essentials	16			8				2	24	✓	722 W	1,440 W		2	1 x 1,100 W AC	320	1 RU
C9300L-24UXG-2Q-A	CON-SNT-C932QA4A	Advantage	16			8				2	24	✓	722 W	1,440 W		2	1 x 1,100 W AC	320	1 RU
C9300L-48T-4G-E	CON-SNT-CL4GET84	Essentials	48					4								2	1 x 350 W AC	320	1 RU
C9300L-48T-4G-A	CON-SNT-CAT9300L	Advantage	48					4								2	1 x 350 W AC	320	1 RU
C9300L-48P-4G-E	CON-SNT-C930G4EP	Essentials	48					4			48		505 W	1,440 W		2	1 x 715 W AC	320	1 RU
C9300L-48P-4G-A	CON-SNT-C9300AG4	Advantage	48					4			48		505 W	1,440 W		2	1 x 715 W AC	320	1 RU
C9300L-48PF-4G-E	CON-SNT-C93004FE	Essentials	48					4			48		890 W	1,440 W		2	1 x 1,100 W AC	320	1 RU
C9300L-48PF-4G-A	CON-SNT-C93004GA	Advantage	48					4			48		890 W	1,440 W		2	1 x 1,100 W AC	320	1 RU
C9300L-48T-4X-E	CON-SNT-C9300L4E	Essentials	48						4							2	1 x 350 W AC	320	1 RU
C9300L-48T-4X-A	CON-SNT-CX9300L4	Advantage	48						4							2	1 x 350 W AC	320	1 RU
C9300L-48P-4X-E	CON-SNT-C93004X4P	Essentials	48						4		48		505 W	1,440 W		2	1 x 715 W AC	320	1 RU
C9300L-48P-4X-A	CON-SNT-CA00LXL8	Advantage	48						4		48		505 W	1,440 W		2	1 x 715 W AC	320	1 RU
C9300L-48PF-4X-E	CON-SNT-C9300PFE	Essentials	48						4		48		890 W	1,440 W		2	1 x 1,100 W AC	320	1 RU
C9300L-48PF-4X-A	CON-SNT-C9300P4X	Advantage	48						4		48		890 W	1,440 W		2	1 x 1,100 W AC	320	1 RU
C9300L-48UXG-4X-E	CON-SNT-C9G430EX	Essentials	36			12			4		48	✓	675 W	1,775 W		2	1 x 1,100 W AC	320	1 RU
C9300L-48UXG-4X-A	CON-SNT-CA9300L4	Advantage	36			12			4		48	✓	675 W	1,775 W		2	1 x 1,100 W AC	320	1 RU
C9300L-48UXG-2Q-E	CON-SNT-CXG934QE	Essentials	36			12				2	48	✓	675 W	1,775 W		2	1 x 1,100 W AC	320	1 RU
C9300L-48UXG-2Q-A	CON-SNT-C9302QA4	Advantage	36			12				2	48	✓	675 W	1,775 W		2	1 x 1,100 W AC	320	1 RU

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Product SKU	Service SKU SNTC 8×5×NBD	Software Package	Downlinks				Uplinks					PoE				Power Supply		Stack- Wise	Rack Mount
			1GE RJ45	mGig RJ45			1GE SFP	1GE SFP	10GE SFP+	40GE QSFP+	Network Module Slot	Ports	UPOE	Power Budget		Slots	Default		
				2.5GE	5GE	10GE								Default	Max				
C9300-24T-E	CON-SNT-C93002TE	Essentials	24							1						2	1 × 350 W AC	480	1 RU
C9300-24T-A	CON-SNT-C93002TA	Advantage	24							1						2	1 × 350 W AC	480	1 RU
C9300-24P-E	CON-SNT-C93002PA	Essentials	24							1	24		445 W	720 W	2	1 × 715 W AC	480	1 RU	
C9300-24P-A	CON-SNT-C93002PE	Advantage	24							1	24		445 W	720 W	2	1 × 715 W AC	480	1 RU	
C9300-24U-E	CON-SNT-C93002UE	Essentials	24							1	24	✓	830 W	1,440 W	2	1 × 1,100 W AC	480	1 RU	
C9300-24U-A	CON-SNT-C93002UA	Advantage	24							1	24	✓	830 W	1,440 W	2	1 × 1,100 W AC	480	1 RU	
C9300-24UX-E	CON-SNT-C930024U	Essentials				24				1	24	✓	560 W	1,440 W	2	1 × 1,100 W AC	480	1 RU	
C9300-24UX-A	CON-SNT-C93024XU	Advantage				24				1	24	✓	560 W	1,440 W	2	1 × 1,100 W AC	480	1 RU	
C9300-48T-E	CON-SNT-C930048E	Essentials	48							1					2	1 × 350 W AC	480	1 RU	
C9300-48T-A	CON-SNT-C93004TA	Advantage	48							1					2	1 × 350 W AC	480	1 RU	
C9300-48P-E	CON-SNT-C93004PE	Essentials	48							1	48		437 W	1,440 W	2	1 × 715 W AC	480	1 RU	
C9300-48P-A	CON-SNT-C93004PA	Advantage	48							1	48		437 W	1,440 W	2	1 × 715 W AC	480	1 RU	
C9300-48U-E	CON-SNT-C93004UE	Essentials	48							1	48	✓	822 W	1,800 W	2	1 × 1,100 W AC	480	1 RU	
C9300-48U-A	CON-SNT-C93004UA	Advantage	48							1	48	✓	822 W	1,800 W	2	1 × 1,100 W AC	480	1 RU	
C9300-48UXM-E	CON-SNT-C93E048X	Essentials		36		12				1	48	✓	490 W	1,590 W	2	1 × 1,100 W AC	480	1 RU	
C9300-48UXM-A	CON-SNT-C93A048M	Advantage		36		12				1	48	✓	490 W	1,590 W	2	1 × 1,100 W AC	480	1 RU	
C9300-48UN-E	CON-SNT-C93004UN	Essentials			48					1	48	✓	645 W	1,745 W	2	1 × 1,100 W AC	480	1 RU	
C9300-48UN-A	CON-SNT-C930048N	Advantage			48					1	48	✓	645 W	1,745 W	2	1 × 1,100 W AC	480	1 RU	
C9300-24S-E	CON-SNT-C930024E	Essentials					24			1					2	1 × 715 W AC	480	1 RU	
C9300-24S-A	CON-SNT-C930024A	Advantage					24			1					2	1 × 715 W AC	480	1 RU	
C9300-48S-E	CON-SNT-C930048S	Essentials					48			1					2	1 × 715 W AC	480	1 RU	
C9300-48S-A	CON-SNT-C93004SA	Advantage					48			1					2	1 × 715 W AC	480	1 RU	

Cisco DNA Licenses for Cisco Catalyst 9300L Fixed Uplink Models

Software Package	Product SKU			Compatible Model
	3-Years	5-Years	7-Years	
Cisco DNA Essentials	C9300L-DNA-E-24-3Y	C9300L-DNA-E-24-5Y	C9300L-DNA-E-24-7Y	24-port Catalyst 9300L (Network Essentials)* ¹
	C9300L-DNA-E-48-3Y	C9300L-DNA-E-48-5Y	C9300L-DNA-E-48-7Y	48-port Catalyst 9300L (Network Essentials)* ²
Cisco DNA Advantage	C9300L-DNA-A-24-3Y	C9300L-DNA-A-24-5Y	C9300L-DNA-A-24-7Y	24-port Catalyst 9300L (Network Advantage)* ³
	C9300L-DNA-A-48-3Y	C9300L-DNA-A-48-5Y	C9300L-DNA-A-48-7Y	48-port Catalyst 9300L (Network Advantage)* ⁴

*¹ C9300L-DNA-E-24 is required in CCW. *² C9300L-DNA-E-48 is required in CCW.

*³ C9300L-DNA-A-24 is required in CCW. *⁴ C9300L-DNA-A-48 is required in CCW.

Cisco DNA Licenses for Cisco Catalyst 9300 Modular Uplink Models

Software Package	Product SKU			Compatible Model
	3-Years	5-Years	7-Years	
Cisco DNA Essentials	C9300-DNA-E-24-3Y	C9300-DNA-E-24-5Y	C9300-DNA-E-24-7Y	24-port Catalyst 9300 (Network Essentials)* ¹
	C9300-DNA-E-48-3Y	C9300-DNA-E-48-5Y	C9300-DNA-E-48-7Y	48-port Catalyst 9300 (Network Essentials)* ²
Cisco DNA Advantage	C9300-DNA-A-24-3Y	C9300-DNA-A-24-5Y	C9300-DNA-A-24-7Y	24-port Catalyst 9300 (Network Advantage)* ³
	C9300-DNA-A-48-3Y	C9300-DNA-A-48-5Y	C9300-DNA-A-48-7Y	48-port Catalyst 9300 (Network Advantage)* ⁴

*¹ C9300-DNA-E-24 is required in CCW. *² C9300-DNA-E-48 is required in CCW.

*³ C9300-DNA-A-24 is required in CCW. *⁴ C9300-DNA-A-48 is required in CCW.

 **Ordering and Licensing Guide**

You must order a **Cisco DNA License** in order to purchase a switch.

A **Cisco Smart Account** is mandatory when ordering a Cisco DNA License.

The Cisco Smart Account is a new solution that provides a central location to manage Cisco software licenses across an entire organization, allowing partners and customers to optimize their software management.

To obtain a Cisco Smart Account, visit **Cisco Software Central** and select the [Request a Smart Account] option under the [Administration] heading.

 software.cisco.com

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Network Modules for Cisco Catalyst 9300 Modular Uplink Models

Product SKU	Description	Compatible Model
C9300-NM-4G	4 × 1GE SFP Network Module	Catalyst 9300
C9300-NM-4M	4 × mGig Network Module	Catalyst 9300
C9300-NM-8X	8 × 10GE SFP+ Network Module	Catalyst 9300
C9300-NM-2Y	2 × 25GE SFP28 Network Module	Catalyst 9300
C9300-NM-2Q	2 × 40GE QSFP+ Network Module	Catalyst 9300

Power Supply Modules for Cisco Catalyst 9300 Series

Product SKU		Product SKU (80+ Platinum)		Product SKU (Upgrade) ^{*1}	Description	Compatible Model
Primary	Secondary	Primary	Secondary			
PWR-C1-350WAC	PWR-C1-350WAC/2	PWR-C1-350WAC-P	PWR-C1-350WAC-P/2		350 W AC Power Supply Module	Catalyst 9300L/9300
PWR-C1-715WAC	PWR-C1-715WAC/2	PWR-C1-715WAC-P	PWR-C1-715WAC-P/2	PWR-C1-715WAC-UP	715 W AC Power Supply Module	Catalyst 9300L/9300
PWR-C1-1100WAC	PWR-C1-1100WAC/2	PWR-C1-1100WAC-P	PWR-C1-1100WAC-P/2	PWR-C1-1100WAC-UP	1,100 W AC Power Supply Module	Catalyst 9300L/9300
PWR-C1-715WDC	PWR-C1-715WDC/2				715 W DC Power Supply Module	Catalyst 9300L/9300

*1 Options to upgrade the default AC power supply module.

Cisco StackWise-320 Kit & Cables for Cisco Catalyst 9300L Fixed Uplink Models

Product SKU	Description	Compatible Model
C9300L-STACK-KIT	StackWise-320 Kit ^{*1}	Catalyst 9300L
STACK-T3-1M	StackWise Cable (1 m)	Catalyst 9300L
STACK T3-3M	StackWise Cable (3 m)	Catalyst 9300L

*1 The kit consists of two adapters and a stacking cable (50 cm).

Cisco StackWise-480 Cables for Cisco Catalyst 9300 Modular Uplink Models

Product SKU	Description	Compatible Model
STACK-T1-50CM	StackWise Cable (50 cm)	Catalyst 9300
STACK-T1-1M	StackWise Cable (1 m)	Catalyst 9300
STACK-T1-3M	StackWise Cable (3 m)	Catalyst 9300



Cisco StackWise-320/480

The Cisco StackWise-320/480 provides stacking of up to eight Cisco Catalyst 9300 Series switches with the optional Cisco StackWise-320/480 Kits (Cables).

Mixed stacking is not supported. You cannot stack fixed uplink models (Catalyst 9300L) with modular uplink models (Catalyst 9300), or other Catalyst switches, e.g., Cisco Catalyst 3650 and 3850 Series.

Cisco StackWise-320/480 Scalability & Performance

Stack Member	Stack Bandwidth	Stack Limit
Catalyst 9300L Fixed Uplink Models with Same License Level	320 Gbps	8
Catalyst 9300 Modular Uplink Models with Same License Level	480 Gbps	8

Benefits of Transitioning to Cisco Catalyst 9300 Series

Feature	Catalyst 3560-X/3750-X	Catalyst 3650	Catalyst 3850	Catalyst 9300	Benefit	
 Scale and Performance	Bandwidth per Stack	64 Gbps	160 Gbps	480 Gbps	320 Gbps 480 Gbps	Greater throughput.
	Uplinks	4 × 1GE 2 × 10 GE	4 × 1GE 2 × 10GE 4 × 10GE 8 × 10GE 2 × 40GE	4 × 1GE 2 × 10GE 4 × 10GE 8 × 10GE 2 × 40GE	4 × 1GE 4 × mGig 4 × 10GE 8 × 10GE 2 × 25GE 2 × 40GE	Greater uplink scale.
	Multigigabit Downlink		✓	✓	✓	Support speeds above 1G in traditional cabling environments.
 Advanced Security	Native Flexible NetFlow		✓	✓	✓	
	TrustSec and SGT for Wired and Wireless	Wired only	✓	✓	✓	Orchestrate role-based access to corporate resources.
	Trustworthy Systems		✓	✓	✓	
	Native MACsec-256			✓ ^{*1}	✓	Most secure link authentication and encryption.
	Encrypted Traffic Analytics (ETA)				✓	Detect malware hiding in encrypted traffic without decrypting it.
 Simplicity and Automation	x86 CPU				✓	Faster CPU performance.
	IOS XE OS		✓	✓	✓	Single common network OS across routing, switching, wireless, and IoT.
	KVM and Container-based Hosting Environments				✓	App hosting in the network.
	Guest Shell			✓	✓	On-box Python scripting.
	Model-Driven Programmability			✓	✓	Standards-based programmable interfaces.
	Streaming Telemetry			✓	✓	Rich contextual insights.
	Fabric-in-a-box				✓	
	SD-Access Programmability			✓	✓	Enable SD-Access without needing separate devices for each fabric role.

*1 Except some models.

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Existing Model		New Model	
Catalyst 3650	Catalyst 3850	Catalyst 9300	Interface
WS-C3650-24TS		C9300L-24T-4G 	24 × 1GE, 4 × 1GE SFP
WS-C3650-24PS		C9300L-24P-4G 	24 × 1GE PoE+, 4 × 1GE SFP
WS-C3650-24TD		C9300L-24T-4X 	24 × 1GE, 4 × 10GE SFP+
WS-C3650-24PD		C9300L-24P-4X 	24 × 1GE PoE+, 4 × 10GE SFP+
WS-C3650-8X24PD		C9300L-24UXG-4X 	16 × 1GE UPOE, 8 × mGig UPOE, 4 × 10GE SFP+
WS-C3650-8X24UQ		C9300L-24UXG-2Q 	16 × 1GE UPOE, 8 × mGig UPOE, 2 × 40GE QSFP+
WS-C3650-48TS		C9300L-48T-4G 	48 × 1GE, 4 × 1GE SFP
WS-C3650-48PS		C9300L-48P-4G 	48 × 1GE PoE+, 4 × 1GE SFP
WS-C3650-48FS		C9300L-48PF-4G 	48 × 1GE PoE+, 4 × 1GE SFP
WS-C3650-48TD		C9300L-48T-4X 	48 × 1GE, 4 × 10GE SFP+
WS-C3650-48TQ			
WS-C3650-48PD		C9300L-48P-4X 	48 × 1GE PoE+, 4 × 10GE SFP+
WS-C3650-48FD		C9300L-48PF-4X 	48 × 1GE PoE+, 4 × 10GE SFP+
WS-C3650-48PQ			
WS-C3650-48FQM			
WS-C3650-48FQ			
WS-C3650-12X48FD		C9300L-48UXG-4X 	36 × 1GE UPOE, 12 × mGig UPOE, 4 × 10GE SFP+
WS-C3650-12X48UQ			
WS-C3650-12X48UR			
WS-C3650-12X48UZ		C9300L-48UXG-2Q 	36 × 1GE UPOE, 12 × mGig UPOE, 2 × 40GE QSFP+
	WS-C3850-24T	C9300-24T	24 × 1GE
	WS-C3850-24P	C9300-24P	24 × 1GE PoE+
	WS-C3850-24U	C9300-24U	24 × 1GE UPOE
	WS-C3850-24XU	C9300-24UX	24 × mGig UPOE
	WS-C3850-48T	C9300-48T	48 × 1GE
	WS-C3850-48P	C9300-48P	48 × 1GE PoE+
	WS-C3850-48F		
	WS-C3850-48U	C9300-48U	48 × 1GE UPOE
	WS-C3850-12X48U	C9300-48UXM	36 × mGig (1/2.5GE) UPOE, 12 × mGig UPOE
		C9300-48UN	48 × mGig (1/2.5/5GE) UPOE
	WS-C3850-12S	C9300-24S	24 × 1GE SFP
	WS-C3850-24S	C9300-48S	48 × 1GE SFP

Network modules are supported:

- 4 × 1GE SFP
- 4 × mGig
- 8 × 10GE SFP+
- 2 × 25GE SFP28
- 2 × 40GE QSFP+

Commvault® Cloud Backup and Recovery

Backup everything, everywhere, and recover faster.

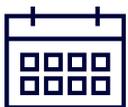
OVERVIEW

Commvault Cloud Backup and Recovery provides powerful backup, verifiable recovery, and cost-optimized cloud workload mobility, helping to ensure data availability, even across multiple clouds. Our simplified backup and recovery solution allows you to manage all your workloads — cloud, VMs, containers, applications, databases, and endpoints — from a single platform, while flexible copy data management allows you to multi-purpose your backed-up data for DevOps, replication, and more, across your entire infrastructure.

CHALLENGE

Organizations need to be confident that their data is readily available across their entire environment, whether on-premises, in the cloud, in multiple clouds, or in hybrid environments. They need help to ensure data availability and avoid costly data loss scenarios.

- Point solutions have limited protection and create data silos
- Additional point solutions are often needed as your data infrastructure evolves, which creates even more segregated data silos
- Segregated data leads to inefficiencies, longer go-to-market cycles, and increased storage costs
- Quick, complete, and cost-effective data access, protection, and recovery is critical for business planning and operation



277 DAYS

Average time for security teams to identify and contain a data breach¹



\$4.35M

Global average total cost of a data breach¹

SOLUTION

Backup & Recovery provides enterprise-grade protection and recovery of virtual machines, containers, databases, applications (including cloud), endpoints, and files. Commvault Cloud®, powered by Metallic® AI allows you to manage backed-up data and workloads efficiently and securely on-premises and in the cloud.

Backup & Recovery:

- Enables role-based access control for self-service while restricting unauthorized access
- Helps eliminate data sprawl and reduces the burden on database administrators
- Increases efficiency and allows focus on critical business activities
- Helps extract more business value from data which facilitates business planning and improves business outcomes

ONE DATA BACKUP SOLUTION FOR YOUR ENTIRE ENVIRONMENT

Wherever your data resides, ensure it's safe, compliant, and rapidly recoverable via a single interface with Backup & Recovery. Say goodbye to costly data loss scenarios, segregated data silos, missing recovery SLAs, and inefficient scaling. Empower your team to do more.

View the list of all supported technologies [here](#).

Capability	Use case	Features and Benefits
Backup	Protection of virtual machines, applications (including cloud), databases, endpoints, and files.	<ul style="list-style-type: none"> • Active defense across production and backup data • Policy-driven automation, monitoring, and reporting — no cumbersome scripts required • Customized schedules to meet any SLA • Deduplicated data for more efficient data transmission • Auto Discovery provides proactive protection of newly added datasets • Customized retention for recovery and compliance • Configurable encryption both at-rest and in-transit
Recovery	Recovery of virtual machines, applications (including cloud), databases, endpoints, and files.	<ul style="list-style-type: none"> • Recovery of entire system, instance, or application • Granular single file recovery • In-place to same location or out-of-place to different location • Latest data in point-in-time • File anomaly dashboard enhances platform resiliency to threats
Migration	Migration of workloads from on-premises to the cloud, or between clouds.	<ul style="list-style-type: none"> • Fully automated processes — no need for customized scripts • No downtime to production systems • Data portability between clouds • Avoid vendor lock-in
Hardware snapshot integration	Leverage hardware snapshots for near- instant recovery of entire data volumes.	<ul style="list-style-type: none"> • Support for all major snapshot hardware vendors • Automated snapshot backup and recovery • Customized snapshot retention
Cloud integration	Utilize the cloud for scalability, mobility, availability, and cost reduction for	<ul style="list-style-type: none"> • Support for all major cloud vendors • Single platform for both on-premises and cloud data management • Backup, recovery, and migration to the cloud, in the cloud, from the cloud
Flexible storage options	Retain copies of protected data in one or multiple locations.	<ul style="list-style-type: none"> • Disk library — individual hard disks or RAID array • Tape library • Cloud storage — all major vendors supported • Network-attached storage (NAS) • Deduplication for more efficient — and cost-effective — data storage

SECURE DATA RECOVERY

Backup & Recovery provides powerful backup, trusted recovery, and cost-optimized workload mobility to help ensure that your data is available regardless of where it resides — on-premises, in the cloud, and even across multiple clouds – to minimize the risk of costly data loss scenarios. Our industry-proven platform simplifies backup and recovery for all your data, applications, and workloads. And with the added benefit of unique security features, resilient ransomware protection, and flexible copy data management, Commvault takes the guesswork out of securing your entire data environment.

RAISE THE BAR WITH COMMVAULT

Commvault named a leader in the 2023 Gartner Magic Quadrant for Enterprise Backup and Recovery Software Solutions (for the 12th straight time).

[Read Report](#)

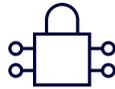
COMMVAULT CONTINUES TO MAKE WAVES

Commvault named a Leader in The Forrester Wave™ Data Resilience Solution Suites, Q4 2022.

[Read Report](#)



Simple,
comprehensive
backup and archiving



Trusted recovery,
ransomware protection,
and security



Scalable,
cost-optimized
cloud data mobility

For more insight into how Commvault Cloud Backup & Recovery solves your organization’s business challenges, visit commvault.com/backup-solutions



CONNECTRIX B-SERIES DS-6600B SWITCHES

32Gb/s Fibre Channel Switches

Scalability from eight to 128 ports

There are five switch models in the 32Gb/s series. All models can function at 4, 8, 16 or 32 Gb/s speeds depending on the installed optic. All switch models can be managed by Connectrix B-Series SANnav.

DS-6610B-L - Designed to support the SAN requirements of small-to-medium-sized environments, the Connectrix DS-6610B-L is a 24-port switch that offers high performance and economy. The 1U base chassis of the DS-6610B is prepopulated with eight 16Gb/s or 32Gb/s Fibre Channel Small Form Factor Pluggable (SFP+) shortwave optics. The ports on demand (PoD) kits allow expansion in 8-port increments. The Enterprise models come with fully populated with twenty-four 16- or 32Gb/s SFPs and include the Enterprise Package.

DS-6620B - Designed to support the SAN requirements of medium-to large sized workgroups as well as that of large enterprises, the Connectrix DS-6620B offers forty-eight SFP+ ports and four QSFP ports in a 1U form factor. Two base models are available which have 24 active 32Gb/s or 16Gb/s ports, populated with 32Gb or 16Gb/s shortwave SFPs. QSFP ports can be used to form dense high performance ISLs with other 32Gb/s switches or directors. QSFPs can also be configured to add up to 16 additional ports. With its speed and port density the DS-6620B can be deployed in any Fibre Channel Storage Area Network (SAN) to enable very dense fabrics in a relatively small package.

DS-6620B-V2 – Supporting up to 64-ports, this next generation DS-6620B is nearly identical to the current DS-6620B. While both versions offer the same key features and functionalities, there are some differences such as the requirement for FOS 9.0+, the DS-6620B-V2 supports 4Gb/s only on F-port to host/target connections and only has one LED per QSFP port. The number and type of ports is the same as the DS-6620B listed above. Like the DS-6620B, this switch is ideal for medium to large enterprises.

DS-6630B – This model has a total of 128 ports. There are 96 standard SFP 32Gb/s capable ports and eight Quad Small Form-factor Pluggable (QSFP) ports which support an additional 32 ports. The DS-6630B will be a good choice for mid-size customers who aren't quite ready to make the added investment into a 4-slot director class product. The DS-6630B will also be a good fit for large enterprise class customers who need more ports at the edge, but don't necessarily need a director class product at the edge of a large SAN.

DS-6630B-V2 – Supporting up to 128-ports, this next generation DS-6630B is nearly identical to the current DS-6630B. While both versions offer the same key features and functionalities, there are some differences such as the requirement for FOS 9.0+, the DS-6630B-V2 supports 4Gb/s only on F-port to host/target and it has no restrictions for topology or for encryption/compression unlike the original DS-6630B. The number and type of ports is the same as the DS-6630B listed above. Like the DS-6630B, this switch is ideal large enterprise environments.

DS-6600B Series Switches

System Architecture	Technical Specification
Fibre Channel Ports	<p>DS-6610B-L The DS-6610B-L base chassis models includes eight active 32Gb/s capable ports that are populated with eight 16Gb/s SFPs or eight 32Gb/s SFPs. The 8-port port-on-demand (PoD) models allow the switch to support an additional 16 ports reaching a maximum of 24 ports. The DS-6610B Enterprise models come fully populated with 24 16Gb/s or 32Gb/s SFPs and include the Enterprise Package.</p> <p>DS-6620B and DS-6620B-V2 The DS-6620B and DS-6620B-V2 feature 48 Fibre Channel SFP+ ports and 4 QSFP ports. There are two base models which have 24 active 32Gb/s or 16Gb/s ports, populated with 32Gb or 16Gb/s shortwave SFPs. The Ports on Demand (PoD) license activates 12 additional ports and includes 12 shortwave SFPs. The QSFP Ports On Demand license activates the four QSFP ports and contains four shortwave QSFPs. The enterprise switch model fully populates the SFP+ ports with forty-eight shortwave SFPs and comes fully licensed with the Enterprise Bundle (Fabric Watch, Trunking, Performance Monitoring, Extended Fabric, Fabric Vision).</p> <p>DS-6630B and DS-6630B-V2 The DS-6630B and DS-6630B-V2 switch models supports up to 128 ports. There are 96 standard SFP 32Gb/s capable ports and eight Quad Small Form-factor Pluggable (QSFP) ports which support an additional 32 ports.</p>
Performance	32Gb/s SFPs can operate at 32, 16 or 8Gb/s; 16Gb/s SFPs will operate at 16, 8 and 4Gb/s
Frame Buffers	<p>DS-6610B - 2K dynamically allocated DS-6620B and DS-6620B-V2 - 15,360 dynamically allocated DS-6630B and DS-6630B-V2 - 15,360 dynamically allocated</p>
Aggregate Bandwidth	<p>DS-6610B – 768 Gb/s DS-6620B and DS-6620B-V2 – 2Tb/s DS-6630B and DS-6630B-V2 – 4Tb/s</p>
Class of service	Class 2, Class 3, Class F (Inter-switch Frames)
Port types	<p>DS-6610B – F_Port, E_Port, M_Port, D_Port (ClearLink Diagnostics Port) on 24 SFP+ ports; Access Gateway mode: F_Port and NPIV-enabled N_Port DS-6620B and DS-6620B-V2 - D_Port (ClearLink Diagnostic Port), E_Port, EX_Port, F_Port, AE_Port; optional port-type control Brocade Access Gateway mode: F_Port and NPIV-enabled N_Port DS-6630B and DS-6630B-V2 - D_Port (ClearLink Diagnostic Port), E_Port, EX_Port, F_Port, AE_Port, optional port-type control.</p>
Fabric services	<p>BB Credit Recovery; Brocade Advanced Zoning (Default Zoning, Port/WWN Zoning, Peer Zoning); Congestion Signaling; Dynamic Path Selection (DPS); Extended Fabrics; Fabric Performance Impact Notification (FPIN); Fabric Vision; FDMI; FICON CUP (DS-6620B only); Flow Vision; F_Port Trunking; FSPF; Integrated Routing; ISL Trunking; Management Server; Name Server; NPIV; NTP v3; Port Decommission/Fencing; QoS; Registered State Change Notification (RSCN); Target-Driven Zoning; Traffic Optimizer; Virtual Fabrics (Logical Switch and Logical Fabric; DS-6610B requires FOS 9.1.x and higher); VMID and AppServer.</p> <p>Note: Some fabric services do not apply or are unavailable in Access Gateway mode.</p>
Hot swappable components	<p>DS-6610B-L – The DS-6610B-L has an embedded power supply / fan and it is non-replaceable. The entire switch is a Field Replaceable Unit (FRU). The only FRU's on the DS-6610B-L are the SFP's. The DS-6610B-L will support in-service firmware upgrades. DS-6620B and DS-6620B-V2 – Dual power supplies with three embedded cooling fan FRUs, SFPs and QSFP optics. The fans are connected to the power supplies and are not themselves replaceable. DS-6630B and DS-6630B-V2 – Dual power supplies, three fan FRUs, SFPs and QSFPs</p>
Installation options	All models can be installed in a standard, customer-supplied, 19-inch Electronic Industries Alliance (EIA) rack
Scalability	Refer to Dell E-Lab Navigator smart phone App downloadable from the Apple or Google Store or E-Lab Navigator found at this link: https://www.delltechnologies.com/en-us/products/interoperability/elab.htm
Maximum frame size	2,112-byte payload

DS-6600B Series Switches

Management	Technical Specification
Minimum Fabric Operating System (FOS)	DS-6610B-L FOS 9.0.1 or higher DS-6620B FOS 8.0.0 or higher DS-6620B-V2 FOS 9.0.0 or higher DS-6630B FOS 8.0.0 or higher DS-6630B-V2 FOS 9.0.0 or higher
Management	Advanced Web Tools. SSH, Auditing, Syslog NTP v3, CLI, SMI-S compliant; REST API, HTTP, SNMP v1/v3 (FE MIB, FC Management MIB)
SANnav Management	SANnav Management Portal and SANnav Global View empower IT administrators to be more efficient and productive by providing comprehensive visibility into the SAN environment. SANnav only supports open systems and requires FOS v7.4 or higher.
Management access	10/100/1000 Mb/s Ethernet (RJ-45), In-band over Fibre Channel, Serial port (RJ-45), and one USB port
Firmware upgrades	Non-disruptive download and activation
Security	DS-6610B-L DH-CHAP (between switches and end devices), FCAP switch authentication; HTTPS, IPsec, IP filtering, LDAP with IPv6, Open LDAR, Port Binding, RADIUS, TACACS+, user-defined Role-based Access Control (RBAC), Secure Copy (SCP), Secure RPC, Secure Syslog, SSH v2, SSL, Switch Binding, Trusted Switch DS-6620B, DS-6620B-V2, DS-6630B, DS-6630B-V2 AES-GCM-256 encryption on ISLs; DH-CHAP (between switches and end devices), FCAP switch authentication; HTTPS, IPsec, IP filtering, LDAPwith IPv6, OpenLDAR, Port Binding, RADIUS, TACACS+, user-defined Role-based Access Control (RBAC), Secure Copy (SCP), Secure RPC, Secure Syslog, SSH v2, SSL, Switch Binding, Trusted Switch
Diagnostics	ClearLink optics and cable diagnostics, including electrical/optical loopback, link traffic/latency/distance, flow mirroring; built-in flow generator, POST and embedded online/offline diagnostics, including environmental monitoring, FC ping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart, optics health monitoring, power monitoring, RAS trace logging, and Rolling Reboot Detection (RRD)
Call home	Call home integration with SANnav and Connectrix Manager Converged Network Edition
Optional license-key features	Enterprise Package - includes Fabric Vision, Extended Fabric and ISL Trunking Mainframe License - includes ISL Trunking, Fabric Vision and FICON Control Unit Port (CUP) Integrated Routing – allows ports to be configured as EX-Ports supporting FC-FC routing Note: “-EP” DS-6600B models include the Enterprise Package

DS-6600B Series Switches

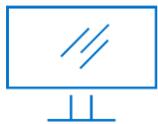
Physical Specifications	Technical Specification
Enclosure	DS-6610B-L - chassis supports rear-to-front (RTF) airflow DS-6620B and DS-6620B-V2 - There are two air flow options: front-to-rear (FTR) and rear-to-front (RTF) DS-6630B and DS-6630B-V2 - There are two air flow options: front-to-rear (FTR) and rear-to-front (RTF)
Dimension and weight	DS-6610B Width: 428.80 mm (16.88 in.) Height: 42.90 mm (1.69 in.) Depth: 306.60 mm (12.07 in.) Weight: 5.75 kg (12.67 lb.) DS-6620B and DS-6620B-V2 Height x Width x Depth: 1.73x17.32x14.0 inches (43.9mmx440mmx355.6mm), 1RU Weight with 2 power supplies and no transceivers: 17lbs (7.73kg) DS-6630B and DS-6630B-V2 Height x Width x Depth: 3.41x17.32x24.0 inches (86.7mmx440mmx609.6mm), 2RU Weight with 2 power supplies and no transceivers: 42lbs (19.05kg)

DS-6600B Series Switches

Power Requirements	Technical Specification
Power supply	<p>DS-6610B-L - Switch chassis includes one fixed power supply. Note: Although the DS-6610B ships with a single power supply, two power cords are included. Only one power cord is required.</p> <p>DS-6620B and DS-6620B-V2 - Switch chassis includes dual, hot-swappable power supplies with integrated cooling system</p> <p>DS-6630B and DS-6630B-V2 - Switch chassis includes dual, hot-swappable power supplies with integrated cooling system</p>
AC Input	<p>DS-6610B-L – 90 V to 264 V ~2.2A</p> <p>DS-6620B and DS-6620B-V2 – 90 V to 264 V ~3.5A</p> <p>DS-6630B and DS-6630B-V2 – 90 V to 264 V ~12A</p>
Input line frequency	47-63 Hz
Power consumption	<p>DS-6610B-L - 77 WATTS with all 24-ports populated</p> <p>DS-6620B and DS-6620B-V2 - 206 WATTS with all 64 ports populated</p> <p>DS-6630B and DS-6630B-V2 - 942 Watts with all 128-ports</p>

DS-6600B Series

Environment	Technical Specification
Operating environment	<p>Temperature: 0°C to 40°C/32°F to 104°F</p> <p>Humidity: 10% to 85% (non-condensing)</p>
Non-operating environment	<p>Temperature: -25°C to 70°C/-13°F to 158°F</p> <p>Humidity: 10% to 90% (non-condensing)</p>
Operating altitude	Up to 3000m (9,842 ft)
Storage altitude	Up to 12 km (39,370 ft)
Shock	<p>Operating: Up to 20G, 6 ms half-sine</p> <p>Non-operating: Half sine, 33G 11 ms, 3G axis</p>
Vibration	<p>Operating: 0.5g sine, 0.4 grms random, 5 Hz to 500 Hz</p> <p>Non-operating: 2.0g sine, 1.1 grms random, 5 Hz to 500 Hz</p>
Heat dissipation	<p>DS-6610B-L - 24 ports at 215 BTU/hr</p> <p>DS-6620B and DS-6620B-V2 64 ports at 716 BTU/hr</p> <p>DS-6630B and DS-6630B-V2 - 128 ports at 3512 BTU/hr</p>
Caron Footprint Reports	DS-6610B , DS-6620B and DS-6630B . (These documents are produced and maintained by Broadcom)



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Product Specification

Hitachi Virtual Storage Platform E Series Family Matrix

	Hitachi Virtual Storage Platform (VSP) E590H	Hitachi Virtual Storage Platform (VSP) E790H	Hitachi Virtual Storage Platform (VSP) E1090	Hitachi Virtual Storage Platform (VSP) E1090H
Max. Raw Internal Capacity	10.62 PB (30TB NVMe, 30TB SAS SSD and 18TB HDD)	10.62 PB (30TB NVMe, 30TB SAS SSD and 18TB HDD)	26 PB (30TB SAS SSD)	
Total Efficiency Guarantee Ratio ¹	Up to 7:1			
Data Reduction Guarantee Ratio	Up to 4:1 (sight unseen)			
Max. Raw External	144PB	216PB	287 PB	
Max. Number of Drives (Flash and Hard Drives)	552	552	864	960
Max. Number of Flash Drives, Including Spares	24 (2.5" NVMe SSD) and 240 (2.5" SAS SSD)		96 (2.5" NVMe SSD) or 864 (2.5" SAS SSD)	864 (2.5" SAS SSD)
Max. Number of Hard Drives, Including Spares	480 (3.5" SAS HDD)	480 (3.5" SAS HDD)	N/A	960 (3.5" SAS HDD)
Flash Drive Options	<ul style="list-style-type: none"> ● 1.9TB (2.5" NVMe) ● 3.8TB (2.5" NVMe) ● 7.6TB (2.5" NVMe) ● 15TB (2.5" NVMe) ● 30TB (2.5" NVMe) ● 1.9TB (2.5" SAS) ● 3.8TB (2.5" SAS) ● 7.6TB (2.5" SAS) ● 15TB (2.5" SAS) ● 30TB (2.5" SAS) 			<ul style="list-style-type: none"> ● 1.9TB (2.5" SAS) ● 3.8TB (2.5" SAS) ● 7.6TB (2.5" SAS) ● 15TB (2.5" SAS) ● 30TB (2.5" SAS)
SAS Hard Drive Options	<ul style="list-style-type: none"> ● 2.4TB (2.5" 10K) ● 6TB (3.5" 7.2K) ● 10TB (3.5" 7.2K) ● 14TB (3.5" 7.2K) ● 18TB (3.5" 7.2K) 	<ul style="list-style-type: none"> ● 2.4TB (2.5" 10K) ● 6TB (3.5" 7.2K) ● 10TB (3.5" 7.2K) ● 14TB (3.5" 7.2K) ● 18TB (3.5" 7.2K) 	N/A	<ul style="list-style-type: none"> ● 2.4TB (2.5" 10K) ● 6TB (3.5" 7.2K) ● 14TB (3.5" 7.2K) ● 18TB (3.5" 7.2K)
Max. Standard Expansion Drive Trays	10 expansion trays total 2 (2U: 24 SFF SAS SSD) and 8 (2U: 24 SFF SAS SSD/HDD or 2U: 12 LFF SAS HDD)	10 expansion trays total 2 (2U: 24 SFF SAS SSD) and 8 (2U: 24 SFF SAS SSD/HDD or 2U: 12 LFF SAS HDD)	4 (2U: 24 SFF NVMe SSD) or 36 (2U: 24 SFF SAS SSD)	36 expansion trays total 4 (2U: 24 SFF SAS SSD) and 32 (2U: 24 SFF SAS SSD/HDD) or 2U: 12 LFF SAS HDD)
Max. High Density Expansion Drive Trays	8 (4U: 60 LFF HDD)	8 (4U: 60 LFF HDD)	N/A	16 (4U: 60 LFF HDD)
Performance (IOPS)	4.0 million	6.8 million	8.4 million	
Performance (Bandwidth)	22 GB/s	32 GB/s	52GB/s	
Fibre Bandwidth to Host	76,800 MB/s		256,000 MB/s	
Max. Cache	768 GiB		1024 GiB	
Max. Host Port Counts	16 x FC 8 x iSCSI	16 x FC 8 x iSCSI	80 x FC-NVMe 80 x FC 40 x iSCSI [®]	

Hitachi Virtual Storage Platform E Series Family Matrix

	Hitachi Virtual Storage Platform (VSP) E590H	Hitachi Virtual Storage Platform (VSP) E790H	Hitachi Virtual Storage Platform (VSP) E1090	Hitachi Virtual Storage Platform (VSP) E1090H
Host Interface Types	<ul style="list-style-type: none"> • FC: 32Gb/s • FC: 16Gb/s • iSCSI: 10Gb/s • iSCSI: 25Gb/s 		<ul style="list-style-type: none"> • FC-NVMe: 32Gb/s • Fibre Channel: 32Gb/s • Fibre Channel: 16Gb/s • iSCSI: 10Gb/s • iSCSI: 25Gb/s 	
Height Width Depth (Controller)	2U, 3.5" (87 mm) 19.0" (482 mm) 33.6" (852mm)		4U, 6.9" (175 mm) 19.0" (483 mm) 31.8" (809 mm)	
Max. Weight (Controller w/ internal media²)	106 lbs (48 kg)		166 lbs (75 kg)	
Built-in Drive Tray	24 SFF NVMe SSD		N/A	N/A
Back-End Disk Interface and Links	Built-in Drive Tray: 32 x NVMe PCIe Expansion Drive Tray: 8 x SAS		64 x NVMe PCIe or 64 x 12 Gb/s SAS	
Expansion Host I/O Tray				
Max qty	0		1	
Height Width Depth	N/A		2U, 3.5" (88 mm) 19" (483mm) 35.2" (892 mm)	
Max. Weight	N/A		95 lbs (43 kg)	
Software Specifications				
Value Added Bundled Features	<ul style="list-style-type: none"> • 100% Data Availability Guarantee • Total Efficiency Guarantee • Adaptive Data Reduction • Storage Virtualization • Embedded Management • In System Replication • Copy Data Management • Infrastructure Analytics • Non-disruptive Migration 			
RAID Supported³	<ul style="list-style-type: none"> • RAID6 (6D+2P, 12D+2P, 14D+2P) • RAID5 (3D+1P, 4D+1P, 6D+1P, 7D+1P) • RAID1 (2D+2D, 4D+4D) 			
Data-at-Rest Encryption	Yes			
Max. LUN Size	256TB			
Max. Number of LUNs	32,768	49,152	65,280	

Hitachi Virtual Storage Platform E Series Family Matrix

	Hitachi Virtual Storage Platform (VSP) E590H	Hitachi Virtual Storage Platform (VSP) E790H	Hitachi Virtual Storage Platform (VSP) E1090	Hitachi Virtual Storage Platform (VSP) E1090H
Virtual Storage Scale Out Specifications				
Max Controller nodes per cluster	65			
Max Clusters one node may participate	15 ⁶			
Fibre Bandwidth to Host	1,560	4,160	4,160	
Max Cache (without intermix)	49,920 GiB		66,560 GiB	
ENERGY STAR[®] certified	 Yes			

¹ The Total Efficiency Guarantee of up to 7:1 for the VSP E990/E790/E590 covers savings from data de-duplication, compression, thin provisioning and snapshots.

² VSP E790 and E590 controller weight includes internal NVMe SSDs

³ RAID 1 selection mirrors blocks across two drives and then creates a striped set across multiple drive pairs. This is commonly referred to as RAID 1+0.

⁴ Maximum port count reflect diskless configuration

⁵ Maximum port count reflects diskless configuration and additional Channel Board Box (2U)

⁶ 15 non-meta Virtual Storage Machines per node shared with NDM and GAD uses of VSMs

1MB = 1,000,000 bytes

1MiB = 1,048,576 bytes

NVMe = non-volatile memory express

SSD = solid state drive

FC = Fibre Channel

iSCSI = internet small computer systems interface

About Hitachi Vantara

Hitachi Vantara, a Hitachi, Ltd. subsidiary, is the data foundation for innovation. We build resilient data storage and infrastructure the world's innovators rely on.



Corporate Headquarters
 2535 Augustine Drive
 Santa Clara, CA 95054 USA
hitachivantara.com | community.hitachivantara.com

Contact Information
 USA: 1-800-446-0744
 Global: 1-858-547-4526
hitachivantara.com/contact



PowerEdge R6615

Powerful performance per investment dollar

The new Dell PowerEdge R6615 is a 1U, single-socket rack server. Designed to be the best investment per dollar for your data center, this server provides performance and flexible, low-latency storage options in an air or Direct Liquid Cooling (DLC) configuration.

Stay ahead of the curve

Delivering breakthrough innovation for traditional and emerging workloads, including dense virtualization, hyper-converged infrastructure (HCI), and Network Function Virtualization (NFV) with OpenStack for Telco using the latest performance and density with optional acceleration.

Invest wisely in a platform that grows with your business

- Using AMD EPYC 4th generation processor to deliver up to 50% more core count per single socket platform in an innovative air-cooled blueprint.
- Enables DDR5 at 4800 MT/s memory and PCIe Gen5 with double the speed of previous Gen4 for faster access and transport of data optimizing application output.
- Optional DLC is available to more efficiently cool high-performance processors.

Experience more virtual machine density to support the most demanding applications

- Deliver more virtual machines per physical host using increased core count and higher memory footprint than previous generations.
- Improve responsiveness or reduce app load time for power users with up to 2 x single-wide half-length GPUs.

Expect increased expandability by storing more data in one server, saving space in your datacenter

- Deliver more memory density with DDR5 (up to 3TB of RAM) providing greater memory capacity.
- Support lower latency higher performance NVMe SSD in a hardware RAID solution helps maximize compute performance.

Cyber Resilient Architecture for Zero Trust IT environment & operations

Security is integrated into every phase of the PowerEdge lifecycle, including protected supply chain and factory-to-site integrity assurance. Silicon-based root of trust anchors end-to-end boot resilience while Multi-Factor Authentication (MFA) and role-based access controls ensure trusted operations.

Increase efficiency and accelerate operations with an autonomous infrastructure

The Dell OpenManage™ systems management portfolio delivers a secure, efficient, and comprehensive solution for PowerEdge servers. Simplify, automate and centralize one-to-many management with the OpenManage Enterprise console and iDRAC.

Sustainability

From recycled materials in our products and packaging, to thoughtful, innovative options for energy efficiency, the PowerEdge portfolio is designed to make, deliver, and recycle products to help reduce the carbon footprint and lower your operation costs. We even make it easy to retire legacy systems responsibly with Dell Technologies Services.

Rest easier with Dell Technologies Services

Maximize your PowerEdge Servers with comprehensive services ranging from [Consulting](#), to [ProDeploy](#) and [ProSupport suites](#), [Data Migration](#) and more – available across 170 locations and backed by our 60K+ employees and partners.

PowerEdge R6615

The Dell EMC PowerEdge R6615 rack server is a dense single-socket 1U rack server delivering peak performance and excellent TCO.

Ideal for:

- Virtualization
- Hyper-Converged Infrastructure (HCI)
- Network Functions Virtualization (NFV)

Feature	Technical Specifications
Processor	One AMD EPYC 4th Generation 9004 Series with up to 128 cores
Memory	<ul style="list-style-type: none"> 12 DDR5 DIMM slots, supports RDIMM 3 TB max, speed up to 4800 MT/s Supports registered ECC DDR5 DIMMs only
Storage controllers	<ul style="list-style-type: none"> Internal Controllers (RAID): PERC H965i, PERC H755, PERC H755N, PERC H355, HBA355i Internal Boot: Boot Optimized Storage Subsystem (BOSS-N1): HWR RAID 2 x M.2 NVMe SSDs or USB External HBA (non-RAID): HBA355e Software Raid: S160
Drive Bays	<p>Front bays:</p> <ul style="list-style-type: none"> Up to 4 x 3.5-inch SAS/SATA (HDD/SSD) max 80 TB Up to 8 x 2.5-inch NVMe (SSD) max 122.88 TB Up to 10 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 153.6 TB Up to 14 x EDSFF E3.S Gen5 NVMe (SSD) max 107.52 TB Up to 16 x EDSFF E3.S Gen5 NVMe (SSD) max 122.88 TB <p>Rear bays:</p> <ul style="list-style-type: none"> Up to 2 x 2.5-inch SAS/SATA (HDD/SSD) max 30.72 TB Up to 2 x EDSFF E3.S Gen5 NVMe (SSD) max 15.36 TB
Power Supplies	<ul style="list-style-type: none"> 1800 W Titanium 200–240 V AC or 240 HVDC, hot swap redundant 1400 W Platinum 100–240 V AC or 240 HVDC, hot swap redundant 1400 W Titanium 277 V AC or 336 HVDC, hot swap redundant 1100 W Titanium 100–240 V AC or 240 HVDC, hot swap redundant 1100 W LVDC -48 – -60 VDC hot swap redundant 800 W Platinum 100–240 V AC or 240 HVDC, hot swap redundant 700 W Titanium 200–240 V AC or 240 HVDC, hot swap redundant
Cooling Options	<ul style="list-style-type: none"> Air cooling Optional Direct Liquid Cooling (DLC) <p>Note: DLC is a rack solution and requires rack manifolds and a cooling distribution unit (CDU) to operate.</p>
Fans	<ul style="list-style-type: none"> Standard (STD) fans/High performance GOLD (VHP) fans Up to 4 sets (dual fan module) hot plug fans
Dimensions	<ul style="list-style-type: none"> Height – 42.8 mm (1.685 inches) Width – 482 mm (18.97 inches) Depth – 822.89 mm (32.39 inches) with bezel 809.05 mm (31.85 inches) without bezel
Form Factor	1U rack server
Embedded Management	<ul style="list-style-type: none"> iDRAC9 iDRAC Direct iDRAC RESTful API with Redfish iDRAC Service Module Quick Sync 2 wireless module
Bezel	Optional LCD bezel or security bezel
OpenManage Software	<ul style="list-style-type: none"> OpenManage Enterprise OpenManage Power Manager plugin OpenManage Service plugin OpenManage Update Manager plugin CloudIQ for PowerEdge plug in OpenManage Enterprise Integration for VMware vCenter OpenManage Integration for Microsoft System Center OpenManage Integration with Windows Admin Center
Mobility	OpenManage Mobile
OpenManage Integrations	<ul style="list-style-type: none"> BMC Truesight Microsoft System Center OpenManage Integration with ServiceNow Red Hat Ansible Modules Terraform Providers VMware vCenter and vRealize Operations Manager
Security	<ul style="list-style-type: none"> AMD Secure Encrypted Virtualization (SEV) AMD Secure Memory Encryption (SME) Cryptographically signed firmware Data at Rest Encryption (SEDs with local or external key mgmt) Secure Boot Secured Component Verification (Hardware integrity check) Secure Erase Silicon Root of Trust System Lockdown (requires iDRAC9 Enterprise or Datacenter) TPM 2.0 FIPS, CC-TCG certified, TPM 2.0 China NationZ
Embedded NIC	2 x 1 GbE LOM card (optional)
Network Options	1 x OCP card 3.0 (optional) Note: The system allows either LOM card or an OCP card or both to be installed in the system.
GPU Options	Up to 2 x 75 W SW

Feature	Technical Specifications	
Ports	Front Ports <ul style="list-style-type: none"> • 1 x iDRAC Direct (Micro-AB USB) port • 1 x USB 2.0 • 1 x VGA 	Rear Ports <ul style="list-style-type: none"> • 1 x Dedicated iDRAC Ethernet port • 1 x USB 3.0 • 1 x USB 2.0 • 1 x Serial (optional) • 1 x VGA (optional for Direct Liquid Cooling configuration)
	Internal Ports <ul style="list-style-type: none"> • 1 x USB 3.0 (optional) 	
PCIe	Up to three PCIe slots: <ul style="list-style-type: none"> • Slot 1: 1 x16 Gen5 or 1 x16 Gen4 Low profile, Half length or 1 x16 Gen5 Full height, Half length or 1 x8 Gen4 Low profile, Half length • Slot 2: 1 x16 Gen4 Low profile, Half length or 1 x16 Gen5 Full height, Half length or 1 x8 Gen4 Low profile, Half length • Slot 3: 1 x16 Gen5 or 1 x16 Gen4 Low profile, Half length 	
Operating System and Hypervisors	<ul style="list-style-type: none"> • Canonical Ubuntu Server LTS • Microsoft Windows Server with Hyper-V • Red Hat Enterprise Linux • SUSE Linux Enterprise Server • VMware ESXi For specifications and interoperability details, see Dell.com/OSsupport .	
OEM-ready version available	From bezel to BIOS to packaging, your servers can look and feel as if they were designed and built by you. For more information, visit Dell.com > Solutions > OEM Solutions.	

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SPARC T8-1 Server

Oracle's SPARC T8 servers are the world's most advanced systems for enterprise workloads. They deliver significantly faster performance for databases and Java applications compared with competitors' systems¹. Oracle's Software in Silicon technology accelerates Oracle Database In-Memory queries and enables real-time analytics. Security in Silicon provides full-speed wide-key encryption, plus protection to data in memory. This is the foundation for building the best and most secure mission-critical cloud infrastructure.

PRODUCT OVERVIEW

Oracle's SPARC T8-1 server is a resilient, single-processor system that enables organizations to respond to IT demands with extreme security and performance at a lower cost compared to alternatives. It is ideal for a wide range of enterprise-class workloads, including databases, applications, Java, and middleware, especially in a cloud environment. This system is based on the SPARC M8 processor, using the revolutionary Software in Silicon technology from Oracle.

Oracle's SPARC servers are coengineered with Oracle software for the best performance, efficiency, and security when running enterprise applications, OLTP, and analytics. With up to 2x better performance than competitor products¹, Oracle's SPARC servers allow IT organizations to make the most of their investment in Java applications and database software.

Software in Silicon technology is a breakthrough in microprocessor and server design, enabling databases and applications to run faster and with unprecedented security and reliability. Now in its second generation, this innovative Software in Silicon design includes Data Analytics Accelerator (DAX) engines designed directly into the SPARC M8 processor silicon to handle SQL primitives, such as those used by Oracle Database In-Memory starting in Oracle Database 12c. The DAX units can also be leveraged by Java applications operating on streams of data through the use of open APIs. The accelerators operate on data at full memory speeds, taking advantage of the very high memory bandwidth of the processor. This produces extreme



Key Benefits

- Up to 2x faster performance than competitor systems for Java software, databases, and enterprise applications¹
- Extreme acceleration of Oracle Database In-Memory queries, especially for compressed databases
- Ability to accelerate analytics on OLTP databases and Java applications, enabling real-time insight on transactional data
- Unique protection of application data from memory attacks or exploits of software
- End-to-end encryption of data with near-zero performance impact
- Easy compliance management of application environments throughout their lifecycles, ensuring the security of cloud infrastructure
- Near-zero overhead virtualization for deploying more than 100 virtual machines per processor, lowering the cost per virtual machine
- Advanced design that enables this single-processor system to outperform competitive two-processor systems, lowering IT cost.

acceleration of in-memory queries and analytics operations while processor cores are freed up to do other useful work. In addition, the ability of the DAX units to handle compressed data on the fly means that larger databases can be kept in memory or that less server memory needs to be configured for a given database size. Lastly, the SPARC M8 processor introduces Oracle Numbers units, which greatly accelerate Oracle Database operations involving floating point data. Consider the result: you can run fast in-memory analytics on your database, using much less memory than the size of your data, without significantly increasing server utilization rates or affecting your OLTP operations.

The Silicon Secured Memory feature of the SPARC M8 processor provides the capability of detecting and preventing invalid operations on application data, through hardware monitoring of software access to memory. This can stop malware from exploiting software vulnerabilities, such as buffer overflows. The hardware approach of Silicon Secured Memory is much faster than traditional software-based detection tools, meaning that security checks can be done in production without significant impact to performance. In addition, each processor core contains the fastest cryptographic acceleration in the industry, allowing IT organizations to deliver end-to-end data encryption and secure transactions with near-zero performance impact. In summary: you can easily activate data protection and encryption security, by default, without additional hardware investment.

Software in Silicon features can be easily integrated with existing applications during development, testing, and production. Developers can use and validate Software in Silicon features by using Oracle's Software in Silicon open APIs, which are supported by a community of collaboration among developers, engineers, and experts offering resources to help you understand and integrate this revolutionary open technology.

The record-breaking performance of the servers based on the SPARC M8 processor comes from its 32 cores, each of which handles up to 8 threads using unique dynamic threading technology. The processor can dynamically adapt to provide extreme single-thread performance, or it can enable massive throughput by running up to 256 threads. The processor cores are designed to accelerate Java workloads, especially Java 8 applications or later, as well as database operations. Using this efficient design, together with Oracle Solaris virtualization technology with near-zero overhead, a much larger number of virtual machines can be supported on Oracle's SPARC servers compared with Intel® Xeon®-based systems. This results in a significant decrease in the cost per virtual machine.

The technology breakthrough in SPARC servers is enabled by the Oracle Solaris operating system. Oracle Solaris 11 is a secure, integrated, and open platform engineered for large-scale enterprise cloud environments with unique optimization for Oracle Database, middleware, and application deployments. Security can be easily set up and enabled by default, while single-step patching and immutable zones allow compliance to be maintained with simplicity.

You can create complete application software stacks, lock them securely, deploy them in a cloud, and update them in a single step, all while maintaining compliance and easily generating audit reports. Oracle Solaris 11 combines unique management options with powerful application-driven software-defined networking for agile deployment of cloud infrastructure.

Built-in virtualization capabilities in Oracle's SPARC servers include both Oracle Solaris Zones and Oracle VM Server for SPARC. These allow enterprise workloads to be run within a virtual environment with near-zero performance impact. You can virtualize and consolidate many servers onto one, reducing the physical footprint of the data center as well as lowering the costs of operation, power, and cooling. Oracle Solaris Zones technology provides the capability to run legacy applications that require earlier versions of Oracle Solaris.

Key Features

- Based on the advanced SPARC M8 processor, with proven second-generation Software in Silicon technology for efficiency, performance, and security
- Scalability within the same family of servers from 32 to 256 cores with complete compatibility for applications and management
- Oracle Solaris 11 operating system for secure and compliant application deployment through single-step patching and immutable zones
- Built-in, no-cost virtualization technology with Oracle Solaris Zones and Oracle VM Server for SPARC
- Guaranteed binary compatibility and support for legacy applications that run under Oracle Solaris 10, 9, and 8
- Up to 53TB of accelerated storage utilizing industry-standard NVMe technology in order to satisfy the most demanding I/O requirements
- Resilient server system with highest levels of reliability, availability, and serviceability (RAS) in a compact, energy-efficient footprint.

Other advanced capabilities of the SPARC T8-1 server are large memory capacity, higher bandwidth, and minimal latency, which are achieved through four enhanced memory controllers per socket, faster and reduced-power DDR4 memory, and prefetch acceleration techniques. The I/O subsystem supports low-profile PCIe 3.0 adapters and industry-standard NVMe flash technology to provide high-capacity storage with minimal latency. Integrated controllers for networking, disks, and management reduce the cost of the system and provide greater expandability.

All Oracle servers ship with comprehensive server management tools at no additional cost. Oracle Integrated Lights Out Manager (Oracle ILOM) utilizes industry-standard protocols to provide secure and comprehensive local and remote management, including power management and monitoring, fault detection, and notification. Oracle Premier Support customers have access to My Oracle Support and multiserver management tools in Oracle Enterprise Manager Ops Center, a system management tool that, in conjunction with Oracle Enterprise Manager, coordinates servers, storage, and networking for a complete cloud infrastructure as a service (IaaS). Oracle Enterprise Manager Ops Center also features an automated service request capability, whereby potential issues are detected and reported to Oracle's support center without user intervention, ensuring the maximum service levels and simplified support.

SPARC T8-1 SERVER SPECIFICATIONS

ARCHITECTURE
Processor
<ul style="list-style-type: none"> • Thirty-two core, 5.0 GHz SPARC M8 processor • Up to 256 threads per processor (up to 8 threads per core) • Eight Data Analytics Accelerator units per processor, each supporting four concurrent in-memory analytics engines with decompression • Thirty-two on-chip encryption instruction accelerators (one per core) with direct non-privileged support for 16 industry-standard cryptographic algorithms: AES, Camellia, CRC32c, DES, 3DES, DH, DSA, ECC, MD5, RSA, SHA-1, SHA-224, SHA-256, SHA-3, SHA-384, and SHA-512 • Thirty-two floating-point units and thirty-two Oracle Numbers units per processor (one per core) • One random number generator (one per processor)
Cache per Processor
<ul style="list-style-type: none"> • Level 1: 32 KB instruction and 16 KB data per core • Level 2: 256 KB L2 I\$ per four cores, 128 KB L2 D\$ per core • Level 3: 64 MB L3\$ on chip
System Configuration
<ul style="list-style-type: none"> • SPARC T8-1 servers are always configured with one SPARC M8 processor; not expandable • Sixteen dual inline memory module (DIMM) slots per processor supporting half and fully populated memory configurations using 16, 32, 64 or 128 GB DDR4 DIMMs <ul style="list-style-type: none"> • 2 TB maximum memory configuration with 128 GB DIMMs
System Architecture

- SPARC V9 architecture, ECC protected

INTERFACES

- Network: Four 10 GbE (100 Mb/sec, 1 Gb/sec, 10 Gb/sec) ports, full duplex only, auto-negotiating
- Disks and internal storage: One SAS-3 controller providing hardware RAID 0, 1, and 1E/10 (ZFS file system provides higher levels of RAID)
- Expansion bus: Six low-profile PCIe 3.0 (four x8 and two x16 or x8) slots
- Ports: Four external USB (two front USB 2.0 and two rear USB 3.0), one RJ45 serial management port, console 100 Mb/1 Gb network port, and one VGA port

MASS STORAGE AND MEDIA

Internal storage:

- Up to eight 2.5-inch drives
 - 1,200 GB SAS-3 hard disk drives (HDD), maximum of eight
 - 800 GB SAS-3 solid state drive (SSD), maximum of eight
 - 6.8 TB NVMe solid state drives, maximum of four
- Oracle flash accelerators NVMe PCIe 3.0 cards
 - Oracle Flash Accelerator F640 v2, maximum of four

External storage:

- External DVD drive available
- Oracle offers a complete line of best-in-class, innovative storage, hardware, and software solutions, along with renowned world-class service and support. For more information, please refer to oracle.com/storage

POWER SUPPLIES

- Two hot-swappable AC 1,200 W redundant (1 + 1) power supplies
- Voltage 200 to 240 VAC, frequency 50/60 Hz
- Maximum operating input current at 200 VAC: 7 A per cord
- Maximum operating input power at 200 VAC: 1,300 W

KEY RAS FEATURES

- Hot-pluggable disk drives
- Redundant, hot-swappable power supplies and fans
- Environmental monitoring
- Extended memory protection with error correction within single SDRAM, triple-bit detection across SDRAMs, page retirement, memory scrubbing, cyclic redundancy check (CRC), message retry, and lane retire in hardware
- DIMM sparing enabled with fully populated memory slots, increasing system reliability and uptime
- System Interconnect: message retry, link retrain, and lane failover
- Integrated dual disk controllers with RAID 0, 1, and 1E/10
- Fault Management Architecture and Predictive Self Healing
- Live operating system upgrades
- Firmware updates during system operation
- Multiple PCIe root complexes for isolated I/O virtualization

SOFTWARE

Operating System

Oracle recommends the latest version of Oracle Solaris 11.4 for enhanced performance and functionality, including features enabled by Software in Silicon technology

- Control domain: Oracle Solaris 11.3 SRU 24 or later
- The following versions are supported within guest domains:
 - Oracle Solaris 11.3 SRU 24 or later
 - Oracle Solaris 10 1/13*
 - * Plus required patches

Applications certified for Oracle Solaris 9 or 8 only may run in an Oracle Solaris 9 or 8 branded zone running within an Oracle Solaris 10 guest domain.

Software Included

- Oracle Solaris 11.4 (latest version), which includes Oracle VM Server for SPARC
- Oracle Solaris ZFS (default file system)

Virtualization

Built-in, no-cost Oracle VM Server for SPARC provides the flexibility and power for running multiple logical domains in a single server. Multiple Oracle Solaris Zones may be run within a single Oracle VM Server for SPARC logical domain.

ENVIRONMENT

Operating temperature:

- 5° C to 35° C at 900 m (41° F to 95° F at 0 to 3,000 ft.)
- Decrease in maximum temperature: above 900 m (3,000 ft.) 1° C/300 m (1.8° F/1,000 ft.)

Nonoperating temperature:

- -40° C to 65° C at 900 m (-40° F to 149° F at 0 to 3,000 ft.)
- Decrease in maximum temperature: above 900 m (3,000 ft.) 1° C/300 m (1.8° F/1,000 ft.)

Operating relative humidity: 10% to 80% relative humidity, noncondensing, 27° C (81° F) wet bulb

Nonoperating relative humidity: Up to 85% relative humidity, noncondensing, 38° C (100° F) wet bulb

Operating altitude: 0 m to 3,000 m (0 ft. to 9,840 ft.) except in China markets where regulations may limit installations to a maximum altitude of 2,000 m

Nonoperating altitude: Up to 12,000 m (Up to 39,370 ft.)

Acoustic noise

DESCRIPTION	OPERATING AT 60%	OPERATING AT 100%
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Sound power level — LwAd (1 B = 10 dB)	8.2 B	9.7 B
Sound pressure level — LpAm (energy average of four bystander positions)	66.2 dBA	80.3 dBA

Cooling: 4,437 BTU/hr., 220 cfm max.

REGULATIONS (MEETS OR EXCEEDS THE FOLLOWING REQUIREMENTS)

Safety:

- UL/CSA 60950-1, EN 60950-1, and IEC 60950-1 CB Scheme with all country differences

EMC:

- Emissions: FCC 47 CFR 15, ICES-003, EN55032, EN61000-3-2, and EN61000-3-3
- Immunity: EN 55024

Certifications:

- North America Safety (NRTL), European Union (EU), International CB Scheme, BIS (India), BSMI (Taiwan), RCM (Australia), MSIP (Korea), and VCCI (Japan)

European Union directives:

- Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU, and WEEE Directive 2012/19/EU

All standards and certifications referenced are to the latest official version. For additional detail, please contact your sales representative.

Other country regulations/certifications may apply.

DIMENSIONS AND WEIGHT

- Height: 88 mm (3.5 in.); 2U
- Width: 445 mm (17.5 in.)
- Depth: 737 mm (29.0 in.)
- Weight: approx. 26.3 kg (58 lb.) without rackmount kit

WARRANTY

The SPARC T8-1 server comes with a one-year warranty. Visit oracle.com/us/support/policies/ for more information about Oracle's hardware warranty.

COMPLETE SUPPORT

With Oracle Premier Support, you will get the services you need to maximize the return on your investment in Oracle's SPARC T8-1 server. Complete system support includes 24/7 hardware service, expert technical support, proactive tools, and updates to Oracle Solaris, Oracle VM, and integrated software (such as firmware)—all for a single price. Learn more at oracle.com/support

¹For Java and database workloads, at product release time. See the [performance blog](#)

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