Data Center Switch

Product Prensentation

Lanbras
Optical & Ethernet Transmission

White Box Solution

Software for Open Networking in the Cloud (SONiC)

Why Open Network?

Fast Iteration

Based on the **rapid iteration** of self-developed SONiC, it supports the rapid development of business

Avoid Vendor Lock-in

Separation of software and hardware
Eliminate reliance on a single chip or manufacturer
Adhere to the standard Linux software ecology

Supplement Security

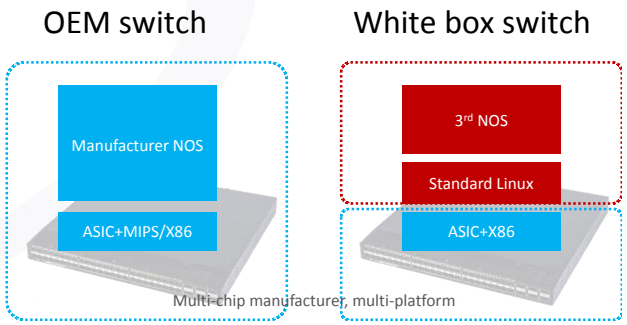
Controllable supply chain
Quality controllable
Controllable risk
Information and data security and controllable

Flexibility and Customization

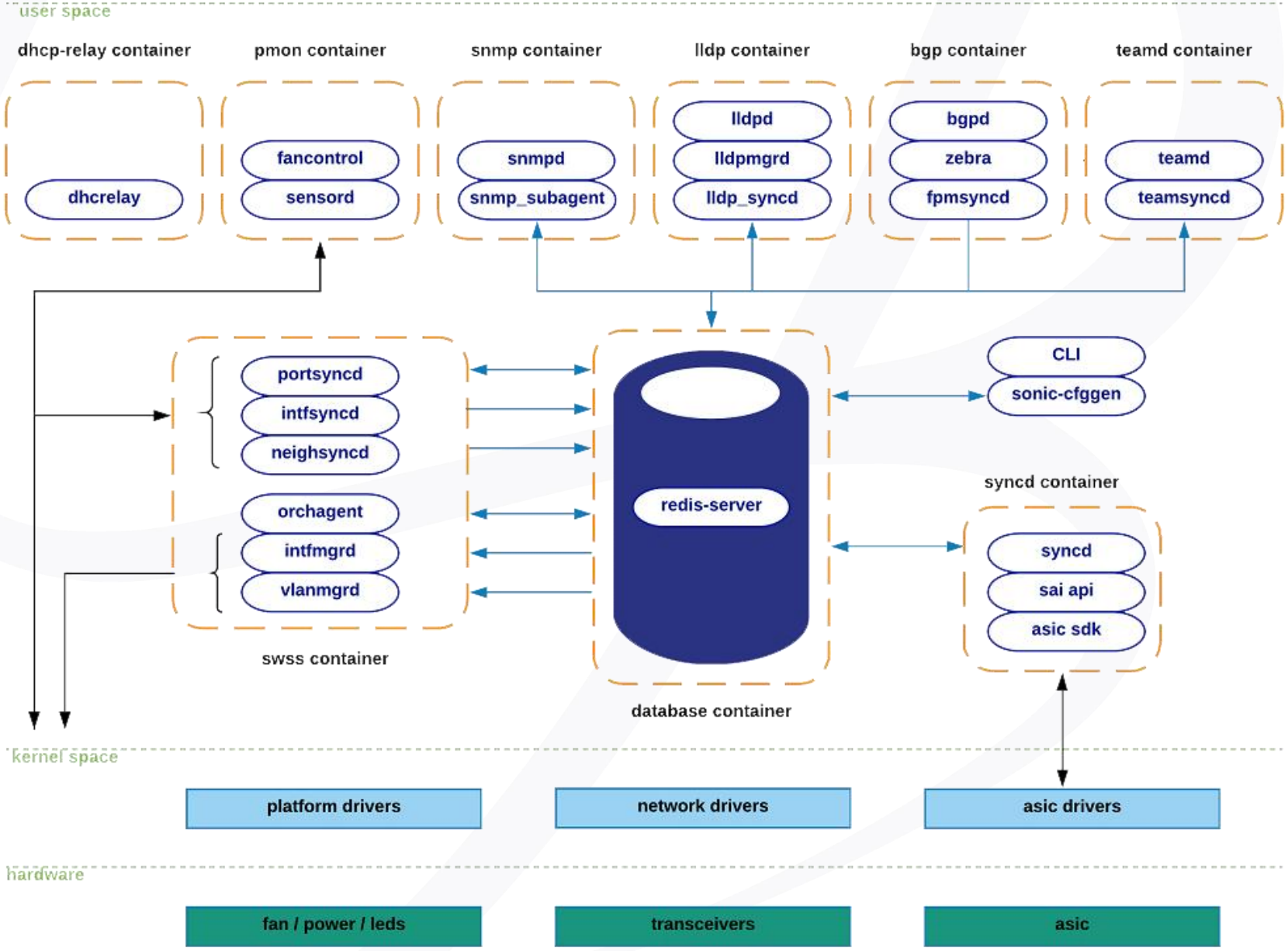
Precise control over network configurations
Ideal for scalable and programmable networks

Cost Efficiency

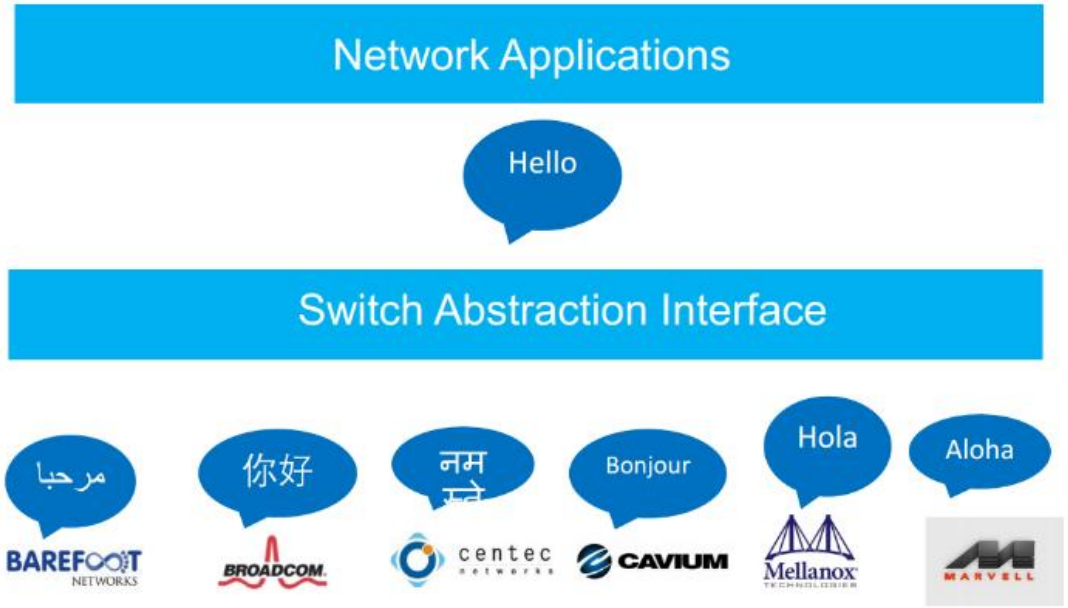
Decoupling based on software and hardware

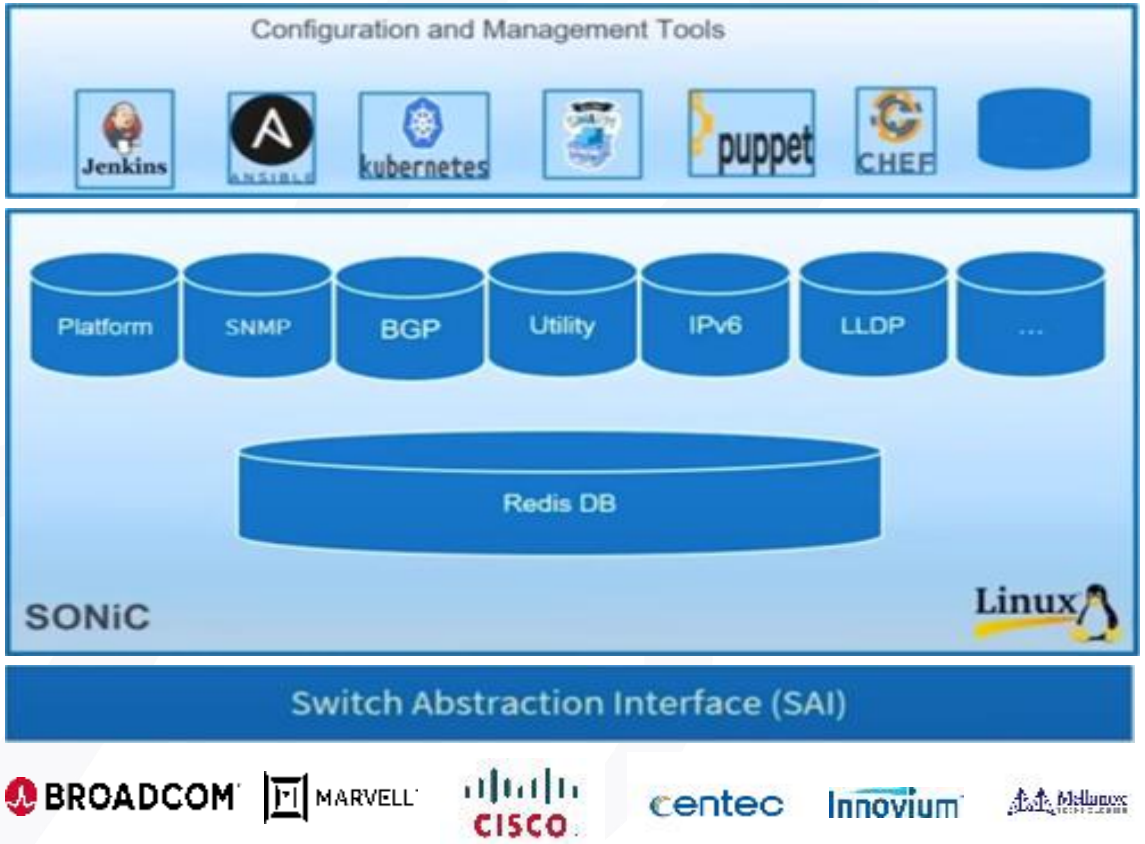


SONiC Architecture



SONiC Key Tech: SAI (Switch Abstraction Interface)





SONiC is a Debian Linux-based network Operating system supporting more than 100 switch platforms and ASICs

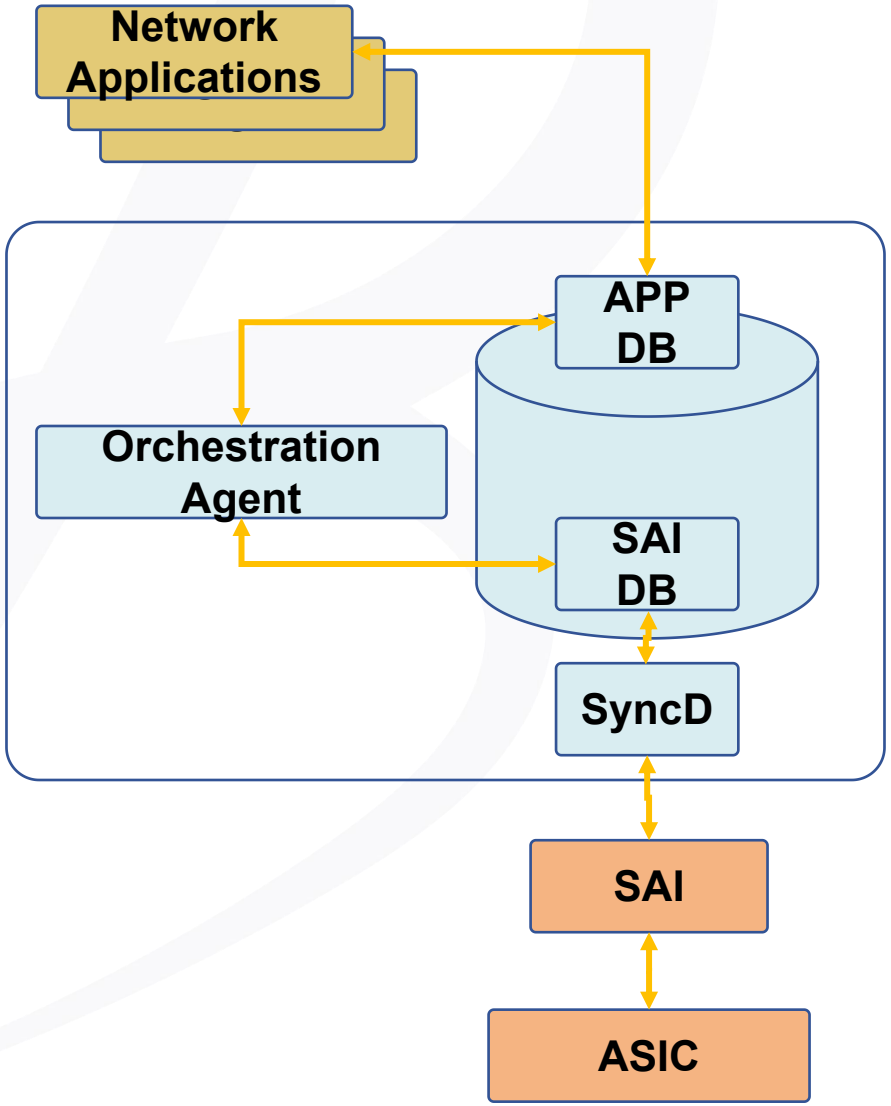
Different ASIC vendor needs to abstract an API to make all different ASIC vendors speak the same lanaguages ; Because of SAI, SONiC can run on different hardware platforms.

SONiC Key Features: SWSS (Switch State Service)

APP to ASIC need to transform the format that ASIC can recognize.

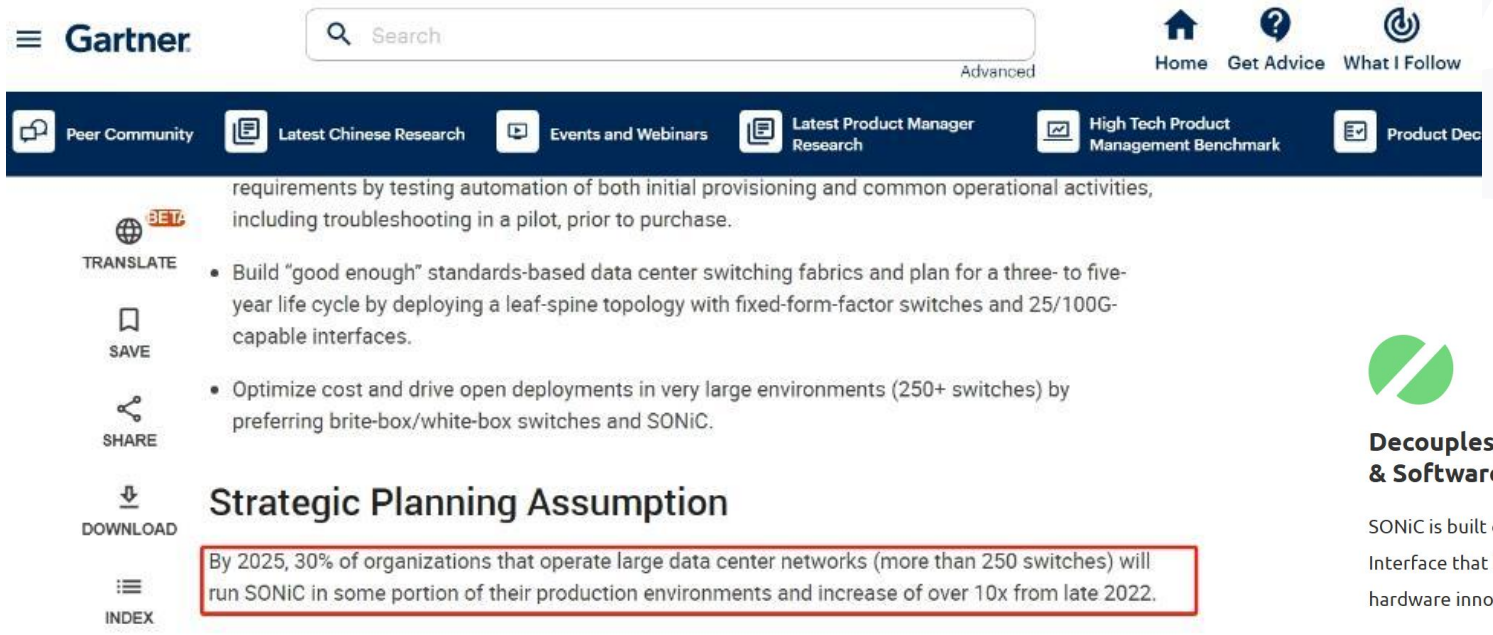
- APP DB: persist App objects
- SAI DB: persist SAI objects
- Orchestration Agent: translation between apps and SAI objects, Resolution of dependency and conflict
- SyncD: sync SAI objects between software and hardware

Key Goal: Evolve components independently



SONiC Benefits

Software for Open Networking in the Cloud (SONiC) is an open source network operating system (NOS) based on Linux that runs on switches from multiple vendors and ASICs. SONiC offers a full suite of network functionality, like BGP and RDMA, that has been production-hardened in the data centers of some of the largest cloud service providers. It offers teams the flexibility to create the network solutions they need while leveraging the collective strength of a large ecosystem and community.



Decouples Hardware & Software

SONiC is built on Switch Abstraction Interface that helps in accelerating hardware innovation

Accelerates Software Evolution

First solution to break monolithic switch software into multiple containerized components that accelerate software evolution

Rapidly Growing Ecosystem

SONiC has gained wide industry support over the last year that includes major network chip vendors

SONiC Maturity

Community Ecosystem

- 3 releases per year
- 120-250 commits/months
- 850+ community members
- 200+ active code contributors
- 68+ supported platforms

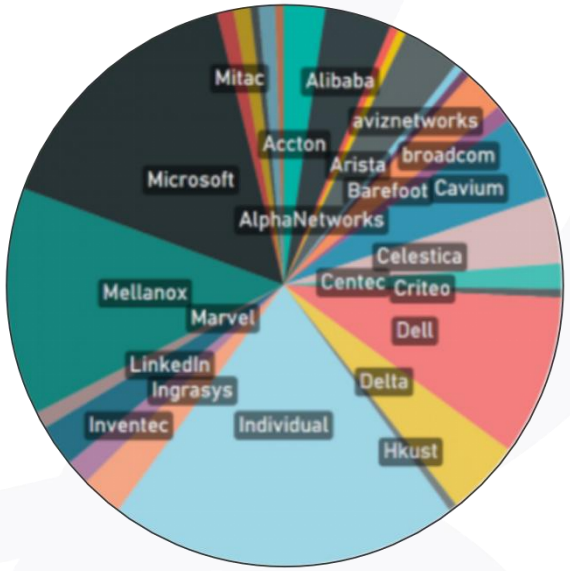
Monitoring Tools Available

Proven Management Tools

Major Customers are running it in Prod

- Contributing & Hardening
- Alibaba, Tencent, Linkedin...

Commercial Support Available



BGP	QoS	Syslog	VLAN	COPP	TACACS	Critical Res. Monitoring	Asymmetric PFC	PMON
ECMP	Flow Control	NTP	ACL	BGP GR	LAG	FIB Acceleration	PFC Watermark	FRR
VLAN Trunk	WRED	Mirroring	IPv4/ IPv6	BGP MP	ConfigDB	RDMA	Warm Reboot	BGP EVPN
LLDP	SNMP	DHCP Relay	Tunnel Decap	Fast Reboot	MAC Aging	gRPC	L3 VRF & VxLan	Dtel

SONiC Ecosystem

SONiC provides customers with the possibility to create their own NOS; Based on the independent and controllable NOS, maximize the interests of the enterprise.

Friendly Ecology

- Linux- based Foundation operation
- Participation in the entire industry chain, including users, chip manufacturers, equipment manufacturers, etc.

Low Cost

- SONiC in the open community is free to use.

Open

- Community SONiC code open

Continuous Evolution

- SONiC is driven by global top customers, and the continuous evolution is guaranteed.

Who are Using SONiC?

Company	White Box Proportion	Chipset	Hardware Supplyments	Port Configuration	Software
aws	**Almost**	BCM Marvell Mellanox	Edge-Core Celestica delta	32*400G 32*100G	DENT
Microsoft	20%+	TH Mellanox	Edge-core Mellanox Arista	32*100G 64*100G	SONiC
Google	First white box player Almost	XGS Self design chip	Quanta Delta Foxconn	400G	Self- Development
facebook	Almost	TH3: Wdge 200 TH4: Minipack2	Arista Celestica	128*200G 32*200G+16*400G	FBOSS
LinkedIn	40%	TH Innovium	Celestica	32*100G 400G	SONiC

What Can Offer on White Box Switch Business?

SONIC Software Service

Assist customers to create own Sonic NOS

Enhanced SONiC

- Enhanced SONiC that install with the device
- Enhanced SONiC supports rich L2/L3 features, free for users
- We does not assume any software responsibility and software services

SONiC Subscription

- Based on the subscription fee, we provides professional technical support and service guarantee
- Including software upgrades, bugs, configuration guidance

SONiC Custom Development

- For community SONiC / customer SONiC software, including adapting third-party hardware and providing source code
- NRE fees are charged according to the code workload

SONiC Bug Repair

- Provide source code for community SONiC / customer SONiC and SAI bugs purchased by customers
- NRE fees are charged according to the code workload

SONiC Test

- Provide testing services and detailed test reports
- According to the number of use cases, charge after converting the engineering quantity

White Box Hardware

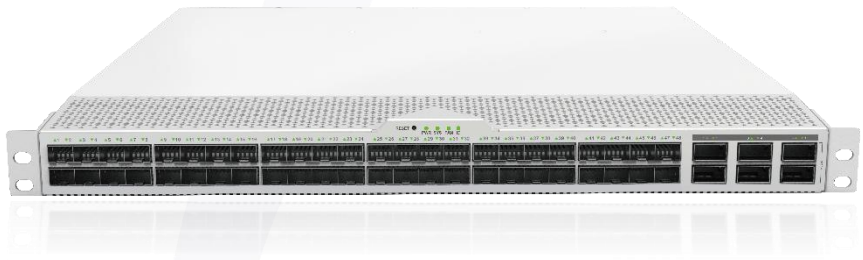
Network architecture and hardware switches can compatible to Alibaba/Facebook/…

Data Center White Box

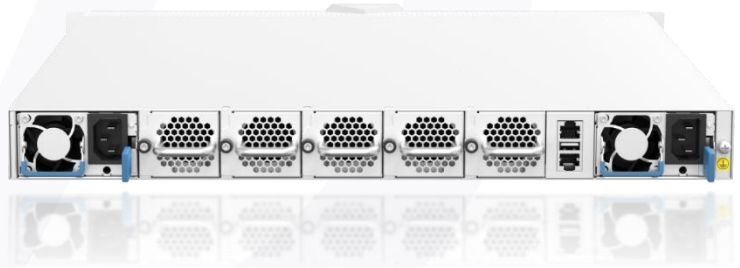
Marvell Falcon / Aldrin Series Switch

Data Center White Box Switch PTP with Renesas

48x10G SFP+, 6x100G QSFP28



Rear Side



DCSL3M-06C48X

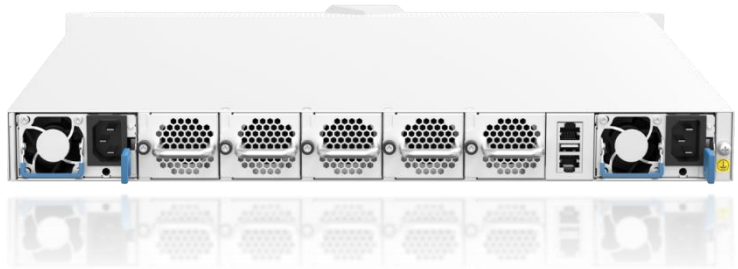
- Compact 1RU standard, 19-inch rack mountable design
- Cut-through with ultra-low-latency
- 2 (1+1 redundant) Redundant Hot-swappable PSU
- 5 (4+1 redundant) Hot-swappable Fan
- 48 x 10G SFP+ ports and 6 x 100G QSFP28 ports
- Each 100G QSFP28 port can be configured 40G, 4x25GbE or 4x10GbE via breakout cables
- Up to 2.18Tbps (1.09Tbpsx2) of switching performance
- Open automated configuration and zero-touch provisioning capabilities
- Simplify management of network environments
- Interface flexibility & Power efficiency

Provided Fix Ports	48 x 10G SFP+, 6 x 100G QSFP28
Management Ports	1x RJ45 100/1000Base-T Out-of-band 1x RJ45 Console 1x USB2.0
Switching Chip	Marvell Aldrin2 98DX8548
CPU	Maverll Octeon TX2 CN9130
PTP	Renesas 8A34002E
Memory	8GB DDR4
Storage	SSD: 64GB eMMC, optional M.2 STAT slot
Power Supply Units	2 x AC110~240V, 350w 1+1 Hot-swappable
Power Consumption	≤250 Watts
Fan Unit	5 (4+1 Redundant), Hot-swappable

Data Center White Box Switch

48x25G SFP28, 8x100G QSFP28

Rear Side



DCSL3M-08C48K

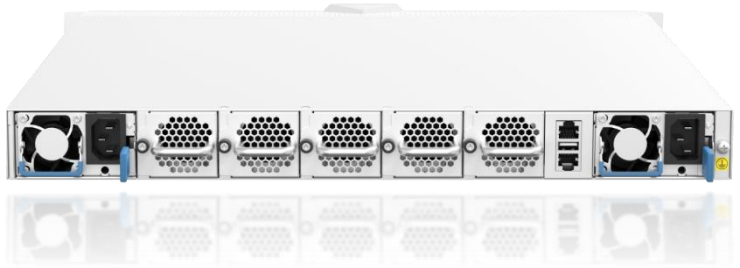
- Compact 1RU standard, 19-inch rack mountable design
- Cut-through with ultra-low-latency
- 2 (1+1 redundant) Redundant Hot-swappable PSU
- 5 (4+1 redundant) Hot-swappable Fan
- 48 x 25 Gbps (SFP28) ports and 8 x 100 Gbps (QSFP28) ports
- Up to 2Tbps of switching I/O bandwidth (full duplex)
- Open automated configuration and zero touch provisioning capabilities
- Simplify management of network environments

Provided Fix Ports	48 x 25G SFP28, 8 x 100G QSFP28
Management Ports	1x RJ45 100/1000Base-T Out-of-band 1x RJ45 Console 1x USB2.0
Switching Chip	Marvell Falcon 98CX8514
CPU	Intel Broadwell-DE D1508
Memory	8GB DDR4
Storage	SSD: 64GB eMMC, optional M.2 STAT slot
Power Supply Units	2 x AC110~240V, 550w 1+1 Hot-swappable
Power Consumption	≤520 Watts
Fan Unit	5 (4+1 redundant) Hot swappable

Data Center White Box Switch

32x100G QSFP28, 2x10G SFP+

Rear Side



DCSL3C-02C24X-5S

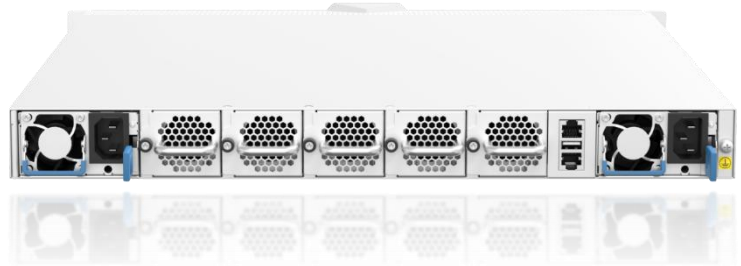
- Compact 1RU standard, 19-inch rack mountable design
- Cut-through with ultra-low-latency
- 2 (1+1 redundant) Redundant Hot-swappable PSU
- 5 (4+1 redundant) Hot-swappable Fan
- 32x100G QSFP28 in 1U form factor
- Each 100G QSFP28 port can be configured 40G, 4x25GbE or 4x10GbE via breakout cables
- Up to 6.4Tbps (3.2Tbpsx2) of switching performance
- 2x10Gpbe SFP+ and 1xGBaseT RJ45 Management Port
- Open automated configuration and zero-touch provisioning capabilities
- Simplify management of network environments
- Interface flexibility & Power efficiency

Provided Fix Ports	32 x 100G QSFP28, 2 x 10G SFP+
Management Ports	1x RJ45 100/1000Base-T Out-of-band 1x RJ45 Console 1x USB2.0
Switching Chip	Marvell Falcon 98CX8522
CPU	Intel Broadwell-DE D1508
Memory	8GB DDR4
Storage	SSD: 64GB eMMC, optional M.2 STAT slot
Power Supply Units	2 x AC110~240V, 800w 1+1 Hot-swappable
Power Consumption	≤640 Watts
Fan Unit	5 (4+1 Redundant), Hot-swappable

Data Center White Box Switch

32x400G QSFP56-DD, 2x10G SFP+

Rear Side



DCSL3M-32E02X

- Compact 1RU standard, 19-inch rack mountable design
- Cut-through with ultra-low-latency
- 2 (1+1 redundant) Redundant Hot-swappable PSU
- 5 (4+1 redundant) Hot-swappable Fan
- 32x400G QSFP56-DD in 1U form factor
- 256x56G High Speed Serdes MAC in a single PFE Packet Forwarding Engine that support 1/10/25/56 port speed modes
- 2x10Gpbe SFP+ and 1xGBaseT RJ45 Management Port

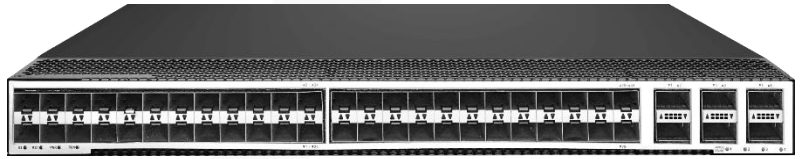
Provided Fix Ports	32 x 400G QSFP56-DD, 2 x 10G SFP+
Management Ports	1x RJ45 100/1000Base-T Out-of-band 1x RJ45 Console 1x USB2.0
Switching Chip	Marvell Falcon 98CX8580
CPU	Intel Broadwell-DE D1508
Memory	8GB DDR4
Storage	SSD: 64GB eMMC, optional M.2 STAT slot
Power Supply Units	2 x AC110~240V, 1600w 1+1 Hot-swappable
Power Consumption	≤1200 Watts
Fan Unit	5 (4+1 Redundant), Hot-swappable

Data Center (incl. Software)

Broadcom Series Switch

Data Center Switch (incl. Software)

48x10G SFP+, 6x40G QSFP+



Rear Side

DCSL3B-06Q48X

High Reliability

It provides enhanced Ethernet reliability technologies such as STP/RSTP/MSTP, R-link at millisecond-level protection switchover, as well as LB (loopback check) to ensure link-level reliability. Support 1+1 redundant hot swappable power supply and an AC power supply and a DC power can be used simultaneously. Moreover, the switch supports fault detection and alarms for power modules and fan, fan speed can be auto adjusted according to temperature variations.

High Switching Capacity

The backplane capacity is up to 2.56Tbps to provide all ports with non-stop forwarding. Its high performance makes sure to build a reliable, sustainable high speed IP networks. It provides high density 10/40G port. It can meet the high density, high bandwidth access and aggregation application scenarios of data center and campus network.

Powerful Services Support

It supports IGMP snooping, IGMP proxy, IGMP filter, and IGMP fast leave for robust multicast. It offers wire-speed replication of multicast packets between VLANs, and multicast load balancing among trunk member interfaces to meet requirements for IPTV services and other multicast services.

Superior Quality of Service

It offers Gigabit Ethernet with intelligent services that keep everything flowing smoothly with mechanisms for marking, classification, and scheduling. Supports traffic classification based on abundant criteria such as MAC/IP address, Layer 4 TCP/UDP port number, protocol, port and VLAN. Each port supports 8 priority queues with multiple queue scheduling algorithms such as SP/PQ, DRR, SP/PQ+DRR to ensure the highest-priority packets are processed ahead of all other traffic.

Advanced Security

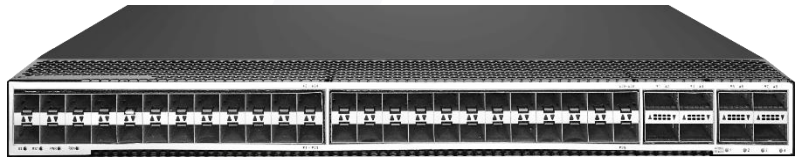
It offers a comprehensive security solution by providing service security in three aspects: subscriber, switch and network. Subscriber security helps create protections among customers with multiple features. DHCP Snooping, ARP Inspection, and IP Source Guard help to identify each customer based on MAC, IP address and port information to help prevent malicious attack. Switch security means CPU can be protected from DoS attack and storm. The port security feature allows controlling number of MAC addresses against overwhelming the switch memory. Network security is to filter all incoming traffic for ensuring only valid traffic passing through by applying different ACL rules and IEEE 802.1x authentication prevents insecure terminals to intrude illegally into entire network.

Provided Fix Ports	48x10G SFP+, 6x40G QSFP+
Management Ports	1xRJ45 100/1000Base-T out-of-band 1xRJ45 Console, 1xUSB Type A
Main Chip	Broadcom BCM56771
CPU	NXP LS1046A
Throughput	1000Mpps
Switching Capacity	2.56Tbps
VLAN	4K VLANs; 1:1 & 2:2 VLAN Mapping; QinQ, selective QinQ; MAC based VLAN; Protocols based VLAN; Guest VLAN; Voice VLAN
Port Trunk	LACP; 32 trunk groups at most, up to 8 ports in each group
MAC	128K MAC; Static MAC; Dynamic MAC;
IP Routing	Static routing; OSPF; ISIS; BGP, GRE
Multicast	IGMP snooping, IGMP filter; IGMP Proxy and IGMP fast leave; Multicast replication between VLANs; PIM-SM; PIM-DM; Source Specific Multicast (SSM)
Reliability	STP, RSTP, MSTP; R-Link protection; VRRP, Trunk, Redundancy power; BPDU Guard, Loop protection, Root protection;

QoS/ACL	Packet filtering at Layer 2 to Layer 4, filtering out invalid frames based on source MAC address, destination MAC address, source IP address, destination IP address, TCP/UDP port number, protocol type and VLAN ID Time range ACL Rate limiting with granularity at 64Kbps Port-based traffic policing and two-rate three-color CAR 8 queues on each port Flexible scheduling algorithms, including SP/PQ/DRR/SP/PQ+DRR Re-marking of the 802.1p priority and DSCP priority
Security	User privilege management and password protection DoS attack defense, ARP attack defense, IP source guard Binding of the IP address, MAC address, interface Port isolation, Port security Black hole MAC address entries Limit on number of learned MAC addresses 802.1x authentication, RADIUS authentication SSH v2.0 CPU protection
Data Center Feature	EVPN, VXLAN, M-Lag
Energy Saving	Dynamic fan speed adjusting

Data Center Switch (incl. Software)

48x10G SFP+, 8x100G QSFP28



Rear Side

DCSL3B-08C48X

High Reliability

It provides enhanced Ethernet reliability technologies such as STP/RSTP/MSTP, R-link at millisecond-level protection switchover, as well as LB (loopback check) to ensure link-level reliability. Support 1+1 redundant hot swappable power supply and an AC power supply and a DC power can be used simultaneously. Moreover, the switch supports fault detection and alarms for power modules and fan, fan speed can be auto adjusted according to temperature variations.

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Management Ports	1xRJ45 100/1000Base-T out-of-band 1xRJ45 Console, 1xUSB Type A
Main Chip	Broadcom BCM56771
CPU	NXP LS1046A
Throughput	1000Mpps
Switching Capacity	2.56Tbps
VLAN	4K VLANs; 1:1 & 2:2 VLAN Mapping; QinQ, selective QinQ; MAC based VLAN; Protocols based VLAN; Guest VLAN; Voice VLAN
Port Trunk	LACP; 32 trunk groups at most, up to 8 ports in each group
MAC	128K MAC; Static MAC; Dynamic MAC;
IP Routing	Static routing; OSPF; ISIS; BGP, GRE
Multicast	IGMP snooping, IGMP filter; IGMP Proxy and IGMP fast leave; Multicast replication between VLANs; PIM-SM; PIM-DM; Source Specific Multicast (SSM)
Reliability	STP, RSTP, MSTP; R-Link protection; VRRP, Trunk, Redundancy power; BPDU Guard, Loop protection, Root protection;

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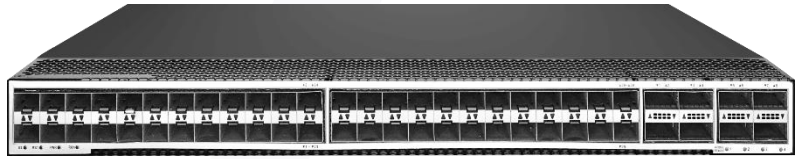
Data Center Feature	EVPN, VXLAN, M-Lag
Energy Saving	Dynamic fan speed adjusting

Data Center Black Box Switch

48x25G SFP28, 8x100G QSFP28



Rear Side

DCSL3B-08C48K

High Reliability

It provides enhanced Ethernet reliability technologies such as STP/RSTP/MSTP, R-link at millisecond-level protection switchover, as well as LB (loopback check) to ensure link-level reliability. Support 1+1 redundant hot swappable power supply and an AC power supply and a DC power can be used simultaneously. Moreover, the switch supports fault detection and alarms for power modules and fan, fan speed can be auto adjusted according to temperature variations.

High Switching Capacity

The backplane capacity is up to 4Tbps to provide all ports with non-stop forwarding. Its high performance makes sure to build a reliable, sustainable high speed IP networks. It provided high density 10/25/40/100G port. It can meet the high density, high bandwidth access and aggregation application scenarios of data center and campus network.

Powerful Services Support

It supports IGMP snooping, IGMP proxy, IGMP filter, and IGMP fast leave for robust multicast. It offers wire-speed replication of multicast packets between VLANs, and multicast load balancing among trunk member interfaces to meet requirements for IPTV services and other multicast services.

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Provided Fix Ports	48x10/25G SFP28, 8x40/100G QSFP28
Management Ports	1xRJ45 100/1000Base-T out-of-band 1xRJ45 Console, 1xUSB Type A
Main Chip	Broadcom BCM56873
CPU	NXP LS1046A
Throughput	2000Mpps
Switching Capacity	4Tbps
VLAN	4K VLANs; 1:1 & 2:2 VLAN Mapping; QinQ, selective QinQ; MAC based VLAN; Protocols based VLAN; Guest VLAN; Voice VLAN
Port Trunk	LACP; 32 trunk groups at most, up to 8 ports in each group
MAC	128K MAC; Static MAC; Dynamic MAC;
IP Routing	Static routing; OSPF; ISIS; BGP, GRE
Multicast	IGMP snooping, IGMP filter; IGMP Proxy and IGMP fast leave; Multicast replication between VLANs; PIM-SM; PIM-DM; Source Specific Multicast (SSM)
Reliability	STP, RSTP, MSTP; R-Link protection; VRRP, Trunk, Redundancy power; BPDU Guard, Loop protection, Root protection;

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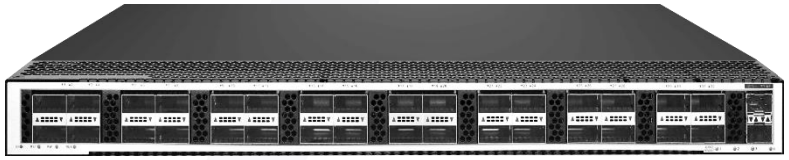
Data Center Feature	EVPN, VXLAN, M-Lag
Energy Saving	Dynamic fan speed adjusting

Data Center Black Box Switch

32x100G QSFP28, 2x10G SFP+



Rear Side

DCSL3B-32C02X

High Reliability

It provides enhanced Ethernet reliability technologies such as STP/RSTP/MSTP, R-link at millisecond-level protection switchover, as well as LB (loopback check) to ensure link-level reliability. Support 1+1 redundant hot swappable power supply and an AC power supply and a DC power can be used simultaneously. Moreover, the switch supports fault detection and alarms for power modules and fan, fan speed can be automatically adjusted according to temperature variations.

High Switching Capacity

The backplane capacity is up to 6.4Tbps to provide all ports with non-stop forwarding. Its high performance makes sure to build a reliable, sustainable high speed IP networks. It provided high density 40/100G port. It can meet the high density, high bandwidth access and aggregation application scenarios of data center and campus network.

Powerful Services Support

It supports IGMP snooping, IGMP proxy, IGMP filter, and IGMP fast leave for robust multicast. It offers wire-speed replication of multicast packets between VLANs, and multicast load balancing among trunk member interfaces to meet requirements for IPTV services and other multicast services.

Superior Quality of Service

It offers Gigabit Ethernet with intelligent services that keep everything flowing smoothly with mechanisms for marking, classification, and scheduling. It supports traffic classification based on abundant criteria such as MAC/IP address, Layer 4 TCP/UDP port number, protocol, port and VLAN. Each port supports 8 priority queues with multiple queue scheduling algorithms such as SP/PQ, DRR, SP/PQ+DRR to ensure highest-priority packets are processed ahead of all other traffic.

Advanced Security

It offers a comprehensive security solution by providing service security in three aspects: subscriber, switch and network. Subscriber security helps create protections among customers with multiple features. DHCP Snooping, ARP Inspection, and IP Source Guard help to identify each customer based on MAC, IP address and port information to help prevent malicious attack. Switch security means CPU can be protected from DoS attack and storm. The port security feature allows controlling number of MAC addresses against overwhelming the switch memory. Network security is to filter all incoming traffic for ensuring only valid traffic passing through by applying different ACL rules and IEEE 802.1x authentication prevents insecure terminals to intrude illegally into entire network.

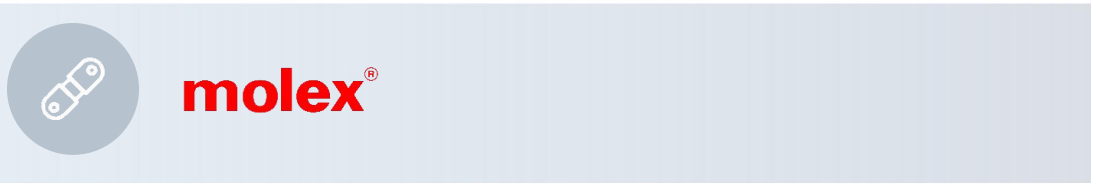
Provided Fix Ports	48x100G QSFP28/40G QSFP+, 2x10G SFP+
Management Ports	1xRJ45 100/1000Base-T out-of-band 1xRJ45 Console, 1xUSB Type A
Main Chip	Broadcom BCM56870
CPU	NXP LS1046A
Throughput	2000Mpps
Switching Capacity	6.4Tbps
VLAN	4K VLANs; 1:1 & 2:2 VLAN Mapping; QinQ, selective QinQ; MAC based VLAN; Protocols based VLAN; Guest VLAN; Voice VLAN
Port Trunk	LACP; 32 trunk groups at most, up to 8 ports in each group
MAC	128K MAC; Static MAC; Dynamic MAC;
IP Routing	Static routing; OSPF; ISIS; BGP, GRE
Multicast	IGMP snooping, IGMP filter; IGMP Proxy and IGMP fast leave; Multicast replication between VLANs; PIM-SM; PIM-DM; Source Specific Multicast (SSM)
Reliability	STP, RSTP, MSTP; R-Link protection; VRRP, Trunk, Redundancy power; BPDU Guard, Loop protection, Root protection;

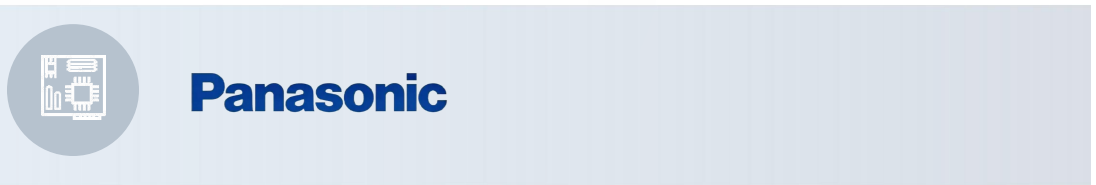
QoS/ACL	Packet filtering at Layer 2 to Layer 4, filtering out invalid frames based on source MAC address, destination MAC address, source IP address, destination IP address, TCP/UDP port number, protocol type and VLAN ID Time range ACL Rate limiting with granularity at 64Kbps Port-based traffic policing and two-rate three-color CAR 8 queues on each port Flexible scheduling algorithms, including SP/PQ/DRR/SP/PQ+DRR Re-marking of the 802.1p priority and DSCP priority
Security	User privilege management and password protection DoS attack defense, ARP attack defense, IP source guard Binding of the IP address, MAC address, interface Port isolation, Port security Black hole MAC address entries Limit on number of learned MAC addresses 802.1x authentication, RADIUS authentication SSH v2.0 CPU protection
Data Center Feature	EVPN, VXLAN, M-Lag
Energy Saving	Dynamic fan speed adjusting

Why Choose Us?

Stable Supply Chain Mostly Same with Cisco/Arista

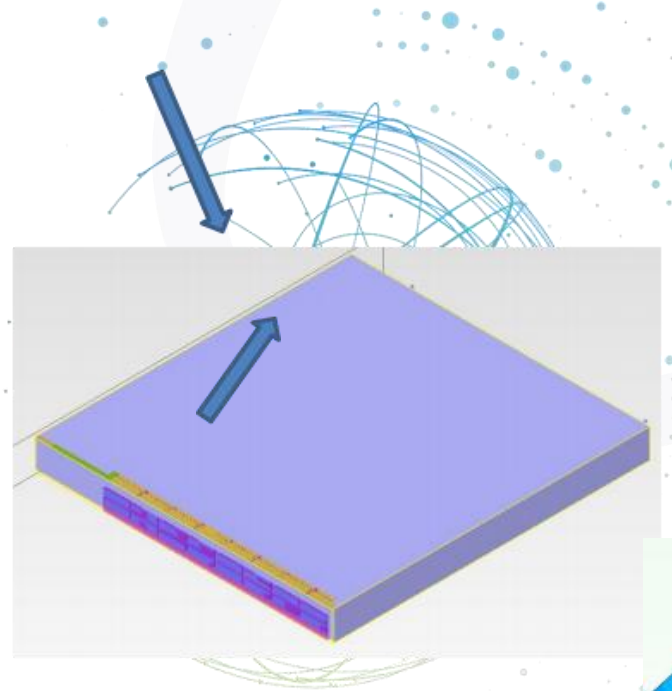
Main chip, CPU, storage, connector, fan and other core components establish close and extensive cooperation with the industry‘s leading suppliers.

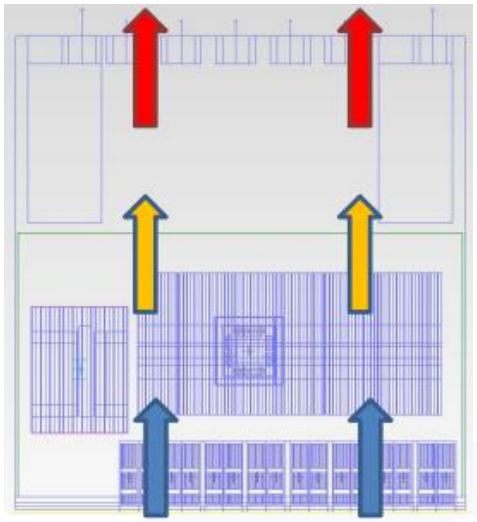




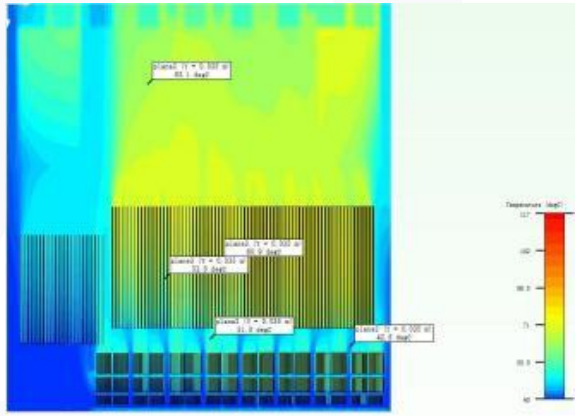
World-class Thermal Design

Air Inlet 1: inclined air inlet, for the upper optical port and the top of the main chip heat dissipation hole depth 13mm, the opening rate of 50%. The hole in the upper part of the panel is 3mm, and the hole rate is 50%.



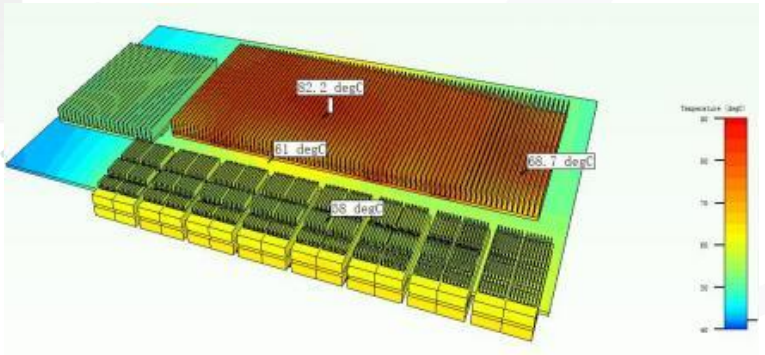


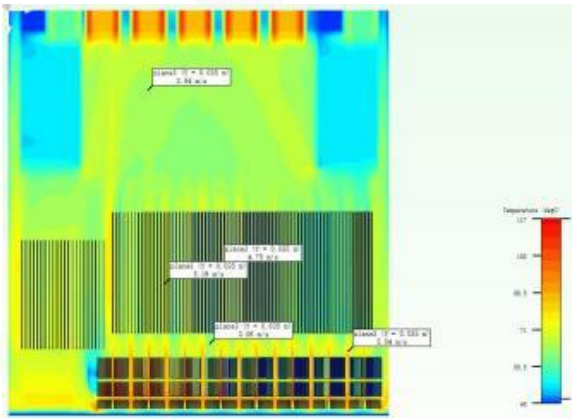
Front/Rear Straight Air Duct Design



Temp. Distribution

Air Inlet 2: The hole in the upper part of the heat dissipation panel of the lower optical port is 2mm. The opening rate is 50%.



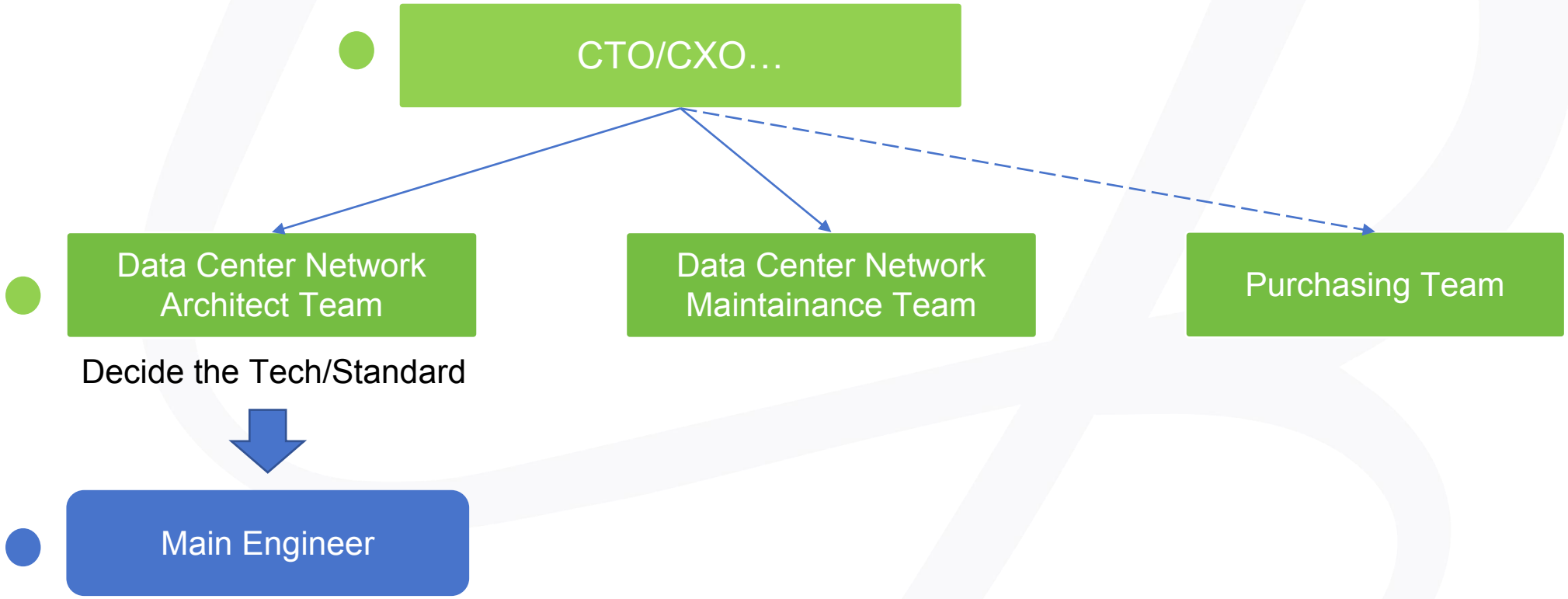


Speed Distribution

Unique Values for Big Data Center Customers on SONiC Hardware and Software Support

Description	Mellanox	Edgecore	Lanao
800G Ready?	N	Y	N. In development
400G Ready?	Y	Y	Y
Cases and Shipment Quantities	Y	Y	Y
SONiC Community L2-L3 Capabilities	Y	Not so good	Y
SAI Capabilities (VxLAN Quantites)	Y	N	Y
SAI Capabities (Port Breakout)	N. Old model only 1/2	N. 100G ok; 400G breakout and to support 25G no support	Y. 100G ok, 400G ok
SAI Capabilities (Cover-all)	Y	N	Y
Git Hash Version Frequency	1. Season Twice	?	1. Season Twice
Fixable (Fans&Power+SSD)	Y	N. Only Fans & Power	Y
Community Sonic Service Boundary	Y. Community SONiC Bug fixed	N	Y. Only Few Features
Life Cycle	Y	Y	Y
Openness	Y	Y	Y
Lead Time	6Month+	6Month+	2-3Month
Response Time 24h	N. Too long	Y. Hard to Solve Problems	Y. R&D Response
Flexible Service	N	N	Y

Reliable Analysis Level



Green Part 1: We must get the supporter from C level. Let them to introduce open network idea and teldat to data center network Architecture team.

Green Part 2: Network architecture leader is very important, we need to know his kpiand challenges that he met, whether or not we can solve.

Blue Part 3: We can just collect their habits and know their KPI to see how to satify their KPI of daily routine.

Data Center
Market Opportunity

Market on Open Network (Whitebox)

Region	CY20 (Million USD)	CY21 (Million USD)	CY22 (Million USD)
Global	1,096,101.740	1,234,590.491	2,672,870.312
North America	596,391.902	666,325.892	1,529,689.725
Europe	411,670.619	506,182.102	957,503.892
Asia & Oceania	55,156.168	58,025.753	176,908.079
South America	32,883.052	4,056.745	8,768.615

Source: OMDIA - Ethernet Switches Campus vs. Data Center Market Database – 4Q22

Whitebox data includes manufacturers such as: QCT, Celestica, Edgecore/Accton, Foxconn, Asterfusion, and Ruijie (this report categorizes Dell into the commercial sector).

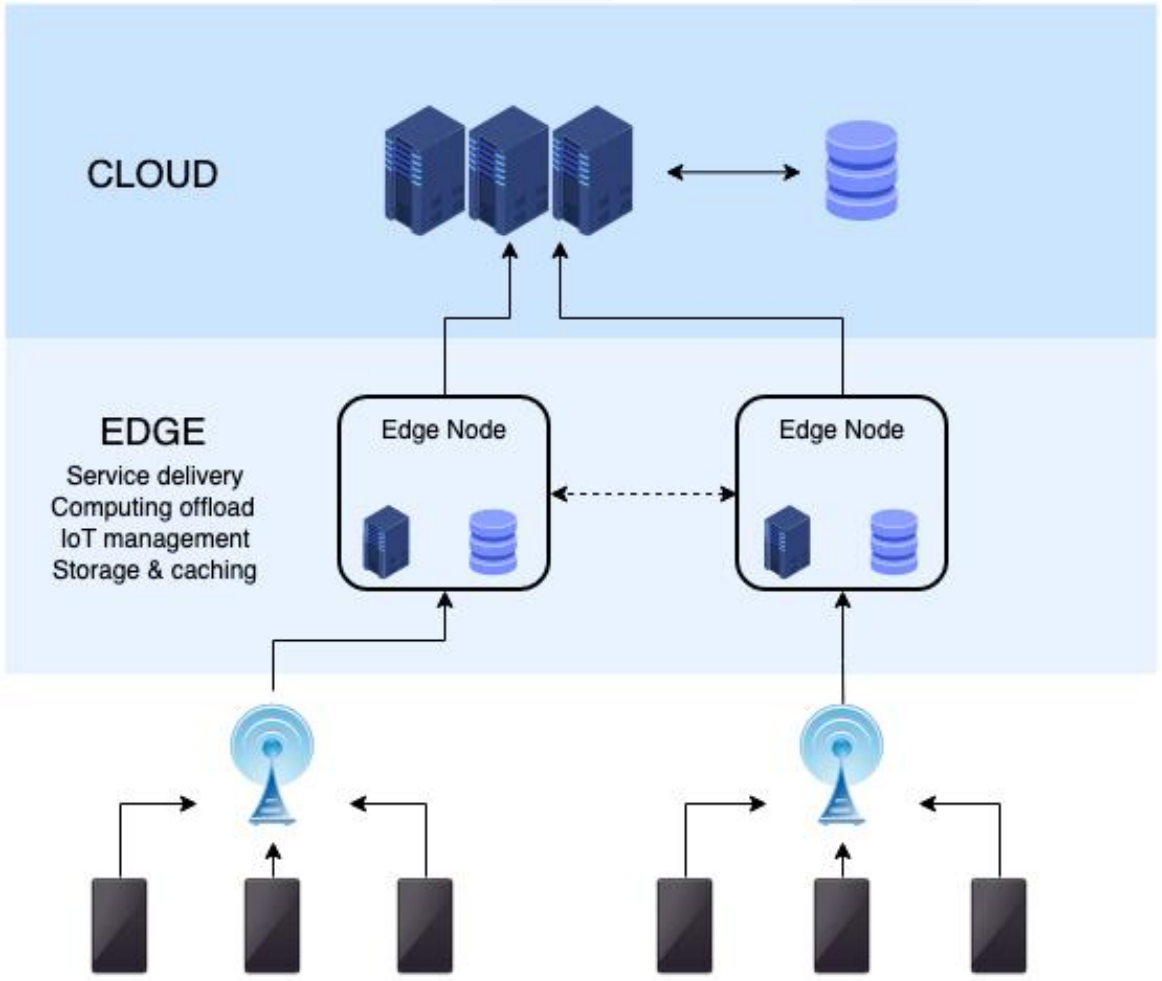
Port	Market	Revenue	Total	
10g	2021	$23,477,775	0.046380192	$506,202,625
25g		$10,956,719	0.021644928	$506,202,625
40g		$325,162	0.000642356	$506,202,625
50g		$0	0	$506,202,625
100g		$379,502,222	0.749704176	$506,202,625
200g		$6,592,800	0.013024034	$506,202,625
400g		$85,347,947	0.168604315	$506,202,625

Port	Market	Revenue	Total	
10g	2022	$35,363,678	0.036933195	$957,503,892
25g		$18,537,273	0.019359997	$957,503,892
40g		$262,239	0.000273878	$957,503,892
50g		$0	0	$957,503,892
100g		$509,001,480	0.531592074	$957,503,892
200g		$11,896,876	0.012424885	$957,503,892
400g		$382,442,347	0.399415971	$957,503,892

- In 2022, the global white-box market reached a total of $2.6 billion, representing a 116% increase compared to 2021.
- In 2022, the total white-box market in EMEA was $950 million , accounting for 36% of the global market.
- In terms of shipment volume in 2022, white-box 100G and 400G port shipments accounted for 90% of the total.
- The change in white-box port shipments from 2021 to 2022 was characterized by a decrease in 100G port volumes and an increase in 400G port volumes.

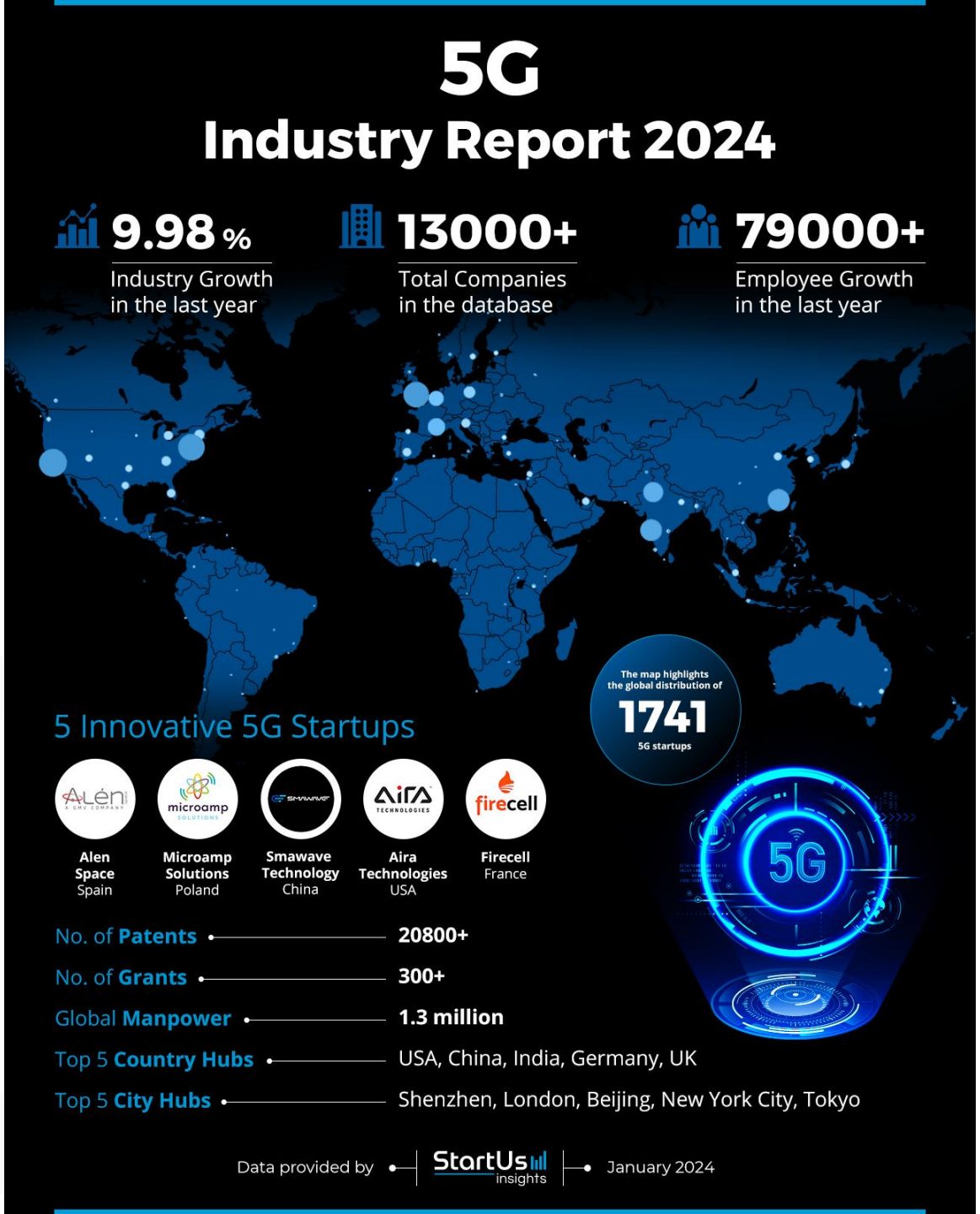
Cloud and Edge Computing

The rise of cloud services and edge computing has created a need for data centers to process and store vast amounts of data closer to the end user. This shift is driving demand for high-performance, low-latency switches.



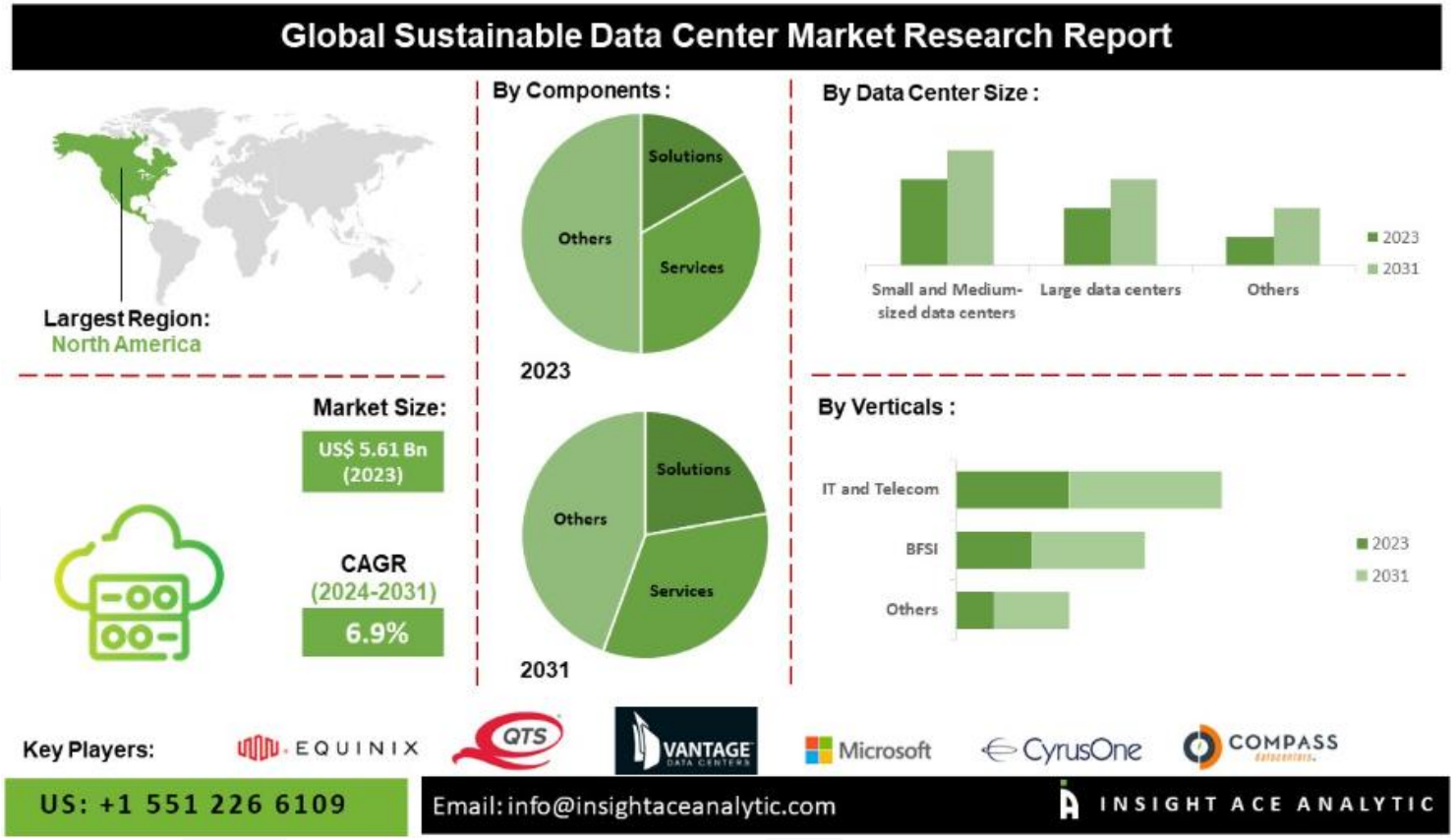
5G Rollout

As 5G networks expand globally, the infrastructure supporting these networks, including data centers, is upgrading to handle increased traffic and faster data transmission. This opens opportunities for switches with enhanced bandwidth capabilities.



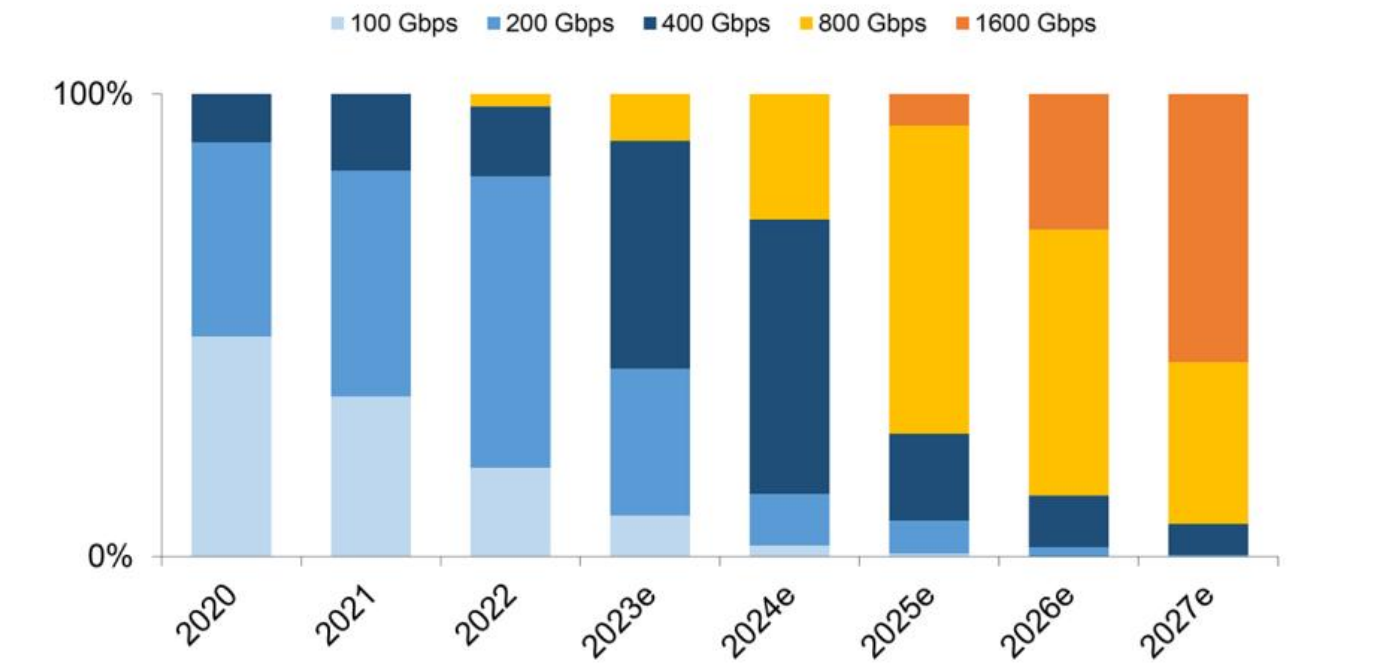
Energy Efficiency and Sustainability

Data centers are focusing more on energy-efficient solutions to reduce operational costs and environmental impact. Switches with lower power consumption are in high demand.



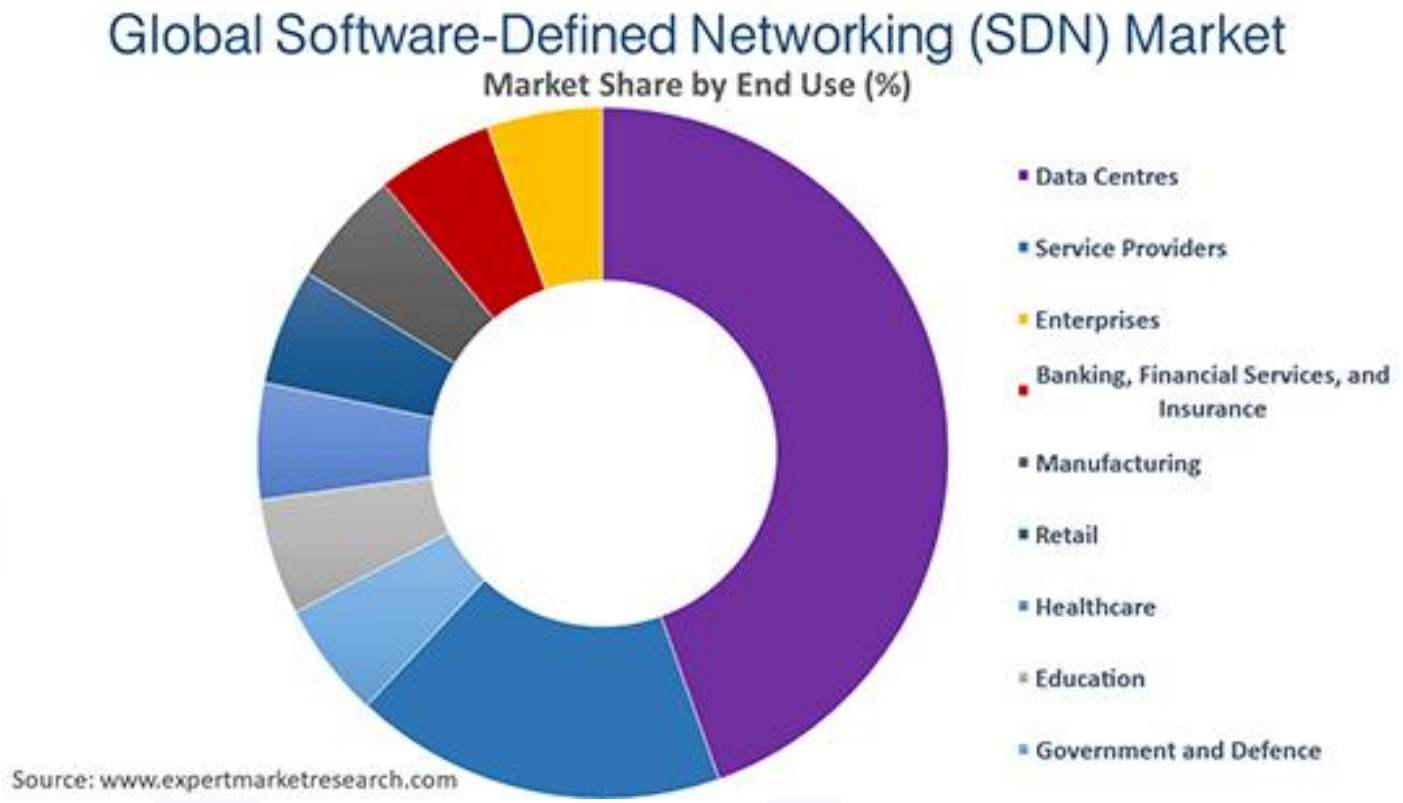
AI and Machine Learning

The growing adoption of AI and machine learning in data centers for data processing requires advanced switching solutions that can handle higher data throughput.



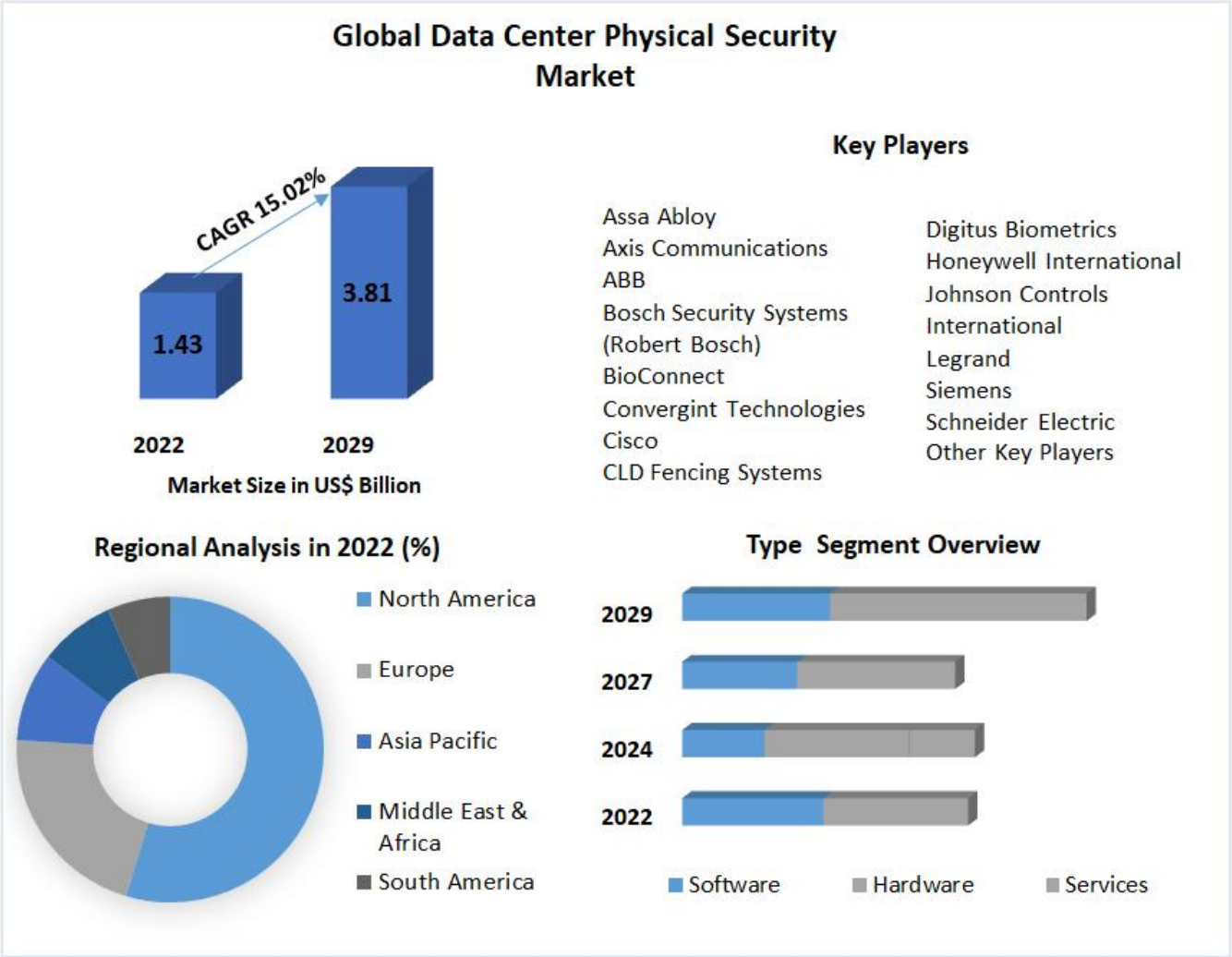
Customization and Software-Defined Networking (SDN)

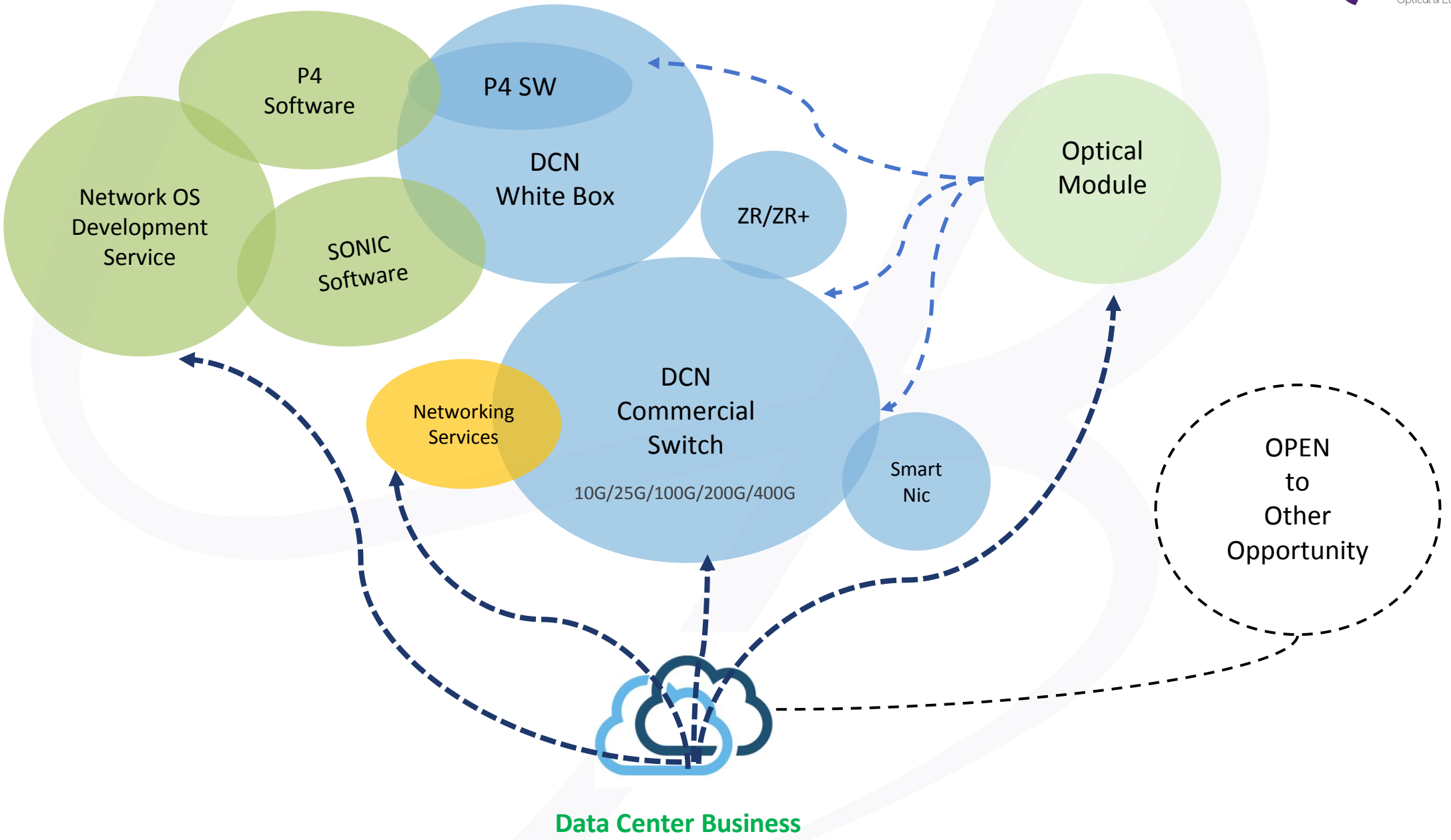
Customers are looking for switches that can be customized for specific workloads and managed via software, enabling better flexibility and control. SDN-enabled switches are gaining popularity for their programmability and automation capabilities.



Security Enhancements

As data centers become more critical to businesses, the need for secure networking solutions has grown. Switches with integrated security features are increasingly important.




P4
Software
P4 SW
DCN
White Box
Network OS
Development
Service
SONIC
Software
ZR/ZR+
Optical
Module
Networking
Services
DCN
Commercial
Switch
10G/25G/100G/200G/400G
Smart
Nic
OPEN
to
Other
Opportunity
Data Center Business

THANK YOU !