

Cisco Routers with Aviz ONES Orchestration, Visibility, and Support for SONiC Networks



Cisco Routers

SONiC on the Cisco 8000 Series Router provides massive scalability with open-source flexibility. Supporting Switch Abstraction Interface (SAI) on the Cisco 8000 provides network vendors with consistent ASIC programming, while allowing hyperscalers to benefit from silicon innovations.

Cisco 8000 series routers support disaggregating the hardware and software to provide a more robust, open ecosystem for service provider networks. As part of the disaggregation journey, Cisco has enabled [SONiC on Cisco 8000 Series Routers](#) on multiple platform models.

The 8100 Series supports the open-source network operating system SONiC (Software for Open Networking in the Cloud). Cisco 8100 Series extends the small footprint, low power, and high performance of 8000 Series to data center fabric roles.

The 8100 Series designed with Cisco's Q200 and G100 generation ASICs delivers the low power and high performance of 7nm technology at four bandwidth levels 3.2 TBPS, 6.4 TBPS, 12.8 TBPS and 25.6 TBPS so that the latest silicon developments can be fully leveraged across data center networks in roles such as Top of Rack (ToR), high-density IP Fabric leaf and spines.

Cisco's enablement of Open Community SONiC broadens the spectrum for cloud and service provider transformations, hardware innovations, software evolutions, flexibility, lower costs, and better control of the network infrastructure.

Cisco Routers Use Cases with SONiC

Routing on Host Fabric

As the Networks are getting simpler, some Data center operators who have adopted IP BGP in their switch stacks find

that Routing on the Host (RoH) is a way to go. With RoH the Networks are designed as pure Layer 3 fabric while BGP extended to the TOR/Leaf Edges. Border Gateway Protocol (BGP) has proven to be an ideal routing protocol for IP fabric due to its maturity, ubiquity, and robust features. A data center design must facilitate scaling out (horizontally) to accommodate additional workloads quickly and with minimal impact on network operations.

EVPN VXLAN Fabric

EVPN VXLAN provides a scalable, high-performance, and secure way to extend Layer 2 Ethernet networks over a Layer 3 IP network infrastructure. EVPN VXLAN is mostly used for multi-tenant environments where each tenant can have its own virtual network which is isolated from other tenants' networks. EVPN VXLAN can also be used to connect multiple data centers (DCI), allowing them to appear as a single logical data center with a unified network infrastructure. This enables workload mobility and disaster recovery scenarios, where workloads can seamlessly migrate between data centers without impacting network connectivity.

Aviz ONES - SONiC Stack for Cisco Routers

Aviz empowers customers to build a modern, scalable data center, with the same paradigms of manageability, clustering, monitoring, and orchestration as those applied at the server and virtual machine layer to the network, and enabling them to realize the full promise of open-source NOS over Cisco routers.

Aviz ONES Use Cases

| Functions | ONES and Cisco Routers |
|-------------------------------------|---|
| Deployment Quality | Ongoing qualified SONiC builds for specific use cases |
| Orchestration (Intent Based) | Fabric Manager for BGP, VXLAN and other protocols |
| Visibility (Telemetry) | Streaming of 200+ data points for Protocols, Platform and Traffic |
| Assurance | Latency and performance monitoring between any two endpoints in DC |
| NetOps APIs | Multi-NOS normalized APIs for seamless migration and interoperability |
| Deployment | Multiple deployment options with enterprise grade security compliance |
| Support | 24x7 enterprise grade support |

The Aviz solution fully supports Cisco routers with open-source SONiC distribution enabled by the Aviz ONES platform. Aviz provides level 1 to level 3 technical support, and a variety of different support package options with different service level objectives. The support package includes bug fixes and patch releases, enabling an enterprise-class solution.

Why SONiC

- NOS Standardization offers control and flexibility
- Enables in-house innovation opportunities
- Improved operational efficiency
- CAPEX optimization with Lowest TCO
- Multiple choices for supply chain diversification

Requirements for Successful SONiC Deployment

- Customer-driven quality standards
- Multi-NOS networking stack
- Hybrid-cloud ready networking stack
- Integration ready APIs for existing NetOps
- Ease of procurement from multiple vendors

Solving SONiC Challenges with Aviz

- Pre-deployment network assessment
- Development of multi-vendor SONiC fabric
- Continuous SONiC qualification
- Pre-deployment APIs & tooling integration
- Unified Inventory management for hardware
- Unified fabric management for NOS layer
- Real-time normalized multi-vendor telemetry
- Post-deployment support

Cisco Router Options

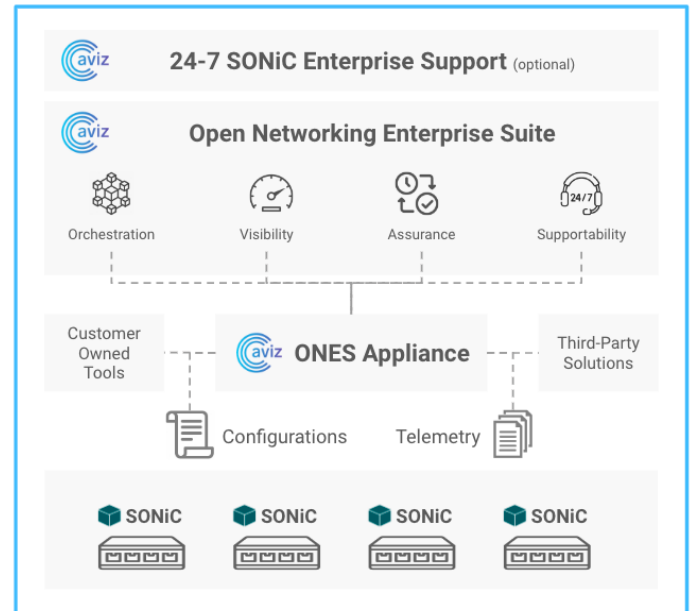
| Cisco 8000 Series Router SKU | Ports |
|------------------------------|--------------------------------|
| 8101-32H-O | 32 QSFP28 100GbE |
| 8102-64H-O | 64 QSFP28 100GbE |
| 8101-32FH-O | 32 QSFP56-DD 400GbE |
| 8111-32EH-O | 32 800G (2x 400GbE QSFP-DD800) |

Steps to Deploy SONiC & ONES on Cisco Routers

- Install sonic and deploy ONES container on Cisco routers
- Deploy 3 Stage CLOS architecture with Static VXLAN over EBGP or Static Routes on SONiC enabled Cisco 8000

Customers can evaluate SONiC on the Cisco 8000 router from Cisco's developer sandbox lab [SONiC on DevNet Sandbox](#).

ONES Architecture Diagram



How to start & where to buy?

Book the Demo and POC today at [ONE Center](#) for SONiC. You will get instant access to:

- SONiC readiness report for your network architecture and use cases, alongwith TCO savings
- [Maximizing SONiC Success](#): A F500 Customer Case Study from Aviz Networks
- SONiC first networking stack, ONES, designed for migrating and transforming your network to SONiC
- Ready to use APIs for integration
- Easy procurement process from existing or new channels

Cisco and Aviz solutions can be procured from WWT

Resources

- <https://www.cisco.com/c/en/us/products/routers/8000-series-routers/sonic.html>
- <https://www.cisco.com/c/en/us/buy.html>
- <https://www.aviznetworks.com/products/ones>
- <https://www.aviznetworks.com/one-center>
- <https://support.aviznetworks.com/hc/en-us>

Cisco 8000 Series Router Community SONiC Supported Features (version: 202205, 202012)

- Bidirectional Forwarding Detection (BFD) hardware offload
- Static VxLAN-based overlay ECMP with BFD monitoring
- ZTP (8101-32FH-0)
- TACACS+ authentication for IPv4 or IPv6 addresses
- SSHv2 authentication for IPv4 or IPv6 addresses
- AAA authentication
- Syslog logging for IPv4 or IPv6 addresses
- Network Time Protocol (NTP) for IPv4 or IPv6 addresses
- Simple Network Management Protocol (SNMP) over IPv4 and IPv6 transport
- TFTP file transfers over IPv4 or IPv6 addresses
- Secure Copy (SCP) server support
- Dynamic Host Configuration Protocol (DHCP) relay agent
- L2 access and trunk port
- Link Layer Discovery Protocol (LLDP)
- Media Access Control (MAC) address aging
- Access Control Lists (ACLs) over IPv4 and IPv6 addresses
- IPv4 or IPv6 ACL match on 7 tuple
- ERSPAN and Everflow Support
- IPv4 or IPv6 decapsulation
- IPv4 or IPv6 routing
- Static route
- iBGP over IPv4 or IPv6 addresses
- eBGP over IPv4 or IPv6 addresses
- Route policies
- IP prefix lists
- BGP
 - Multihop, AS-set, prefix-set, community-list
 - Max prefix limit
 - Bestpath as-path multipath-relax
 - Soft reconfiguration
 - Update source loopback
- 32-way ECMP
- LAG: IPv4 or IPv6 interfaces addresses
- LACP Support
- RDMA: QOS-RDMA and QOS-ECN
- MTU: Jumbo MTU 9100 for Management, Switched Virtual Interface (SVI) and Native interfaces
- SVI: IPv4 or IPv6 Support
- SVI: IP DHCP Relay Support for IPv4 and IPv6 server destination
- SNMP: Trap source management interface in the management VRF
- COPP/LPTS: For both management and inband interfaces (v4 or v6 UMPP)
- NTP- Support of IPv4 or IPv6 Servers
- Security ACL:
 - SSH IPv4 and IPv6 access
 - Physical interfaces—IPv4 and IPv6 ACL support
 - ACL permit, deny actions or counters
- Layer 2 ACLs
 - VLAN ACLs (VACLs)
 - Layer 2 ACLs: Port ACLs
 - Layer 2 ACLs: Routed ACLs (RACLs) for IPv4 or IPv6 addresses on native L3 or SVI interfaces
- ACL
 - Match conditions:
 - 5-tuple match for an ACL (source and destination IP, source and destination port and protocol type)
 - port range
- QoS classification and scheduling over IPv4 or IPv6 addresses
- Fast reboot
- Warm reboot
- Cisco IOS XR to SONiC migration and rollbacks
- Syslog support
- gRPC: Dial-out support to stream telemetry data

