

Product Brief

Key Highlights

- Open networking with Standard Linux and ONIE support
- Zero Touch Provisioning (ZTP) support
- IPv4/IPv6 switching and routing with eBGP and iBGP
- Container-based architecture
- Programmability and visibility with gNMI/REST/Openconfig
- Advanced silicon driven telemetry such as Buffer Statistics Tracking and Inband Flow Analyzer
- SONiC Unified Manageability Framework
- Dynamic Port Breakout for 400G → 4x100G, 100G → 4x25G
- Automation support: ZTP, Chef, and Ansible Playbooks
- L3 protocols such as iBGP, eBGP, VRRP, BFD, and VRF-Lite
- Network Address Translation (NAT)
- Full support for VXLAN and Logical VTEP (LVTEP) using BGP-EVPN control plane
- Multi-chassis LAG (MLAG)
- Multicast features (IGMP snooping, PIM-SSM)

Enterprise SONiC Distribution by Broadcom[®]

Overview

SONiC is an open source network operating system based on Linux that runs on merchant silicon-based platforms. The open source SONiC project is available at GitHub (<https://github.com/Azure/SONiC/wiki>).

SONiC is in production today at multiple web-scale companies for Data Center fabric deployments and has a thriving developer community and vendor ecosystem. The underlying architecture of SONiC is described at GitHub (<https://github.com/Azure/SONiC/wiki/Architecture>).

Enterprise SONiC Distribution by Broadcom is a commercial offering based on open source SONiC with feature enrichment and hardening that is targeted at Data Center leaf, spine, and super-spine deployments. Enterprise SONiC Distribution by Broadcom supports ODM and OEM platforms based on the StrataXGS[®] family of silicon from Broadcom.

Enterprise SONiC Distribution by Broadcom offers benefits such as cloud performance, simplicity based on industry leading merchant-silicon and standards based IP-Clos architecture. It also provides agility driven by a Unified Manageability Framework with programmatic APIs and an extensible, container-based architecture. Its open source foundation and standardized ecosystem provide strong economic benefits for a Data Center fabric solution.

Enterprise SONiC Distribution by Broadcom 3.1.0 General Availability (GA) uses Broadcom SAI Adapter version 3.8.2.13. The Broadcom SDK version being used for this release is 6.5.19.

Enterprise SONiC Distribution by Broadcom 3.1.0 Packages include the following:

- **Cloud_Base Package** – Includes features and functionality (such as BGP, ZTP, programmatic API, QoS, and ACL), and security features (such as TACACS+) needed for DC Fabric underlay leaf, spine, super-spine use cases, plus base telemetry features (such as Thresholds and Snapshots [BST])
- **Cloud_Advanced Package** – Includes all features in Cloud_Base, plus Inband Flow Analyzer (IFA, version 2.0), Tail Time Stamping and Drop Monitor
- **Enterprise_Base Package** – Includes underlay features (such as eBGP, ZTP, programmatic API, QoS, ACL, and so on) needed for DC Fabric underlay, and overlay features (such as BGP EVPN, VxLAN) for DC fabric overlay use cases (for PINs leaf, spine, super-spine), and Enterprise features (such as RPVST+, IP Multicast, and so on), and Base telemetry features (such as Thresholds and Snapshots [BST])
- **Enterprise_Advanced Package** – Includes all features in Enterprise_Base, plus Inband Flow Analyzer (IFA, version 2.0), Tail Time Stamping and Drop Monitor

All the packages are supported on the platforms listed below.

Enterprise SONiC Distribution by Broadcom 3.1.0 Packages are available as a 3-year or 5-year subscription license.

** Available in the future releases.

Customer Use Cases

Data Center L3 CLOS (Underlay) Use Case

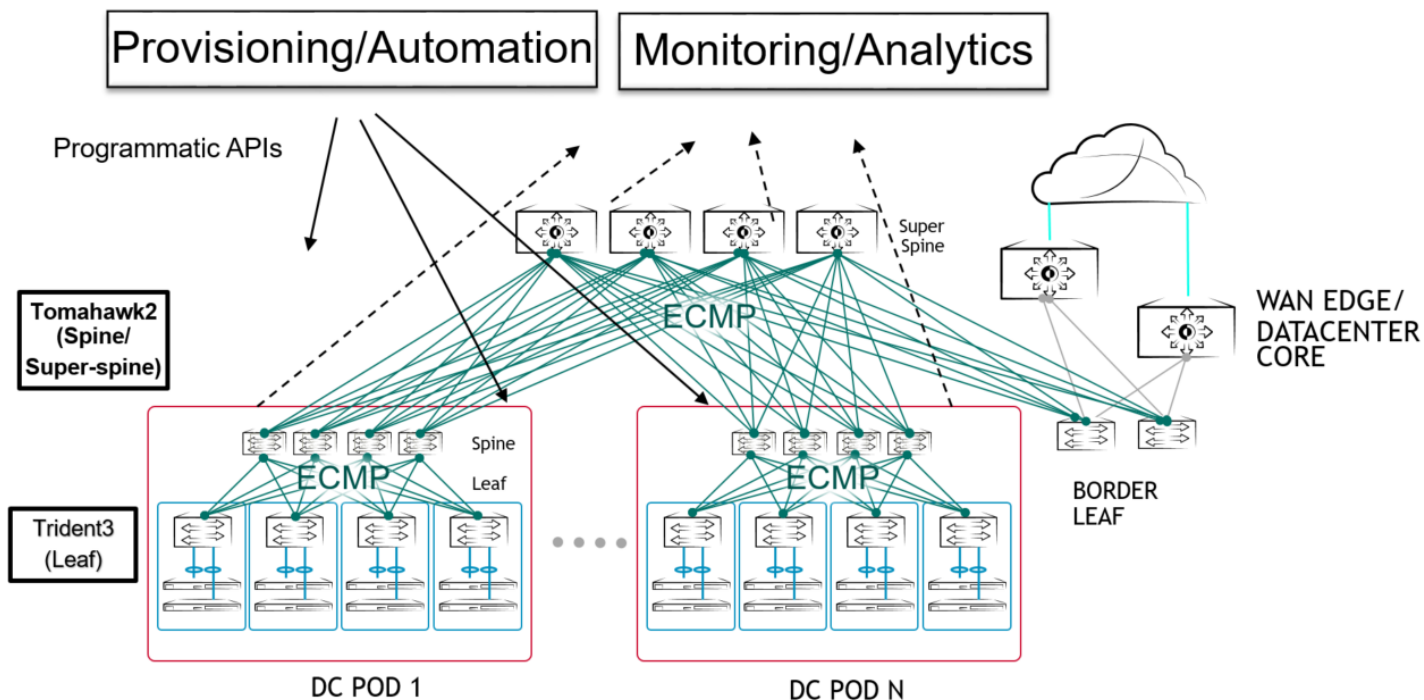
Enterprise SONiC Distribution by Broadcom Cloud editions are targeted for Data Center Fabric deployments (Public, Private, and Edge compute). Broadcom SONiC can be deployed at various Places-In-Network (PIN) - ToR, Leaf, Spine, Super spine, and Border Leaf PINs.

Enterprise SONiC Distribution by Broadcom-based data center fabrics can be deployed in an underlay use case for web-scale data center architectures, or for data center PODs in enterprises or service providers for select workloads, such as Hadoop, that require an underlay network. Enterprise SONiC Distribution by Broadcom can also be used in enterprises and service providers as an underlay data center fabric for VMware-based PODs deploying VMware ESX, NSX, vSAN, and other VMware solutions

Data Center L3 CLOS Overlay Use Case (with VXLAN and BGP-EVPN)

Starting with the 3.1.0 release, Enterprise SONiC Distribution by Broadcom can also be deployed in enterprises or service providers for select workloads, such as Hadoop, that require an overlay to support multi-tenancy.

Figure 1: Data Center L3 CLOS (Underlay) Use Case

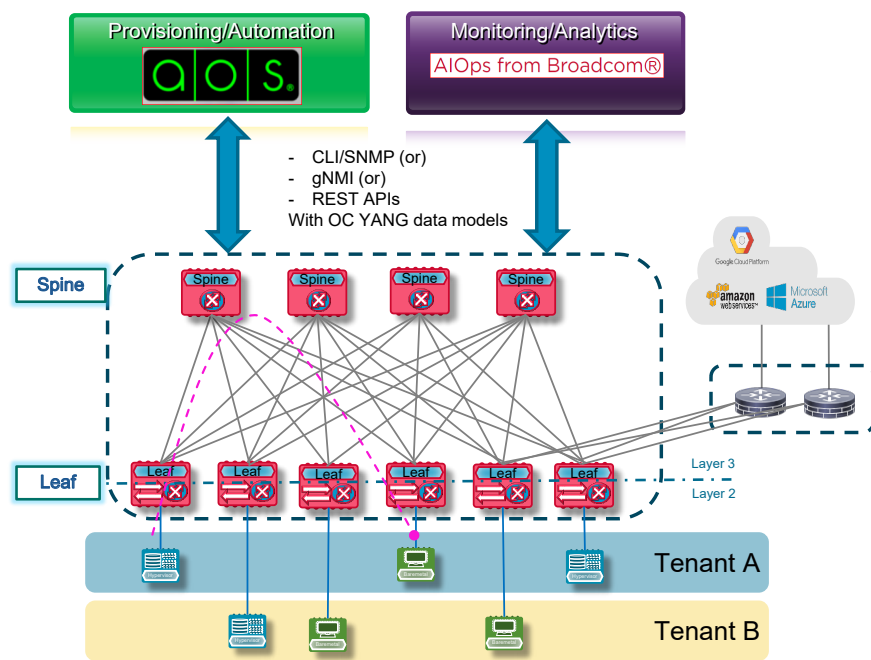


Using an overlay architecture in the data center allows end users (network administrators) to place endpoints (servers or virtual machines) anywhere in the network and remain connected to the same logical Layer 2 network, enabling the virtual topology to be decoupled from the physical topology. This decoupling allows the data center network to be programmatically provisioned at a per-tenant level.

Overlay networking generally supports both Layer 2 and Layer 3 transport between servers or VMs. It also supports a much larger scale. SONiC overlay networks use a control-plane protocol (BGP-EVPN) to facilitate learning and sharing of endpoint information, and use VXLAN tunneling protocol to create the data plane for the overlay layer.

Figure 2: Data Center L3 CLOS Overlay Use Case (with VXLAN and BGP-EVN)

Multi-tenancy with EVPN VXLAN + Provisioning/Monitoring



Key Integrations

- Broadcom provides northbound APIs (gNMI or REST APIs with Open Config YANG data models) that integrate with
 - Provisioning, Automation tools such as **Apstra**
 - Monitoring, Analytics tools such as **AIOps from Broadcom** (formerly CA technologies)

Full List of Features

Ethernet

- IEEE 802.3ae 10G Ethernet
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1p Class-of-Service Prioritization and Tagging
- IEEE 802.1v VLAN Classification by Port
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
- IEEE 802.3x Flow Control (Pause Frames)
- IEEE 802.3z 1000BASE-X

Layer 2 and Layer 3 Protocols

- Border Gateway Protocol (v4, v6)
- iBGP
- eBGP
- FRR BGP for EVPN (with MLAG)
- IGMP Snooping (v1, v2, v3) (with MLAG)
- Route Reflector
- Layer 3 ACLs
- Static routes
- IPv4 ACL
- Bidirectional Forwarding Detection (BFD)
 - BFD IS-CLIs
 - BFD with VRF
- 64-Way ECMP
- VRF Lite
- VRF Support for SSH.in
- Management VRF Hardening
- VRRP (IPv4)
- VRRPv3, VRRP/VRRPv3 over VRF IPv4/IPv6 Dual Stack
- ICMPv6 Route-Advertisement
- Route Policies

- BGP-Allow AS
- BGP Peer Auto-shutdown
- Dynamic BGP Neighbor
- IPv6 routing
- Wirespeed routing for IPv4 and IPv6

Quality of Service

- Class of Service (CoS) IEEE 802.1p
- DSCP to Traffic Class Mapping
- Random Early Discard
- Scheduling: Strict Priority (SP), Deficit Weighted Round-Robin (DWRR)
- Priority Flow Control (PFC)
- Explicit Congestion Notification (ECN)

Manageability, Automation, and Monitoring

- Zero-Touch Provisioning (ZTP)
- IPv4/IPv6 management
- Industry-standard Command Line Interface (CLI)
- SSH/SSHv2
- Link Layer Discovery Protocol (LLDP) IEEE 802.1AB
- MIB II RFC 1213
- Syslog
- SNMP v1, SNMP v2C, and SNMP v3
- SNMP CLI
- SNMP Trap Infra and MIBs Support
- Out-of-band management
- Network Time Protocol (NTP)
- Management Access Control Lists (ACLs)
- ACL DSCP map/remarking

- ACL rate limiting
- DHCP Relay Enhancements

Other

- BUM/Storm Control
- Configuration Services – Chef for EVPN
- Drop Monitor
- Inband Flow Analyser (IFA, version 1.1)
- IP Fabric over IPv6 underlay RFC5549
- IP Helper
- IGMP
- IPv4 PIM-SSM Support
- IPv4 Unnumbered interfaces
- Instrumentation (Snapshots and Thresholds)
- L2 and L3 Multi-Chassis LAG (MCLAG)
- L2 and EP (LVTEP) support using BGP-EVPN control plane
- Link Aggregation Optimizations
- Link Aggregation : Static LAG support
- Linux PTP (KNETSynC)
- Management Framework Enhancements
- OSPFv2
- Port Mirroring on Port Channel and VLAN
- Port and Priority Shaping
- RADIUS
- REST and gNMI interfaces
- RPVST+
- Role-based Access Control (RBAC)
- Tail Time Stamping
- Transceiver parameter tuning
- UDLD