**be networks**

Verity® Intent-Based Networking

Solving Today's Network Challenges

For businesses' digital transformation processes to be successful, infrastructure and operations (I&O) leaders must deliver new applications and services at hyperscale and hyperspeed.

These transformation initiatives are having massive impacts on the data center including increased complexity, pressure to reduce downtime (both planned and unplanned), the requirement for greater agility, and the need for staff with deeper and broader skill sets.

BE Networks Verity software helps businesses leverage the same open technologies used by hyperscale cloud providers to achieve the required agility, efficiency, and resiliency to meet the rapidly growing and dynamically changing needs of the business.

Network Like a Hyperscaler.

V VERITY®

SONiC

70%

70% Reduction in Downtime
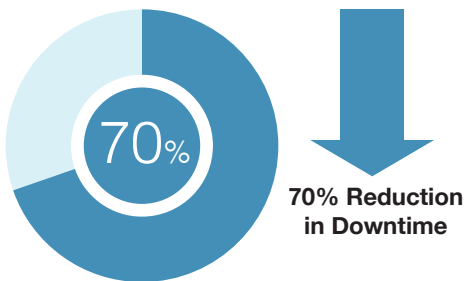
Decreased Network Downtime

Human error is the #1 cause of data center downtime. According to industry data, the percentage of outages caused by human error ranges from 60 percent to 70 percent. With Verity as the single point of management, the process of device-by-device provisioning using error-prone syntax is eliminated. Additionally, Verity's provisioning algorithms alert operators of actions that could be service impacting.

80%

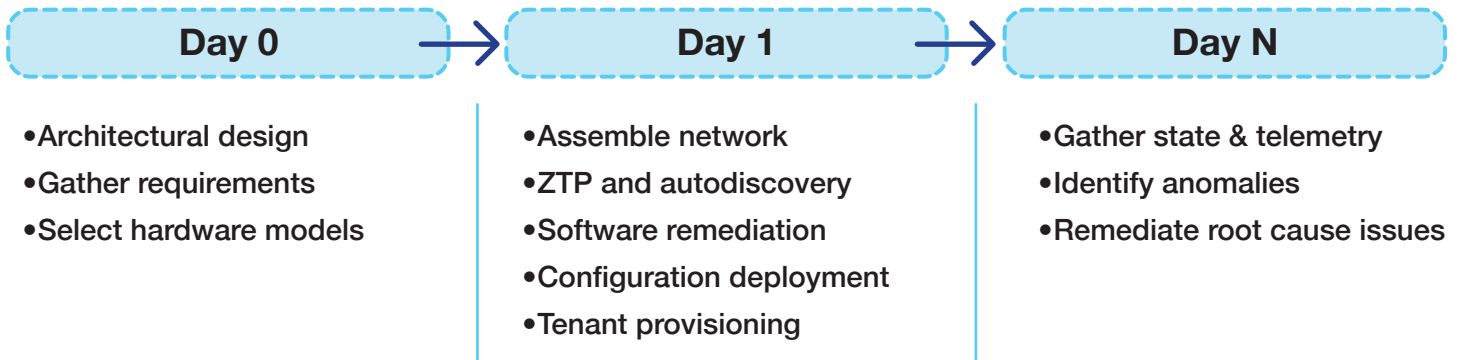**80% Reduction in OPEX**
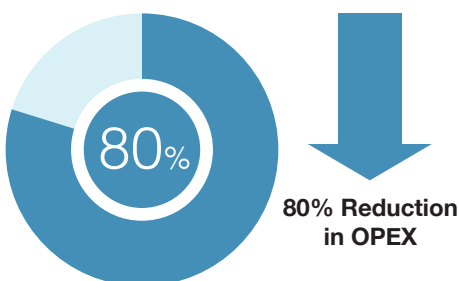
Reduced OPEX

The combined solution's centralized management, Zero-Touch Provisioning (ZTP), Intent-Based Networking (IBN), and detailed, actionable analytics deliver game-changing increases in operational efficiency and reduce the skill sets required for day-to-day tasks. Task times for normal activities such as onboarding new tenants, adding new switch instances, upgrading firmware versions, and identifying and remediating service issues are reduced by 80 to 90 percent.

Verity Functionality

Verity helps IT infrastructure operators design and manage a highly resilient, high performance physical network system. Interconnecting tens of thousands of servers, GPUs or endpoints. Verity optimizes the configuration and behavior of the network to provide physical and logical tenant isolation for multiple applications, server farms, private clouds and storage arrays.

Verity can create a wide variety of network topologies including the common data center Leaf-Spine design. Automating the primary network as well as the management network, Verity provisions multiple tenants and verifies that the network is functioning properly. Once the network is operational, telemetry can be streamed to external analysis tools and higher level cloud automation software enables end-users to create new network services on demand.

Verity Lifecycle Management

Day 0	→	Day 1	→	Day N

Day 0
- Architectural design
- Gather requirements
- Select hardware models

Day 1
- Assemble network
- ZTP and autodiscovery
- Software remediation
- Configuration deployment
- Tenant provisioning

Day N
- Gather state & telemetry
- Identify anomalies
- Remediate root cause issues

Day 0: Simple and Flexible Design Process

Before any network hardware is unboxed, racked, and powered on, Verity can automatically generate a data center site map for each location and network device planned for deployment.

Day 1: Zero Touch Provisioning (ZTP) Deployment

Verity enables ZTP installation of SONiC switches without operator preconfiguration. Switches for both the Ethernet fabric and the out-of-band management network can be unboxed, racked, powered, and cabled to a fully operational status immediately with no on-site configuration required. Verity updates the firmware and SONiC version of each switch and then makes them available for provisioning. Devices are easily placed into an operational state and all connections in the network topology are checked for anomalies. Verity makes cabling mistakes a thing of the past.

Day 1: Intent-Based Networking (IBN) Provisioning

Verity uses an industry-leading, declarative IBN model that enables IT teams to focus on delivering data center services using a simplified, intent-driven methodology. Verity intelligently captures network intent on the administrator's behalf through a series of intuitive templates and dropdown menus. Verity builds the individual configuration for each device and then automatically programs the data center network fabric with 100% accuracy.

Day N: Authoritative Network Source of Truth (NSoT)

Verity acts as the single, authoritative data repository for all network fabric configuration parameters and physical inventory for both fabric and attached devices as well as the out-of-band management network. It is impossible to achieve the required high levels of automation and security without this accurate, live view of the intended network state. Representative configuration data collected by Verity automatically collects IP addresses, interface parameters, VLAN mapping, VXLAN configurations, neighboring devices, etc., and device inventory such as models, firmware versions, MAC addresses, etc. Additionally, Verity continuously audits the current operational network state against the intended state, with deviations being alerted and automatically remediated.

Verity System Architecture
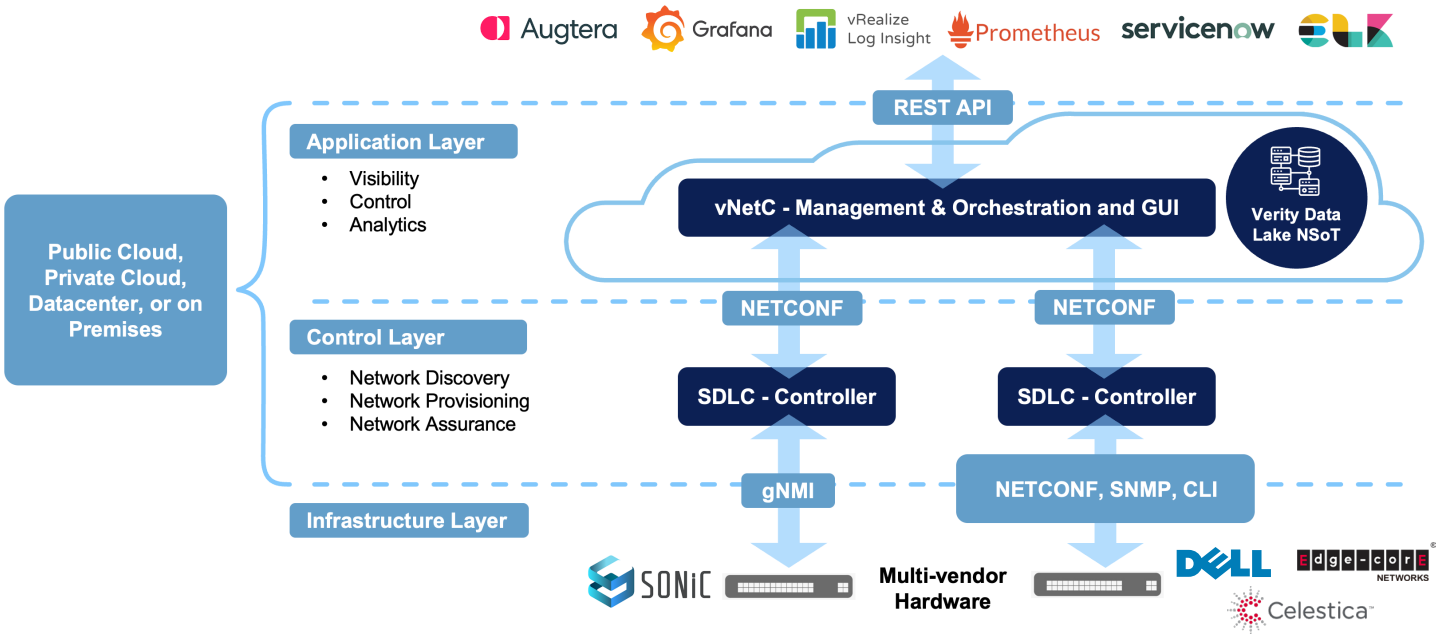
Verity consists of two tightly coupled software components, vNETC and SDLC. vNetC includes the database, web server, and northbound RESTful API. SDLC provides the control function for managed physical devices and serves as the abstraction layer between the devices and vNetC. Both vNetC and SDLC are packaged as Virtual Machines (VMs). The vNetC virtual machine (VM) can be installed in a public or private cloud or on-premises in a VM cluster environment.

SDLC consists of a series of containers that map one-to-one to the managed physical devices. The SDLC can be collocated with the vNetC or installed in geographically diverse VM cluster environments to reduce latency and improve performance. The SDLC communicates with the managed devices through their native management interface protocols, eliminating the requirement for on-device or off-device agents.

Supported Features

Network Design & Protocols
3 and 5-stage Clos architectures
Leaf/Spine/Superspine
BGPv4
Static routing
Dynamic BGP peers
HA leaf/TOR switch (MLAG, ESI)
MP-BGP EVPN – Type 2, 3, 5
VXLAN & VTEP
VRFs
Inter-VRF routing
L3 SVI
L3 Anycast Gateway
DHCP relay
RoCE v2

Telemetry
NOS versions
MAC tables
DHCP snooping
BGP sessions
Routing table
External route display
LLDP edge ports
SFP metadata
Hostname
LAG/MLAG state
Current running configuration
System Resource utilization
Device health/state
Errors on interfaces
Cabling visualization
Integrated Grafana Dashboard

Supported Features (continued)

Network Policy
Ethernet port profiles
Breakout cable profiles
Route maps
AS path ACLs
Community lists
Prefix lists
Priority queuing (PQ)
DSCP-Pbit mapping

Workflows
ZTP w/ ONIE
SONiC image management
Config
Network discovery

Security
Role-base access control
Multiuser admin
HTTPS GUI
802.1x edge ports

Hardware Compatibility List

Manufacturer	Speed	Model
DELL	400G	Z9332F-ON Z9432F-ON Z9664F-ON
	100G	S5448F-ON Z9264F-ON
	25G	S5212F-ON S5224F-ON S5232F-ON S5248F-ON S5296F-ON
	10G	S4112F-ON S4112T-ON S4128F-ON S4128T-ON S4148F-ON S4148T-ON
	1G	S3048-ON S3100-ON
Edge-core NETWORKS	400G	DCS240 DCS510 DCS520 DCS810
	100G	DCS204 DCS500 DCS501 DCS800 DCS801 DCS802
	25G	DCS203
	10G	DCS201 DCS202 DCS208 DCS209
	1G	EPS201 EPS202
Celestica	400G	DS4000
	100G	DS3000
	25G	DS2000
	1G	DS1000

vNETC Requirements

vNetC	vCPU	RAM (GB)	Disk (GB)	Storage I/O Bandwidth (Mb/s)
Minimum	8	16	128	
1 - 100 Switches	8	16	128	17.0
101 - 500 Switches	8	16	128	65.0
501 – 1,000 Switches	15	32	128	125.0
1,001 – 5,000 Switches	75	157	128	605.0
5,001 – 10,000 Switches	150	313	157	1205.0

SDLC Requirements

SDLC	vCPU	RAM (GB)	Disk (GB)	Storage I/O Bandwidth (Mb/s)
Minimum	4	4	41	
1 - 100 Switches	10	20	51	1.0
101 - 500 Switches	50	98	251	1.2
501 – 1,000 Switches	100	196	501	1.3
1,001 – 5,000 Switches	500	977	2501	2.5
5,001 – 10,000 Switches	1000	1954	5001	4.0

Client Requirements

Browser
Google Chrome

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For more information on Verity, please feel free to contact us:

Email: **info@be-net.com**

Phone Number: **+1 (214) 575 9300**

Corporate Headquarters: **2600 North Central Expressway, Suite 950, Richardson, TX 75080**

Website: **www.be-net.com**