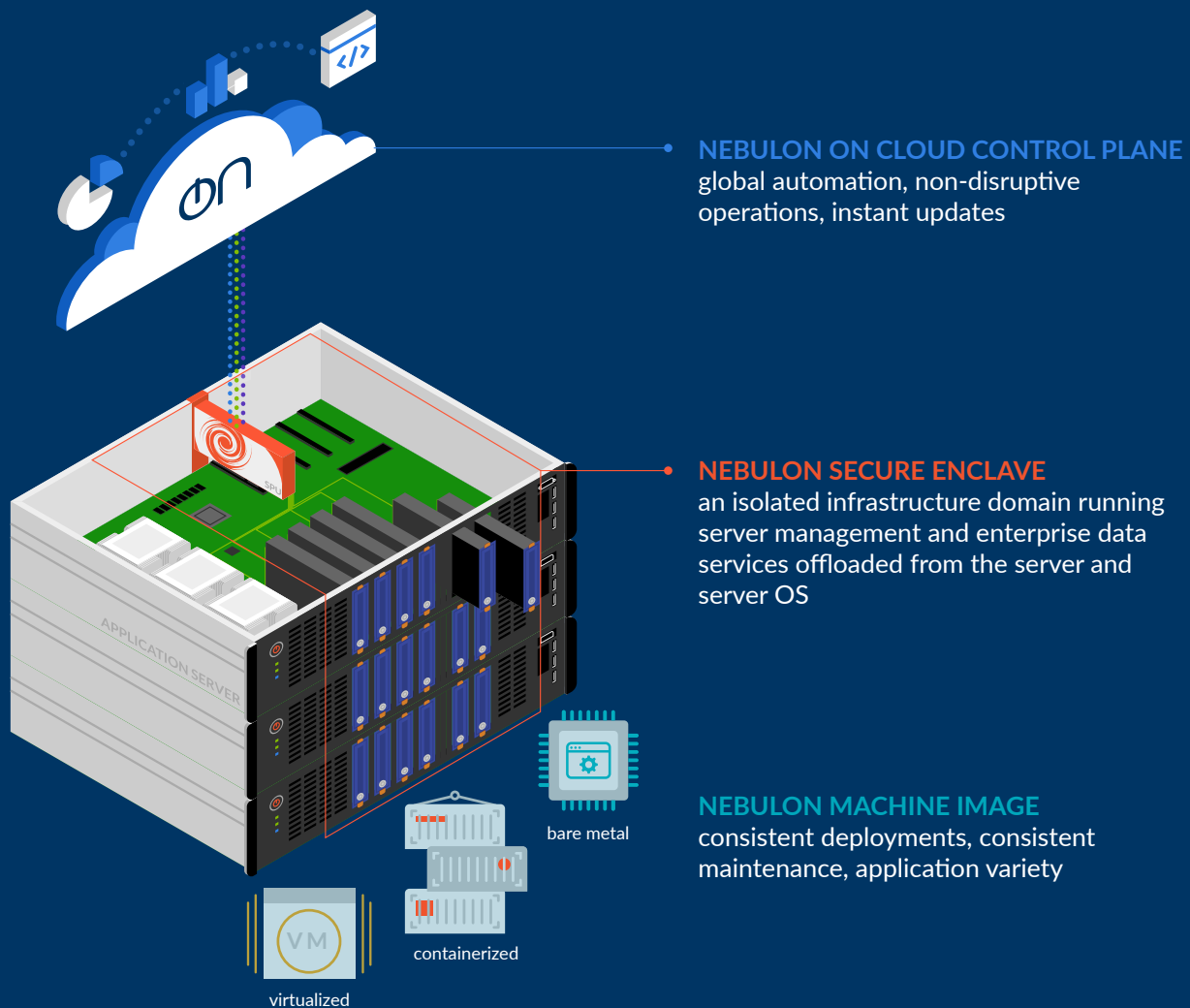


cyber-resilient **smart**Infrastructure 101

Nebulon **smart**Infrastructure transforms industry standard rack servers into cloud-managed, cyber-resilient application infrastructure for any application type—whether bare metal, virtualized or containerized. **smart**Infrastructure is ideal for data center management, recovery clusters, and distributed edge data centers.



Nebulon ON Cloud Control Plane



Fully manage your on-premises infrastructure from the cloud

With Nebulon ON, infrastructure management is a breeze. Anyone can provision and monitor infrastructure from anywhere and deep infrastructure operations can be handled non-disruptively. Plus, Nebulon ON is packaged in a way that is maintenance-free with new capabilities appearing seamlessly in the UI like any cloud-based application.

Simple, consistent infrastructure provisioning



TEMPLATE-BASED PROVISIONING

Application templates allow rapid, repeatable and consistent infrastructure provisioning for a variety of operating systems and hypervisors.

AUTOMATIC INFRASTRUCTURE DISCOVERY

Services Processing Unit (SPU)-based servers automatically and securely register with the control plane to deliver seamless, rapid onboarding and provisioning of new infrastructure services anywhere.

One secure management endpoint in the cloud



INFRASTRUCTURE AS CODE

Centralized cloud-scale automation & control through a single API for the entire infrastructure. Also provides for centralized creation and management of user and group roles and permissions.

CLOUD-SCALE FIRMWARE DEPLOYMENT

Fleet-wide deployment of server-storage software & firmware in minutes based on geography, revision, priority, etc. Reporting and orchestration with thousands of nodes is as fast as managing a single node, without resource overheads.

OTA SOFTWARE UPDATES

Instant Over-The-Air cloud-based server-storage feature and management updates provides new capabilities autonomously without having to install software on-premises. Additionally, the lightweight data plane makes SPU updates quickly and non-disruptively.

ALWAYS SECURE

Management isolation, auditing, role-based access control (RBAC), multi-factor authentication, and detailed reporting make cloud-management comparable to any on-premises management solution, but with the benefits of the cloud.

Cybersecure, cyber-resilient infrastructure



RANSOMWARE PROTECTION WITH EVERY SERVER REBOOT

Nebulon ImmutableBoot allows you to protect your application infrastructure with immutable, or “frozen,” server software from malware infection, errant patch, or a misconfigured server. Revert your operating systems and application configurations to a known, good version with each server reboot.

CRYPTOGRAPHIC RANSOMWARE DETECTION IN MINUTES

Nebulon TripLine provides real-time analysis and reporting of suspicious IO activity for both the operating system and data volumes. Pinpoint the time and place of an attack & limit the spread to other parts of the infrastructure.

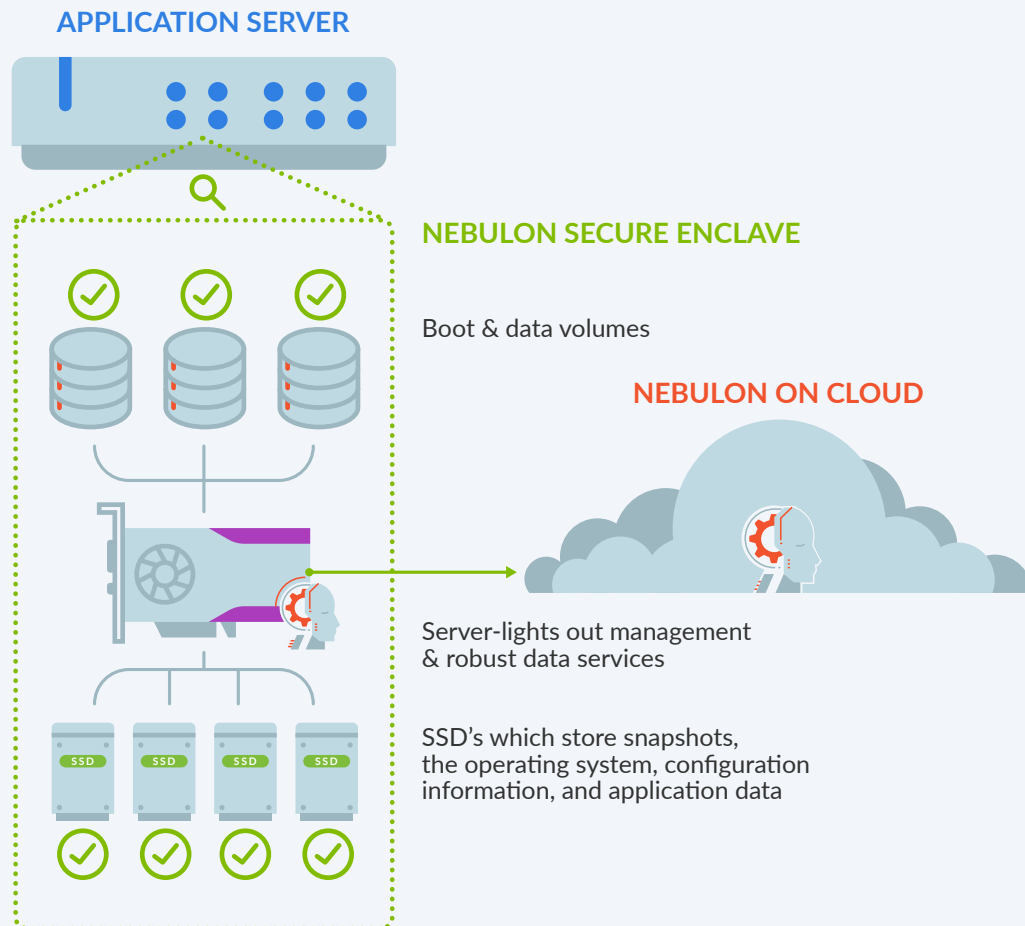
4-MINUTE RANSOMWARE RECOVERY

Nebulon TimeJump delivers push-button, API-accessible recovery of all affected servers—including operating system/hypervisor, configuration settings, application software and data—saving you millions in downtime and ransomware costs.

Nebulon Secure Enclave

A new class of server-based infrastructure for enterprises that mirrors hyperscale data centers with secure isolation of infrastructure services from application services

Hyperscalers like Amazon Web Services have used their Nitro System and Nitro Enclave to isolate infrastructure services from application services for significant efficiency and security benefits. With Nebulon, standard servers are equipped with the Nebulon Secure Enclave, an isolated infrastructure domain which includes a PCIe-based SPU using standard O/S drivers. The SPU replaces the PCIe storage card in the server, and connects to SSDs in the server with standard cables and/or SAS expander. Nebulon Secure Enclave runs SPU-based server management and data services software separate from the server and server OS.



The benefits of this modern server-based infrastructure approach (called secure domain infrastructure) versus hyperconverged infrastructure are significant:

REDUCED CPU OVERHEAD

By offloading all data services from the server CPUs, the SPU reduces CPU overhead by 25% so all server cores can be used for application workloads. Deploy fewer servers, spend less money on socket-based or core-based software licenses, and consume less power and cooling resources.

CYBERSECURITY AND CYBER-RESILIENCE

Isolation of infrastructure services, including the boot volume, is critical for delivering cybersecurity and cyber-resilience. All recovery utilities, server SSDs, the operating system, and data volumes, as well as data snapshots are protected within the Secure Enclave. Ransomware attacks can be detected in real-time, then with full control over the server's boot device, recover physical infrastructure in minutes.

BROAD SOFTWARE STACK SUPPORT

Separation of the infrastructure domain from the application domain enables support of any operating system, hypervisor and application type. Run any bare metal, containerized, or virtualized workloads without loading any additional software or drivers to your servers.

SECURE CLOUD BASED CONTROL

With a cloud-based control plane, get instant feature updates, powerful APIs, global automation, and rapid self-service provisioning.

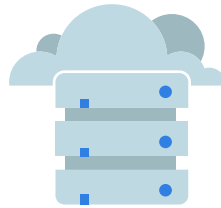
It's time to think about the **cloud as an operating model**, not just the destination.

FEATURED SMARTINFRASTRUCTURE SOLUTIONS



smartEdge

Addresses the density, cost, noise, and remote management challenges for highly distributed infrastructure.



smartCore

Reduces infrastructure & energy costs while providing cloud-like operations for core data centers.



smartIaaS

Enables new revenue, incremental gross margin, and increased customer satisfaction for cloud service providers.



smartDefense

Narrows threat vectors, detects an attack in real time for both the operating system and data, and recovers the entire physical infrastructure in four minutes.

FEATURED GO-TO-MARKET PARTNERS

DELL Technologies


Hewlett Packard
Enterprise

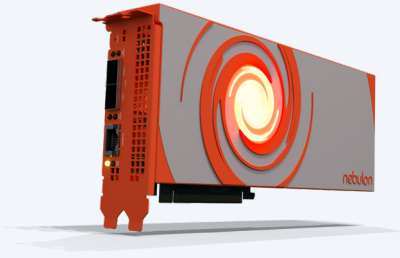
Lenovo

 **SUPERMICR**

 **TD SYNnex**

 **UNICOM** Engineering, Inc.
A Division of UNICOM Global

product specs



PHYSICAL

Form Factor

PCIe 3.0, Full-Length, Full-Height, Double-Wide

Dimensions

266.7mm (L), 98.40mm (H) 41.91mm (W)

PCIe Interface

x16 (8-lanes) PCIe Gen3

Indicators

Port activity and link, SPU status and health

ENVIRONMENTAL

Power consumption

85W

Operating Temperature

10°C to 35°C (ambient data center temperature)

Altitude (max.)

3050 m (10,000 ft)

Humidity

8% to 90% Relative Humidity

Safety Compliance

UL/EN/IEC 62368

Environmental Compliance

RoHS/WEEE

EMC Compliance

FCC Class A, EN 55032 Class A, EN 55035

CONNECTIVITY

Port configurations

2x 10Gb/25Gb Ethernet, SFP28+ DAC

Management port

1x 1Gb Ethernet, RJ45

Internal ports/connectors

two x8 Slimline SATA (6G)*

operating systems

VMWARE VSPHERE

ESXi 6.7 - ESXi 7.0**

Integrations

VAAI-Block, vCenter Metrics Integration,
Storage-aware VM placement

MICROSOFT WINDOWS SERVER

2019, 2022

Windows Failover Clustering

LINUX

CentOS, Debian, Red Hat Enterprise Linux, Ubuntu Server

Nebulon CSI Driver for Kubernetes

data services

Compression, Deduplication, Thin Provisioning, Encryption, Erasure-Coding, Volume Mirroring, Immutable Snapshots, Volume Clones.

* Drive support depends on server vendor and model. Please consult the product documentation from your server vendor.

** <https://www.vmware.com/resources/compatibility/detail.php?deviceCategory=san&productid=50957>