SOLUTION BRIEF

SUPERCLOUD COMPOSER

Your Infrastructure Gateway

Executive Summary

SuperCloud Composer is a composable cloud management platform that provides a unified dashboard to administer software-defined data centers.

Supermicro's cloud infrastructure management software brings speed, agility, and simplicity to IT administration by integrating data center tasks into a single intelligent management solution. Our hybrid approach allows traditional paradigm data centers to continue to support their existing operations while allowing their current workloads to have the flexibility to move to a disaggregated infrastructure model. Our robust composer engine can orchestrate cloud workloads through a streamlined Redfish API.

SuperCloud Composer also monitors and manages the broad portfolio of multi-generation Supermicro servers and third-party systems through its data center lifecycle management feature set from a single unified console.

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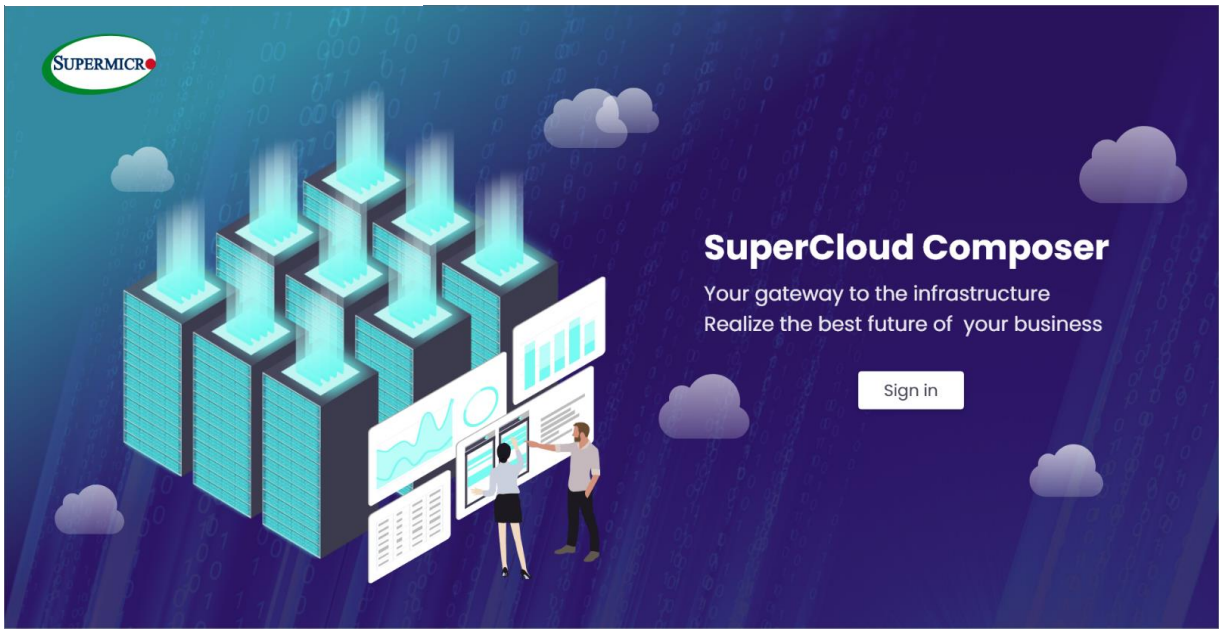
SUPERMICRO

Supermicro is a global leader in high performance, green computing server technology and innovation. We provide our global customers with application-optimized servers and workstations customized with blade, storage, and GPU solutions. Our products offer proven reliability, superior design, and one of the industry's broadest array of product configurations, to fit all computational needs.

SuperCloud Composer



Today's modern data centers face the growing need for operating efficiency through cost reduction in IT spending. Supermicro understands that IT organizations require a management platform to span multiple generations of infrastructure technology.

IT managers are faced with the ever-rising cost of technology refresh and scale-out of systems due to Big Data. The Intel Data Center Group estimates resources are underutilized at rates of up to 45 %, and data center operating efficiency is only at 50 %. In addition, PUE costs are increasing, data center real estate square footage prices are on the rise, and manpower hour rates are climbing exponentially. In addition, Patrick Nelson from Network World (Reference 1) estimates in-house server capacity to be in the range of 20% to 50% even when you factor in virtualization gains.

The traditional IT paradigm resulted in a cumbersome hardware provisioning process, with a fixed ratio of computing, storage, accelerator resources, and a lack of a one-size-fits-all platform capable of monitoring, telemetry, analytics, and intelligent system management. The new SuperCloud Composer embodies Supermicro's approach to software-defined and composable cloud solutions for future data centers. This solution brief provides you some of the key benefits and features of SuperCloud Composer and system requirements and licensing details of the solution.

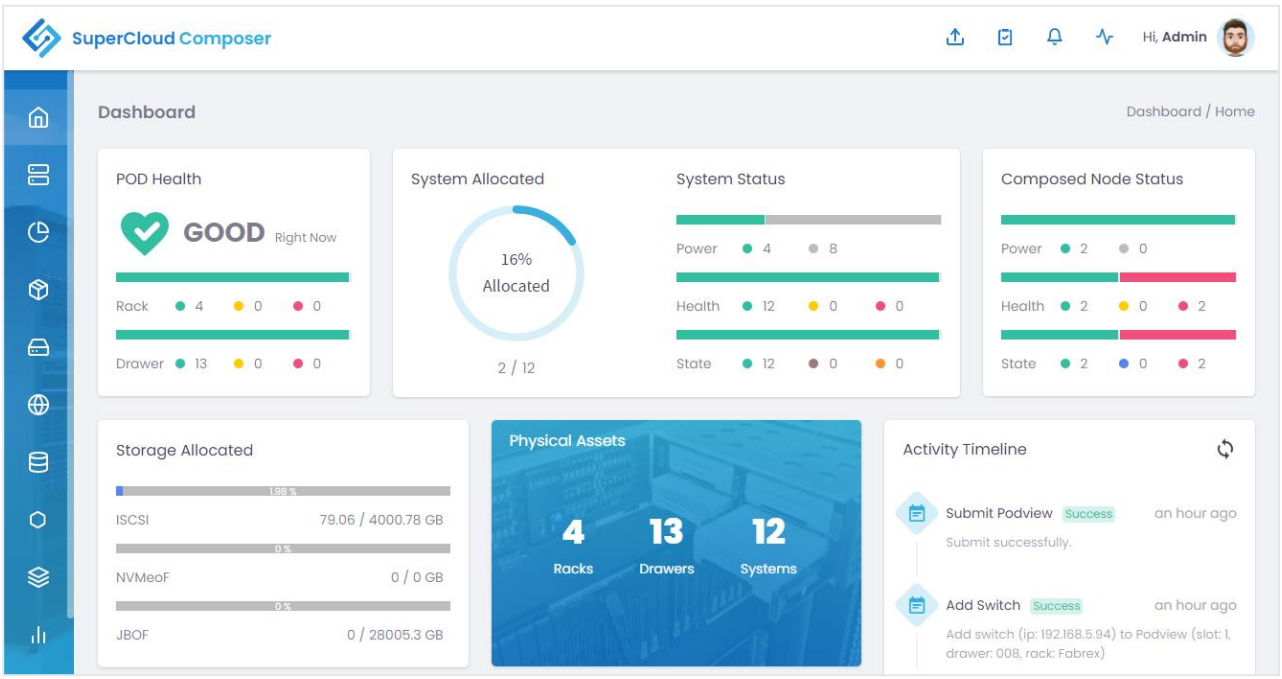
Key Benefits of SuperCloud Composer

- A single-pane-of-glass platform with a streamlined, intuitive management interface
- A standardized Redfish Northbound API Message Bus for easy third-party software platform integration
- A scalable management platform without adding unnecessary complexity
- A unified dashboard that encompasses compute, storage, networking, and rack management
- The ability to monitor and manage all elements of the resource pools in a Composable Disaggregated Infrastructure (CDI)
- Inherently software-defined and automated in support of multi-tiered datacenter-to-edge cloud infrastructure management
- Role-based access control to support modern data center security policies
- Rich analytics, telemetry, and intelligent system lifecycle management
- Parallel multi-system upgrade and configuration capability reducing hardware maintenance downtime

Features

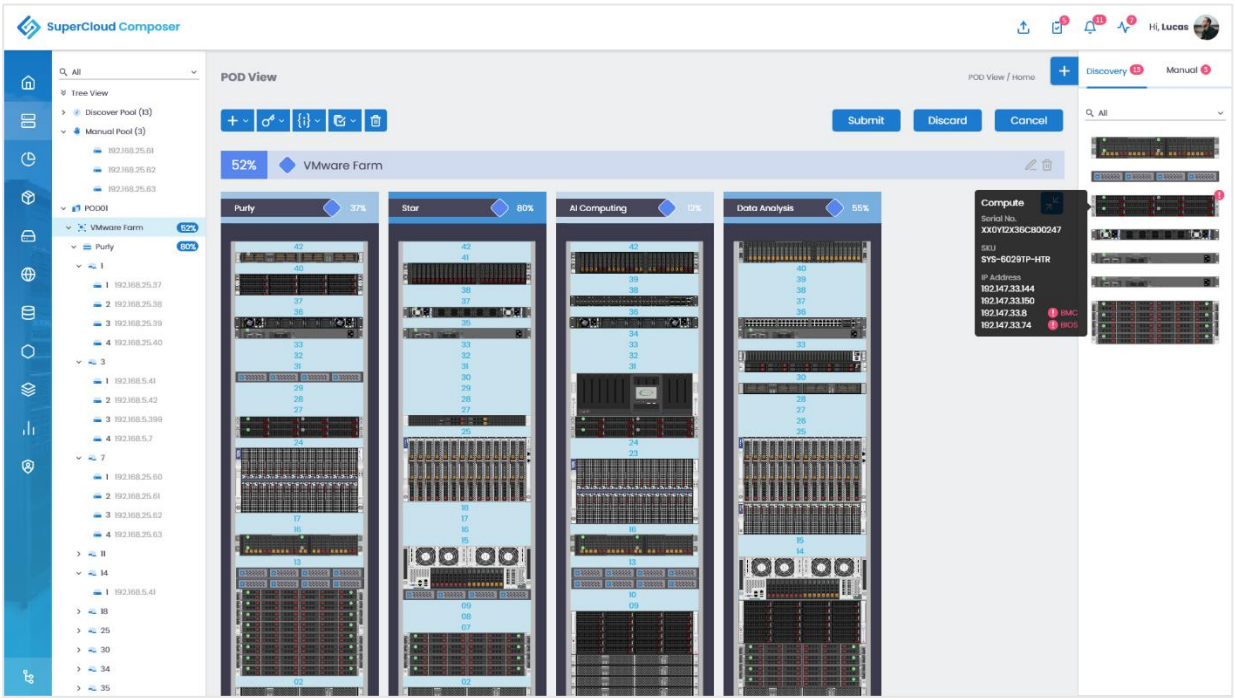
Intelligent Data Center Management	Network	Storage	Disaggregated Infrastructure	Composed Node	Administration of Management Appliance
Comprehensive system health monitoring and alerting	Top-of-rack (TOR) Network Provisioning utilizing streamlined GUI wizards	JBOF management	Integration support for GigaIO™ PCIe Switch	OS deployment in seconds utilizing fast-deploy (Centos, RHEL Ubuntu)	Support for SNMP v2 and SNMP v3
Rack management	Powerful network configurator wizard that creates network template build plans	Storage fabric configurator wizard that creates storage template build plans for NVMe network fabrics	JBOF management	Repository to store golden images for fast-deploy deployments	Change IP address/CIDR of SCC appliance
Device discovery and deep discovery	Robust network orchestrator that utilizes a REST API gateway to push network configuration build plans to infrastructure fabric	Creation of storage integration support, including GigaIO Switch	JBOG management	Operating provisioning utilizing PXE boot (ESX 6.8, RHEL 7.5, Ubuntu 18.04, 16.04, 14.04, SUSE Enterprise Linux 15.1, and Centos 7)	DNS
Pod management utilizing POD View	Switch sweeper	Management support for ISCSI initiators and targets	Allocation of GPUs from a resource pool utilizing GigaIO PCIe fabric	Software inventory to manage Kickstart and ISO images for PXE deployment	NTP
BMC access	Switch configuration detail	Management support for NVMe initiators and targets	Allocation of NVMe storage from a resource pool utilizing GigaIO PCIe fabric		Support to send logs to a Syslog server
iKVM console	Interface status and counters	RAID management and storage controller monitoring for Broadcom 3008 and 3108	Dynamic fabric topology discovery		Streamlined installation configuration wizard that utilizes Ansible Playbooks
UID management	MAC address table		Fabric configuration and reporting		
BIOS harvesting	Zero-touch provisioning		Fabric representation persistence & recovery		
Asset Tagging			Analytics of thermal and power for JBOG resource box		
Physical asset collateral and collection			JBOG physical asset collection		
FRU management			Interface status and counters		
DMI					
GPU monitoring					

Dashboard



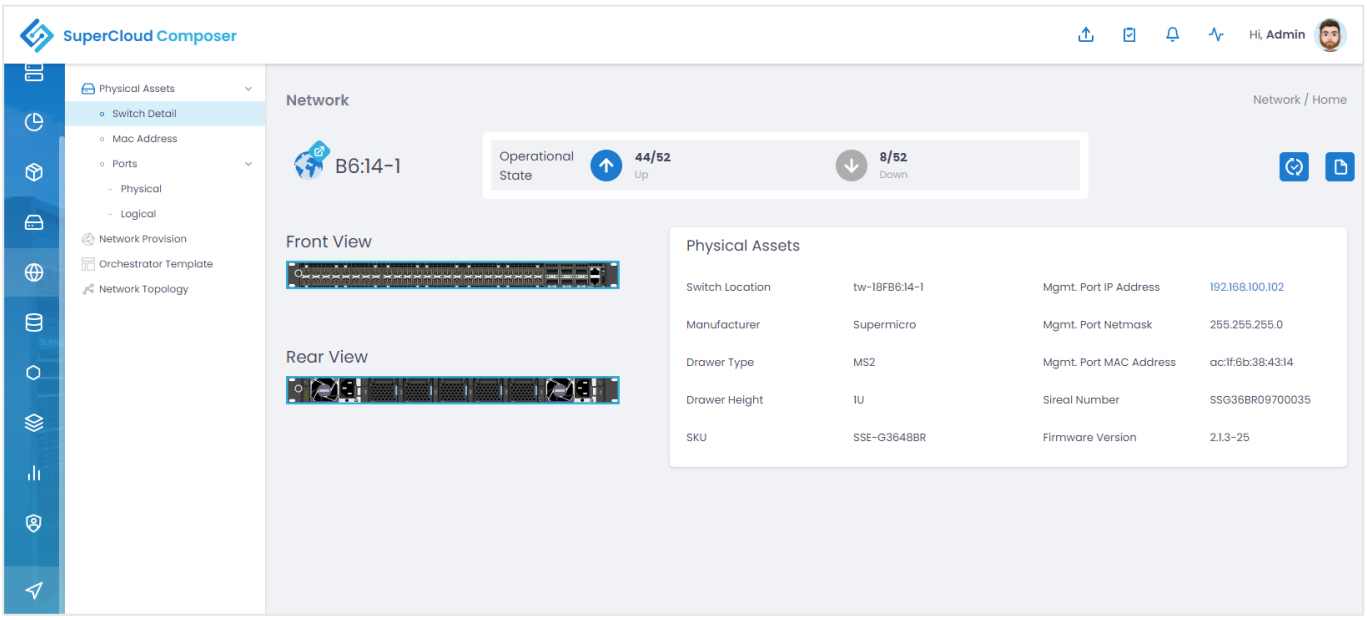
Dashboard is an information management tool to provide aggregated views of POD health, visualized system data analytics, activity event timeline tracking utilizing standardized icon footprints, providing the administrator at a glance awareness of data center operations. Administrators can click on each component within the dashboard to learn more detailed metadata about system status, composed node status, and allocated storage.

POD View

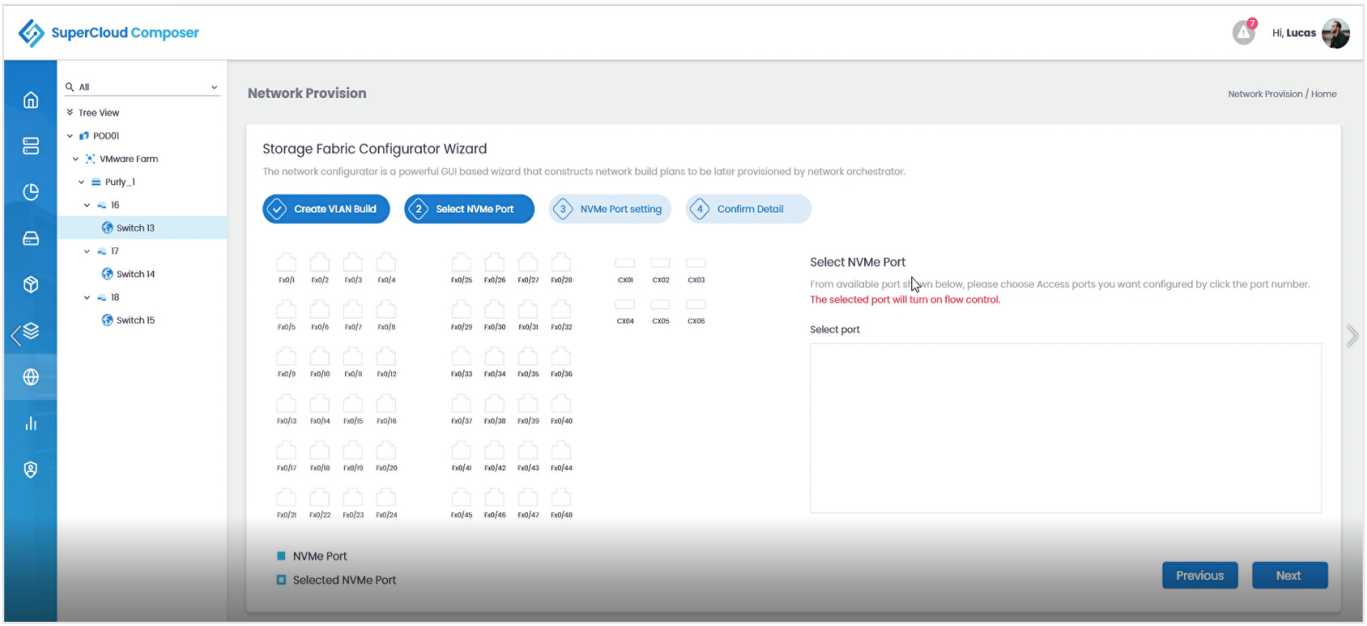


The Pod View's rack management solution provides Data Center operatives the flexibility to organize their data center requirements based on common workloads assigned to a rack deployment either at the edge or physical appliances within a Data Center that are miles away.

Network

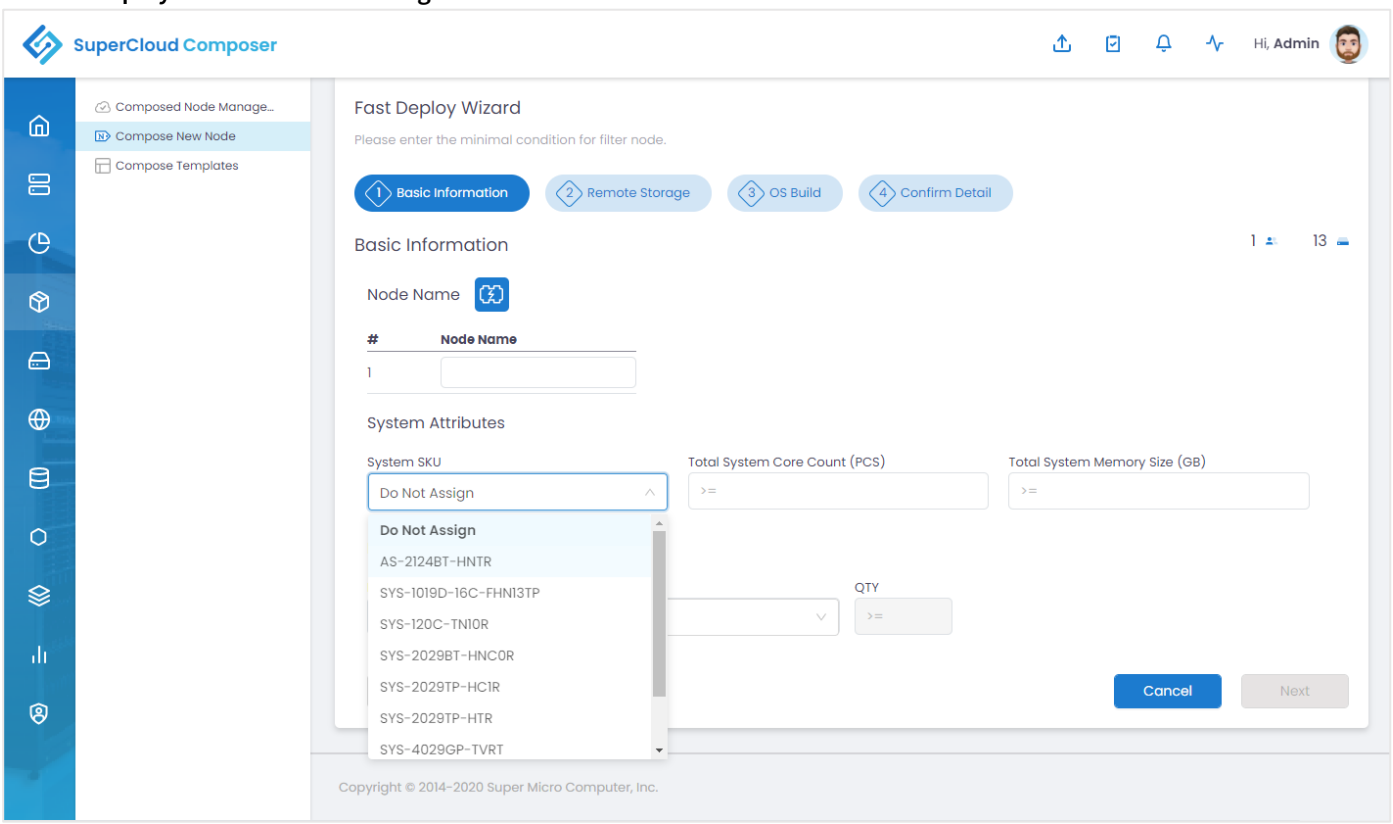


SuperCloud Composer (SCC) enforces a network blueprint where it constructs VLANs to partition specific workloads from segmented broadcast domain traffic.

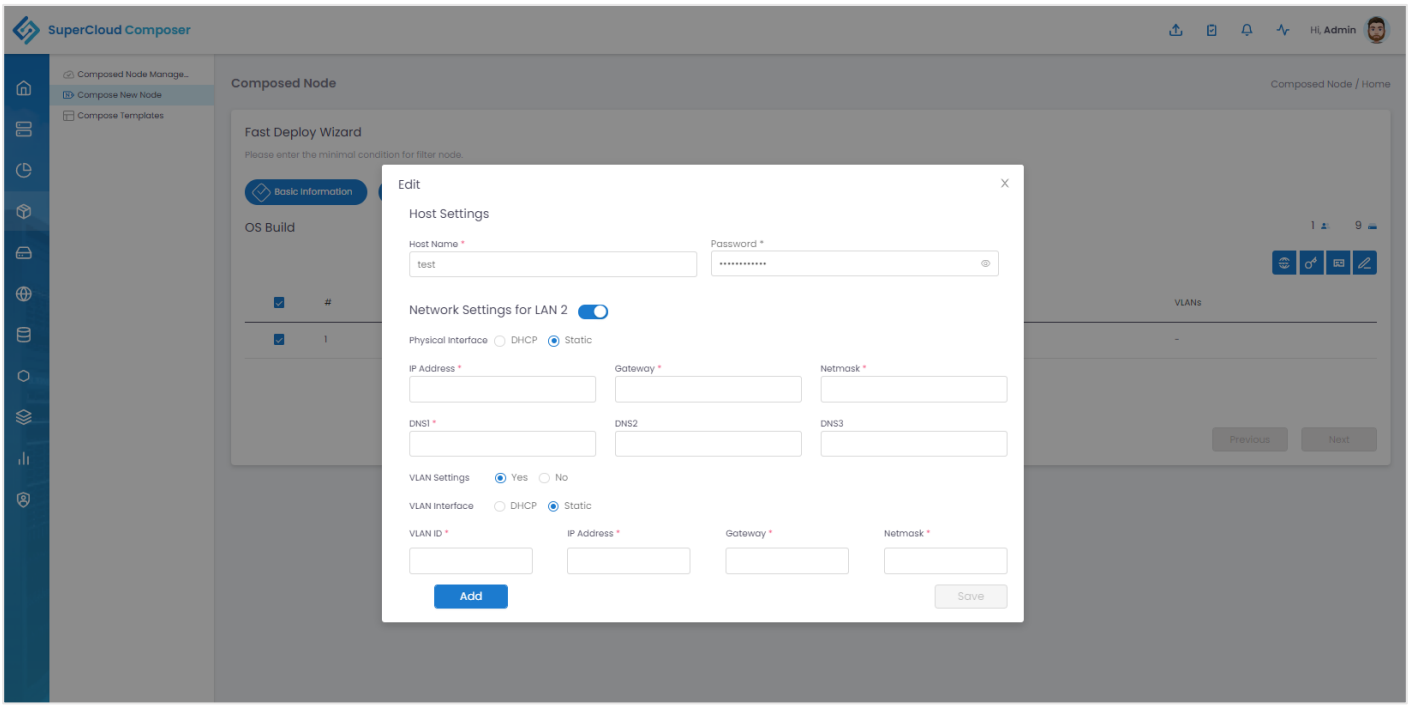


SuperCloud Composer utilizes a rich feature called network provisioning. It pushes build plans to data switches either as single-thread or multi-thread operations where Composer updates multiple switches simultaneously by shared or unique build plan templates. Build plan templates for data switches are constructed by a Network Configurator Wizard in JSON format and pushed by a Network Orchestrator engine utilizing industry standardized API calls. During network management operation, SuperCloud Composer also offers a rich, intelligent network agent called switch sweeper to maintain configuration compliance between original build plans constructed by network configurator and operational build plans within switch dynamic memory.

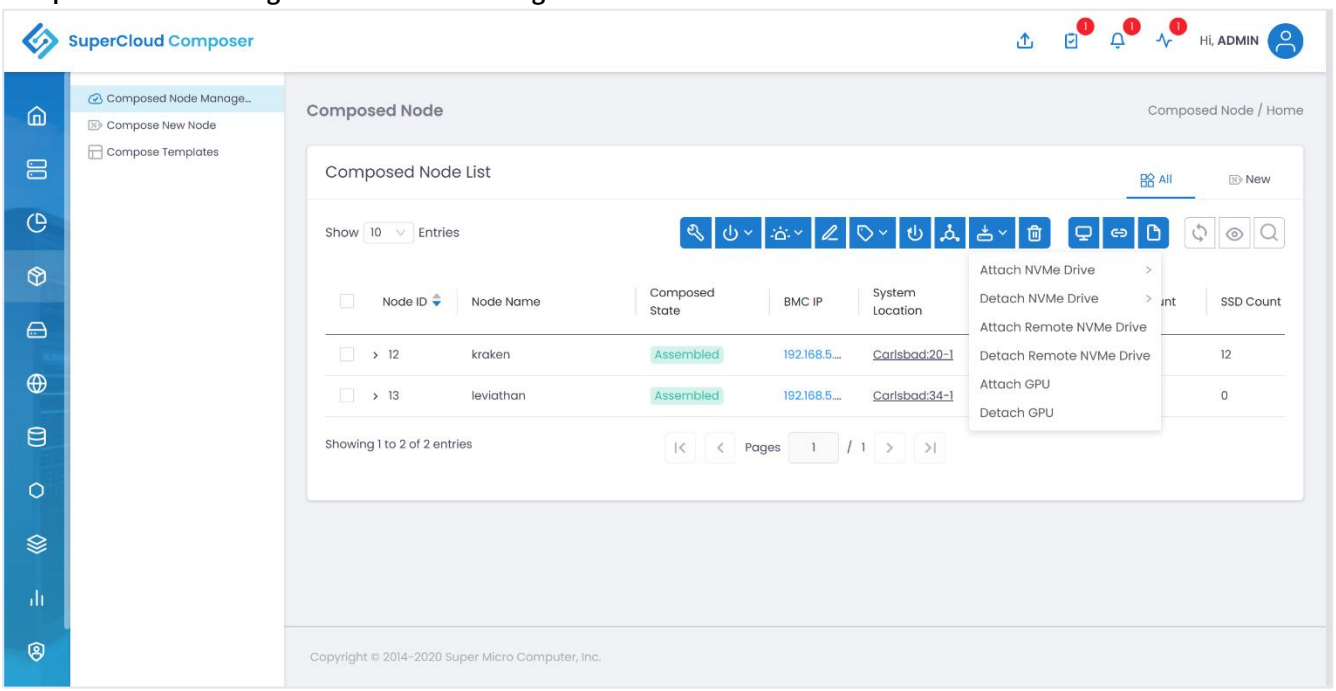
Fast OS Deployment and Provisioning



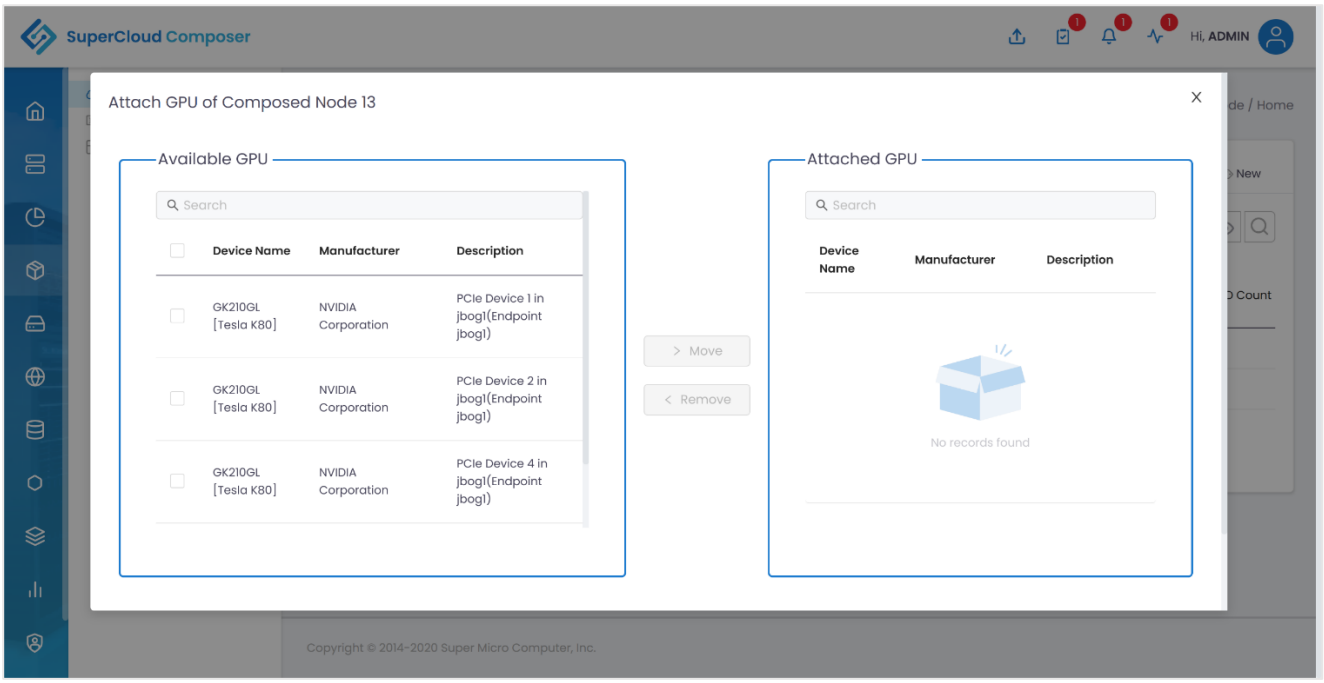
During the fast-deploy composition phase, architects execute a composed new node wizard where snapshots of OS images are composed with customized metadata that has been ingested within the OS image. The architect instructs this customized metadata when performing the creation of a user-defined build template.



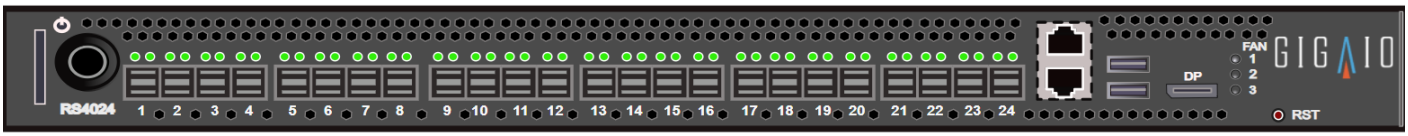
Composed Node and GigaIO™ PCIe Switch Integration

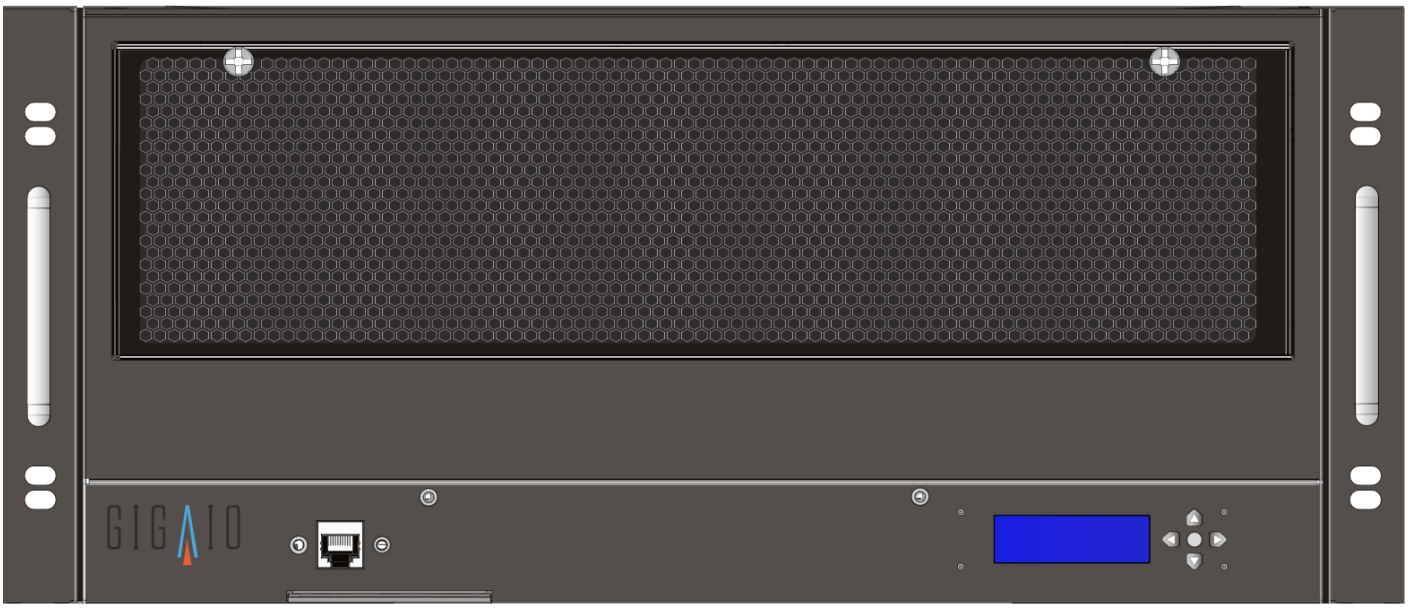


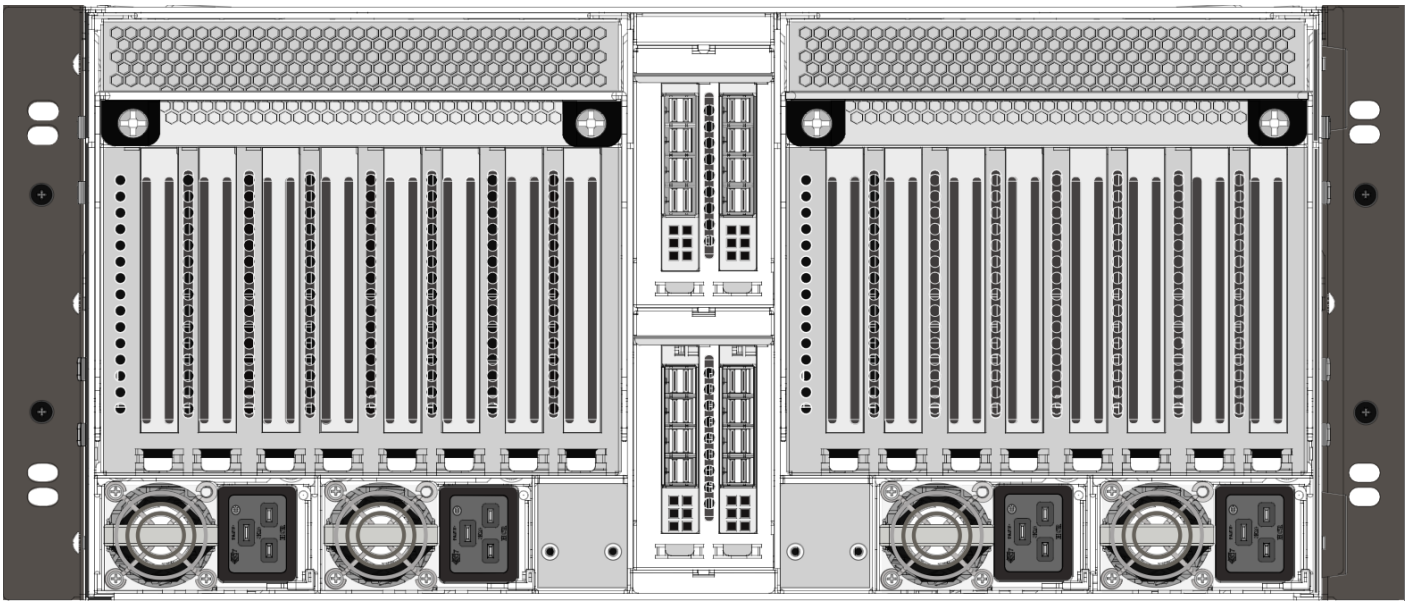
SuperCloud Composer delivers a software-defined model, leveraging pools of Composable Disaggregated resources across GigaIO's PCIe switch fabric for low latency workloads



Supermicro's software framework enables Administrators to deploy collections of fluid resources (GPU, FPGA, and NVMe flash) utilizing an intuitive provisioning wizard within seconds. Each composed system can allocate resources on-demand across a scalable GigaIO FabreX fabric and then return resources back to the pool for other systems.

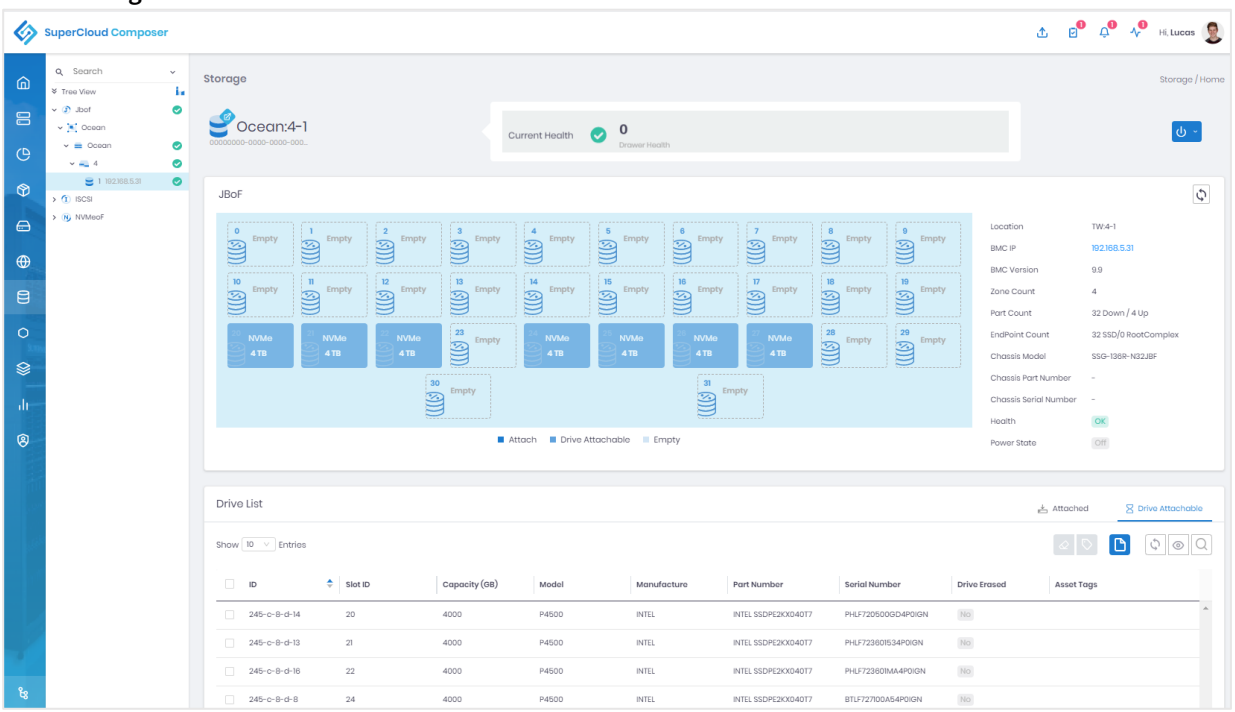






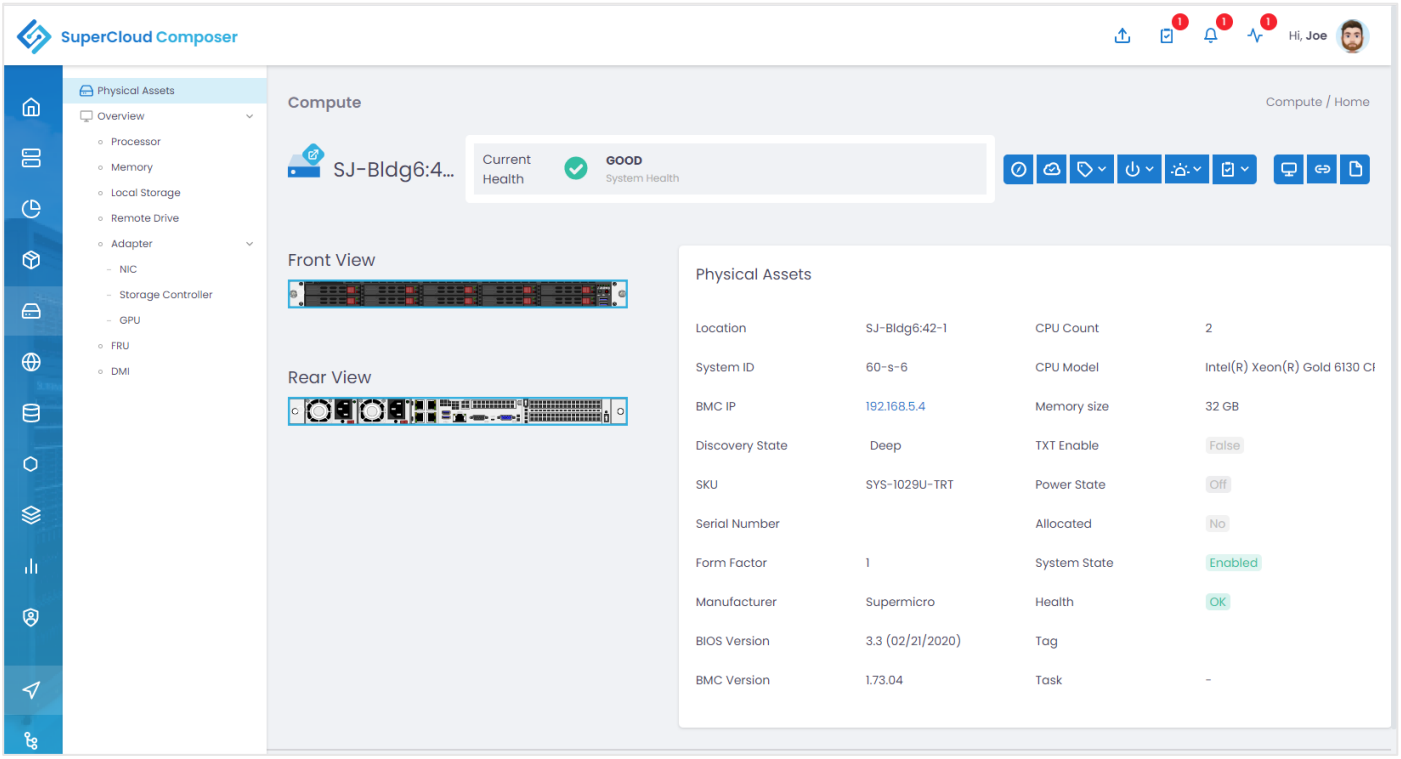
Integration with GigaIO FabreX TOR Switch to deliver NVMe-oF, DAS performance with NAS sharing, and GPUDirect RDMA to GPU systems or JBOGs.

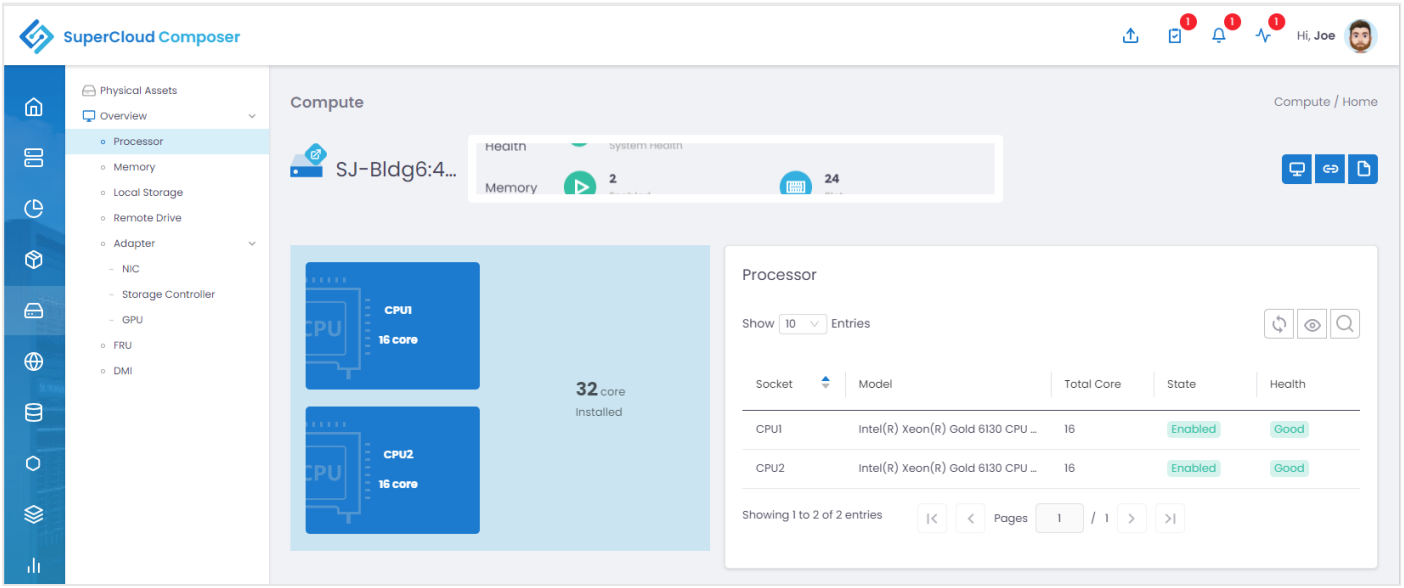
JBOF Management



SuperCloud Composer uplifts the JBOF management experience by exposing an intuitive drive map tool giving the end-user visualization of drive level presence.

Physical Asset Collateral





The compute module is a collection of monitored hosts that have been successfully registered by administrators. It is important to note that monitored hosts cannot perform simple system management tasks unless data center operatives complete drawer configuration functions during POD View execution. SuperCloud Composer provides an inventory of fluid pools of compute to manage physical fabric resources individually without entering the BMC webUI, allowing administrators to drill down and look at the physical attributes of a system.

Hardware and Software Requirements

Standalone Server	SYS-1019P-WTR (SuperServer 1019P-WTR)
HA Server Configuration	2 of SYS-1019P-WTR (SuperServer 1019P-WTR)
Motherboard	Super X11SPW-TF
CPU	Single Socket P (LGA 3647) (Intel® Xeon® Scalable Processor)
Memory	256GB
SSD Drive	2X 1TB SATA set to Raid 1
Operating System	Ubuntu 18.04 LTS
Browser	Chrome, Firefox

Virtual Machine Appliance

Hypervisor Support	Centos, RHEL, VMware ESX
Anti-affinity	Group virtual machines across different hypervisors
CPU	Requires one unit of CPU, 16 core count
Memory	256GB
SSD Drive	RAID SAN configuration of 1TB
Operating System	Ubuntu 18.04 LTS
Browser	Chrome, Firefox
Hypervisor Support	Centos, RHEL, VMware ESX

Supported Server Platforms (as of September 23rd, 2020)

AS -2124BT-HNTR	SYS-1019P-WTR	SYS-2029U-E1CR4	SYS-6019P-WT	SYS-7049GP-TRT
AS -2124BT-HTR	SYS-1029GP-TR	SYS-2029U-E1CR4T	SYS-6019P-WTR	SYS-F619P2-RC0
MBE-314E-420	SYS-1029GQ-TRT	SYS-2029U-E1CR25M	SYS-6019U-TN4RT	SYS-F619P2-RC1
MBE-628E-822	SYS-1029GQ-TVRT	SYS-2029U-E1CRT	SYS-6019U-TR4	SYS-F619P2-RT
MBE-628L-816	SYS-1029GQ-TXRT	SYS-2029U-E1CRTP	SYS-6019U-TR4T	SYS-F619P2-RTN
SBE-414E-422	SYS-1029P-N32R	SYS-2029TP-HC1R	SYS-6019U-TR25M	SYS-F629P3-RC0B
SBE-610J-822	SYS-1029P-WTRT	SYS-2029TP-HTR	SYS-6019U-TRT	SYS-F629P3-RC1B
SBE-614E-822	SYS-1029U-E1CR4	SYS-2029U-TN24R4T	SYS-6019U-TRTP2	SYS-F629P3-RTB
SBE-820C-820	SYS-1029U-E1CR4T	SYS-2029U-TR4	SYS-6019U-TRTP	SYS-F629P3-RTBN
SSE-F3548	SYS-1029U-E1CR25M	SYS-2029U-TR4T	SYS-6029BT-DNC0R	
SSE-F3548S	SYS-1029U-E1CRT	SYS-2029U-TR25M	SYS-6029BT-HNC0R	
SSE-F3548SR	SYS-1029U-E1CRTP2	SYS-2029U-TRT	SYS-6029P-WTR	
SSE-G3648B	SYS-1029U-E1CRTP	SYS-2029U-TRTP	SYS-6029TP-HC0R	
SSE-G3648BR	SYS-1029U-TN10RT	SYS-2029UZ-TN20R25M	SYS-6029TP-HTR	
SSG-136R-N32JBF	SYS-1029U-TR4	SYS-4029GP-TRT2	SYS-6029U-E1CR4	
SSG-6029P-E1CR12H	SYS-1029U-TR4T	SYS-4029GP-TRT3	SYS-6029U-E1CR4T	
SSG-6029P-E1CR12T	SYS-1029U-TR25M	SYS-4029GP-TRT	SYS-6029U-E1CR25M	
SSG-6029P-E1CR16T	SYS-1029U-TRT	SYS-4029GP-TVRT	SYS-6029U-E1CRT	
SSG-6049P-E1CR24H	SYS-1029U-TRTP2	SYS-5019P-MR	SYS-6029U-E1CRTP	
SSG-6049P-E1CR36H	SYS-1029U-TRTP	SYS-5019P-MT	SYS-6029U-TNR	
SSG-6049P-E1CR60L+	SYS-1029UZ-TN20R25M	SYS-5019P-WT	SYS-6029U-TR4	
SYS-1019D-16C-FHN13TP	SYS-2029BT-HNC0R	SYS-5019P-WTR	SYS-6029U-TR4T	
	SYS-2029BT-HNTR	SYS-5019S-MT	SYS-6029U-TR25M	
	SYS-2029BT-HTR	SYS-5029P-WTR	SYS-6029U-TRT	
	SYS-2029GP-TR	SYS-6019P-MT	SYS-6029U-TRTP	

Licensing Requirements for BMC advanced features

BMC Data Center Product SKU: SFT-DCMS-Single
Note: SuperCloud Composer (SCC) enforces licensing keys for advanced data center BMC licensing and SCC monitor node license.

SuperCloud Composer License

Type of License	Description	SCC Appliance	License P/N
Trial License	90-day trial license with 200 monitored system activation	See the hardware requirements above.	SFT-SDDC-TRIAL (for SCC software and up to 200 systems managed)
Monitor License (per node)	Single monitored system license activation	See the hardware requirements above.	SFT-SDDC-SINGLE (1 license key per system managed by SCC appliance)
BMC License	DCMS License	Monitored system	SFT-DCMS-SINGLE (1 license key per system managed by SCC appliance)

References:

1) https://www.networkworld.com/article/2959532/startup-says-it-has-solved-server-underutilization.html

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