

HYPER-UNITY™

Rugged, Atlantis USX™ Powered, All-Flash
Hyper-Converged Infrastructure Platform

OVERVIEW

Hyper-Unity is the first rugged all-flash hyper-converged, scalable infrastructure featuring Atlantis USX™. Hyper-Unity seamlessly integrates four ruggedized, eight-drive, RES-XR5-1U rack mounted servers, with a high-speed, 12-port Mellanox Infiniband switch, and Atlantis USX, the award-winning, patented Software-defined Storage (SDS) solution. Hyper-Unity is the first turn-key, Mil Spec, SWAP-optimized, hyper-converged infrastructure platform, to deliver all-flash performance for virtualized applications, at less than half the cost of traditional storage or other hyper-converged platforms.

ALL-FLASH PERFORMANCE

Hyper-Unity delivers the performance of an all-flash array in a four-server cluster, enabling IT organizations to easily meet the performance requirements of demanding workloads. Atlantis USX™ software performs in-memory, in-line deduplication and compression, before data is written to storage, leading to extremely low latencies, higher IOPS and lower storage and network traffic.

RUGGED SOLUTION

The Hyper-Unity infrastructure platform features industry-leading performance with enhanced reliability features that ensure survivability in the most demanding environments, and where Size, Weight, and Power (SWAP) is an important consideration. Themis RES rack-mount servers provide superior resilience to shock, vibration, and temperature extremes.

MODULAR SCALABILITY

Instead of buying large and expensive storage arrays with limited performance, the Hyper-Unity Infrastructure enables enterprises to scale out in small, modular units and grow their compute and storage resources in balance. Hyper-Unity delivers the performance of an all-flash array in every solution with flexible storage options based on mission requirements. Hyper-Unity also supports popular hypervisors, preserving prior investments in tools, time, and training.

DISRUPTIVE COST

The rapid proliferation of virtualized server Guest OS instances and associated VM sprawl for databases, web servers, application servers, and other VMs has outstripped the ability of traditional storage systems to adequately service storage traffic.



Features

- ▶ Superior resilience to shock, vibration, and temperature extremes
- ▶ Four-node base solution cluster - for high availability and performance
- ▶ Four RES-XR5-1U, eight drive servers with up to two E5-2600 V3 Series Intel® Xeon® processors, each with up to fourteen cores per socket and up to 512 GB DDR4 ECC DIMMs
- ▶ Base cluster has 6 TB of SSD raw capacity from 12 to over 30 TB effective storage capacity
- ▶ Easy scale-out growth, by adding additional nodes to solution cluster (4-12 nodes)
- ▶ Base 1.5TB per node SSD capacity is expandable up to 16 TB per node today
- ▶ Integral high-speed, low-latency Mellanox Infiniband data network – 56Gb IB, 56/40GbE
- ▶ 1GbE resource management network for node configuration and out-of-band management

Modular Maintainability

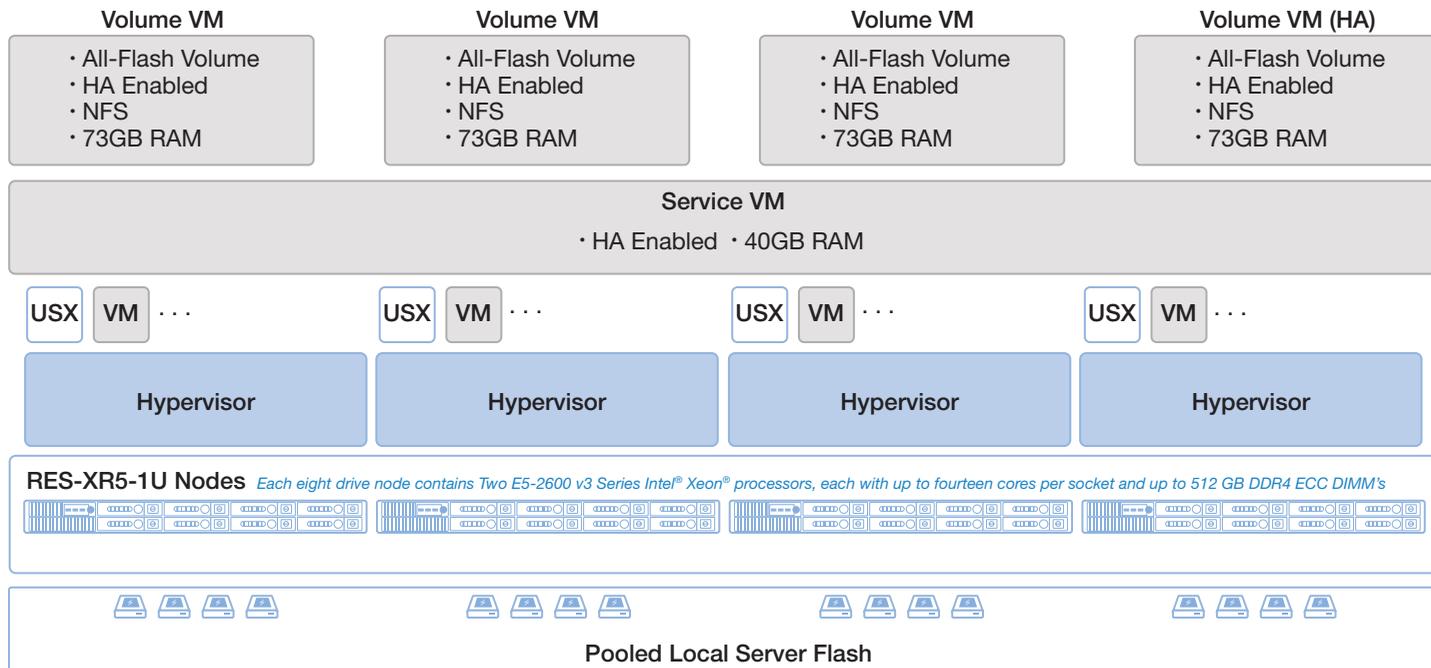
- ▶ Removable fans
- ▶ Power supply options
 - Single or redundant 110/220 VAC (50/60Hz, 400Hz)
 - Single or redundant 18-36 VDC, 32 Amp
 - Single or redundant 36-72 VDC, 18 Amp
- ▶ Hot pluggable solid state drive slots (32 per base cluster)

Environmental Features

- ▶ Operating temperature range: 0°C to 50°C
- ▶ Operating shock: 3 axis, 35g, 25ms
- ▶ Operating vibration: 4.76 Grms, 5Hz to 2000Hz (SSD)
- ▶ Operating humidity: 8% to 95% non-condensing

MIL Specification Compliance

- ▶ MIL-STD-810G
- ▶ MIL-S-901D
- ▶ MIL-STD-167-1*



Compute Resources

- Each node contains Two E5-2600 v3 Series Intel® Xeon® processors, each with up to fourteen cores per socket and up to 512 GB DDR4 ECC DIMMs
- VMware ESX 5.5 U2
- Mellanox Infiniband Network back plane
- Storage: 3x 500GB SSDs (base configuration)

All direct-attached storage, as well as any additional network-attached storage is aggregated into an efficient pool of shared storage capacity by USX and presented to the hypervisor layer for use by virtual machines. USX allocates small portions of the pool for internal usage and failover.

In addition to proliferating capacity requirements, virtualized servers require high performance storage that delivers the IOPS, throughput and latency required to make applications perform their best. The purchase of traditional SAN and NAS storage to meet this requirement is costly and, increasingly, exceeds budgets. The Hyper-Unity platform typically cuts datacenter infrastructure costs by 50 percent or more while delivering All-Flash performance.

Hyper-Unity lowers costs, using Atlantis Computing’s patented data reduction and IO acceleration technology to reduce the amount of physical RAM and local flash required per TB of effective storage capacity. Hyper-Unity eliminates the need for multiple tiers of flash and hard drives, required in other hyper-converged solutions. Hybrid hyper-converged systems remain more costly and lack the level of performance delivered by Atlantis-powered Themis Hyper-Unity platforms.

RAPID, COST-EFFECTIVE AND EASY DEPLOYMENT

Themis’ Hyper-Unity platforms deliver all-flash performance at lower cost than traditional storage or competitive hyper-converged solutions. Instead of integrating costly and complex SAN, NAS or all-flash array storage with servers, Hyper-Unity delivers an all-flash hyper-converged platform, comprising pre-integrated nodes, each with its own compute, enterprise-class SSD storage, Atlantis USX SDS, high-performance networking and virtualization. Organizations can quickly deploy a turnkey solution cluster that provides from 96 up to several hundred CPU cores, from 1 to 6 TB of RAM and 6 to 25 TB of all-flash storage to support several hundreds of server VMs w/12 to 100s of TB of effective storage capacity.

ATLANTIS USX POWERED

The Atlantis USX hyper-converged software seamlessly integrates with the Hyper-Unity infrastructure platform, local flash storage, and 56 GB Infiniband networking to create a hyper-converged platform that provides IT organizations the flexibility to scale compute, networking and storage independently.

The Atlantis USX powered Hyper-Unity Infrastructure platform replaces costly and complex legacy SAN/NAS storage and integrates with the hypervisor to provide integrated server and storage management. Within minutes, the Atlantis USX Manager deploys VMs, creates and registers data stores, and is ready to provide all-flash NFS or iSCSI storage tailored specifically for each application or workload.

Enterprises can run 200 general purpose server VMs, with 25 TB of all-flash storage, or run up to 650 virtual desktops with a 4 node Hyper-Unity System (base configuration).

DATA REDUCTION

Hyper-Unity with Atlantis USX software provides patented, real-time, in-line deduplication, compression and thin provisioning to reduce the capacity required to store data by up to 90%.

IO ACCELERATION

Hyper-Unity with Atlantis USX software processes IO in-memory before writing to its primary storage tier of local flash. This in-memory storage technology accelerates storage by minimizing the data that must traverse the network and be serviced by flash.

DATA MANAGEMENT

Hyper-Unity with Atlantis USX software automates the tiering of data between memory and local flash to simplify data management. In addition, Atlantis USX Fast Clone™, provides the capability to instantly provision full clone VMs in seconds without consuming additional storage capacity.

DATA MOBILITY

Hyper-Unity with Atlantis USX software provides intelligent volume-to-volume rapid migration of files and VMs through a unique, patent-pending, capability called Teleport™. An industry first, Teleport moves data between two virtual volumes by reconstructing the data on the target volume from existing duplicate blocks, enabling VMs to be moved between volumes in a matter of seconds even across low-bandwidth high-latency connections.

DATA PROTECTION

Hyper-Unity with Atlantis USX software has integrated High Availability and data protection capabilities that are highly resilient and can sustain a drive failure, node failure or any individual component of the storage system. Atlantis USX is pre-configured with volume-level high availability and data

protection that allows for one of four nodes in the appliance to fail without affecting the data stores on the system. Even if the entire appliance loses power, all data is protected and consistent with a journaled file system.

UNIFIED STORAGE

Hyper-Unity with Atlantis USX software enables customer to create both file- and block-based storage volumes exported as NFS or iSCSI data stores in the hypervisor.

THEMIS RESOURCE MANAGER

The Themis Resource Manager is a cost-effective, out-of-band system appliance that facilitates administration, management, and monitoring of up to 22 systems.

The Resource Manager server attaches to one or more managed systems through an independent, private network and presents a single user interface for easy access to the baseboard management controllers (BMC) of the managed systems, displaying information from these BMCs as a single integrated unit.

Functions include system health; operating temperature, fan speed, critical voltages, etc. In addition, the Resource Manager provides console access to the individual managed systems via the BMC KVM feature. This interface enables configuration and monitoring of critical in-band functions, including BIOS setup, O/S boot-up as well as execution of O/S run-time commands.

The KVM function also supports the virtual media function, enabling software loading and updates from a single, network-attached client. The RES Manager engine enables in-band reporting from agents that run in the host being managed, reporting CPU utilization, memory capacity, storage and network usage.

The Resource Manager is extensible by adding software functional adapters that can access additional, third party devices, such as switches and other functions not part of the core appliance.

MELLANOX INFINIBAND

A 12-port managed 56 Gb/s Infiniband VPI SDN/40GBe Mellanox Infiniband switch delivers up to 1.3Tb/s of non-blocking bandwidth and 200ns port-to-port latency. The Switch module enables data centers to scale out with Fourteen Data Rate (FDR) Infiniband. Mellanox switching technology provides industry-leading performance, power, and density. The switch also interoperates with existing networks, supports Software Defined Networks (SDN), and provides fabric management for cluster and converged I/O applications.

CONFIGURATION FLEXIBILITY

Unlike other hyper-converged solutions, Hyper-Unity allows you to scale both capacity and performance linearly by providing the flexibility to scale out by adding more nodes or scale up by adding more disks to each server node.

CONFIGURATION, PROCESSORS, AND MEMORY		
SPECIFICATIONS	DESCRIPTION	
Server Compute (per node)	Themis RES-XR5-1U, 8-drive server with E5-2600 V3 Series Intel® Xeon® processors (up to fourteen cores per socket)	
Server Memory (per node)	Up to 512 GB DDR4 ECC RAM	
Hypervisor (customer licensed per node)	VMware vSphere or Citrix XenServer	
Data Network (per node)	Dual 56 Gbps/40Gbps Mellanox Infiniband/Ethernet Ports	
Management Network (per node)	Dual 1Gbps Ethernet Ports & One 1Gbps Ethernet IPMI Port (dedicated)	
Data Network Fabric	12-Port Mellanox 56Gbps FDR Infiniband Switch	
Management Network/Switch	Themis RES-Manager 1U Resource Manager with 22 Gigabit Ethernet Ports	
ON-BOARD EXPANSION PER NODE		
PARAMETER	QUANTITY	DESCRIPTION
Expansion Slots	2	Up to two PCIe 3.0 16X full-height cards
FRONT AND REAR PANEL I/O ACCESS PER NODE		
I/O	QUANTITY	ACCESS
Removable 2.5 SATA or SAS disk drives	Up to 8	Front panel
CD-RW/DVD-RW drive	1	Front panel
Status LEDs	7	Front panel
Gigabit Ethernet ports (RJ45)	2	Rear panel
USB 3.0 ports	Minimum of two	Rear panel
IPMI 2.0 port	1	Rear panel
Power connector	1 or 2	Rear panel
Power switch	1	Rear panel
VGA graphics	1	Rear panel
ENVIRONMENTAL, NOTE 1		
PARAMETER	NON-OPERATING	OPERATING
Temperature range	-40°C to 70°C	0°C to 50°C
Extended temperature range	-40°C to 70°C	-15°C – 65°C, Note 2
Humidity (non-condensing)	5% to 95%	8% to 95%
Shock	3 axis, 35g at 25 ms	3 axis, 35g at 25 ms
Vibration (10-2000 Hz)	4.76 Grms, 5Hz to 2000Hz (SSD)	4.76 Grms, 5Hz to 2000Hz (SSD)
MECHANICAL PER NODE		
PARAMETER	DESCRIPTION	
Dimensions	Height: 1U or 1.75 inches (44.5 mm) Width: 17 inches (432 mm) Depth: 20 inches (508 mm)	
Weight (typical), Note 3	20 lbs (9.1 kg)	
Chassis features	Coated aluminum for light weight and corrosion resistance, stainless steel in selected areas to add strength and stiffness, modular design for easy upgrade and service, optional rack-mount slides and shock pins, and front to rear airflow	
MODULAR MAINTAINABILITY PER NODE		
PARAMETER	DESCRIPTION	
Removable fans	6	
Power	Single or redundant 110/220 VAC (50/60Hz, 400Hz) Single or redundant 18-36 VDC, 32 Amp Single or redundant 36-72 VDC	
Hot pluggable disk drives	8 slots per node	

Notes

1. Themis designs all products to meet or exceed listed data sheet specifications. Some specifications are configuration dependent. I/O options are configuration dependent
2. Extended temperature range is dependent on system configuration, components, and application thermal profile. Contact Themis for information specific to your desired configuration requirements.
3. Weights are provided for typical configurations. Weight may vary depending on configuration. Contact your Themis sales representatives for more information.

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