



GENERAL MICRO SYSTEMS, INC.
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1U isometric, front

GOLIATH-X

Rugged, 16-inch Short Rack, 1U Server with Dual Intel® Scalable Xeon® Processors, Dual-Redundant PSUs, Ethernet and 6 SSDs

Dual Intel® CPUs

Scalable Xeon®
Up to 24 Cores Each

Removable SSDs

NAS Cartridge
SAS/SATA/NVMe

Dual 500W PSUs

Dual PCI Slots
Dual "B Drive" Custom I/O

16" Deep Rugged Chassis

Superior Shock/Vib
Optional -20 °C to +55 °C

SYSTEM HIGHLIGHTS

- Dual Intel® Scalable Xeon® CPUs up to 24 cores (Platinum/Gold)
- Air-cooled with COTS or optional 38999 mil-circular connectors
- Only 16-inch deep short rack saves size, weight, power
- Up to 2 TB total DDR4 ECC DRAM
- Up to two PCIe Gen 3 add-in slots
- One 4-drive removable cartridge (SAS/SATA/NVMe)
- 2x 1/10 GbE and optional dual 10/40 QSFP+
- Optional RAID or Intel VROC for NVMe
- Dual-redundant PSUs in only 1U
- Rack or standalone mounting options
- Optional SecureDNA™ zeroize and SourceSafe™ BIOS

SYSTEM OVERVIEW

Compact, rugged "Goliath-X" servers are only 16-inches deep and are designed for harsh environment use where rack or free-standing space is at a premium. Ideal for airborne, ship-based, or battlefield-mobile installations, "Goliath-X" brings exceptional rackmount processing and flexibility to defense applications in a very small footprint. Each server uses two of Intel's second-generation Scalable Xeon® processors, up to 24 cores each (embedded, Gold/Platinum SKUs) with up to 2.0 TB total system memory (ECC, 2933 DDR4). 1/10/40 GbE is available (dual 1/10 GbE is standard), and there are up to six SSDs in "Goliath". Four SAS/SATA/NVMe drives are installed in a single removable cartridge for easy, secure transport and system de-classify. Dual internal 2280 M.2 drives are used for OS boot or protected application software. Hardware RAID is standard for

all SAS/SATA drives, and Intel VROC or RSTe software RAID is available for NVMe U.2 SSDs. The front panel drive bay can also accommodate GMS "B Drive" modules for application-specific I/O such as CANbus, ARINIC-429, or HD-SDI video.

Unique features in the overall "Goliath" 1U/2U server family are the short rack depth of only 16-inches, dual GPGPU accelerators such as Nvidia V100 Tesla artificial intelligence / data mining cards (2U only), a DVD R+W or Blu-Ray unit, removable cartridges in lieu of individual SSDs, dual redundant power supplies in both 1U and 2U, and the GMS zero-charge NRE modification policy. For example, both "Goliath-X" (1U), "Goliath-NAS" (2U), and "Goliath-AI" (2U) can be lengthened to add MIL-STD-704



power hold-up (via supercaps), an auxiliary power unit battery, or an additional two (in 1U) or four (in 2U) extra add-in slots. Alternatively, mil-circular 38999 connectors can be substituted for COTS-style connectors (depth will increase slightly).

Designed for value-conscious rugged applications and built with GMS RuggedDNA™ design methodology, all “Goliath” servers are air-cooled using GMS-proprietary “TwoCool™” fan control. The server uses our proven egg-crate ruggedization technique that stiffens the chassis to provide exceptional shock and vibration for a rackmount server. A 3-year warranty is standard, along with GMS’s made-in-America end-of-life component monitoring and long-lifecycle sustainment policy. Custom versions can be developed with full programmatics and certifications.



GOLIATH-X (front view)
1U, isometric, with 38999 connectors



GOLIATH-X (rear view)
1U, isometric, with 38999 connectors

I/O AND EXPANSION OPTIONS

- COTS connectors or 38999 mil-circular (increases depth)
- 2x PCIe Gen 3 slots
- SAS/SATA/NVMe SSDs (1U)
- Two M.2 SSDs (internal)
- Dual 1/10 GbE ports
- Optional dual 10/40 GbE QSFP+ cages (inserts for 1/10/40)
- BMC with IPMI and 1 GbE port
- 2x USB 2.0 and 2x USB 3.0
- Optional audio, serial port, and GPIO
- VGA for console video
- Dual-redundant 500 W PSUs
- DVD/Blu-Ray player
- Front-mount or side rails (fixed or sliding)
- Optional dual GMS B-Drive I/O in lieu of SSD(s)
- GMS FlexIO™ panel for user-customized options
- Extended chassis depth for: MIL-STD-704 hold-up/APU and up to 2 more PCIe slots

ENVIRONMENTAL SPECS

- SWaP-E:** Short rack server with unmatched density in one footprint
- Size:** 1U x 16-inches deep
- Weight:** As low as 10 lbs.
- Power:** As low as 400 W
- MIL-STD:** MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD 461E and IP60 compliant (Optional separate MIL-STD-704F AC PSU with 50 ms hold-up)
- Temperature:** 0 °C to +55 °C
-20 °C to +55 °C (Optional)
- Ruggedness:** Available in ruggedization levels R1-R2

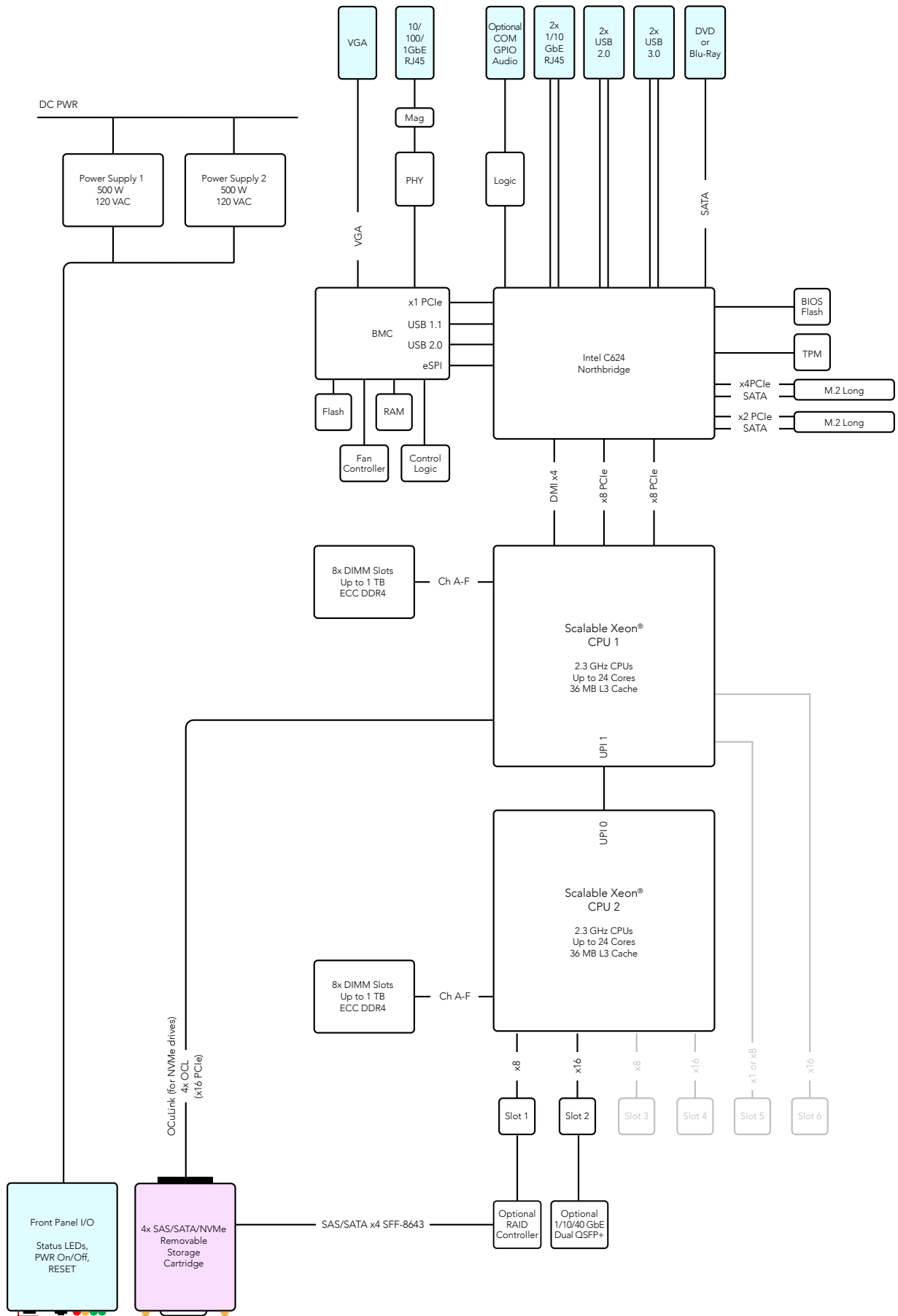
RUGGEDIZATION LEVELS

	TEMP	SHOCK	VIBRATION	MAX IP LEVEL
RUGGED 1	0 °C - 55 °C	20G	.0001 g ² /Hz	54
RUGGED 2	-20 °C - 55 °C	20G	.0008 g ² /Hz	64

* Vibration frequency for systems tested between 5Hz – 2000Hz



BLOCK DIAGRAM: GOLIATH-X (1U)



	GOLIATH-X (1U)	GOLIATH-NAS (2U)	GOLIATH-AI (2U)
Height	1U	2U	
Depth (COTS connectors; deeper by 3" w/ 38999 MIL)	16 inches		
Processors (24C max with "embedded" SKUs 20C max in 1U with dual-red. 500W PSUs)	Intel® Scalable Xeon® Gold/Platinum; Up to 20C max	Intel® Scalable Xeon®, Gold/Platinum, up to 28 cores (non-embedded SKU)	
# CPUs	2		
# UPIs	2, between CPUs		
Compute architecture	Workload-balanced, flow-through data: HPC, SMP, NUMA		
Max memory/CPU (2.0 TB/CPU with select SKUs)	1.0 TB/CPU		
# DDR4 DIMM Slots up to 2933 MT/s (w/ECC)	8/CPU		
Add-in cards (RAID requires 1 slot; 40 GbE requires 1 slot)	2 (DVD reduces by 1 slot)	6	3
# x16 (FLHH) slots (See optional extended chassis below)	1	3	1
# x8 (FLHH) slots (omit DVD) Note: For AI, Slot 4 can be enabled in lieu of Slot 5 as a factory option	1	3 (x1 slot covers one x8)	2 (x1 slot covers one x8)
PCIe speed: 8 GT/s, Gen 3	PCIe Gen 3		
Max number of SSDs (incl. 2x M.2 2280)	6	22	
Removable SSD cartridges w/RAID (RAID reduces one x8 PCIe slot)	1	5	
# M.2 slots	2x 2280 (x4 and x2)		
# SSD hot-swap slots, 7 mm max (SAS/SATA/NVMe)	4 (4 in single cartridge)	- 4x in lower tier (4 in single cartridge) - 16x in upper tier (4 cartridges; requires RAID card)	
External storage (optional, requires 1 slot)	eSATA, 4x Mini-SAS HD		
Intel VROC software RAID (key is required, RSTe is optional)	Yes (excludes M.2)		
Hardware RAID 0,1,10,50, other (Required for SATA/SAS drives)	Yes (uses FLHH slot)		
Ethernet Service port (copper, 1 GbE)	1 for BMC		
Ethernet (copper, 1/10 GbE)	2		
Ethernet (fiber, 1/10/40 GbE) (add-in card uses one HHFL slot 1/10 GbE requires adapter cable with insert)	2x QSFP+ (copper, fiber inserts)		2x QSFP+ (copper, fiber inserts)
Optional Nvidia® co-processing GPGPU for vector apps, AI or data mining (Tesla V100 or Titan V, dual-slot)	0		2 (double-slot, up to 250 W/slot) (requires power management)
USB 2.0 (rear)	2		
USB 3.0 (rear)	2		
DVD/Blu-Ray (front)	1		
VGA, 2D video (rear) (+ KVM video redirection up to 1080p)	1		
BMC with Ethernet port (rear)	1 BMC with dedicated 1 GbE port		
Optional Audio	Mic In/Stereo Out		
Optional General purpose I/O	8 GPIO		
Optional Serial ports (RS232/422/485)	1		
Dual-redundant PSUs; 80_Plus Platinum; For 110VAC, 2U PSUs are 1000 W/110VAC or 2000 W/220VAC each	2x, 500 W each	2x, 2000 W each (Requires 220VAC)	
# Optional B Drive I/O modules	2		
Cooling	Convection-cooling GMS TwoCool™ fans		
Connectors	COTS/commercial-style or optional 38999 MIL-SPEC		
Optional SecureDNA™ Zeroize, Status, SourceSafe™ BIOS	Yes		
Temperature, standard	0 °C to +55 °C		
Temperature, optional (excl. add-ins)	-20 °C to +55 °C		
Optional chassis extension options	Increased power supplies; APU hold-up; 2x FHFL add-in slots	Increased power supplies; APU hold-up; 4x FHFL add-in slots	
Optional FlexPanel™ I/O customization	Consult factory		