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News Release

General Micro Systems' (GMS) Announces "Apex" Dual Intel Xeon® OpenVPX Server Developed in Alignment with SOSA™ Technical Standard

GMS' second-generation Xeon OpenVPX-based "Apex" server is designed for SOSA alignment in modular open system architectures (MOSA), jointly mandated by Secretaries of the Army, Air Force, and Navy.

San Diego, CA, March 2, 2020 – General Micro Systems (GMS) announces the world's only dual Xeon, OpenVPX modular 19" rack mount server developed in alignment with the emerging Sensor Open Systems Architecture (SOSA) Technical Standard. The company's second-generation Intel® Xeon E5 v4 dual CPU OpenVPX server, "Apex", marries GMS' high-performance, 100 percent LRU-replaceable modularity with OpenVPX profiles intended to conform with the SOSA Technical Standard release expected in late 2020.

In this new second-generation "Apex", all relevant LRU-replaceable modules follow SOSA-inspired OpenVPX profiles ... making "Apex" the only SOSA-aligned rackmount server in the world.

The secretaries of the Army, Air Force, and Navy have mandated modular architectures for future defense systems, specifically citing implementation of standards like SOSA as vital to the DoD's future success. For certain systems, SOSA allows the DoD to control its own destiny through technology refresh and interoperable, multi-vendor products.

GMS's first-gen Apex followed on the heels of the company's groundbreaking S2U "King Cobra" server introduced in 2017. The 22-inch deep short rack Apex "Forever Server" broke more ground by assuring all subsystems are modular, field replaceable, and based on VITA 65 OpenVPX interconnects. In this new second-generation Apex, all relevant LRU-replaceable modules follow SOSA-inspired OpenVPX profiles for one of two Compute Intensive (Payload) profiles, or the Data/Control (Switch) profile. The Apex OpenVPX modules already include SOSA required in-system data and control plane interfaces.

"We have been saying for years that 'OpenVPX' wasn't 'open' at all because vendors' cards would not interoperate like early VME cards did," said Ben Sharfi, CEO and chief architect at GMS. "OpenVPX is essentially useless as an 'interoperable' standard. However, SOSA limits OpenVPX to only a couple of profiles for each 6U card type—allowing OpenVPX to live up to the former hype," continues Sharfi. "It is because of SOSA's rigid constraint to select profiles that GMS is modifying the Apex server to SOSA adherence—making Apex the only SOSA-aligned rackmount server in the world."

Apex is Still the "Forever Server" – Now Aligned with SOSA
From inception, the modularity of Apex was intended for LRU sparing, field upgrades, and technology refresh. Aligning Apex OpenVPX modules with SOSA is a straightforward task—proving the original value proposition of GMS's modular server design. Apex is intended to be upgraded "forever", as technology improves while long-life military programs still require backwards compatibility.

Apex is built using a GMS VPX450 dual Xeon E5 OpenVPX SBC as the motherboard, with all subsystems interconnected internally via GMS FlexVPX™ fabric backplanes. Other Apex subsystems include: 3U OpenVPX triple "smart" N+1 power supplies; twin modular and removable RAID SSD "NAS" modules totaling 12 drives; removable 4-slot 500W full-length PCI cage; and the OpenVPX "XPANSE™" PCIe switch module that connects the server to off-board coprocessors or other fabric-connected servers.

Key Benefits of Apex
The "Forever Server"

- Made and designed in America by ITAR-approved supplier
- Replaces 17U of equipment in 2U, saving massive size and weight
- OpenVPX-based LRU-replaceable modules make for easy repair and are "forever" upgradeable
- Built-in 1 Gb and 40 Gb Ethernet switch allows fast routing in a single chassis
- Add-in dual Nvidia® Tesla V100 GPGPUs gives mobile supercomputer algorithm performance
- SOSA™-aligned OpenVPX profiles

CPU, Bus Fabric, Power
Apex uses two of Intel's highest-performing Xeon E5 22 core server CPUs and adds 1 TB of DDR4 ECC-protected DRAM. The FlexVPX™ bus fabric routes 80 PCIe (Gen 3) 8 Gbps lanes between subsystem modules for a flow-through architecture. FlexVPX™ is capable of scaling to 20 Gbps as technology evolves, making Apex future-proof.

Supporting the CPU subsystem are six 40 Gbps fiber Ethernet ports, plus two 1 Gbps copper Ethernet ports—all operating at full bandwidth, plus a baseboard management controller for out-of-band management capabilities over IPMI, including SNMP. An HDMI port is used for console video, and there are six USB 3.0 ports, and a removable, "sanitizable" SSD for the operating system, which can be substituted for an XMC I/O module for a SOSA Payload profile.

Unique to Apex are 32 PCIe Gen 3 lanes routed externally to other expansion chassis such as those from One Stop Systems or other GPGPU deep learning systems. The fabric also connects multiple Apex servers together.

Apex is powered by three N+1 redundant MIL-STD-704 AC or MIL-STD-1275 DC power supplies and contains an inboard auxiliary power unit (APU). For avionics applications, 400 Hz AC power is available.

- Link to Tri-Service SOSA-referenced memo
- Information on Apex
- High-resolution images of Apex
- Datasheet for Apex
- Press release "Apex SOSA Rackmount Server"

Where: Booth #123, AFCEA West Premier Sea Services event, San Diego, March 2–3, 2020

For interviews at the show, contact Kelly Wanlass at 801-602-4723 or kelly@hughescom.net, or GMS CTO Chris Ciufo at (360) 921-7556 or cciufo@gms4sbc.com.

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About General Micro Systems:
General Micro Systems (GMS) is the rugged server company. The company is known as the industry expert in highest-density, modular, compute-intensive, and rugged small form-factor embedded computing systems, servers, and switches. These powerful systems are ideal for demanding C4ISR defense, aerospace, medical, industrial, and energy exploration applications. GMS is an IEC, ISO, AS9100, NIST-800-171, and MIL-SPEC supplier with infrastructure and operations for long-life, spec-controlled, and configuration-managed programs.

Designed from the ground up to provide the highest performance and functionality in the harshest environments on the planet, the company's highly customizable products include GMS Rugged DNA™ with patented RuggedCool™ cooling technology. GMS is also the leader in deployable high-end Intel® processors and a proud Intel® partner since 1986. For more information, visit www.gms4sbc.com.