News Release

General Micro Systems' (GMS) New S422/X422 Server and AI Engine Set Brings Greater Performance to Next-Gen Army Vehicle and Airborne Systems

The powerful, rugged vehicle-mounted server combo is ideal for applications requiring massive computation and sensor fusion in autonomous vehicles, unmanned aerial systems (UAS), and C4ISR/Electronic Warfare systems

WASHINGTON, D.C., October 14—At the Association for the United States Army (AUSA) conference today, General Micro Systems (GMS) announced that its new S422-SW and X422 combination has been chosen for two new military development programs. The system pair brings a massive amount of server processing power, 10/40/100 Gigabit networking ports for sensors, and general-purpose graphics processing unit (GPGPU) artificial intelligence (AI) onto the battlefield for the first time in two small "shoebox-sized" rugged chassis designed to survive the harshest conditions where regular rackmount servers cannot.

The two programs that selected the S422-SW "Thunder" and X422 "Lightning" combo will deploy it in mobile platforms to move IP-based sensor data instantaneously over multi-sensor LANs into the server and AI processor. Once processed, the server reports out to operators information that can help maneuver a vehicle or UAS in real-time, calculate a fire control solution for a weapon, or identify threats such as stationary IEDs or incoming objects such as projectiles.

"The tremendous processing power of this combo makes it a highly attractive option for these two development programs as well as others creating autonomous, self-driving or self-piloting vehicles," said Ben Sharfi, chief architect and CEO, General Micro Systems. "Through these programs, the sealed, fan-less, computer pair brings local, highest performing commercial-off-the-shelf (COTS) technologies onto the battlefield for the first time in deployable, small form factor systems—right at the 'tip of the spear' where they're needed most."

Proven, Robust and Connected Technology for the Battlefield

The represents the most robust technology available from companies like Intel®, Nvidia®, Broadcom®, and Cumulus Networks®. The S422-SW, a conduction-cooled, fan-less, rugged, low-cost Intel Xeon® E5 server operating over -40 °C to +85 °C, provides an on-platform or in-vehicle 30-port 10 Gigabit Ethernet local area network (LAN) designed to interface with the high-bandwidth sensors needed for next-generation autonomous vehicles or battlefield reconnaissance. Sensors such as radar, LIDAR, CCTV, and multiple wavelength IR or acoustic sensors generate massive amounts of data that must be moved in real-time over the LAN and processed and stored locally by the S422-SW's Intel Xeon E5 server CPU. The

companion X422 co-processor uses two of Nvidia's V100 Tesla GPGPU AI engines to comb through the data to perform target tracking, image processing and enhancement, vector algorithms and more—all in real time at 400 FLOPS.

The S422-SW simplifies local data processing tasks that require an ultra-fast, virtual machine-ready, 22 core Xeon-class server with vast amounts of high-speed, ECC-protected RAM and storage in one ultra-rugged chassis. "Thunder" is also an enterprise-class multi-port LAN or a network attached storage (NAS) appliance equipped with a professional-class intelligent Layer 2/3/pseudo-4 Ethernet switch/router and data center networking software from Cumulus Networks.

Networking capability includes four 40 GbE fiber ports and thirty 10 GbE ports. The 10 GbE ports come from a Broadcom® Layer 2/3/pseudo-4 enterprise class switch that has never before been used in a deployed battlefield computer. Each of the 10 GbE ports support power-over-Ethernet (POE+) to directly power remote nodes or sensors while simplifying wiring requirements, up to 100 W maximum total power sourced. The quad 40 GbE fiber ports—also configurable as 100 GbE—are useful for highest-rate sensors, or inter-system communications to software-defined radios, data intensive EW processors, or other in-vehicle systems.

S422-SW is closely coupled with the X422 via the GMS FlexIO™ 16 lane, 8 GT/s PCI Express Gen 3 bus extension. X422 is equipped with dual Nvidia Tesla V100 data mining/algorithm processing AI engines that together boast up to a staggering 400 TFLOPS of algorithm computation. The GPGPU modules are ruggedized by GMS for reliable conduction cooling in the X422 chassis. In lieu of these modules, other dual-slot, 250 W PCIe cards can be used for co-processing with S422-SW, including: AMD GPGPUs, Altera or Xilinx FPGA modules, DSP cards, and more. Local intelligence in X422 allows the cards to work together or independently, depending upon the application. Separate I/O ports feed data into the X422 via dedicated front panel connections, if the GMS FlexIO™ bus isn't used for I/O transfer. X422 "Lightning" was introduced at AUSA 2018 as a co-processor to GMS's Apex 2U rackmount server.

- High-resolution images S422: https://www.gms4sbc.com/press/S422
- Datasheet S422: https://www.gms4sbc.com/press/S422/thunder

- High resolution image X422: https://www.gms4sbc.com/press/X422
- Datasheet X422: https://www.gms4sbc.com/press/X422/lightning
- Press release X422 (Oct 2018): https://www.gms4sbc.com/news/press/x422

Where: Booth #7664 at the Association of the United States Army (AUSA) annual meeting in Washington D.C., Oct. 14-16, 2019.

For interviews at the show, ask for 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

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