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SOSA demonstration system aims to show what open architectures are made of



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Pentek, Herrick Technology Laboratories (HTL), and Kontron have developed products aligned with the Sensor Open Systems Architecture [SOSA™] Technical Standard that are used in a new 3U VPX demonstrator system designed to illustrate the capabilities of open systems architectures. This flight-qualified system is ideal for electronic warfare (EW), SIGINT, radar, and communications applications.

The SOSA Consortium is chartered with creating a common framework for transitioning sensor systems to an open systems architecture, based on key interfaces and open standards established by industry–government consensus. The benefits of such an architecture include improved interoperability as well as reduced development time, deployment, and costs.

The SOSA approach establishes guidelines for command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems. The objective is to allow flexibility in the selection and acquisition of sensors and subsystems for use over the full life cycle of a C4ISR system.

The demonstrator system – in an HTL HTLv-C-19 chassis with 16 payload slots and three power-supply slots – includes two slots with Kontron VX305C 40G SBCs with 12-core Xeon D processors and Pentek 71813 data-converter XMC modules with Xilinx Kintex Ultrascale FPGAs; eight RF/payload slots; one slot with a Herrick PNTRv PNT reference module with radial clock; two slots with 40/100 Gigabit Ethernet switches; two slots with PCIe Gen 4 and 1/10 Gigabit Ethernet switches; and three 100-watt power supply slots. (Figure 1.)

The system-level interfaces are also aligned with the SOSA Technical Standard to maximize the chassis-level interoperability. The HTLv-C-19 chassis is designed to the VITA 48.2 VPX REDI conduction-cooling standard for rugged environments.



Figure 1 | Pentek/SOSA Collaborative Demonstration System.
Source: Pentek, Inc.

“The Jade Model 71813 directly addresses I/O needs called out in the emerging SOSA standards,” said Paul Mesibov, Pentek’s chief technical officer and SOSA standard contributor.

“Herrick Technology Laboratories and another major U.S. system integrator have received shipments of this Kontron SBC for U.S. defense community applications,” said Mark Littlefield, Kontron’s vertical product manager for defense and a SOSA standard contributor. “Herrick is integrating the VX305C-40G SBC with a Model 71813 XMC board from Pentek, which will provide customizable I/O signal status and control for their new SOSA C4ISR demonstrator system for the U.S. Army.”

Acie Vickers, CEO and president of HTL, says “By providing key components for this design, Kontron and Pentek are helping to deliver on the open systems architecture promise of faster and simplified technology updates for defense sensor platforms.”

Open architecture modules

The following modules are designed to support the open systems architecture of the SOSA approach:

- The Herrick Technology Laboratories HTLv-1 and HTLv-2 are 3U OpenVPX quad- and dual-channel HF/VHF/UHF software-defined radio (SDR) transceiver modules designed to support various missions.
- The Kontron VX305C-40G 3U VPX single-board computer uses a 12-core Intel Xeon D processor, with 40 Gigabit Ethernet data plane (40GBASE-KR4), a four-lane PCIe Express 3.0 expansion plane, dual 10 Gigabit Ethernet control plane (10GBASE-KR), and a rich assortment of user I/O including SAT III, USB (2 and 3), serial links, video (HDMI, with DisplayPort available in 2019), GPIO, and an XMC site with backplane user mapping.
- The Pentek Model 71813 features 28 pairs of LVDS digital I/O to meet the requirements of emerging standards from the SOSA Consortium.

What’s to come

The two-year efforts of the SOSA Consortium are starting to bear fruit. While the actual program platforms are not available to publicly discuss, demonstration platforms show what is possible with the family of standards developed by VITA, SOSA, and other organizations targeted at rugged environment markets. Stay tuned for news on future programs and products using this technology.

<http://vita.mil-embedded.com/articles/sosa-demonstration-system-aims-to-show-what-open-architectures-are-made-of/>