Frequently Asked Questions on VXS™

1. Why was VXS created in the first place?

The VITA community needed a way to expand beyond the performance limitations of the solely parallel bus architectures and incorporate serial fabrics. VXS offers backward compatibility to the VMEbus while adopting the use of serial signals such as Gigabit Ethernet, PCI Express, Serial RapidIO, and other fabrics.

A well-established ecosystem exists for VXS products. With more than 80 unique products offered in the market and deployed throughout the world, the VXS architecture provides developers with a logical extension and performance upgrade to their VME-based applications.

2. What are the general VXS features?

- Backwards compatible to the VME/VME64x architecture. Enabling re-use of existing hardware and software.
- Uses high-speed Multi-Gig RT2 for P0 connector.
- Switch card slot(s) in Star or Dual Star configurations. Switch card slots are not backwards compatible. Mesh and switchless mesh configurations are possible.
- Theoretical slot-to-slot bandwidth of 3,050 Mbps.

3. Where is VXS used?

VXS products are used in a variety of applications

- Military
- Aerospace
- Industrial
- Medical
- Semiconductor
- Research/Government
- Communications
- Homeland Security

These markets all have applications that have traditionally used VME and are looking for ways to improve performance using the latest serial fabric technologies. The backward compatibility of VXS with VME allows them to boost processing performance while keeping the rest of the system intact.

4. What protocols are supported by VXS?

- Infiniband (ANSI/VITA 41.1-2006)
- Serial RapidIO (ANSI/VITA 41.2-2006)
- Gigabit Ethernet (VITA 41.3)
- PCI Express (VITA 41.4)
- Aurora (VITA 41.5)
- Gigabit Ethernet, Control (ANSI/VITA 41.6-2009)
- 10 Gigabit Ethernet (VITA 41.8)

5. Does VPX/OpenVPX replace VXS?

No. VPX is a completely new architecture with new form factors, pinouts, and serial switch fabric topologies. It has a VMEbus pinout option but requires a special hybrid backplane to bridge to VMEbus slots.

VXS and VPX are both based on the same MultiGig RT2 connector family. Mesh versions of VXS can match the slot-to-slot bandwidth of VPX. The primary advantage of VXS is the backward compatibility with millions of existing VMEbus boards with the edition of high-speed serial switch fabrics.

Each architecture has its own advantages that must be carefully considered. Designers should review factors such as the ecosystem, architecture maturity/stability, pricing, power/cooling requirements, I/O availability, bandwidth, and backwards compatibility.

6. What's the difference between VXS and VPX?

VXS offers backwards compatibility for existing VME/VME64x line cards for payload slots. VPX can offer compatibility through the use of hybrid backplanes with VME/VME64x slots. As VXS is based on a 0.8" pitch versus a typical 1.0" pitch for VPX, VXS offers more slots typically in a 19" chassis. VXS uses a straightforward Star or Dual Star centralized architecture (unless special Mesh versions), with defined pinouts for interoperability. With typically lower layer counts and lower power requirements, the costs are usually less for VXS boards, with simpler cooling and routing requirements. VPX offers higher performance, more I/O options, more flexibility, and both 3U and 6U sizes.

7. What is the form factor for VXS?

As it is compatible with VME64x cards, the form factor is 6U x 160mm. The Eurocard form factor is rugged and has been used in Mil/Aero applications for over 25 years.

8. What are the voltages used in VXS?

3.3V, +5V, +/-12V

9. Can I get conduction cooled VXS hardware?

Yes, a popular VXS board style is the conduction cooled module. These are used mainly in military and aerospace applications where convection cooling cannot be used. These allow heat to conduct through the printed circuit board or through a conduction plate on the module. Expanding wedge locks then transfer the heat out to the chassis through wide slots cut into the metal chassis sidewalls.

10. Where can I get a copy of the VXS specification?

VXS is an ANSI/VITA approved standard - ANSI/VITA 41. It is available for purchase from VITA at https://vita.com/secure/online-store.html.

11. Where can I go to learn more?

A list of articles is maintained at www.vita.com/vxs. Check there for the latest information.

VXS™