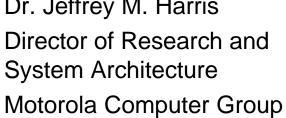


Renaissance

Innovation, Performance, Investment Protection







VXS is VITA 41

VXS is a specification for multi-GBps serial switched interconnects on VMEbus that:

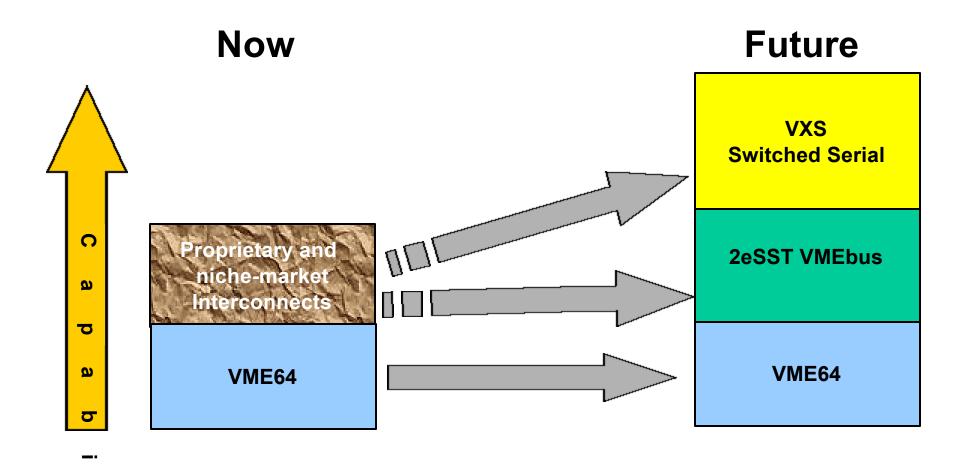
- Adds multi-GBps switched serial interconnect(s) to VMEbus coincident with the VMEbus parallel bus
- Specifies standard open technology for the multi-GBps serial switched links
- 3. Accommodates different link technology standards, but not necessarily at the same time
- 4. Pulls additional D.C. power onto each VME card
- 5. Maintains backward compatibility with the VMEbus ecosystem

VXS is a trademark of the VMEbus International Trade Association (VITA)

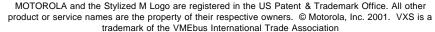




Where Does VXS Fit?







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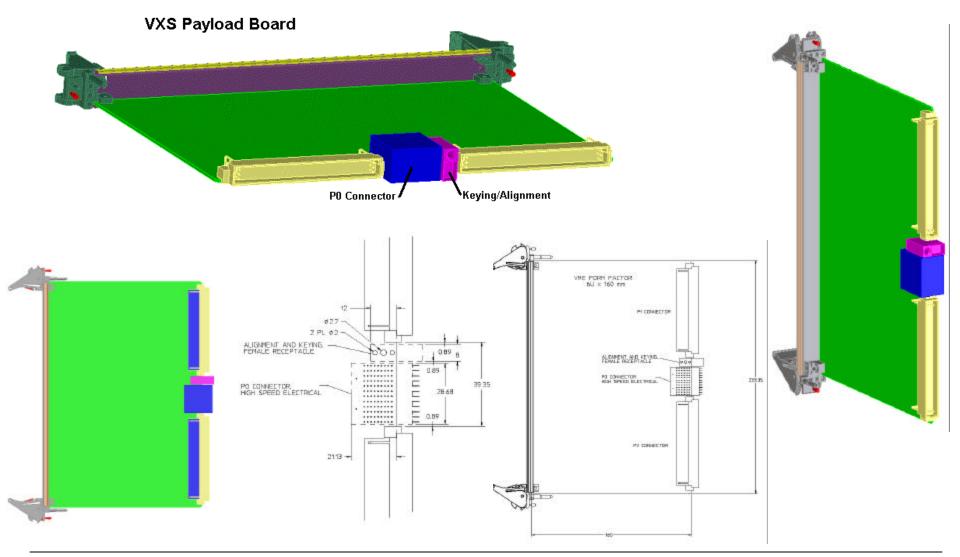
Goal 1: Add switched-serial interconnect(s) coincident with the VME parallel bus

- Specification adds the switched serial interconnect without removing the traditional VME parallel bus
 - Adds a new high speed P0 connector for switched serial
 - Retains existing P1 and P2 connectors
- Specification accommodates a card referencing both the serial interconnect and the parallel bus, but mandates neither
 - Could reference VME bus only
 - Could reference VME bus and Switched Serial Interconnect
 - Could reference Switched Serial Interconnect only
- In instances where the VME parallel bus is not referenced by a card, the P1 and P2 connectors are still required for power, etc.





Example of a VXS Payload Board



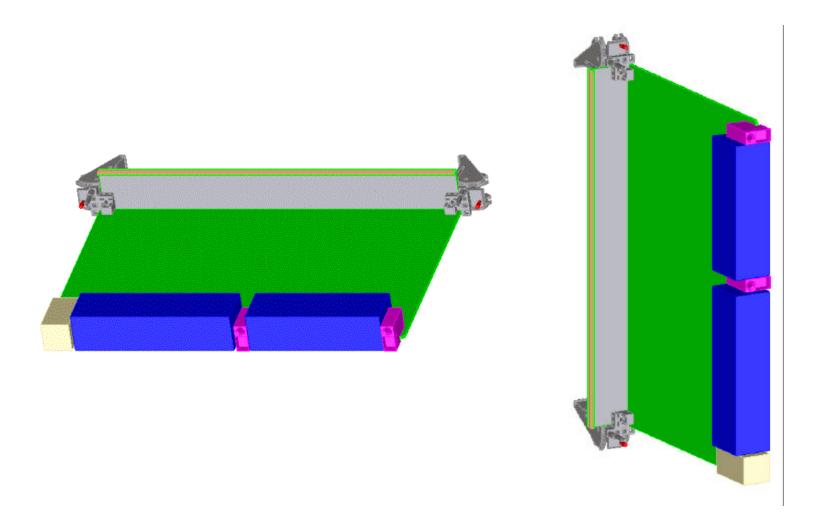


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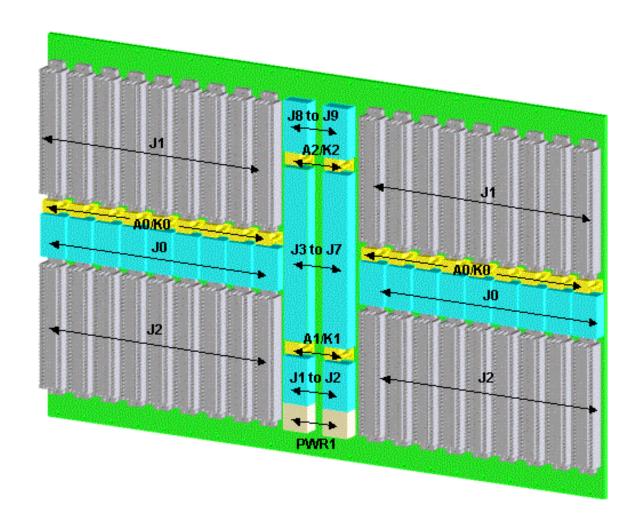
Example of a VXS Switch Card







Example of a VXS Backplane







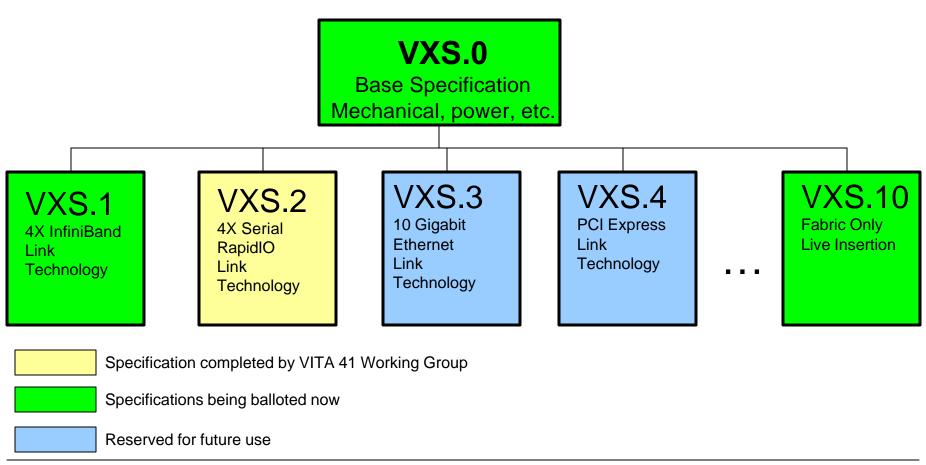
Goals 2&3: Accommodate multiple standard multi-GBps switched-serial link technologies, but not necessarily at the same time

- Specification is structured into multiple documents
 - VXS.0 base specification
 - Mechanicals, power
 - Payload slot & card definitions
 - Switch slot & card definitions
 - One or more "link technology" specifications
 - VXS.1 InfiniBand™ 4X link technology specification
 - VXS.2 Serial RapidIO[™] 4X link technology specification
 - VXS.3 Reserved for 10 Gigabit Ethernet links
 - VXS.4 Reserved for PCI Express links
 - Can add new link technology specifications built on the base specification





Structure of the VXS Specification







Goal 4: Pull Additional D.C. Power onto each VME card

- Accomplished by pulling additional current through the existing power pins on the existing P1 and P2 5-row connectors
- Done in this manner in order to maintain backward compatibility
- Based on extensive testing conducted by Harting
- Doubles the existing power limits on each payload card
- Bottom line power is no longer a limiting factor in VXS, cooling becomes the limiting factor





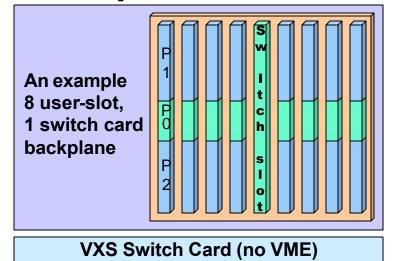
Goal 5: Maintain backward compatibility with the VMEbus Ecosystem

- VXS maintains the traditional 6U high, 160mm deep, Eurocard form factor
- VXS requires a new backplane to accommodate new P0 connector
- Legacy VME cards can plug into a VXS compliant chassis and should work on the VME parallel bus
 - Provided the legacy card does not have an old P0 connector
- VXS payload cards can plug into a legacy VME chassis and should work on the VME parallel bus
 - Provided the legacy chassis does not have an old P0 connector or some other obstruction in that position
 - Provided the chassis can supply the required power and cooling
 - In this scenario payload card will not have access to the switched serial interconnect





Example of VXS Backplane Wiring

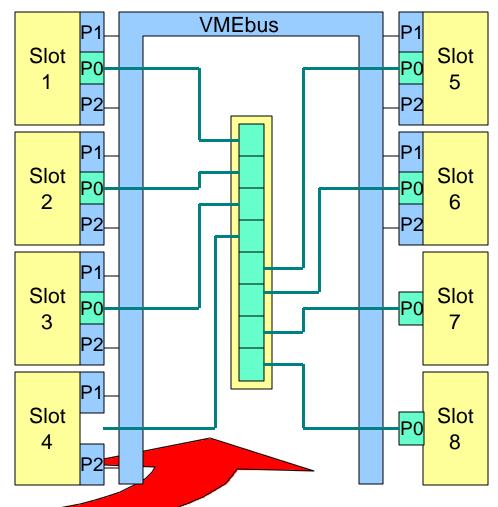


Slot 1 link Slot 2 link Slot 3 link Slot 4 link Switch Slot 5 link Slot 6 link

Slot 7 link

Slot 8 link

Logical connections to switch card







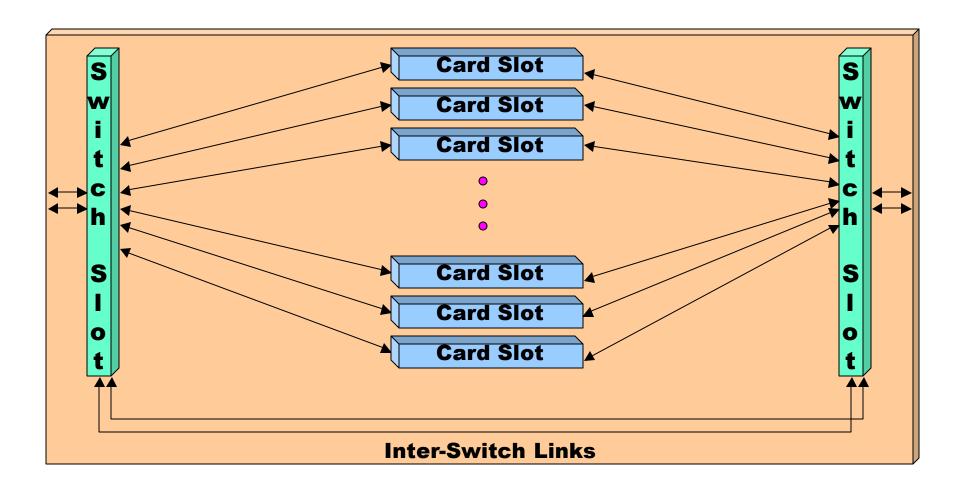
Specification is Topology Agnostic

- The specification does not mandate a specific topology
- Specification describes
 - Payload board and slot
 - Switch board and slot
- It is expected that most implementations will be either single or dual star
- However, using the specification the topologies that could be constructed include but are not limited to:
 - Dual star
 - Single star
 - Daisy chain, port A on card N to port B on card N+1
 - 2X2 mesh
 - Combinations of the above





Typical Topology: Dual Star with Inter-Switch and Inter-Chassis Links







Why VXS?

- VXS provides an infrastructure for multi-GBps switched serial technologies to compete and grow on top of VME
- Expected to extend the life of VME for decades
 - Part of the VME Renaissance
- Pro's
 - Very high bandwidth
 - Low latency
 - Increased scalability (as compared to a bus architecture)
 - Less contention (as compared to a bus architecture)
 - Experiment with switched serial under the safety of the parallel bus
 - Migrate from parallel bus to serial switched at one's own pace
 - Provides a platform for high availability systems hot swap





VXS Current Status

- VITA 41 (VXS) Working Group officially formed in the VSO (VME Standards Organization) in March, 2002
- Over 15 companies of various disciplines are actively participating in the working group
- Testing shows that high speed connector chosen works at 10 Gbps signaling rates per pair
- Download the current VITA41 specifications at
 - http://www.motorola.com/computer (click on VME Renaissance)





