



GlueX Electronics Telephone Meeting Jefferson Lab April 28, 2005

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Topic:

- VXS
- Flash ADC

VXS Crate Systems

The following slides are from the Motorola site.

- Many of the reasons for JLAB to use VXS are outlined
- We have developed the F1TDC using the VME64x standard
- Crate cost for a 12 slot VXS crate is \$6300
 - 12 slot VXS == 10 'payload' + 2 'switch' slots
- Present cost for a 20 slot VME64x [Wiener type] is \$7800
 - 21 slot VME64x with high power supplies, Ethernet monitor
- Envision 20 slot VXS crate to cost slightly more than what we pay for the Wiener type.

VXS Crate Systems

- VXS provides very good solutions for the ADC summing applications of Hall D, and a convenient method to distribute triggers and any clock/synchronization signals to each of the front end modules.
- Development and designs for the Flash ADC are not hindered by the selection of VXS.
- The custom switch modules and trigger modules will have to be designed for the VXS solution, but these designs are mandatory regardless of what backplane standard is used.
- JLAB DAQ group will [obviously] play an important role in the decision of what crate system to use, and VXS offers/supports the switched fabric protocols. E.g.(Gigabit Ethernet, RapidIO, Infiniband)

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

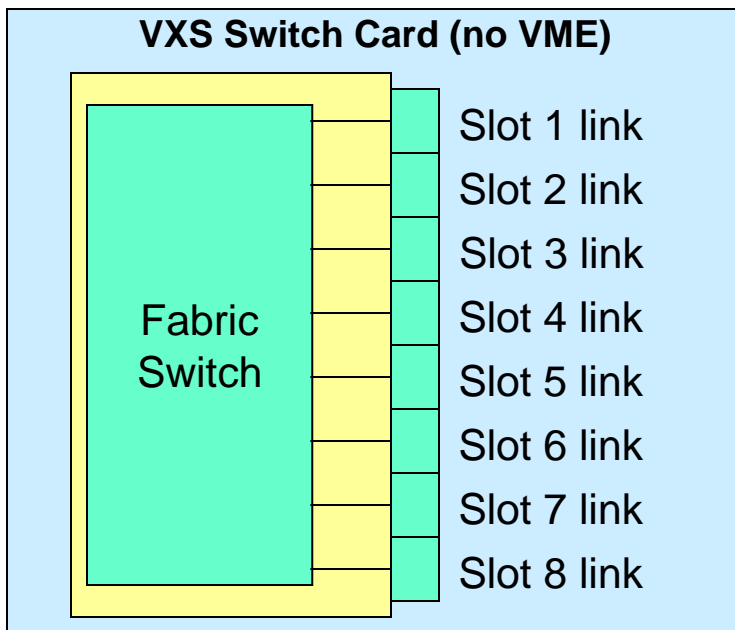
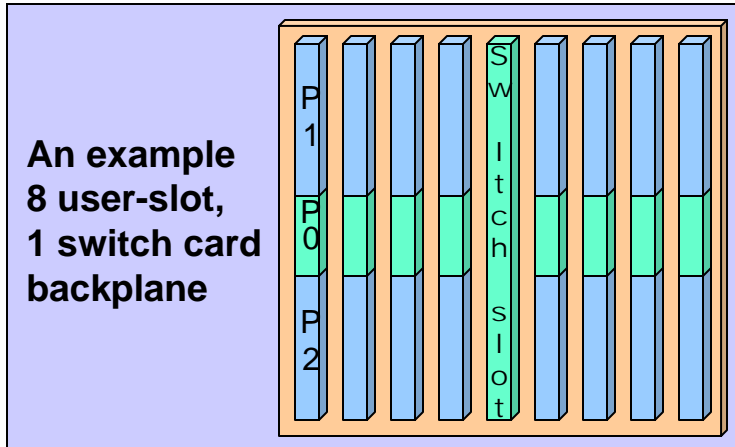
Goal 5: Maintain backward compatibility with the VMEbus Ecosystem

- 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**

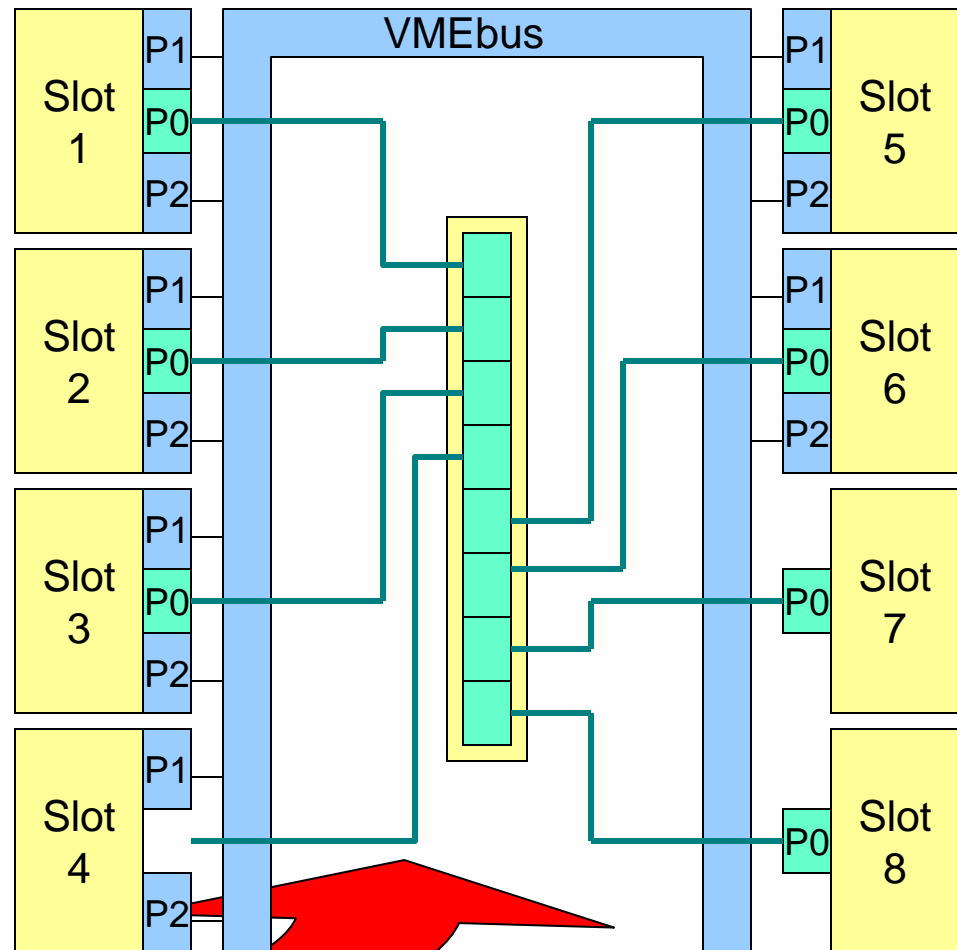
Specification is Topology Agnostic

- 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

Example of VXS Backplane Wiring

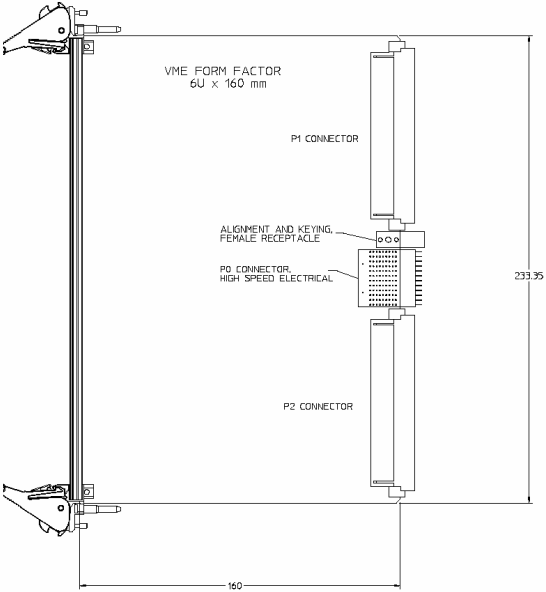
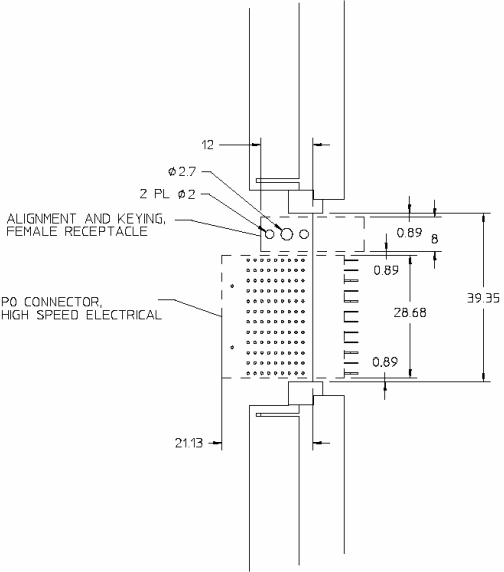
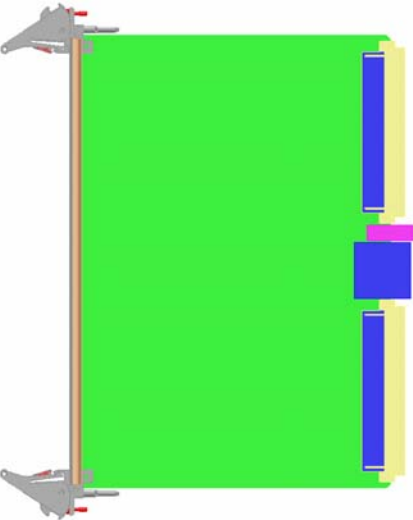
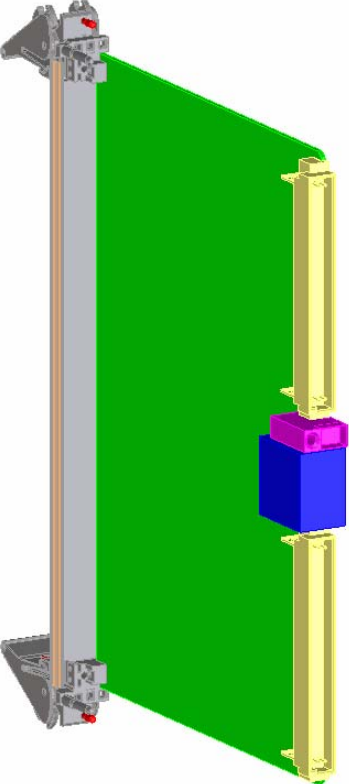
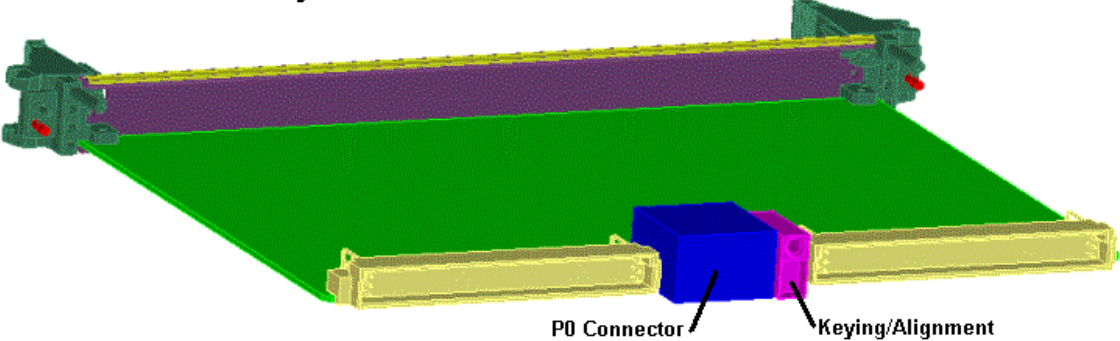


Logical connections to switch card

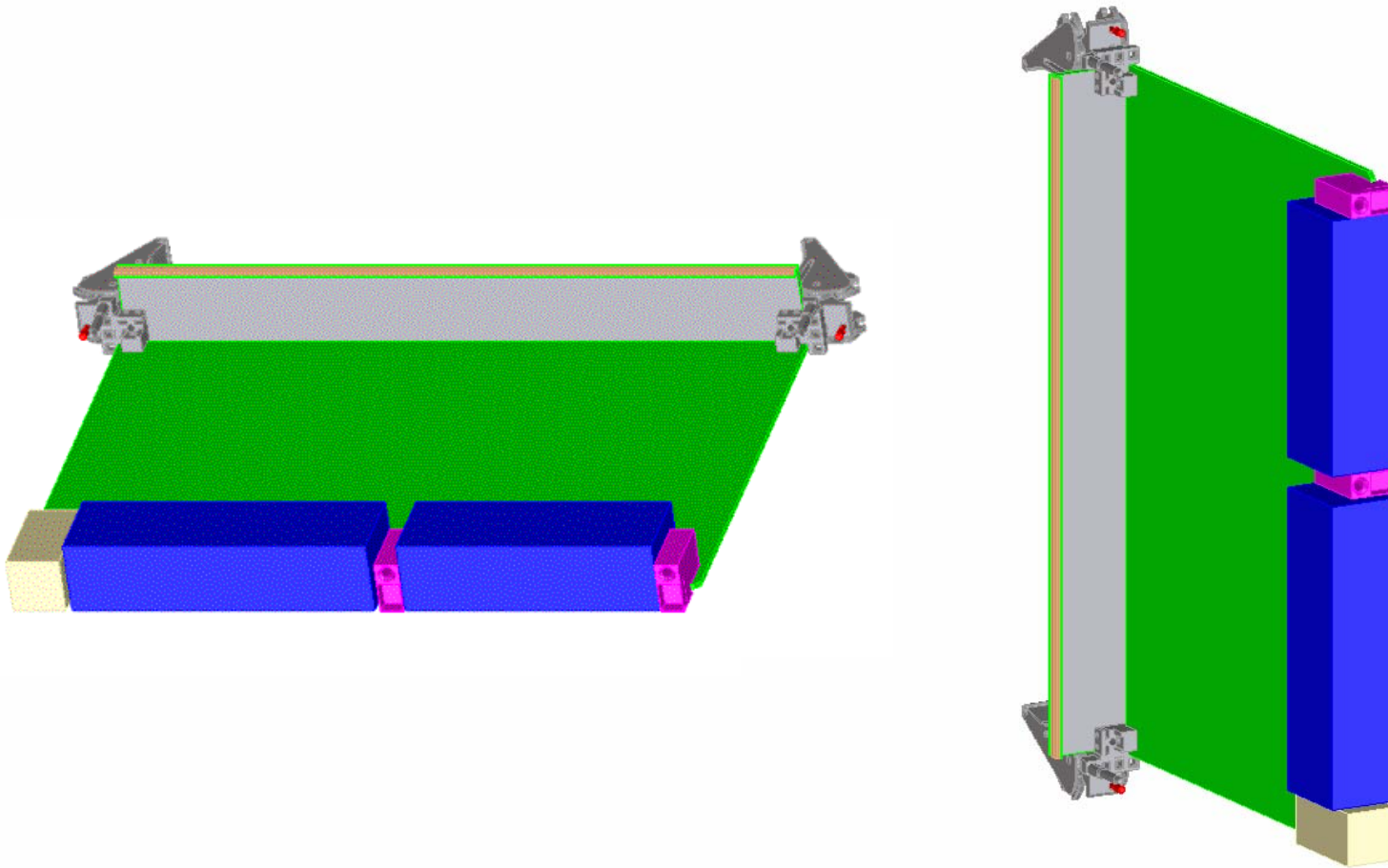


Example of a VXS Payload Board

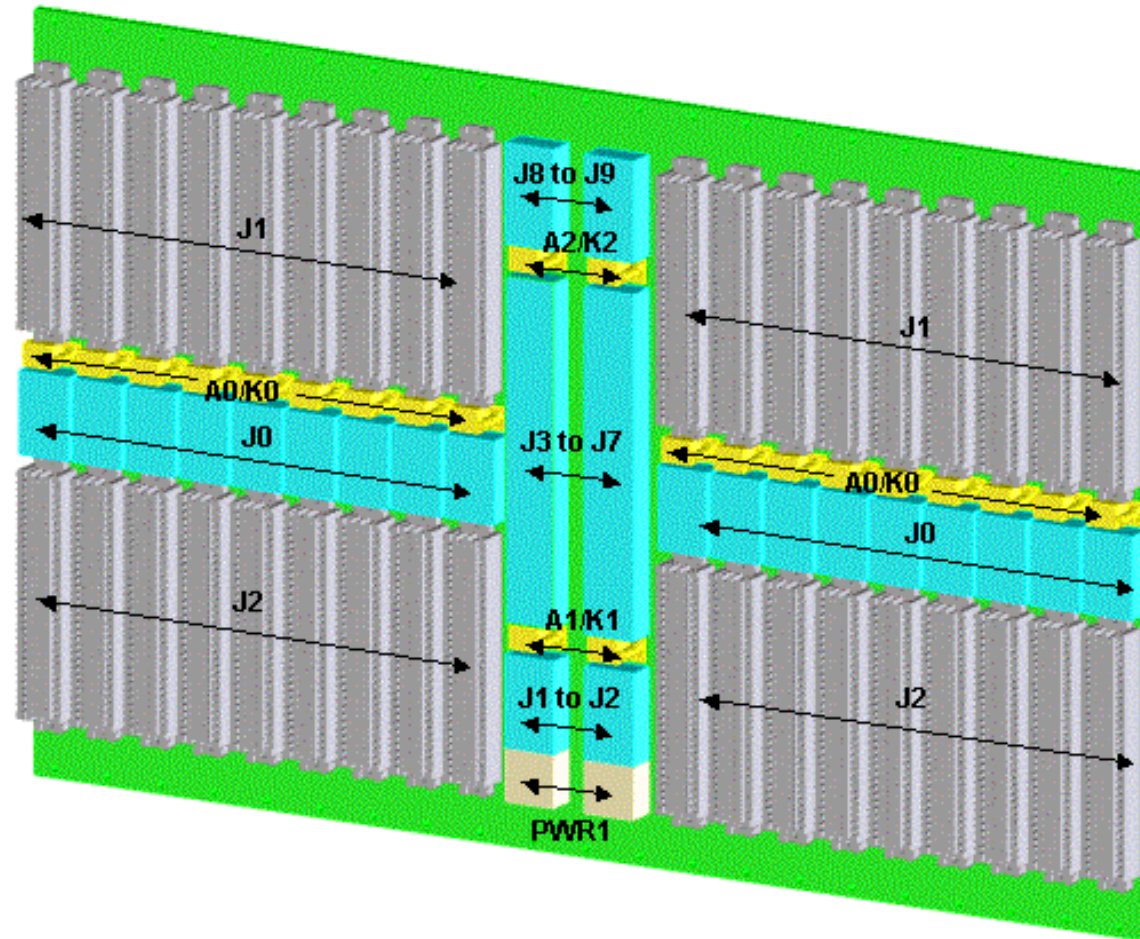
VXS Payload Board



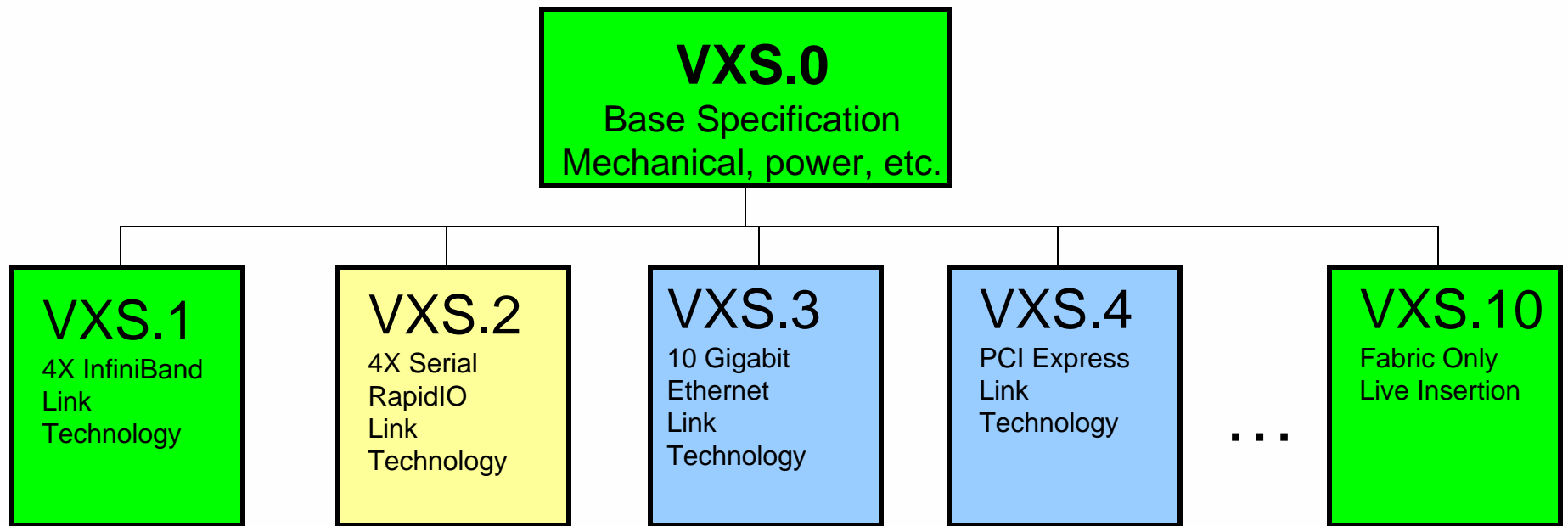
Example of a VXS Switch Card



Example of a VXS Backplane



Structure of the VXS Specification

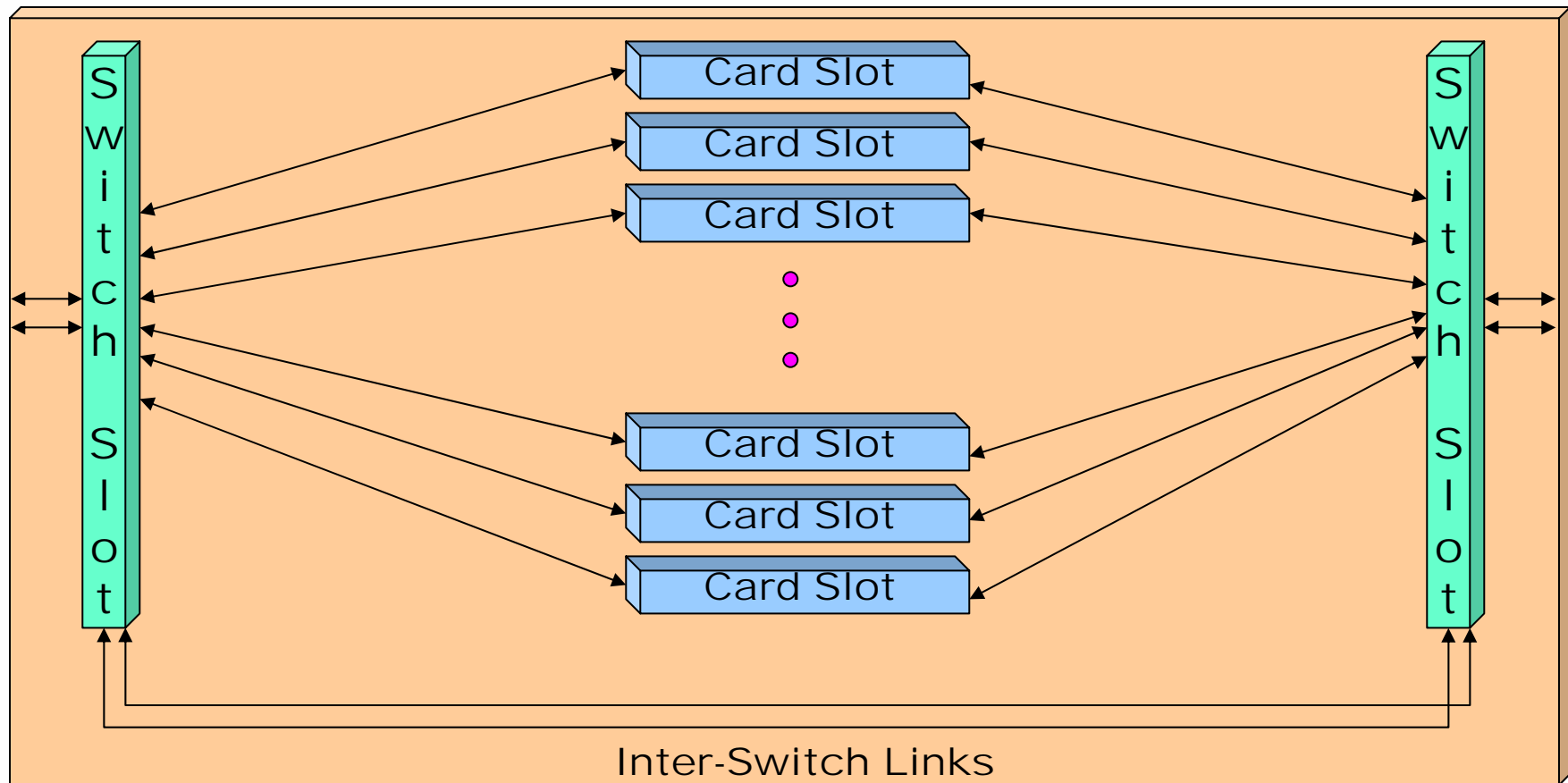


 Specification completed by VITA 41 Working Group

 Specifications being balloted now

 Reserved for future use

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



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)