A Modern Yet Traditional Approach to Embedded Systems
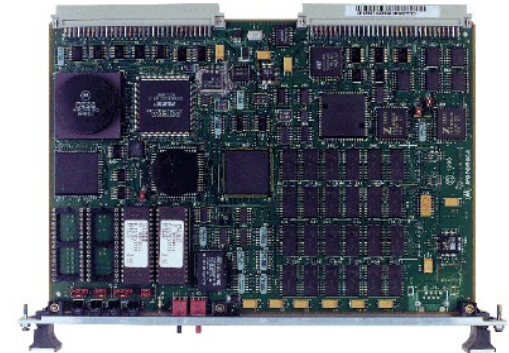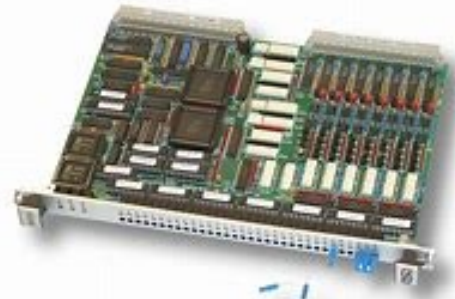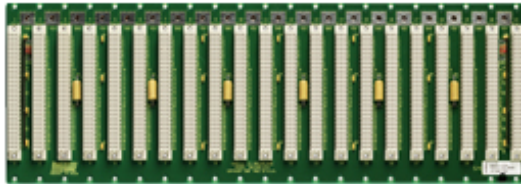
Dave Caserza

Embedded Computing Architect

2019 Embedded Tech Trends

Turn the Clock Back 30 Years to 1989…

System Integration Gained Popularity

VME & CPCI Ecosystems Shrinking

- **Suppliers are discontinuing products**
  - Components are going EOL
  - Declining sales due to need for VPX performance levels
  - A few suppliers have gone out of business

OpenVPX Making Great Strides

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- **Filling need for HPEC**
  - High performance SBCs
  - High performance FPGAs, A/D, D/A, GPGPU
  - High performance interconnect: PCIe, Ethernet, others
  - Well suited for very rugged applications

- # But…
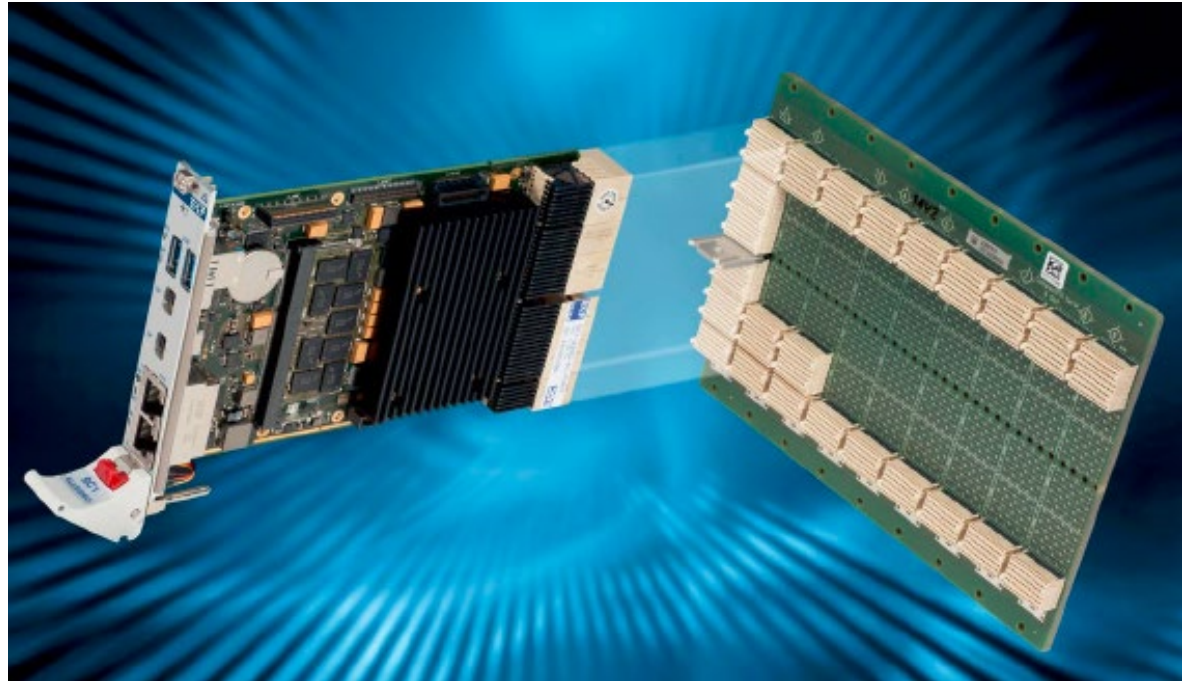
OpenVPX is Not for Everyone

- **Some applications don't need the performance**
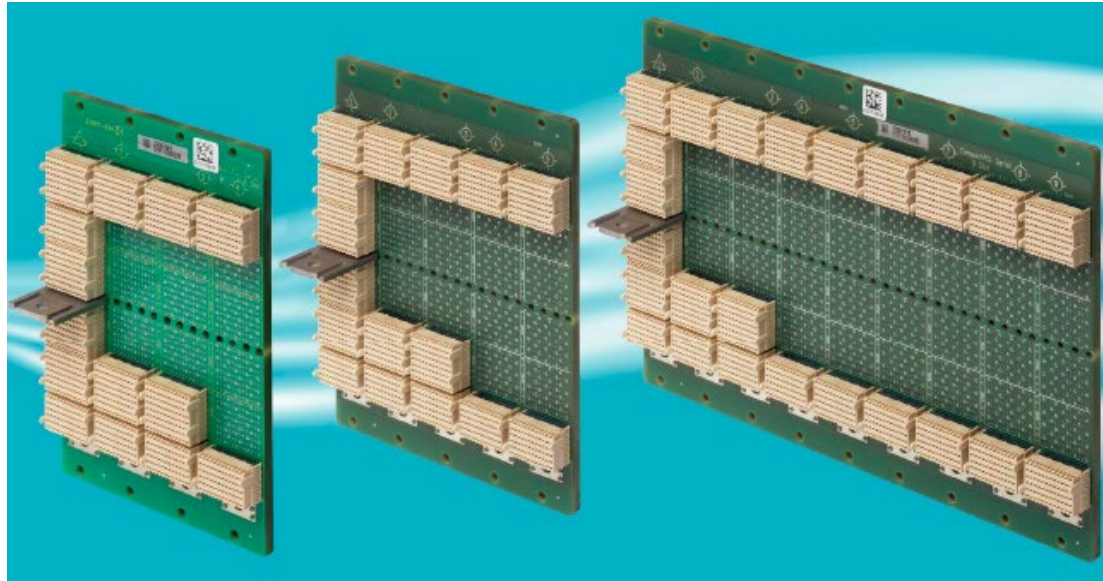- **VPX too expensive for modest performance applications**
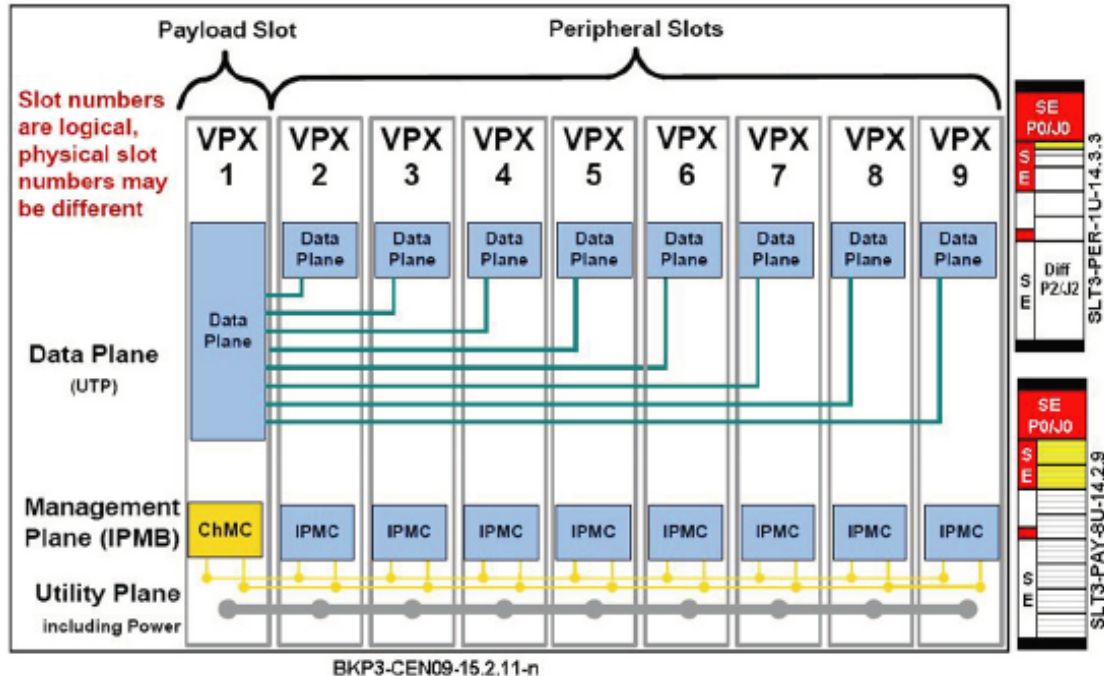
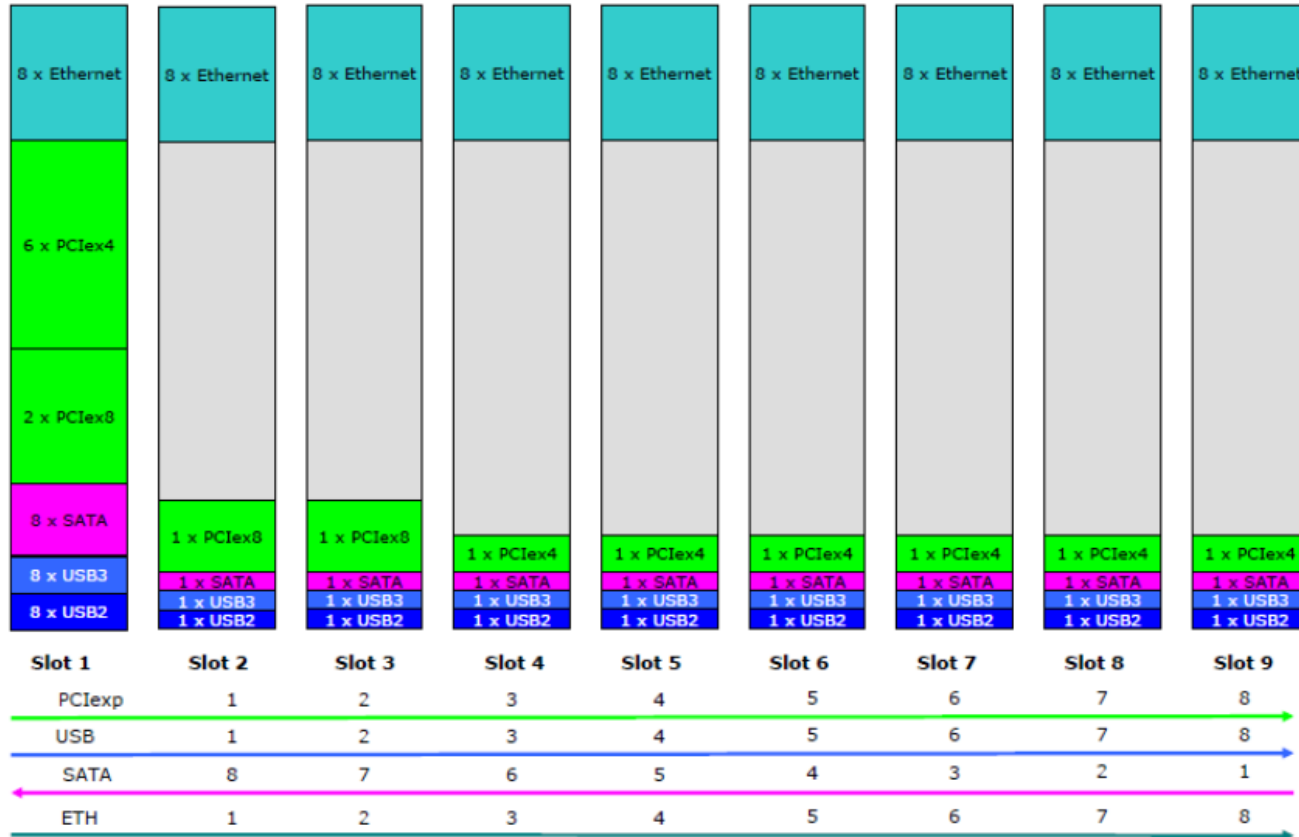# A Modern Technology for Simpler Needs

CPCI-Serial Backplane

- **Up to 9-slots**

- **Single Star or Full Mesh**

- **Hybrid with classic CPCI slots is possible**

CPCI Serial Backplane Topology - Mesh

	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9
PCIexp		1	2	3	4	5	6	7	8
USB		1	2	3	4	5	6	7	8
SATA		8	7	6	5	4	3	2	1
ETH		1	2	3	4	5	6	7	8

CPCI Serial Backplane Topology - Star
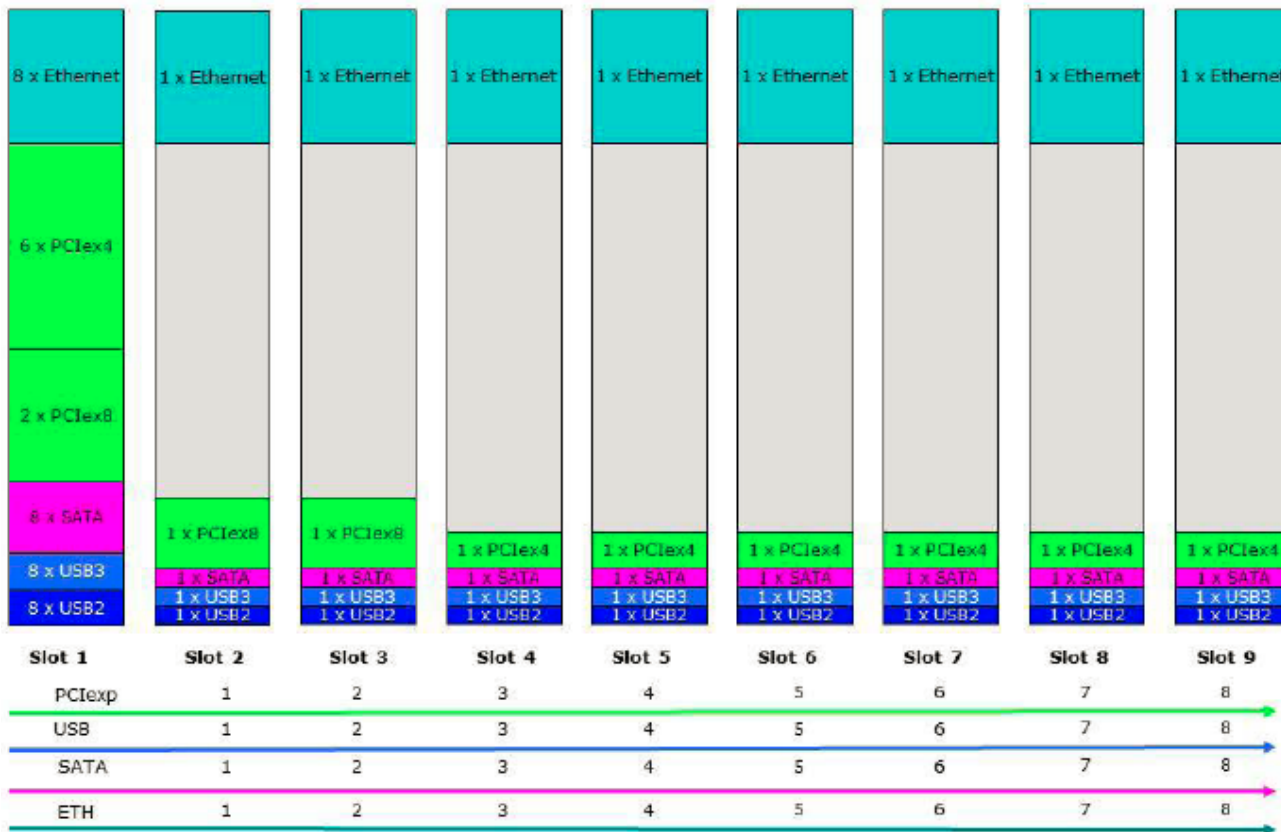
CPCI Serial Board Examples

- **Single Board Computer**

- **Serial I/O**

- **USB I/O**

- **Digital I/O**

- **Motion control**

- **Frame Grabbers and GPUs**

- **Ethernet Controller**

- **Ethernet Switch**

- **SATA and nVME storage**

- **XMC and PMC carriers**

- **PCIe carriers**

- **PCIe expansion**

- **Others…**

CPCI Serial Chassis Examples

Some of the CPCI Serial Ecosystem

- **ADLink**
- **Advantech**
- **Eltec**
- **EKF**
- **Elma Electronic**
- **Eltec**
- **Fastwell**
- **Harting**

- **Kontron**
- **MEN Micro**
- **nVent Schroff**
- **Pixus Technologies**
- **…and growing**

The Future is Now!

- **Futurebus – "VME is going away" – didn't happen**

- **CPCI – "VME is going away" – didn't happen**

- **Etc, etc…**

- **2019: VME is going away!!!**

  – Slowly – still a lot of legacy designs in production

  – Very few new designs using VME (or classic CPCI)

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