

A Cauldron of Fixins for VPX Wizardry

michael munroe

January 2017



VPX – History 10 Years Young

ATCA released – 2002

VITA 46 concept – 2003

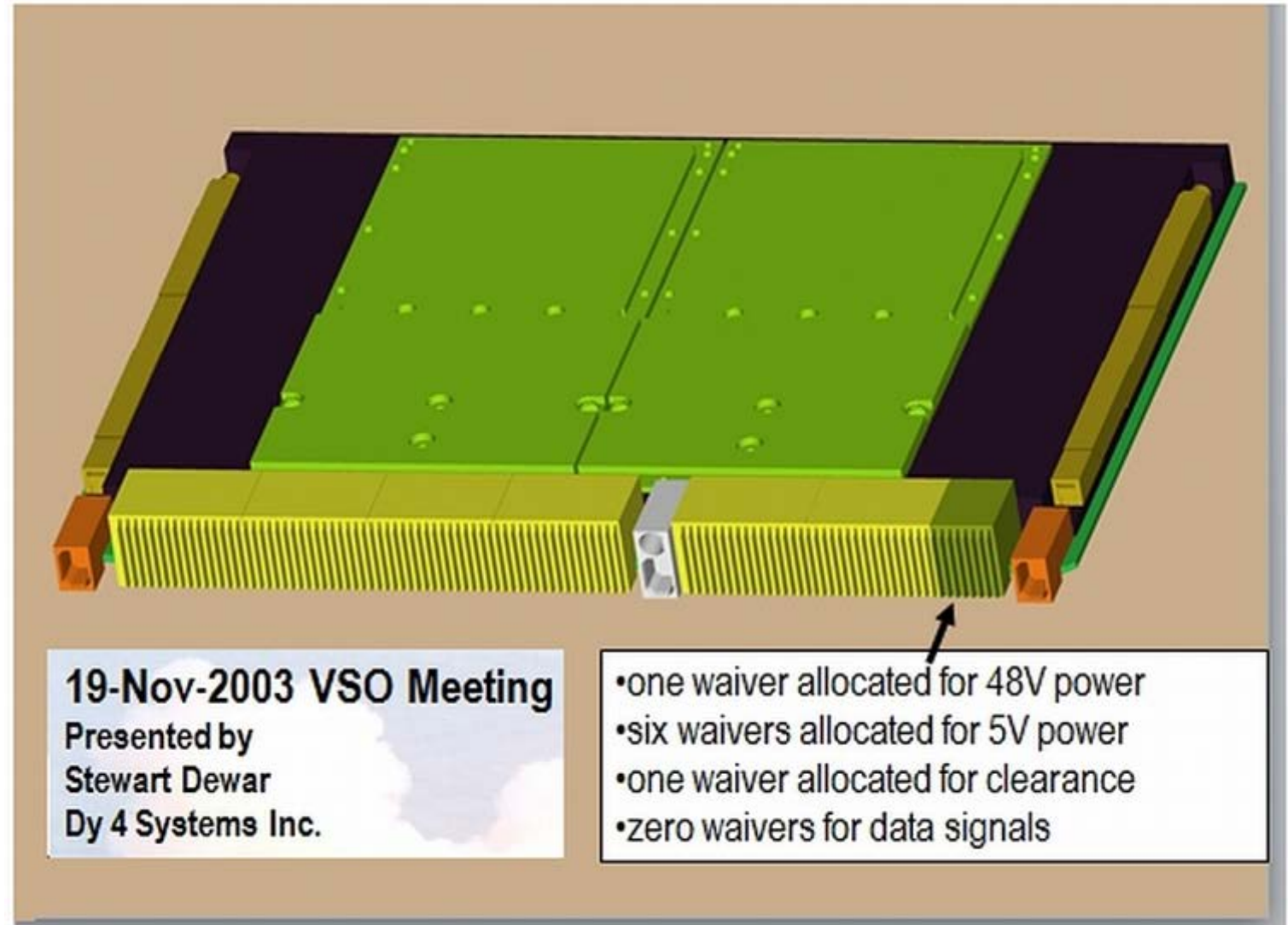
VITA 46 released – 2007

VITA 65 released – 2010

VITA 65 updated – 2012

VITA 46 updated – 2013

VITA 65 updated – 2017



Fabric List

1. Infiniband (2.5, 5, 10Gb/s), also (
2. RapidIO (serial and parallel) URL
3. Starfabric (Stargen) (single and mu
4. PICMG 2.16, Ethernet Backplane are 1.25, 10, 100Gbs, including p
5. PLX Ring (PLX Technologies)
6. Broadcom (10 Gb/s ethernet) [http://](#)
7. Vitesse (Cross-Stream-E) (Giga S
8. 3GIO (Intel)
9. Hypertransport Bus (AMD)
10. Gigastar (Inova Semi in Germany)
11. TI PCI-to-serial LVDS (no crossl
12. Fairchild LVDS (not yet announce
13. Primarion (Phx, AZ) optical fabric
14. 1394b (1.6, 3.2Gbs)
15. USB 2.X (0.48, x.xGbs)
16. On Semiconductor (C
17. Mindspeed (iScale) 1
18. Tachys (French Unive
19. Packet Routing Switc
20. Power-X (Mancheste
21. Gennum (Canada) ser
22. Internet Machines: N
23. MMC/AMCC (OC-4
24. Fibre Channel (1.0625, 2.125, 4.25, 8.5
25. Serial ATA (1.5, 3.0, 6.0Gbs)
26. Scalable Serial I/O (no details as yet)
27. Server Net-II (1.25Gbs)
28. cLAN (1.25, 2.5Gbs)
29. ATM (2.5Gbs), also (10, 40 Gb/s multi
30. SONET (2.5Gbs)
31. OIF (10, 40Gbs)
32. SCI IEEE-1596

Ethernet – 1979
Hays Modem – 1981
VMEbus – 1981
VITA – 1982

ATCA – 2002
IBM Blade Center – 2002
PCI Express – 2004
VITA 41 – 2006
VITA 46 released – 2007
Open Compute – 2013
VITA 65.1 – 2017

Ray Alderman 1/11/2004 VITA

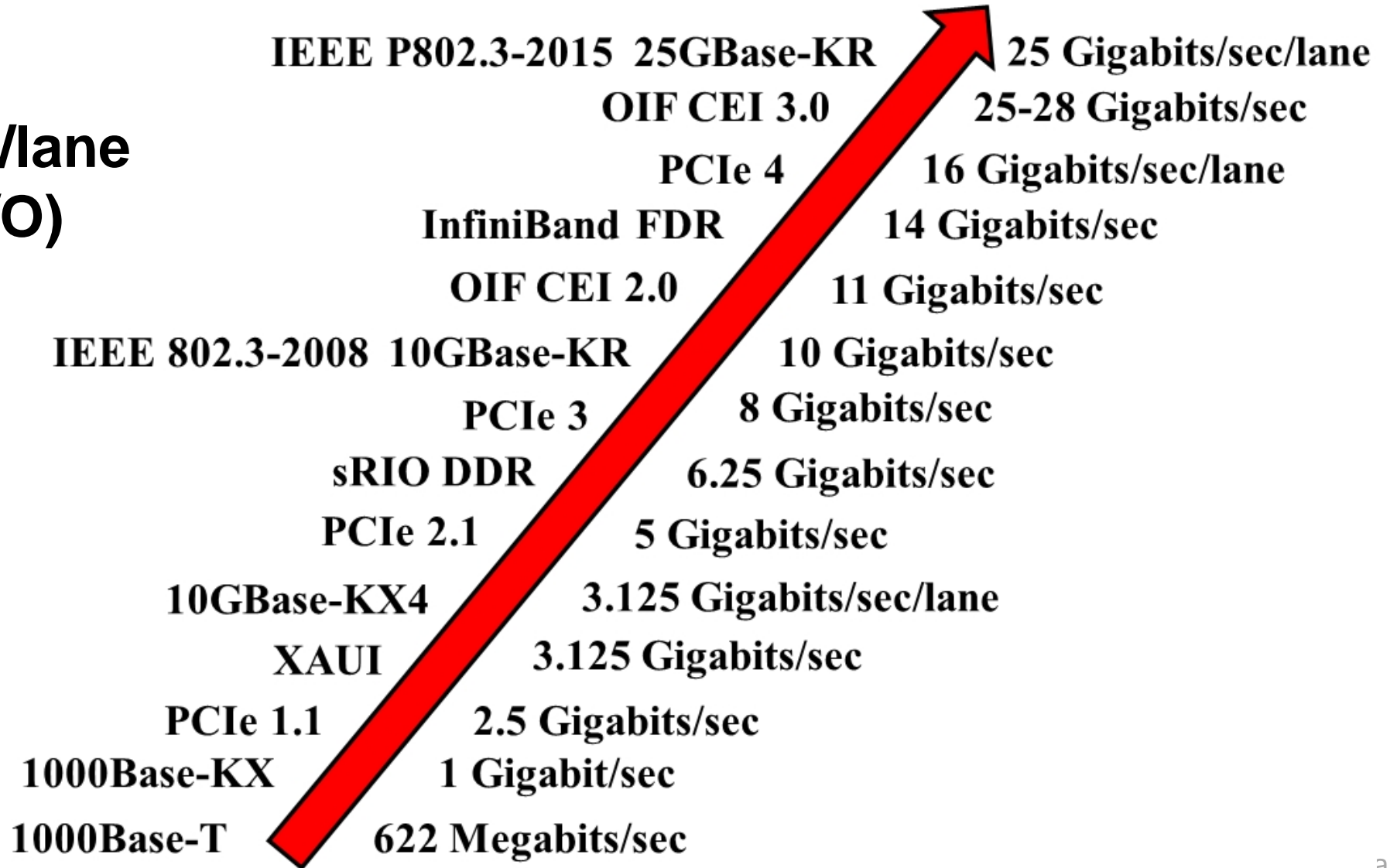
32. SCI IEEE-1596
33. HULC
34. Channel Link
35. Panel Link
36. DVI-1, DVI-
37. SCSI (160, 32
38. HIPPI-6400 P
39. Synfinity paral
40. F-16 (Intel Bu
41. Parallel ATA

42. Hyperchip (Petabit Routing Company, Canada) http://www.hyperchip.com/pres_rel/010529_unveil_router.htm
43. Myrinet (2+2 Gb/s) <http://www.myri.com>
44. Raceway (Mercury Computer) <http://www.mc.com/plusplus/>
45. Skychannel (Sky Computer)
46. PI-40 (Agere) (OC-768c multi-terabit down to 10Gb/s) <http://www.lucent.com/micro/NEWS/PRESS2001/060401f.html>

47. Hotlink (Cypress Semi) 3-4 years old
48. TAXI
49. FPDP and Serial FPDP
50. G-link (Hewlett-Packard)
51. SBS Technologies: data <http://www.sbs.com/con>

55. ESCON (IBM) Mainframe Channel Switching Fabri
56. Wildcat (Accelerant Networks) <http://www.ecnmag.com/ecnmag/issues/2001/04012>
57. Velio http://www.velio.com/corporate/corporate_pr
58. PMC-Sierra <http://www.pmc-sierra.com/products/details/pm530/>
59. iCube http://www.icube.com/News/body_msx340pi
60. Quadrics QsNET <http://www.quadrics.com>
61. GeodeLink (Natl Semi) <http://article.ElectronicNew>
62. QuickSD (QuickLogic) an LVDS-based soft (progra

**VITA 57.4
FMC+ 28Gbps/lane
(FPGA GP I/O)**



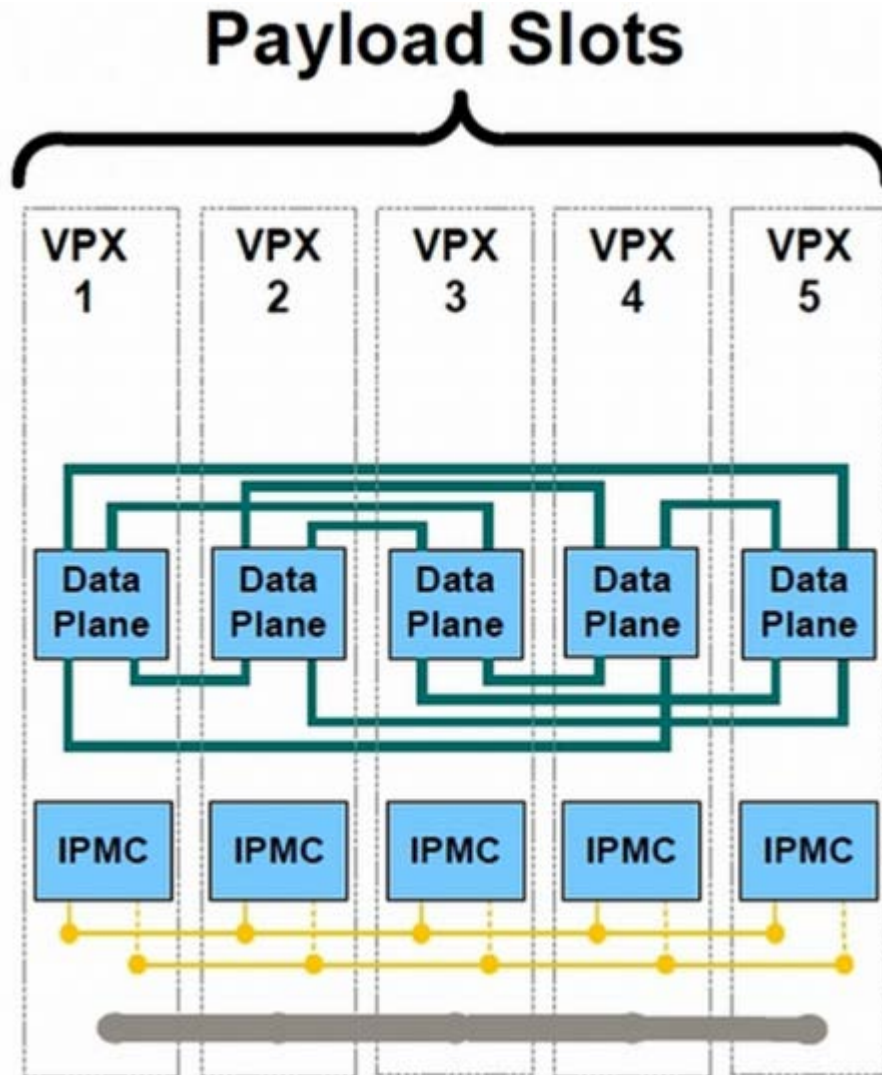
3U and 6U VPX Backplane Topologies

2007 – 1

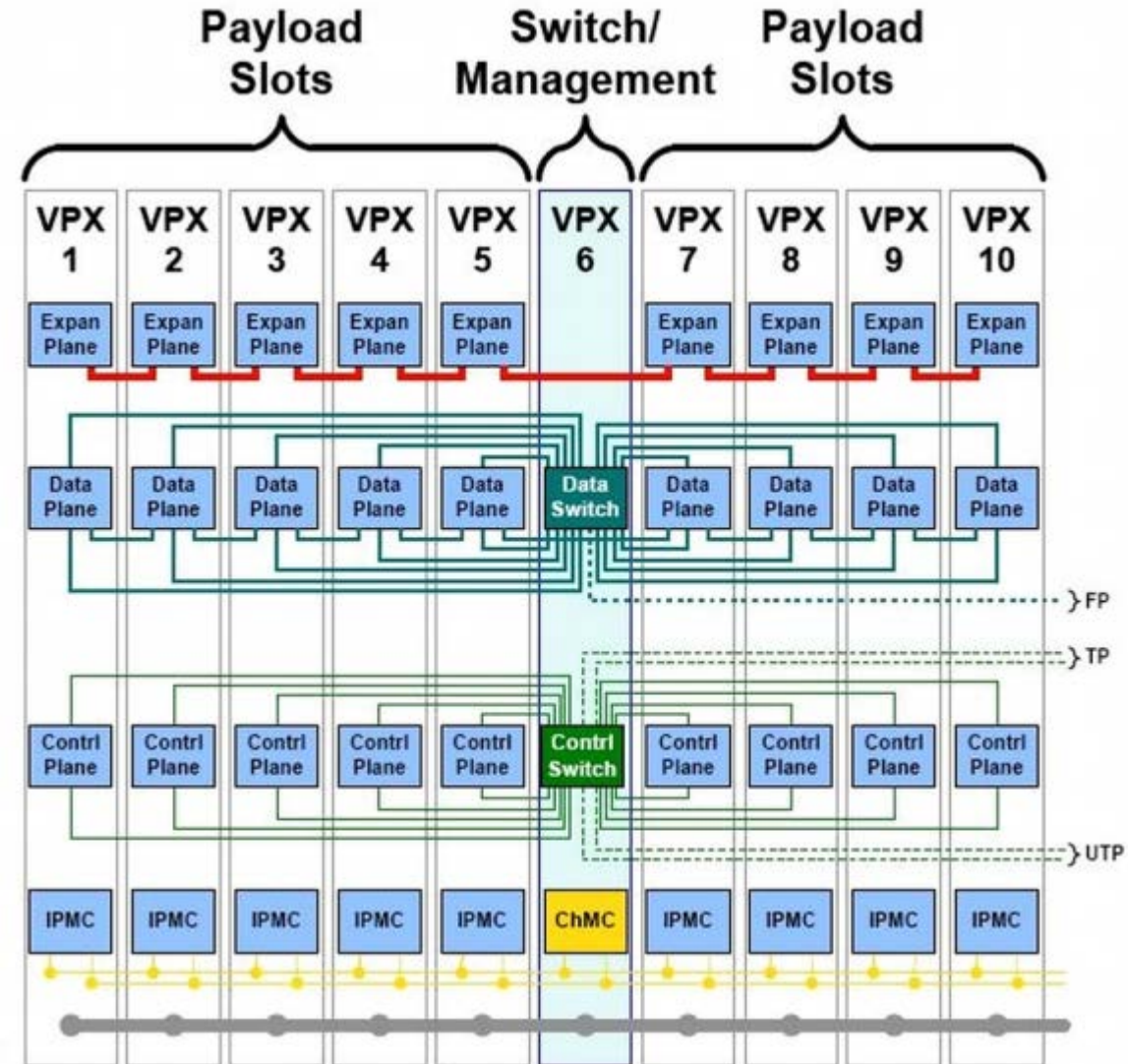
2010 – 28

2012 – 37

2017 – 51



Distributed Meshes



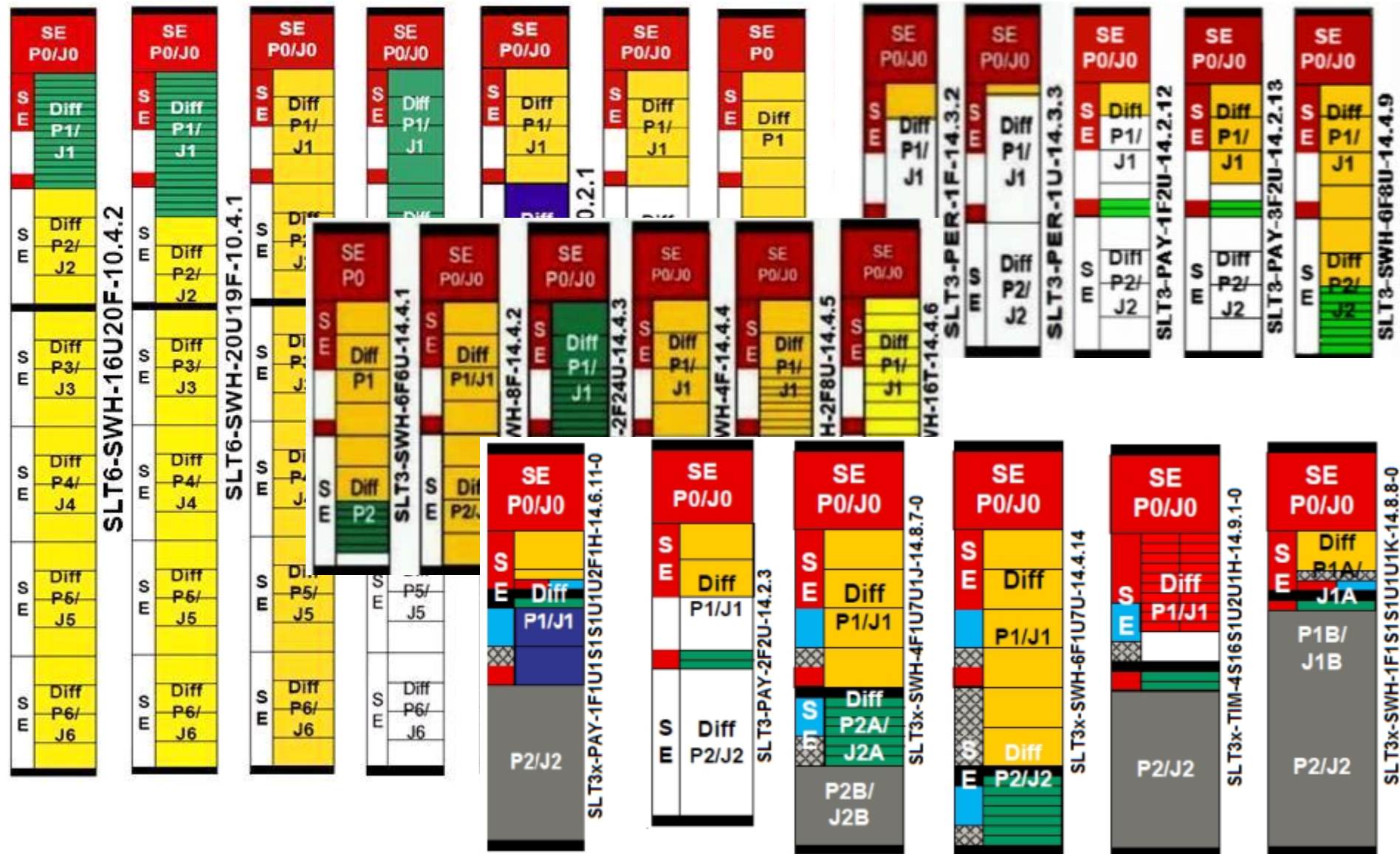
Central Switched

3U and 6U VPX Slot Profiles

2010 – 36

2012 – 47

2017 – 81



Vibrant Ecosystem

31 suppliers (many with extensive product lines due to acquisition of multiple smaller companies)
Also many prime contractors have built their own cards.

Abaco (4DSP Radstone)

Acromag

ADLink

AiTech

Alpha Data

Annapolis Micro

ApiSys

Artesyn

Atrenne

Behlman

ComAgility

Concurrent

CWECC (Transtech, Vmetro)

DRS

DRTi

Dyatem

Elma Electronic

Extreme Engr Solutions

General Dynamics

General Standards

Interface Concept

Kontron

Mercury (CES)

North Atlantic

Parsec

PciSystems

Pentek

Pixus

Themis

Vadatech

Wolf Industrial



- Existing Ecosystem of XMC/PMC cards
- FMC/FMC+ mezzanines to extend features



- **Small but growing number of suppliers offering VITA 62 Power Supplies**
- **At least two suppliers of VITA 46.11 Shelf Managers**

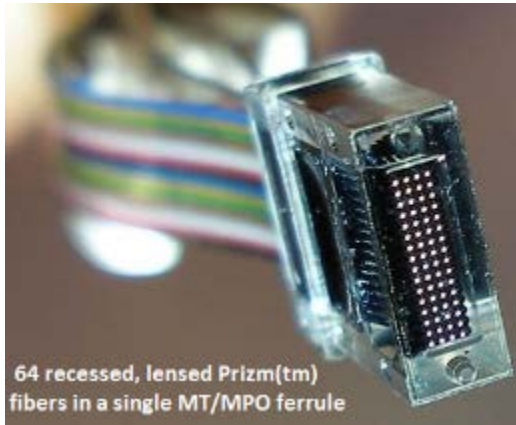


- **VITA 49 and the Modular Radio Frequency Architecture (MORA)**
- **will offer software defined radio cards (SDR) and other advanced electronic warfare (EW) solutions.**
- **Victory Architecture – approved standard interface and system software**
- **NAVAIR – HOST Specification offers increased levels of interoperability**



VITA 66.1/.4 Optical Backplane Modules

Bandwidth capability, flexible slot-to-slot links and versatile I/O

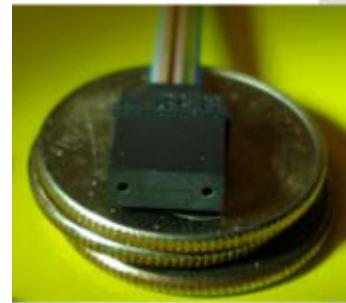


Prototype VITA 66.4 Receptacle (backplane) connectors

MT Ferrule
1 row x 12 fibers

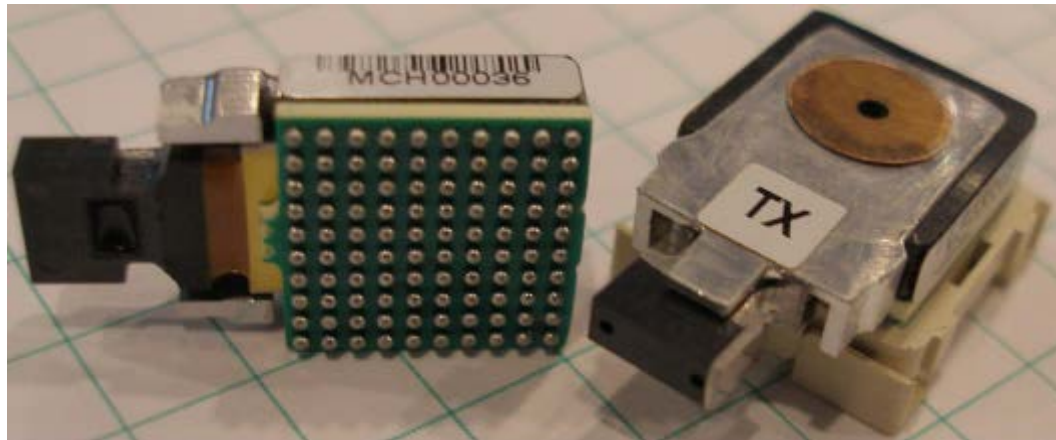


Front of Backplane

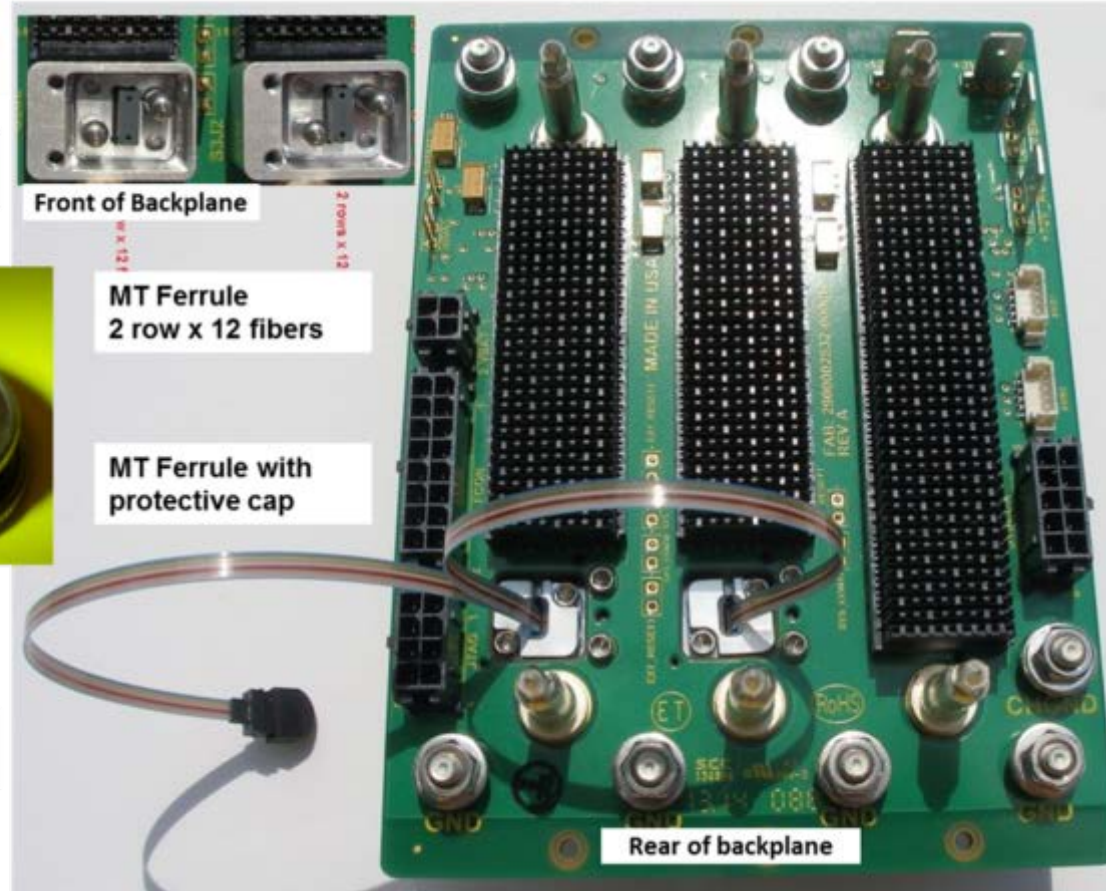


MT Ferrule
2 row x 12 fibers

MT Ferrule with protective cap



MT Ferrule
1 row x 12 fibers

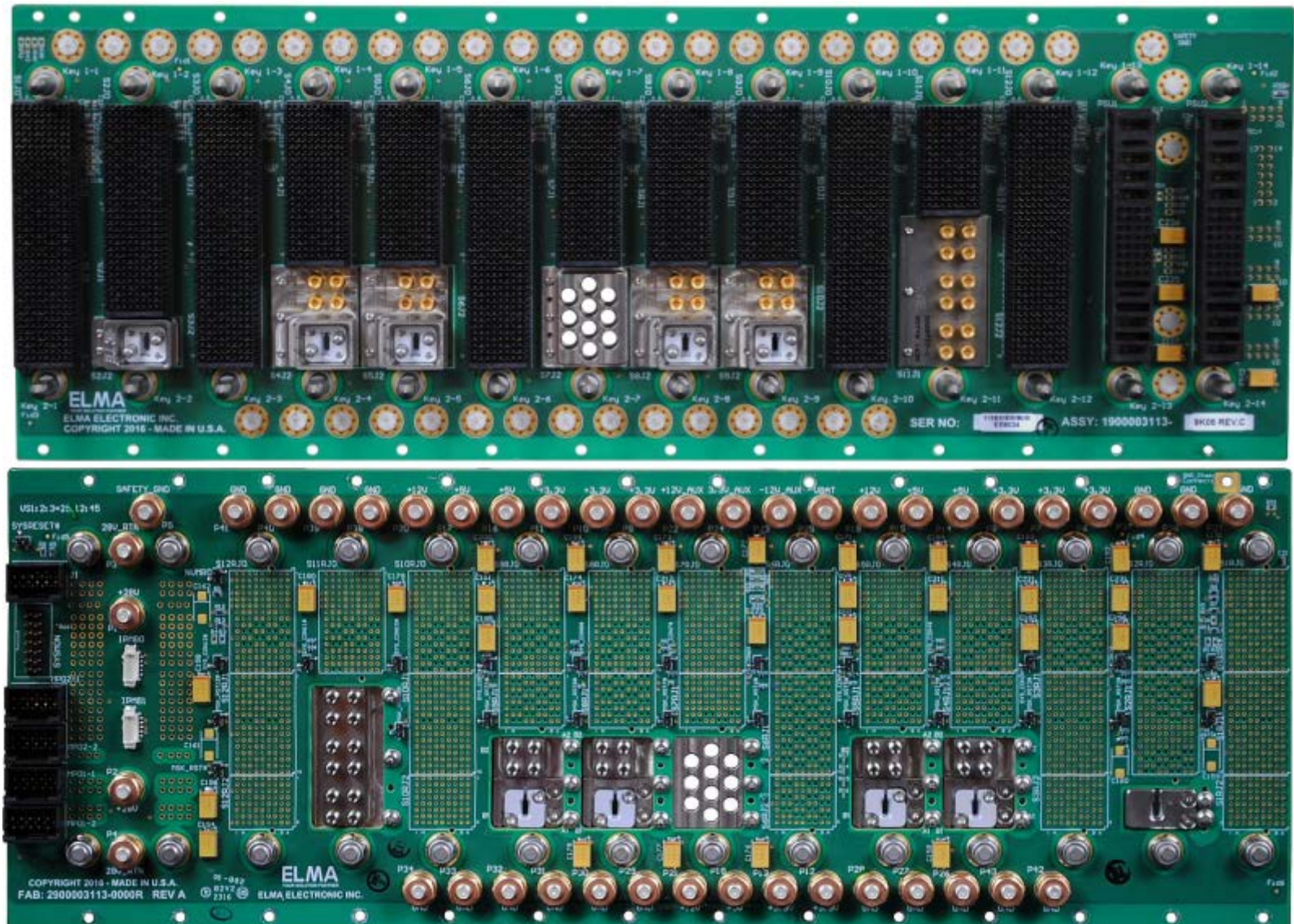


Rear of backplane

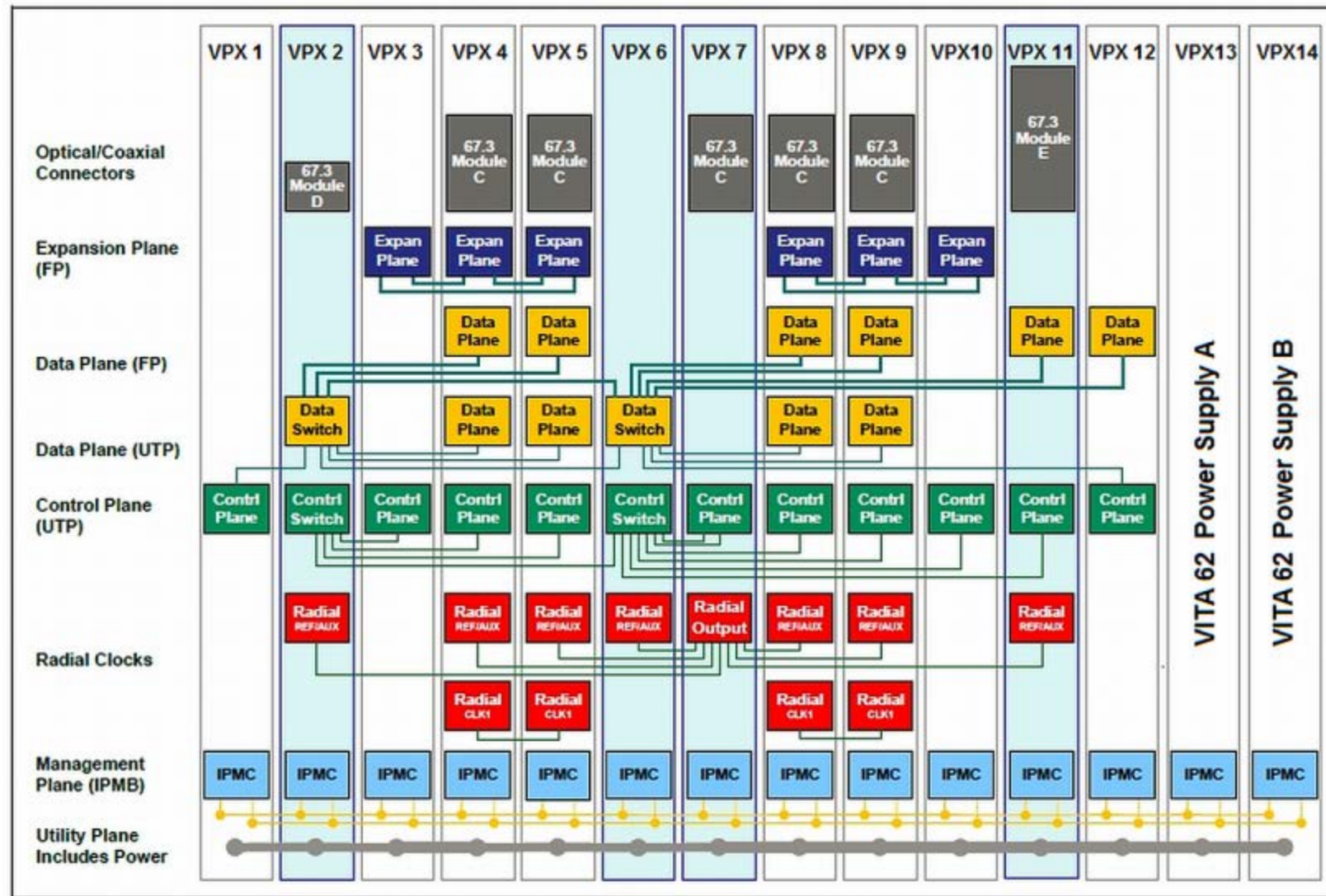


Complex High Performance Convergence Backplane

- 10GBase-KR Data Plane
- 10GBase-KR Control Plane
- Expansion Planes
- Radial Clocks
- Optical Modules
- RF Modules
- RF Switch Module
- VITA 62 Power Supplies



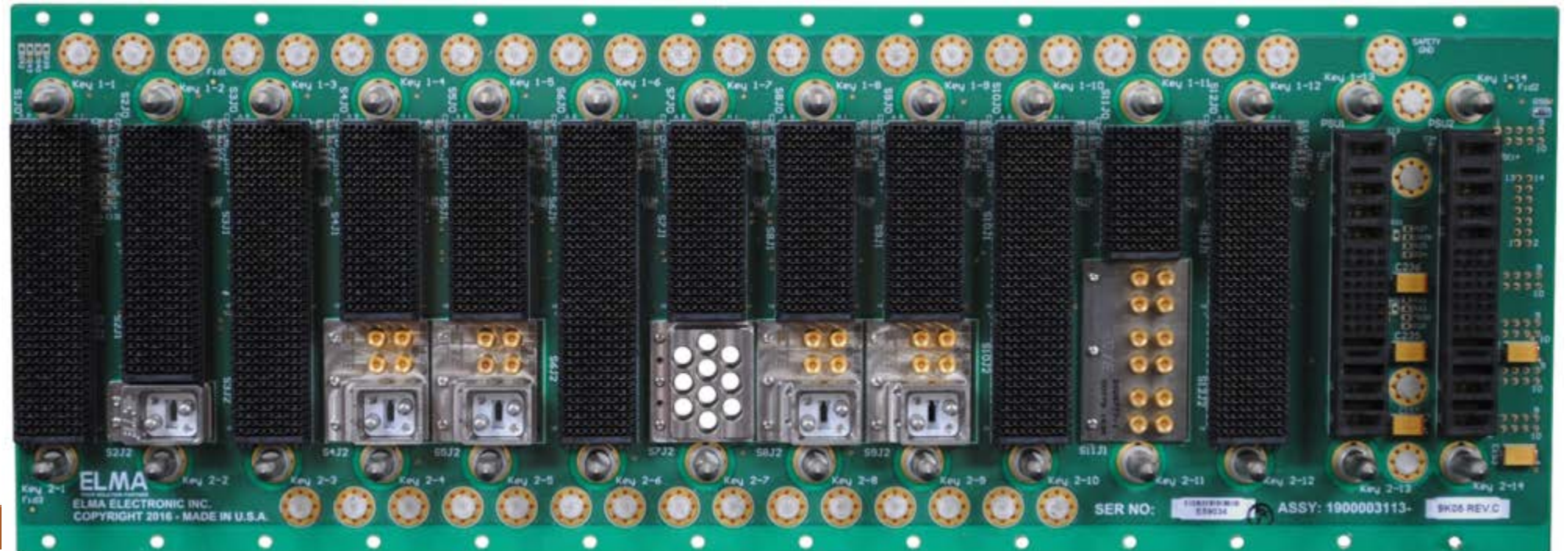
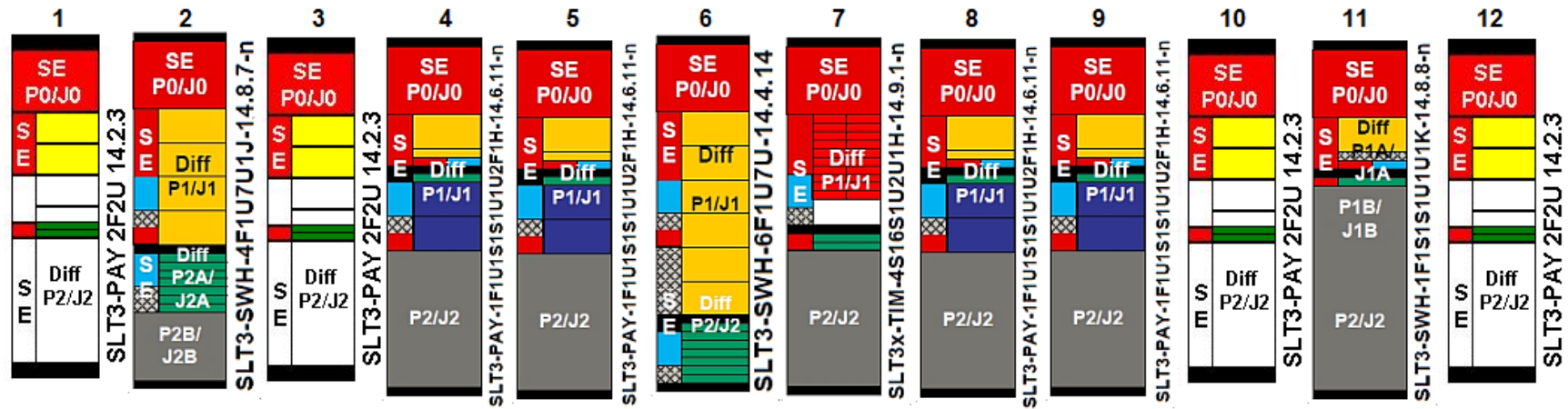
Complex High Performance Convergence Backplane



BKP3-TIM12-15.3.6-n CERDEC Convergence Backplane



BKP3-CEN-12-15.3.6



Ecosystem including many:

- Single Board Computers
- VITA 46.10 Rear Transition Modules (RTMs)
- Switch Cards
- FPGA Cards
- PMC/XMC Mezzanine Cards
- FMC and FMC+ Mezzanine Cards
- VITA 62 Plug In Power Supplies
- VITA 46.11 Shelf Management (2013/2015)
- VITA 49 Software Defined Radio MORA (2009-2015)
- Victory Architecture
- HOST Architecture
- VITA 67.1/.2
- VITA 66.1/.4
- Radial Clocks



Thank you for your time!

