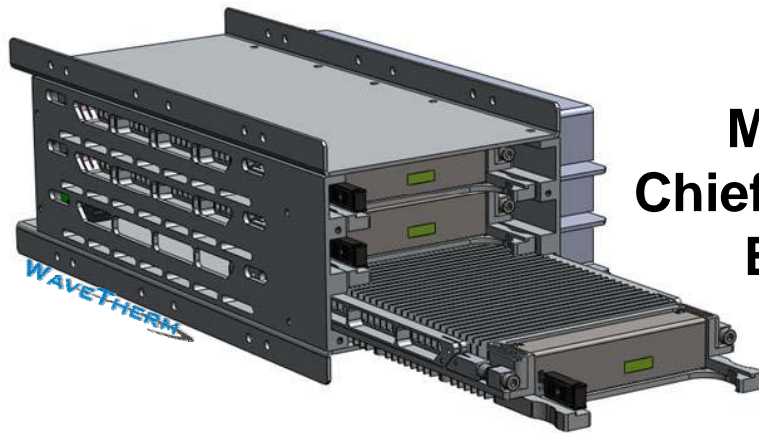
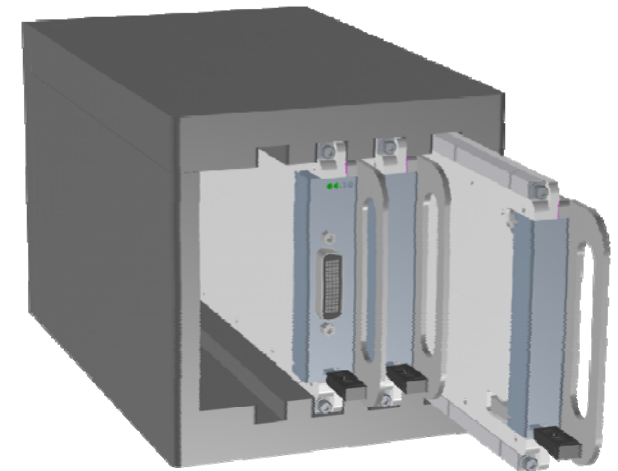


Hardened MicroTCA Gains Momentum



Proposed MicroTCA.2

Mark Leibowitz
Chief System Architect
BAE Systems



MicroTCA.3

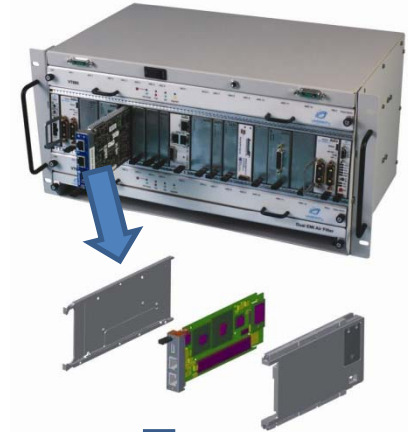
Advanced/MicroTCA Summit
November 2, 2011
Session 2-202, 10:00AM

Hardened μ TCA[®]

MicroTCA for Harsh/Military Environments

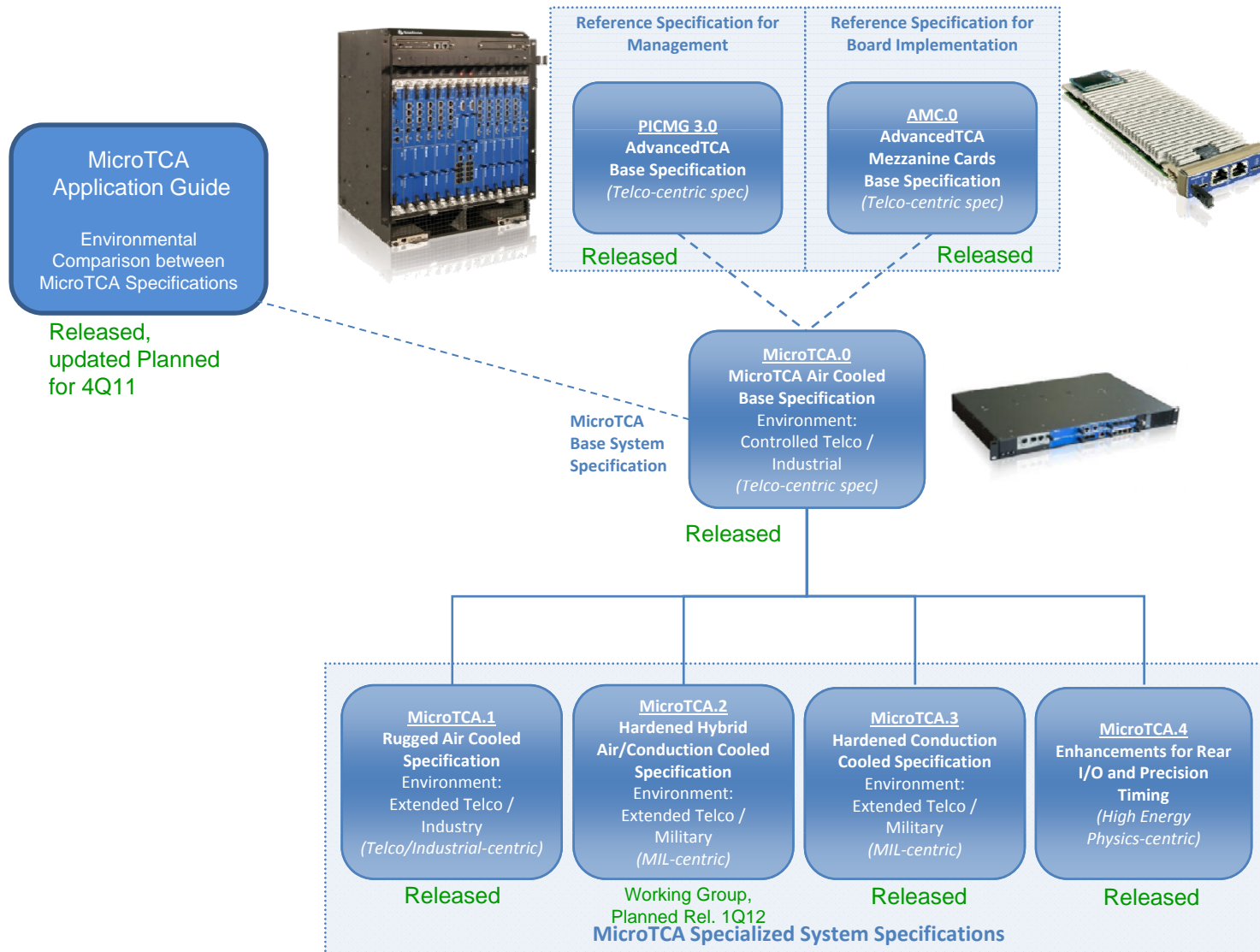
Agenda

- State of Hardened MicroTCA Specifications
- MicroTCA.3 Specification
- MicroTCA.2 Specification
- MicroTCA.2 vs. MicroTCA.3
- Hardware Platform Management



Hardened μ TCA[®]

State of Hardened MicroTCA Specifications



Excerpt from MicroTCA application Guide, version 1.0

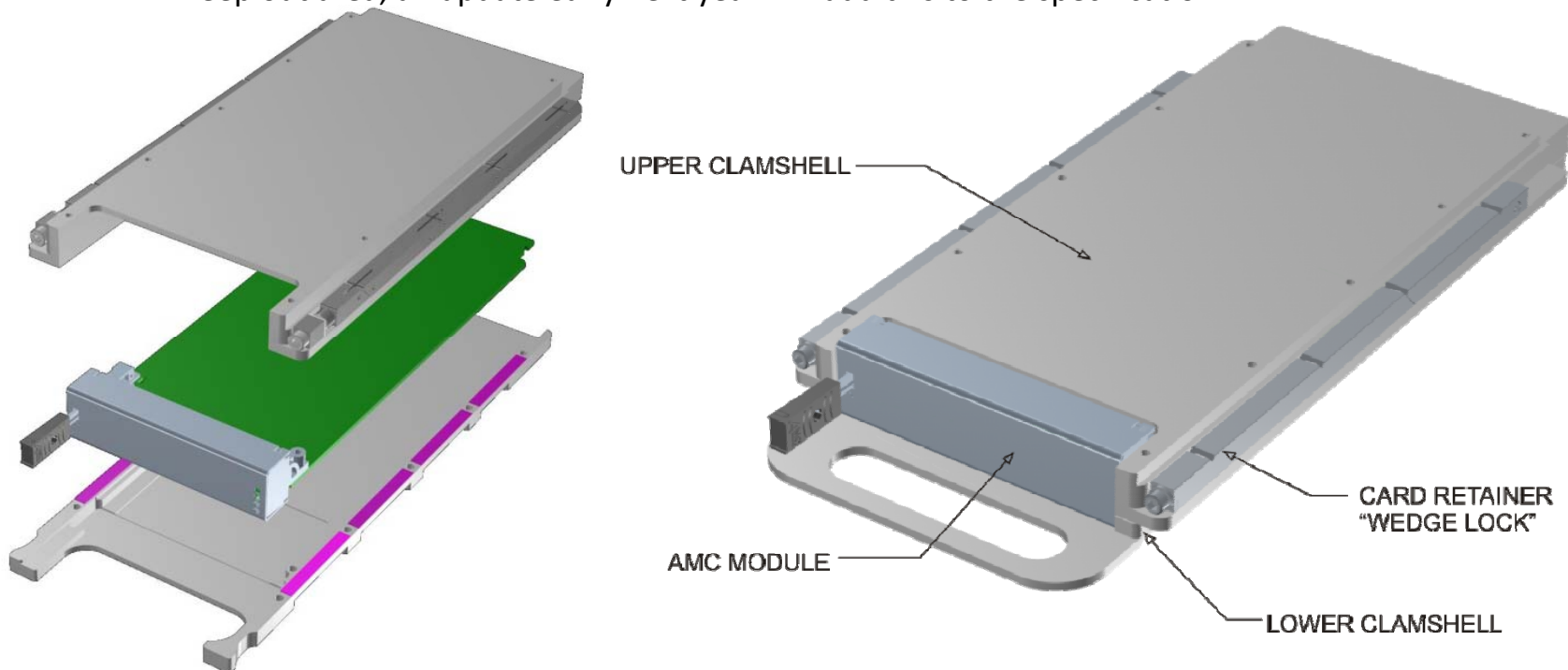
MicroTCA.3 Specification Overview

- MicroTCA.3 Hardened Conduction Cooled specification in conjunction with MicroTCA.0 and .1, provides the requirements necessary for a system to meet the rugged requirements of
 - outside plant telecom, machine and transport industry
 - military airborne, shipboard and ground mobile equipment environments



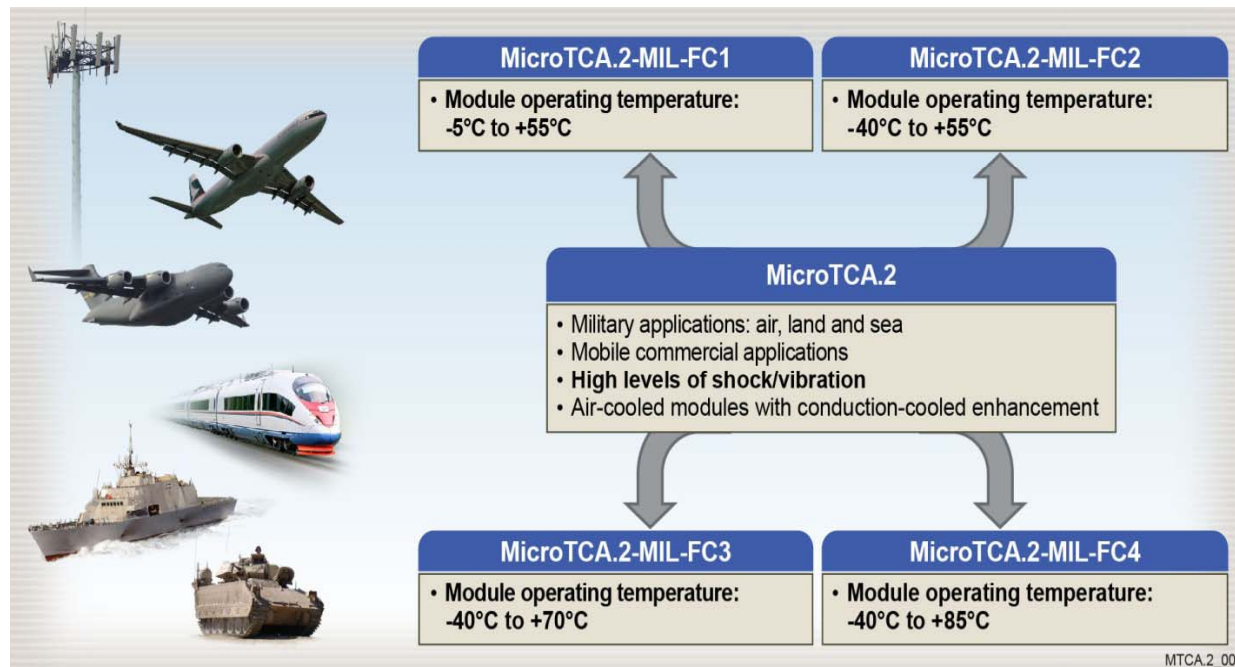
MicroTCA.3 Mechanical

- Typical Conduction Cooled AMC
 - There are five types of Modules sizes defined. They are the Compact, Mid-Size, Full Size, Power, and MCH in Single module configurations
 - Clamshell designed to support
 - Thermal interface to the chassis sidewall
 - Mechanical rigidity
 - 15KV ESD capability for 2 level maintenance
 - Double width modules are not defined, but may be designed following key ICD parameters for size & keep out area, an update early next year will add this to the specification



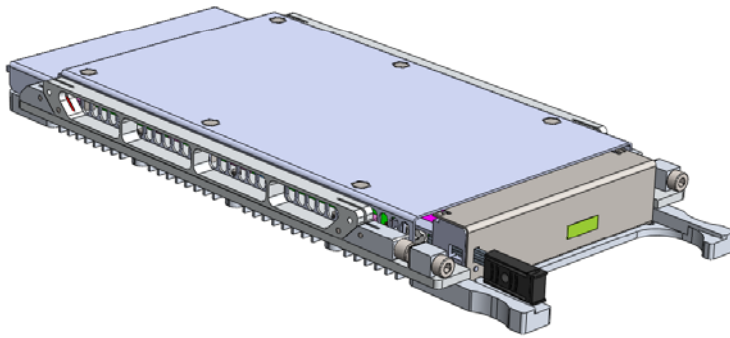
MicroTCA.2 Specification Overview

- MicroTCA.2 (proposed) Hybrid Air/Conduction cooled specification in conjunction with MicroTCA.0, .1, .3 provides the requirements necessary for a system to meet the rugged requirements of
 - Outside plant telecom, machine and transport industry
 - military airborne, shipboard and ground mobile equipment environments

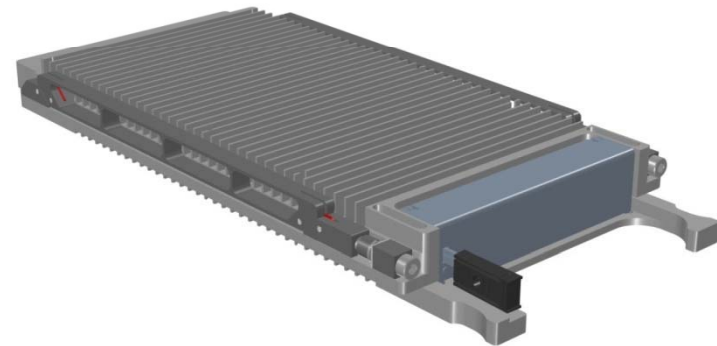


MicroTCA.2 Proposed Mechanical

- Hybrid Air/Conduction Cooled AMC
 - There are ten types of Module sizes defined. They are the Compact, Mid-Size, Full Size, Power, and MCH in both Single and Double module configurations
 - Clamshell designed to support
 - Air cooled over/through clam shell
 - Thermal interface to the chassis sidewall
 - Mechanical rigidity
 - 15KV ESD capability for 2 level maintenance



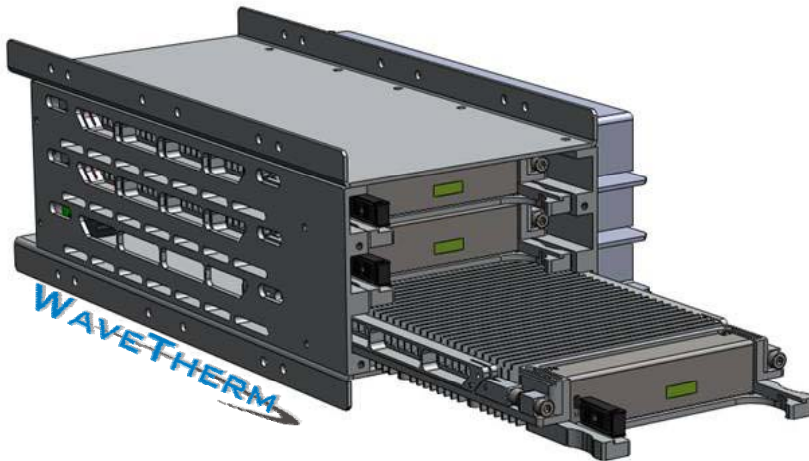
Low Power MicroTCA.2 Module



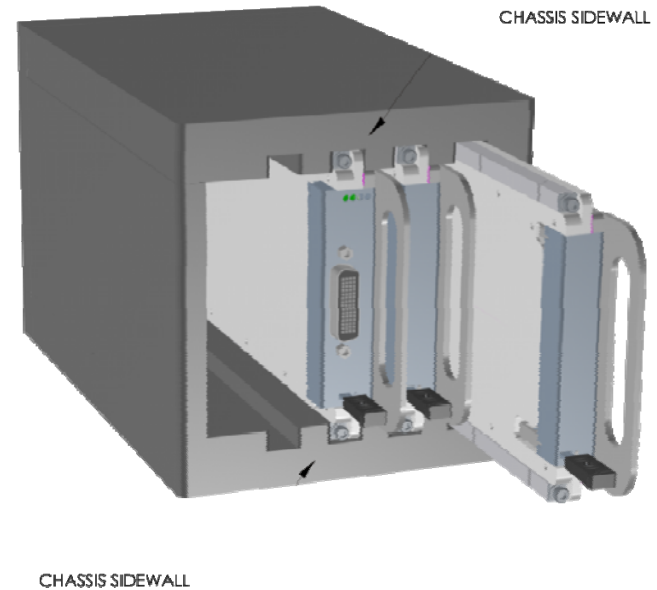
High Power MicroTCA.2 Module

MicroTCA.2 vs. MicroTCA.3

- Proposed MicroTCA.2 Hybrid Air/Conduction Cooled chassis



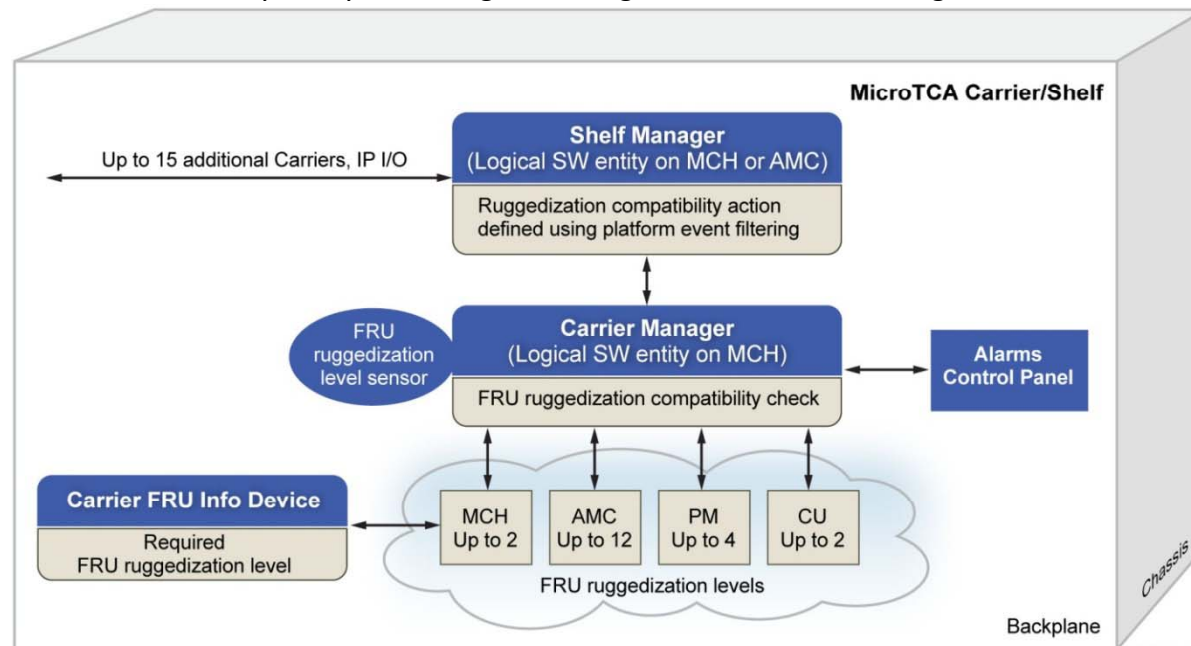
- MicroTCA.3 Conduction Cooled chassis



Product Classification			Requirements (Operating)		
MicroTCA.0	MicroTCA.2	MicroTCA.3	Temperature	Shock	Vibration
Basic		TEL-1	-5°C to +55°C	15g	1g sinusoidal
-	-	TEL-2	-40°C to +85°C	25g	8g random (VITA 47 V2)
	MIL-FC1		-5°C to +55°C	40g (VITA 47 OS2) / 11 ms	12g random (VITA 47 V3)
-	MIL-FC2	MIL-CC2	-40°C to +55°C		
-	MIL-FC3	MIL-CC3	-40°C to +70°C		
-	MIL-FC4	MIL-CC4	-40°C to +85°C		

Hardware Platform Management (HPM)

- MicroTCA.2 & .3 HPM supplement to base specification
 - All FRUs (Field Replaceable Units) have their ruggedization level defined in its FRU information record
 - Carrier FRU info device contains required ruggedization level of the FRU's defined by system integrator or chassis design authority
 - Carrier manager has a FRU ruggedization level sensor that reports the compatibility between all the FRUs and the carrier to determine if the system is configured correctly
 - Shelf manager can use the carrier ruggedization compatibility event to determine action to be taken
 - The action is user defined by the system integrator using Platform Event Filtering



MTCA.3_002

- For further information contact BAE Systems
– Mark Leibowitz – System Architect (631-262-8628)

Bio - Mark Leibowitz holds a BT degree in Electrical Engineering from NYIT and an MS degree in Engineering Management from LI University. He has worked at BAE Systems for 32 years within the Mission Computing Systems business area doing architectural and system level design for various military programs. He has extensive experience in the design of open Mission Computing Systems for avionics and ground based programs, utilizing open standards such as ANSI/VITA and PICMG and has been key in obtaining full military qualification for these programs. BAE Systems is an Executive Member of PICMG. Mark represents BAE Systems on the Executive Committee and also is chairman of the PICMG Hybrid MicroTCA.2 Specification Working Group.