



**SMART**<sup>™</sup>  
Embedded Computing



## Supply Chain Security – A Real Life Scenario

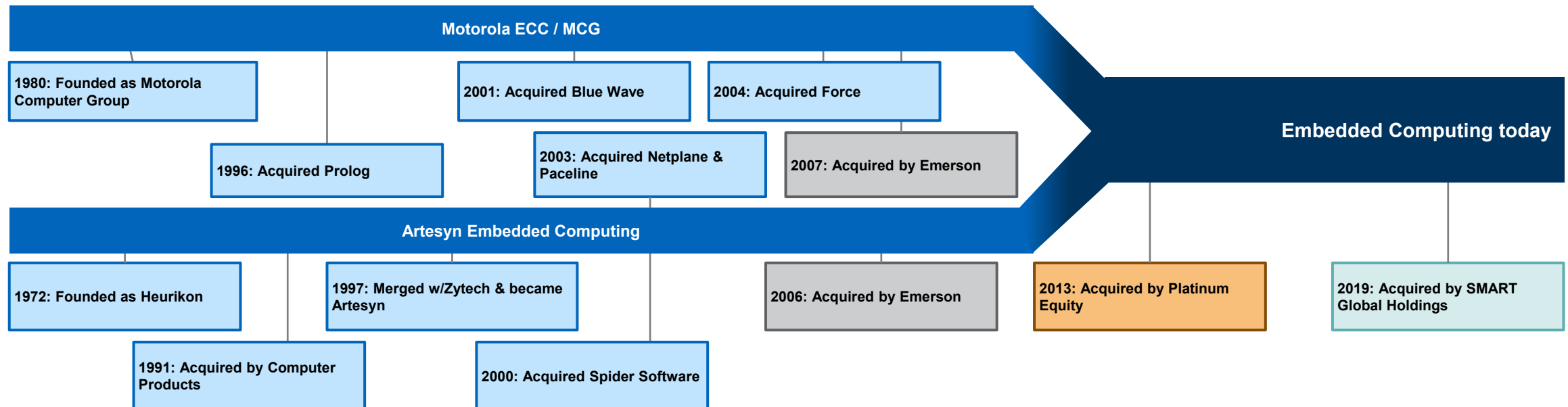
Rob Persons, Sr. Sales Architect, SMART Embedded Computing

*SMART is a proven technology leader in the design, development and deployment of current and next-generation specialty high value memory, storage and compute products and solutions.*



# SMART Embedded Computing History

- 35+ years of history in the embedded computing market, beginning as Motorola Computer Group (MCG)
- Working closely with SMART's Penguin Computing – similar customer base



# NAVY'S ADOPTION OF COTS

Purpose Built  
Custom  
Computing



VME First  
COTS  
Product



Intel Based  
Multi-bladed  
System



SMART  
ATCA  
Adopted



AN/UYK 43  
1984

Transition to COTS  
1992

Open Systems  
Architecture  
2004

Adopts Open  
System - ATCA  
2015

1980'S

1980

1989

1990

1999

2000

2009

2010

2019

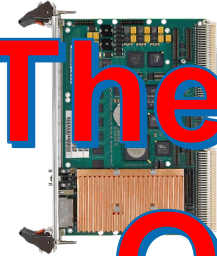
2020



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Custom  
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VME First



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Multi-bladed



SMART  
ATCA  
Adopted



**Bloomberg**  
**“The Big Hack”**  
**Oct. 2018**

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Major Meeting with Captain  
that Controls the Weapon  
System



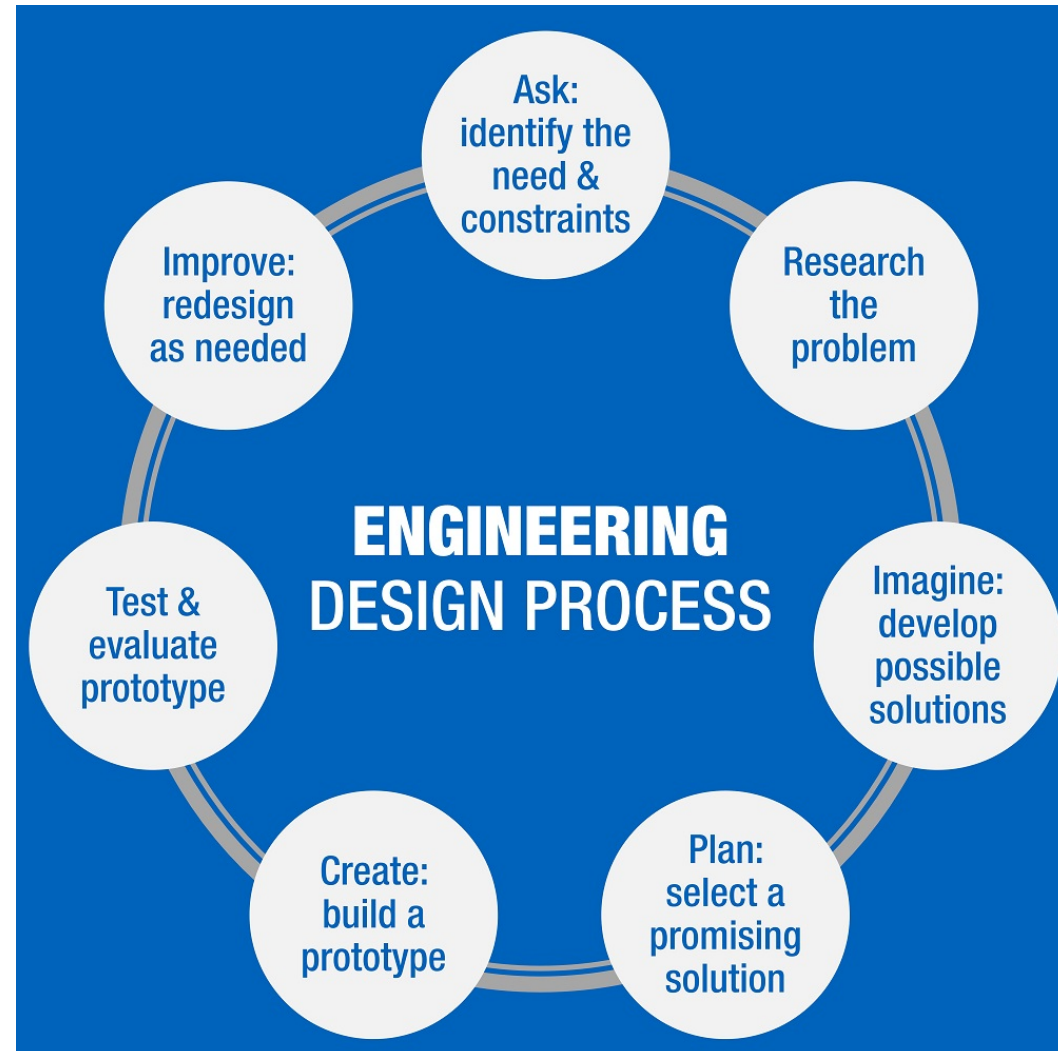
## Major Meeting with Captain that Controls the Weapon System

- Detailed SMART's Approach to Maintaining Product Integrity



## Major Meeting with Captain that Controls the Weapon System

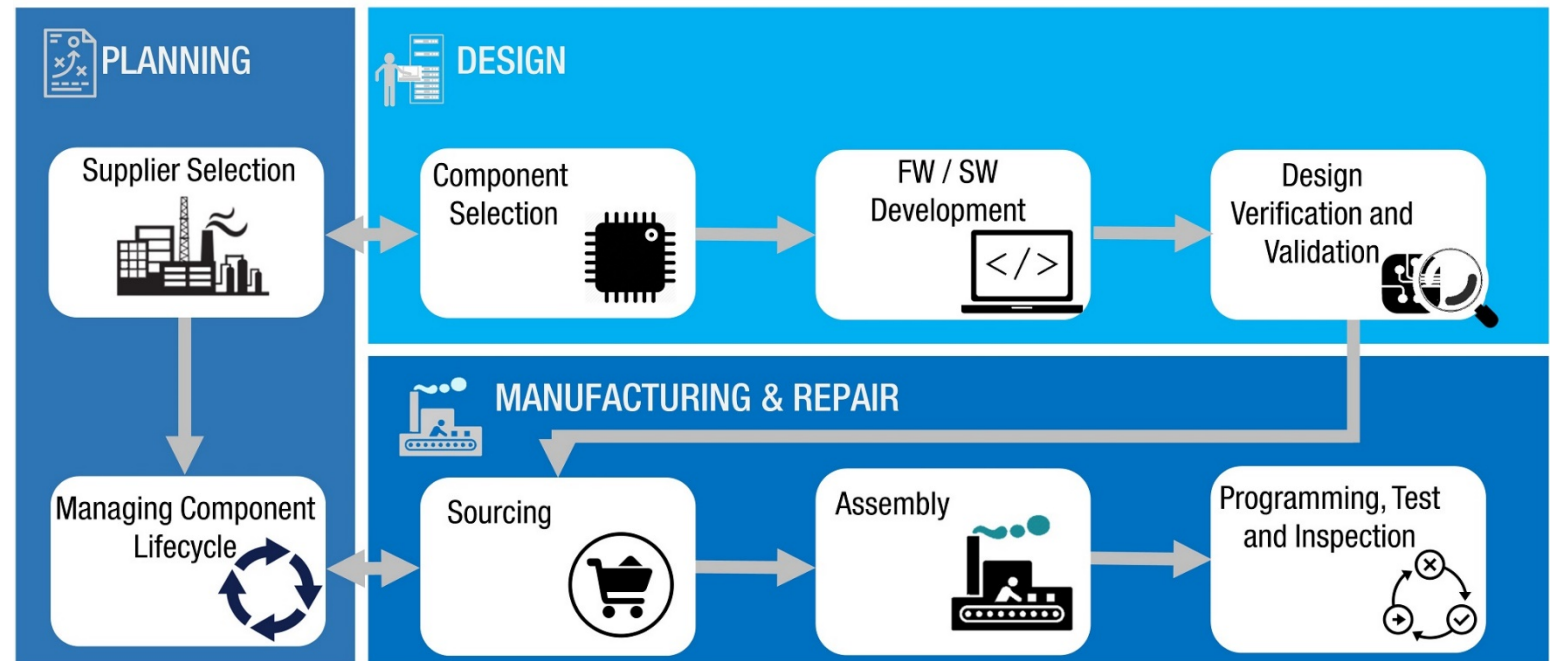
- Detailed SMART's Approach to Maintaining Product Integrity
- Engineering and Design Process to Secure Products





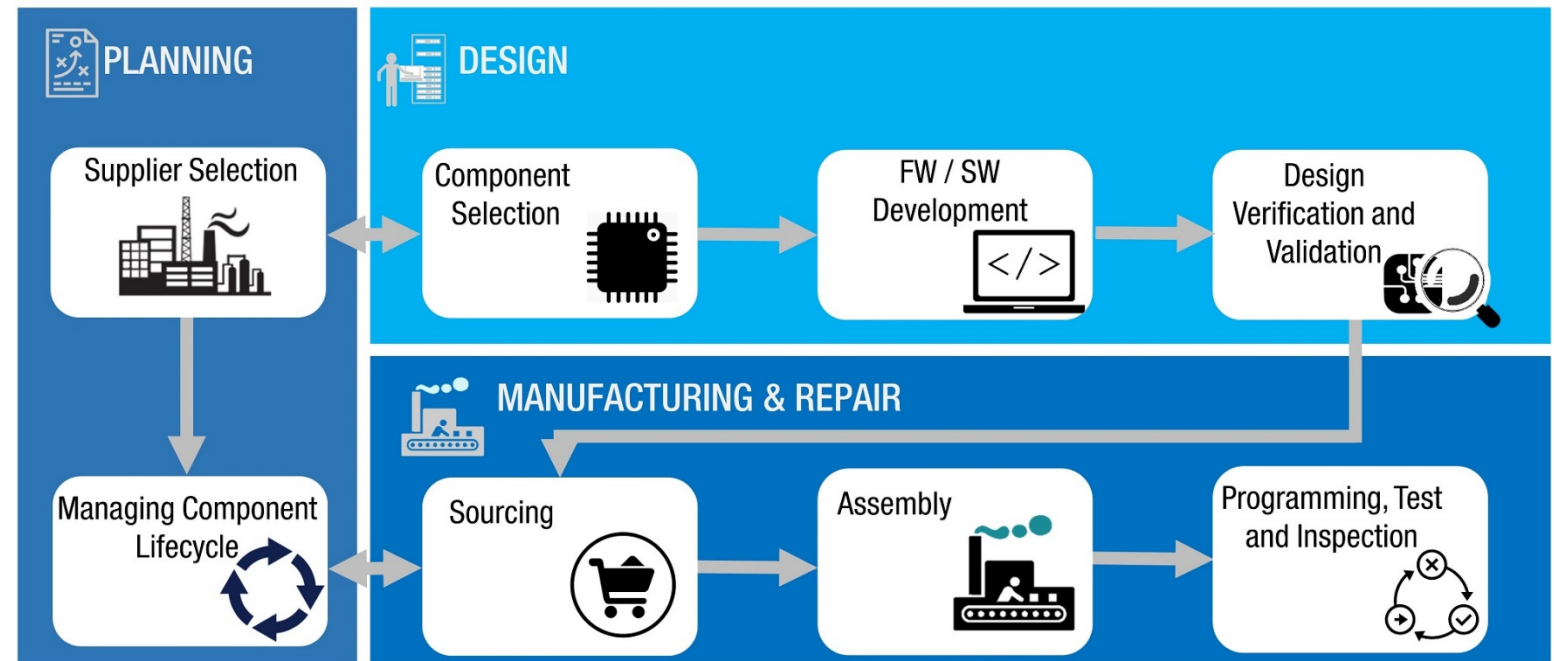
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- Engineering and Design Process to Secure Products
- Supply Chain Security Measures



## Major Meeting with Captain that Controls the Weapon System

- Detailed SMART's Approach to Maintaining Product Integrity
- Engineering and Design Process to Secure Products
- Supply Chain Security Measures
- Product Life Cycle and Repair



**[White Paper - Secure COTS: Ensuring Embedded Computing Products and Supply Chains Can Be Trusted](#)**

That's Great But .....



“What if we are  
Fighting the Country  
That is Manufacturing  
Our Critical Systems!!”



# Repatriation of Hardened ATCA

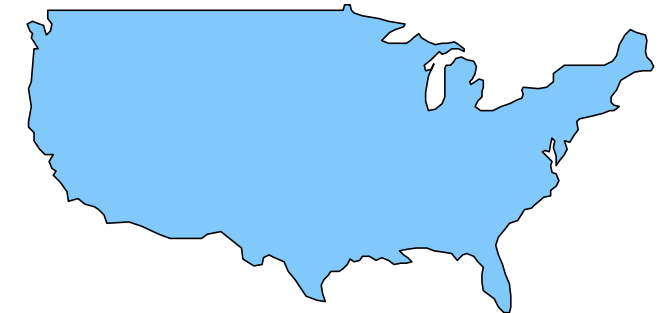
**ARTESYN**<sup>™</sup>  
EMBEDDED TECHNOLOGIES



**Transitioned ATCA to  
US Based ITAR Contract  
Manufacturer**



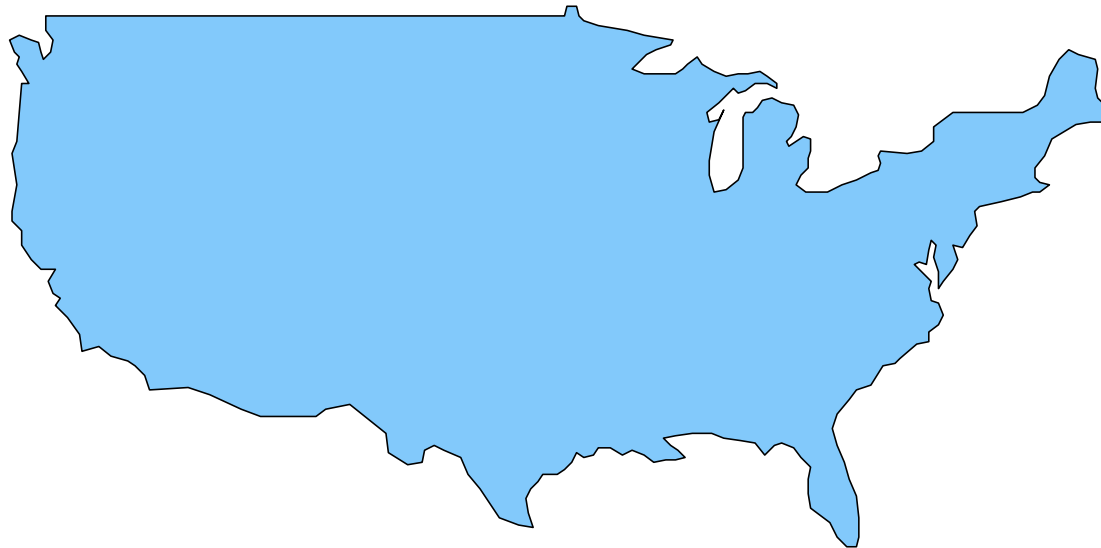
**Move Completed in  
Two Quarters**





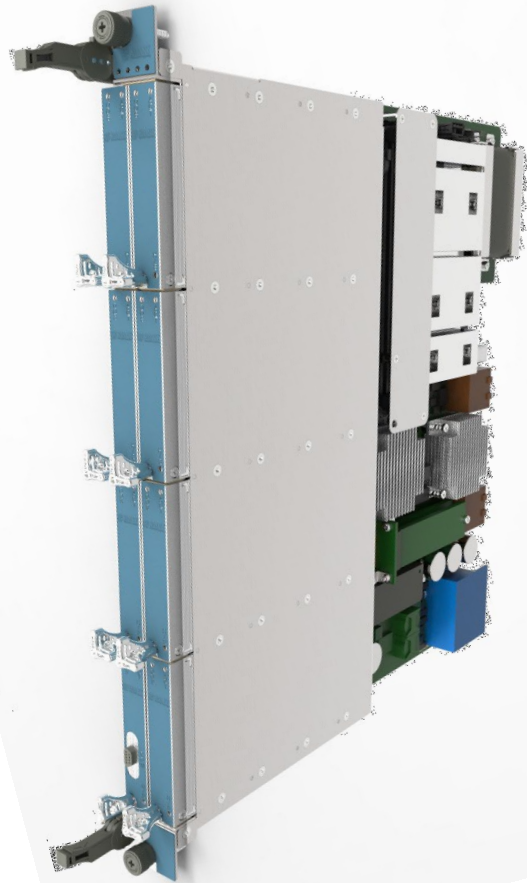
## SMART Acquires Artesyn Embedded Computing

July 2019

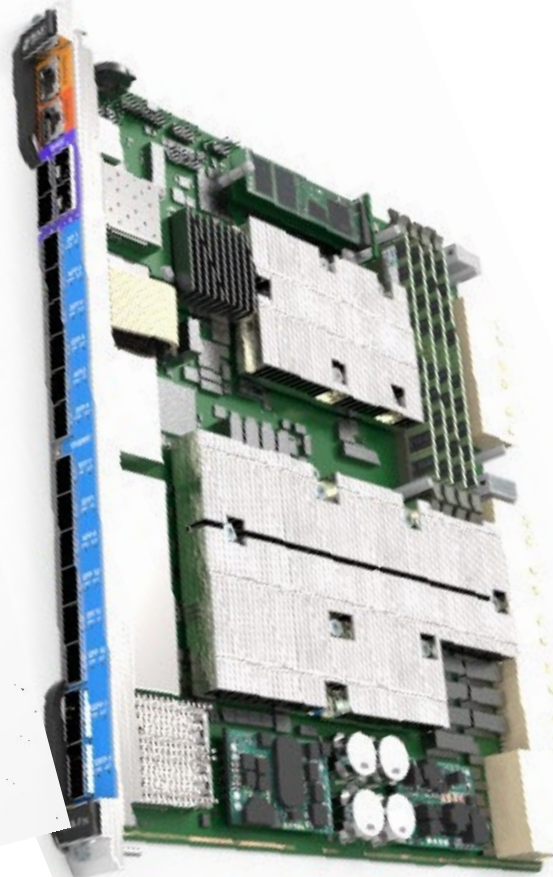


- **Migrate all Artesyn Manufacturing to SMART Owned Facilities**
- **US Based Products to Fremont**
- **Remaining Shenzhen Based Product Move to SMART Malaysia Manufacturing**

# ATCA-F145

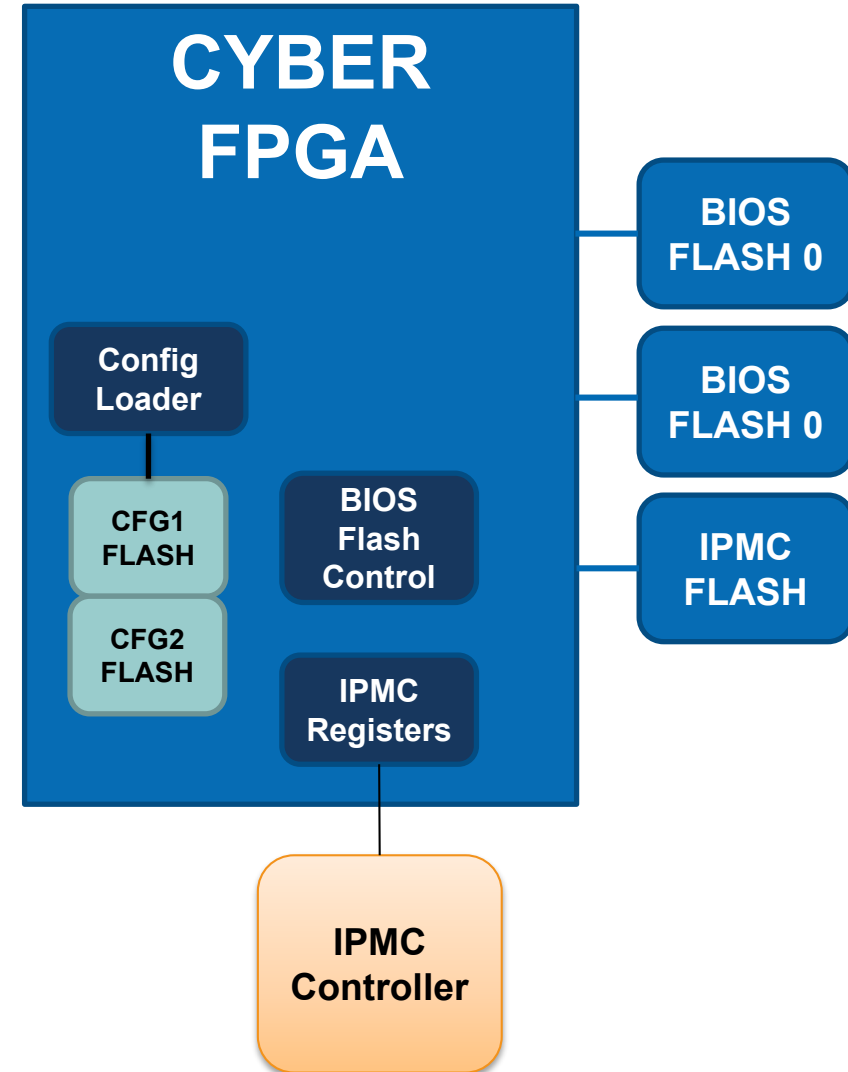


## ATCA-2030



- **New Product Designs**
  - **SWITCH**
    - **ATCA-F145**
  - **RAID STORAGE BLADE**
    - **ATCA-2030**
- **Improving Security of Blade**
- **Analyze Improving Component Security of New Products**

- **Cyber Security Enhancements Unified on Both Designs**
- **Certificate Based Booting of the Software**
- **New Security FPGA For**
  - IPMC Firmware Security
  - BIOS Firmware Security
  - Protection Against Malicious Activity over I2C and SPI Interfaces



- **Focus on Sourcing Parts Not Produced in China**
- **Mixed Results**
- **Some Components Have Multiple Production Facilities**
- **Some Parts Have Limited Sourcing Opportunities**
- **Mechanical Parts Largest Issue**



## ATCA-F145

- 1 Part Still being Investigated for Alternate Part Options
- 13 Mechanical Parts can be Sourced Elsewhere for More Cost
- 6 Mechanical Parts can be Sourced Elsewhere with Additional Cost and Risk
- 1 Electro-mechanical Part would Require Special Contract Manufacturing to Move
- Overall Process Item
  - Many Parts are Built in Multiple Countries with China being one Location
  - This will a Require Modified Procurement Process to Limited Sources

## ATCA-2030

- 6 Parts Still being Investigated for Alternate Part Options
- 27 Mechanical Parts can be Sourced Elsewhere for More Cost
- 6 Mechanical Parts can be Sourced Elsewhere with Additional Cost and Risk
- 1 Electro-mechanical Part would Require Special Contract Manufacturing to Move
- Some China Parts are Specified in the Vendor Reference Design which they asked be copied exact

**Dip Switch**

**Battery Socket**

**Ethernet NIC**

**DDR3 RAM**

**Raid Key**

**Inductor**

**Protection Diode**

**Protection Diode**

**Backplane Connector**

**M.2 Connector**

**U.2 Connector**

**Dip Switch**

**Battery Socket**

**Miscellaneous**

**Mechanical**

### How to protect our warfighter and tactical systems

- **Manage where the product is manufactured**
- **Focus on securing design**
- **Comprehensive supply chain process, including managing components for long life**
- **Analyze what components can be sourced away from China**
- **But there are Tradeoffs**
  - **Lack of supplying new products quickly**
  - **World supply chain most flexible, but with risks**
  - **US supplies very, very limited**
  - **Limiting supplies can impact staying on technology curve**