



# Run-Time Configurable Accelerator (RCA)

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## Specialized Functions: Domain-specific System-on-Chip (DSSoC)



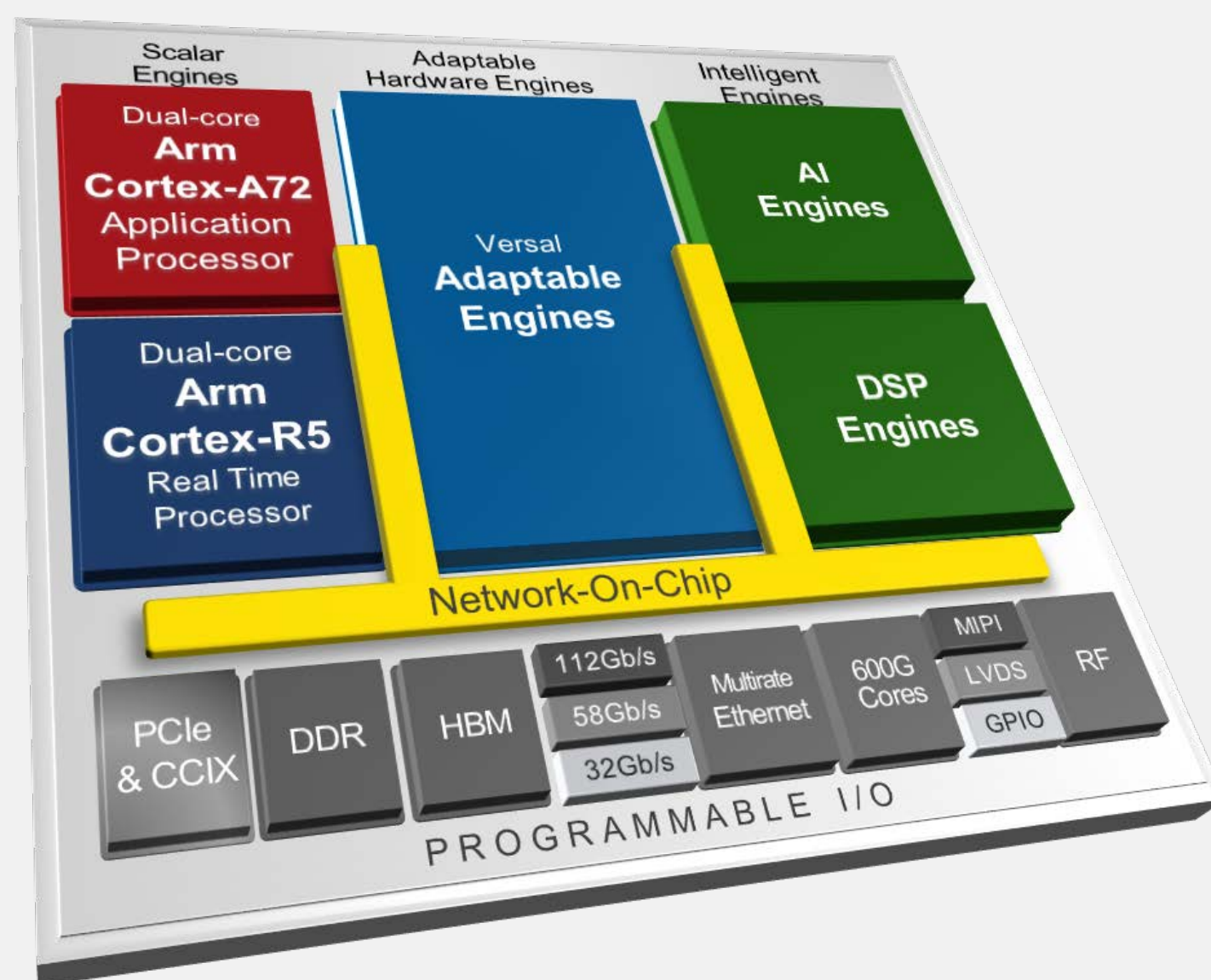
### What problem are we trying to solve?

- Need for efficient, real-time configuration of compute resources to address rapidly emerging threats in increasingly congested/contested electromagnetic environments

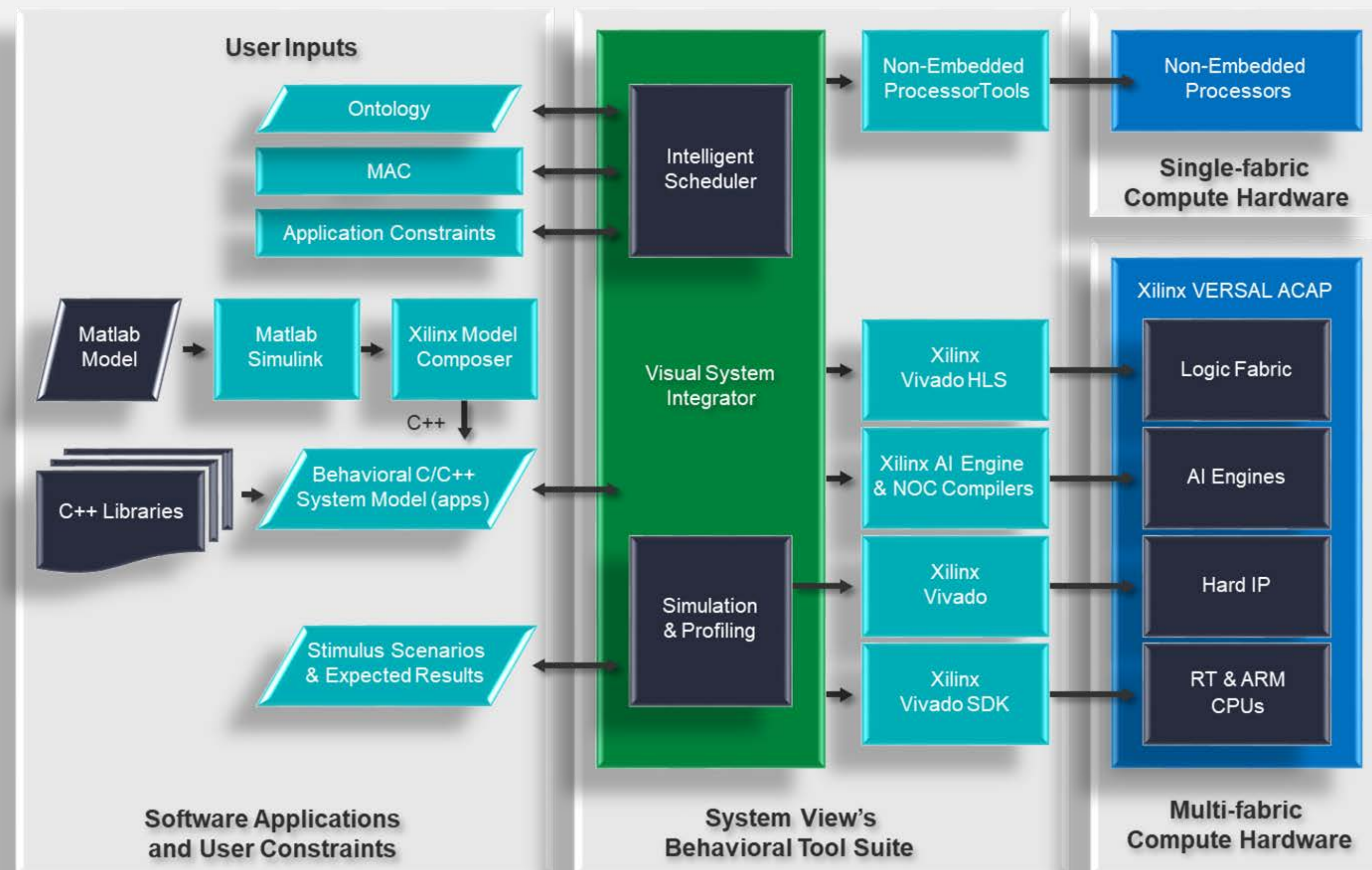
### What is new?

- Configurable, multi-fabric compute architecture

**Xilinx VERSAL ACAP:**  
*a configurable multi-fabric compute SoC*



- Ontology-informed suite of behavioral tools and run-time scheduler with built-in intelligence for resource management



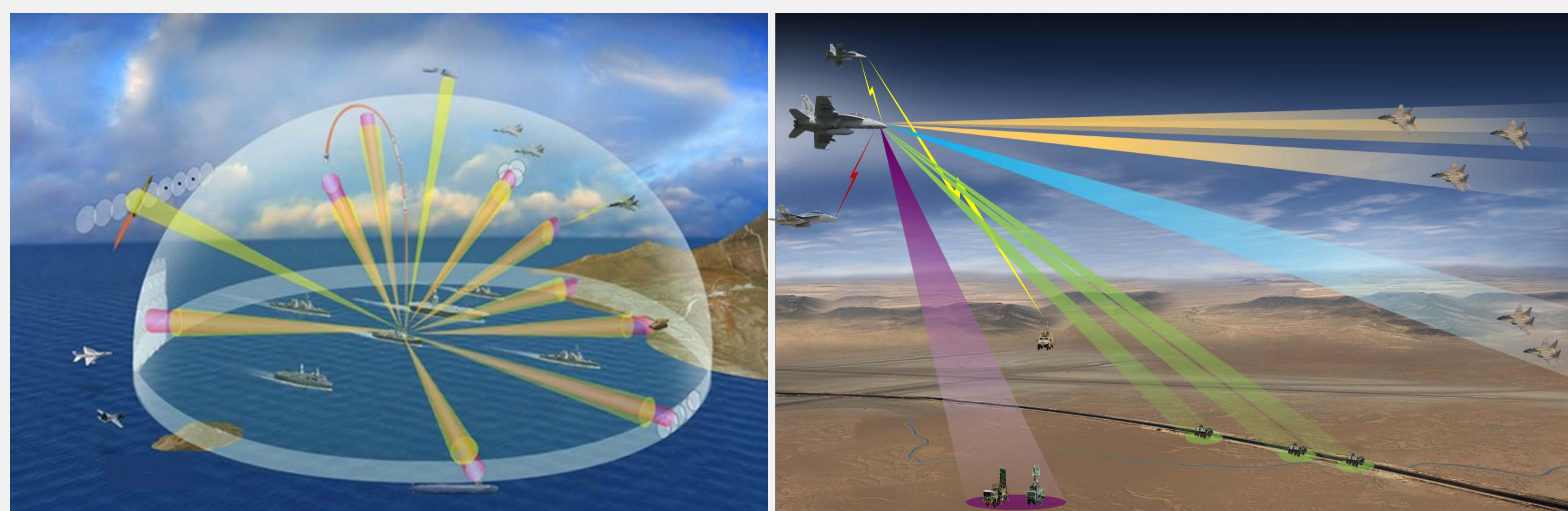
**The ontology-informed, intelligent scheduler is embedded in System View's Behavioral Tool Suite and is used to configure and optimize use of compute resources**

**Impact:** Enhanced behavioral tools automate configuration and optimize utilization of heterogeneous compute resources

- > 10X improvement in compute efficiency (operations / unit power)
- > 20X reduction in latency
- > 40X improvement in productivity (reduced application development time)
- Reduced C-SWAP

### Why is it important?

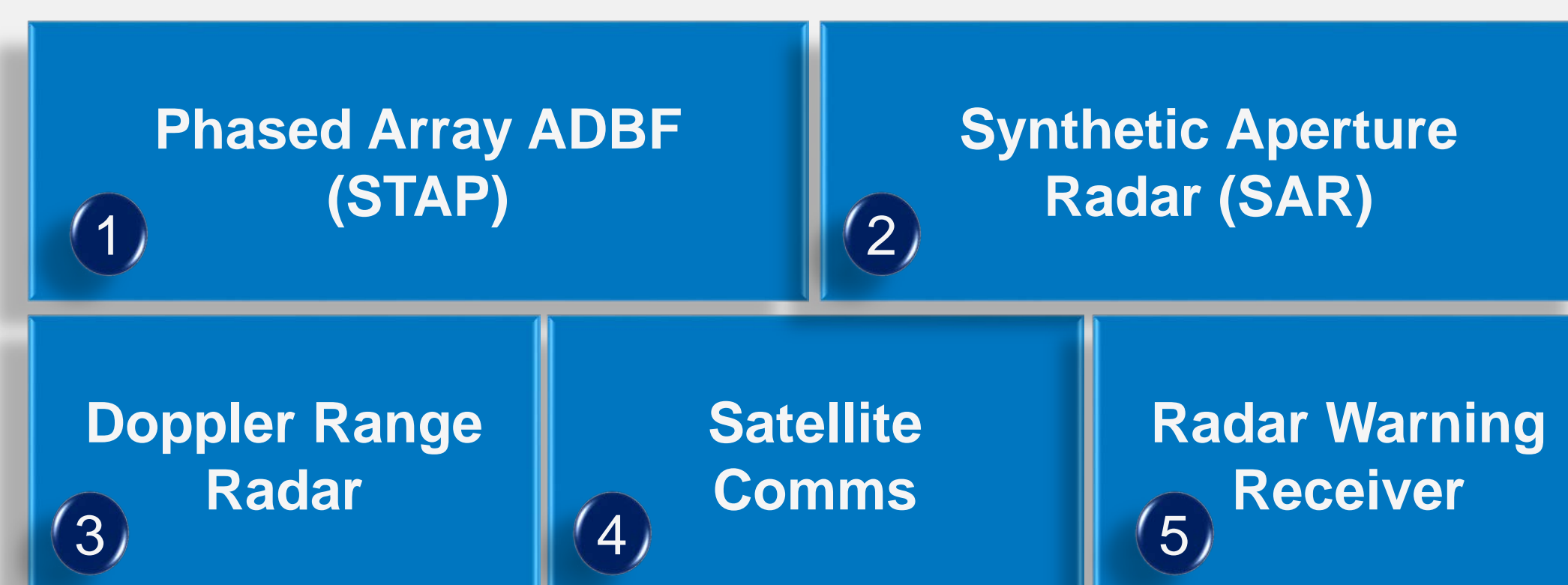
- Key enabler for enhancing performance of multi-function/multi-beam ADBF arrays
- More capability at lower cost to the warfighter



**The ontology-informed, intelligent scheduler executes multiple simultaneous Software Defined Radio applications with real-time "Load on demand" configuration to increase the capability and flexibility/agility of multi-function airborne and surface systems**

### Current Status:

- STAP and SAR applications implemented with 22X and 38X reduced latency
- MAC defined with interfaces to ontology and intelligent scheduler
- Developing ontology to enable simultaneous operation of 5 DoD applications



### Legend:

- ACAP = Adaptive Compute Acceleration Platform
- SoC = System on a Chip
- STAP = Space Time Adaptive Processing
- ADBF = Adaptive Digital Beam Forming
- C-SWAP = Cost, Size, Weight and Power
- MAC = Medium Access Control



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