DEPARTMENT OF DEFENSE
HIGH PERFORMANCE COMPUTING
MODERNIZATION PROGRAM

MAUI HIGH PERFORMANCE COMPUTING CENTER
DOD SUPERCOMPUTING RESOURCE CENTER

ARCADE Software on the HPCMP Portal

The Joint Space Operations Center (JSpOC) Mission System (JMS) program office is partnered with the Air Force Research Laboratory (AFRL) in the deployment of the JMS Advanced Research, Collaboration, and Application Development Environment (ARCADE). JMS ARCADE is being developed by the AFRL in a collaborative effort to mature capabilities through various Technology Readiness Levels (TRLs) to provide a transformational capability to accelerate technology development and acquisition of command and control (C2), space situational awareness (SSA), and space environment applications. ARCADE will provide a software application/capability development environment in support of the JMS Special Progams Office (SPO). ARCADE will be the initial step in the transition pathway for JMS developers, particularly for new candidate applications that meet Post Increment 2 JMS SPO requirements for process testing.

ARCADE:

- Is critical to rapid prototyping of future JMS capabilities to support Increment 3 in the FY16+
- Will provide data sources and services in a JMS relevant environment for all developers to collaborate and build on
- Will usher in a paradigm that could significantly save the Government money to achieve Increment 3 objectives

JMS ARCADE will overcome challenges to JMS, as no JMS environment exists to develop, mature, and evaluate new applications. JMS ARCADE will provide a prototyping enterprise capability for the JMS enterprise mission. ARCADE will further aid JMS, as current technology is inefficient in providing actionable real-time awareness and response to space related events due to:

- Uncertainty into the monitoring of 20K+ orbiting objects
- Threat characterization involves fusion of imprecise data
- Infrastructure for SSA and C2 technology maturation is needed
- SSA community needs a technology transition path to the JSpOC
- Difficulty in space event characterization
- Manual and non-deterministic event processing

JMS ARCADE is Planned to Provide:

- Development suite (DREN only - RD)
  - ~130 candidate software development tools
  - E.g., SDK, end to end, virtual apps
- Benchmarking capability
  - E.g., correlation, metrics, accuracy
- High performance computing
- "Sandboxing" capability (protection of IP)
- Apps evaluation capabilities
  - JMS SOA integration and JSpOC workflows
  - Three (3) representative scenarios
  - Conjunction, anomalies, catalog processing
- Simulation environment
  - Closed loop
  - Real time and up to 24x time step
- Collaboration
  - Access available to limited external users
  - Landing page and Account Generation