Advanced Research Center

Summary

- Major command R&D facility for MD integration, experimentation, and testing
- Highly re-configurable hardware/ software-in-the-loop testbed/lab facility
- Extensive high performance computing capability for MD developers
- Network and communication engineering subject matter expertise
- Software engineering and M&S development support staff
- Security engineering and operations

A state-of-the-art high performance computing facility supporting space and missile defense (MD) elements developing hardware and software capabilities and concepts for MD systems.

The Advanced Research Center (ARC) is one of the U.S. Army Space and Missile Defense Command's (SMDC) major research and development (R&D) facilities for MD research to develop, integrate, and test complex MD systems with state-of-the-art computational and modeling and simulation (M&S) resources. The ARC provides these services to the Missile Defense Agency (MDA), the Army Program Executive Office for Air, Space, and Missile Defense (PEO-ASMD), the Ground-based Midcourse Defense (GMD) Joint Program Office, and the High Performance Computing Modernization Program (HPCMP). The ARC provides resident programs with 95,000 square feet of testbed space, exercise/experiment/test labs, and computer room space to meet customer mission requirements.

Advanced Warfare Center

The Advanced Research Center (ARC) is located in Huntsville, Ala. The ARC has been in existence for more than 33 years providing the following benefits to co-located programs:

- Cost avoidance for technology and facilities infrastructure
- Rapid establishment of testbeds
- Leverage of extensive shared M&S resources
- Access by all users to subject matter expert's critical skills
- Synergy between programs working similar missile defense issues

Capabilities

The ARC supports all phases of weapon system concept and development to include requirements related to evaluation, testing, and training. ARC capabilities include:

Hardware and Hardware-in-the-Loop Integration: Hardware integration includes facility design, cable plant design, installation, computer hardware integration, hardware-in-the-loop (HWIL) installation, and audio/visual design and integration.

Testbed Development: The ARC has responded to the changing requirements within the Department of Defense for diverse missile defense programs. Each testbed has its own unique requirements for space (laboratory and/or computer room), computer resources (dedicated and/or shared), network/connectivity, and security (classified or unclassified). The ARC has demonstrated responsiveness to changing customer requirements resulting in a high level of customer satisfaction. The ARC currently provides testbed support for Missile Defense Agency and U.S. Army Space and Missile Defense Command programs that include:

- Integrated System Test Capability 1 and 2
- Extended Air Defense Testbed
- Israeli Testbed
- Sensor Simulation Testbed
- Army Space and Missile Defense Analysis Center
- Test Evaluation, Data Acquisition, and Communications
- Strategic Test and Evaluation Planning and Analysis Lab
- Missile Defense Product Integrator
- Technology/Concepts Evaluation Learning Lab
- Federation Analysis Support Technology Lab

High Performance Computing: The ARC is a High Performance Computing Modernization Program (HPCMP) Distributed Center partner. ARC hardware supports serial processing, massively parallel processing, and clustered computational resources with more than 2,000 high performance computing processors and more than 1,000 scientific visualization graphic workstations.

Network Engineering and Communications: The ARC facility is interconnected through extensive network and communication architectures to numerous local and remote facilities. There are more than 100 Local Area Networks (LAN) and Wide Area Networks (WAN). These include secure high-speed connectivity to the research, development, test, and engineering communities via the Defense Research and Engineering Network (DREN) and the Secret DREN (SDREN). The ARC is a node on the Missile Defense Agency Network (MDANet). TCP/IP is the main internal protocol supported over Ethernet 10/100/1000 megabit media. The ARC infrastructure provides LAN and WAN connectivity through state-of-the-art Virtual LAN Technology, sophisticated network access, and firewall protection to provide a secure network environment.

Software Engineering: The ARC Software Engineering Department is staffed with highly trained professional software and database engineers. Their fields of expertise range from computer and operating system disciplines, programming, systems integration, communications, database, graphic development skills, modeling and simulation experience, advanced battlefield software expertise, and Web development.

User Services: User support is provided for real-time problem solving and programmer assistance through on-site systems and network analysts. Help desk support, establishing user accounts, and all ARC service requests are managed from this "centralized support" operation.

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