TRW
Spiral Development Experience on Command & Control Product Lines Program
2-10-2000

T. N. Bostelaar
CCPL Program Manager

Command and Control Product Lines

Description
- Customer: Air Force ESC/CX
- Products: Provides C2 Product Line Architectures, components and systems in 3 functional and 8 operational domains.
- Milestones: Task orders on various schedules.
- Importance: Faster, cheaper, better C2 systems.
- Progress: 8 task orders complete. 10 task orders on schedule and budget.

Accomplishments
- Provided integration, execution, and sustainment support for successful EPX98, JEFX99
- GTWAPS IOC supported air operations in Bosnia
- AODA demonstrated successful TCT thread in JEFX99
- Provides successful process for rapid C2 task order definition and contractrait
- Provides successful process for prime contractor collaboration on C2 task orders.
Global Theater Weather Analysis & Prediction System

Description
- Customer: Air Force ESC/ACW
- Product: Wx Model Output and Data Visualization for 21 Theaters
- Milestones: IOC= 10/99; FOC= 10/01
- Importance: Finer-mesh data, multi-theater, worldwide, faster, higher quality
- Progress: IOC 1-4 successfully completed; High degree of customer satisfaction

Mission Capability
- Provides improved weather forecasting ability to Air Force and Army Operations Worldwide
- Supports the Warfighter and Decision-Makers by providing them meso-scale meteorological model output
- Supported air operations in Kosovo
- Provides Back-Up to NOAA’s Supercomputers
- Provided data to the National Hurricane Center; successfully forecasted Hurricane Floyd’s track

GTWAPS Project Profile
- Domain - Global / Theater weather modeling and prediction
- Scope - Requirements analysis, design, development, integration, maintenance of multiple processing systems
- Application - Weather prediction & visualization support to Air Force and Army theater operations.
Forecast Windows

MMS GLOBAL WINDOW CONFIGURATIONS

Timeline

- Contract period of performance
  - Nov 97 to Dec 01
- Major spirals fall on approx 1 year schedule and provide increasing functional and performance capabilities
Major Challenges

- Integrate disparate models into a flexible, high performance, DII COE compliant architecture
- Rapid response to new / changed requirements
- Provide greatly enhanced forecasting capability
  - ability to relocate forecast windows utilizing fine-scale modeling for any area in the world
  - ability to visualize model data for any area in the world

Phases

- Phases (concurrent)
  - concept
  - requirements
  - development
  - refinement & testing
  - implementation
  - Operation / Maintenance
- Completion timeframe established by priority and workload
- All six spiral "invariant" attributes are present
GTWAPS Team

**Contract, Cost, Schedule Status**

GTWAPS CONTRACTOR TEAM
- TRW (Prime)
  - HARRIS (software)
  - IBM (hardware)
  - MRC (meteorology)

**Implementation Process**

- GTWAPS implementation processes based upon an incremental approach for the total program lifecycle
- Allows for concurrent development, integration and test of system components
  - Early performance insight
  - Early hands-on use by the End User
  - Mitigates overall system risk while reducing cost of rework

Software Development Lifecycle

Supporting Processes
- Project Planning
- Requirements Management
- Design
- Implementation
- Integration & Test
- Operation & Support
- Configuration Management
- Development and Life Management
Critical Success Factors

- Government ability to fund changes / additions
- Effective requirements change management / tracking process
  - Government personnel aware of requirements creep impact
  - Requirements priority and deferral process
- Customer / contractor communication
  - Collocation
  - Peer level interchange with upward / downward review of recommendations / decisions
- Strong CM process and tools
- Customer entities unified in the direction to contractor team