OTF CCSDS SM&C
Interoperability
Prototype

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October 13, 2008
Project Definition

• Description:
  – Demonstrate interoperability between two space flight Mission Operations Centers (MOC).
  – Emulate telemetry, actions, and alert flows between the two centers.
  – One framework uses a COTS C3I system that uses CORBA to interface to the local OTF data network.
  – Second framework relies on current Houston MCC frameworks and ad hoc clients.
  – Messaging relies on SM&C MAL, Core and Common Service formats.
  – Transport layer uses AMS.
  – Centralized SM&C Registry uses HTTP/XML for transport/encoding.
Project Status

• Description:
  – Down to one COTS C3I vendor.
  – Implementation uses C/C++, Python, Java, CORBA, WSDL, XML, Java Swing, PyGTK, gSOAP, SOAPy/ZSI.
  – SM&C Registry (Directory Services) is placed globally on the web.
    • The cross registration problem is avoided.
  – SM&C Login is deferred – no authentication is needed.
    • No authorization code required.
  – Defer AMS RAMS gateways – just use two AMS cells.
Issues

• Telemetry:
  – Data cycles and time homogeneity.

• Actions:
  – Precheck is not used.

• Login Service:
  – What common encryption standard?
    • Symmetric, yet in the public domain.
  – Cross authentication.
    • Trust anchor approach.
  – Directory Services without login.
Phase I Prototype – PLANNED

C3I COTS System A

CORBA

SMC Gateway

Gateway

RAMS

AMS

Firewall

Network

Switched Net

AMS

RAMS

AMS

OTF

C3I COTS System B

CORBA

SMC Gateway
Phase I Prototype – ACTUAL

C3I COTS System A

CORBA

SMC Proxy

AMS Cell-1

AMS Cell-2

OTF Network

Switched Net

Firewall

RAMS

C3I COTS System B

SMC Clients
External Interfaces

- C3I COTS System
- CORBA IIOP
- SMC Gateway
- XML/HTTP
- AMS
- RAMS
- SMC Directory Svc
- Adaptor
- SMC Login
Current OTF Phase I Implementation
SMC Telemetry

C3I COTS System

Downlink

Flight Simulation

Telemetry Configuration

IIOP

SMC Proxy

'MCC Cell'

'SMCC Proxy'

SMC Client

CORBA/C++

SMC

AMS

AMS

SMC

UIF
SMC Actions

C3I COTS System

Uplink

Flight Simulation

IIOP

SMC Proxy

CORBA/C++

SMC/XML

AMS

'MCC Cell'

AMS

SMC/XML

JAVA Swing

'SESOC Cell'

Action Database (XML)

SMC Client
SMC Alerts

C3I COTS System

Flight Simulation

Alerts

IIOP

SMC Proxy

'SMC Cell'

'SMCC Cell'

'SMCC Cell'

SMC Client

CORBA/Python

SMC

AMS

AMS

SMC

PyGTK