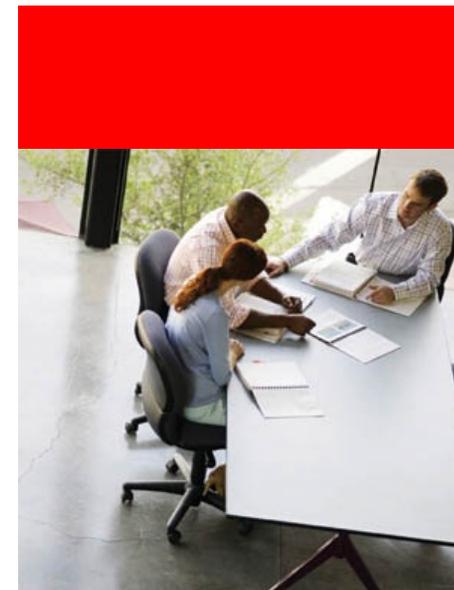


## Discussion of Data Synchronization/Cross Domain Solution (DS/CDS)

On Behalf of the Department of the Navy  
Program Executive Office  
Enterprise Information Systems (PEO-EIS)  
Global Combat Support System (GCSS-MC/LCM Block 1)



# GCSS-MC Operational Imperative



# A Critical Warfighting Deficiency

*Lessons learned from OIF: During the first 30 days of an engagement, the readiness status of the MAGTFs at the “tip of the spear” (most forward deployed zones) was not visible to the logistic planners in the rear echelon because of austere network conditions*

*For twenty-first century Warfighters, the forward edge of combat can be anywhere and everywhere, and their technology must be able to deploy with them, regardless of location or circumstance.*



**MARINES**  
THE FEW. THE PROUD.

## The Burning Platform: Lack of Actionable Logistics Information

- Requests for supply were either not fulfilled or fulfilled multiple times because of invisibility of order status
- Supply pipelines were clogged with redundant orders
- Readiness dropped from 100% to 50% in weeks because transitional status was not available
- Units were dependent on forward-positioned stocks—dragged massive amounts of inventory to compensate for unreliable response to requests
- Documentation on repairs and maintenance of weapons, vehicles, and other equipment was not timely or reliable
- Commanders lacked confidence in their logistics support



**MARINES**  
THE FEW. THE PROUD.

# GCSS-MC: The Challenge

Operating under the constraints imposed by the USMC Tactical Communications Network, exploit state-of-the-art technology to allow Marines to use the same processes and systems whether they are in garrison or in any location on the globe

- Make the system deployable, independent of location or circumstance (Capability Development Document, July 2007)
- Provide for the secure transfer of data.
- Design the system to readily adapt to changes in mission scenario
- Provide sustained, integrated, responsive, and relevant information to the MAGTF regardless of tactical situation
- Establish a discipline that determines which transactions are critical in forward-deployed areas
- Provide a mature and stable systems capability



**MARINES**  
THE FEW. THE PROUD.

# The USMC Tactical Communications Network/ Dealing with the Constraints



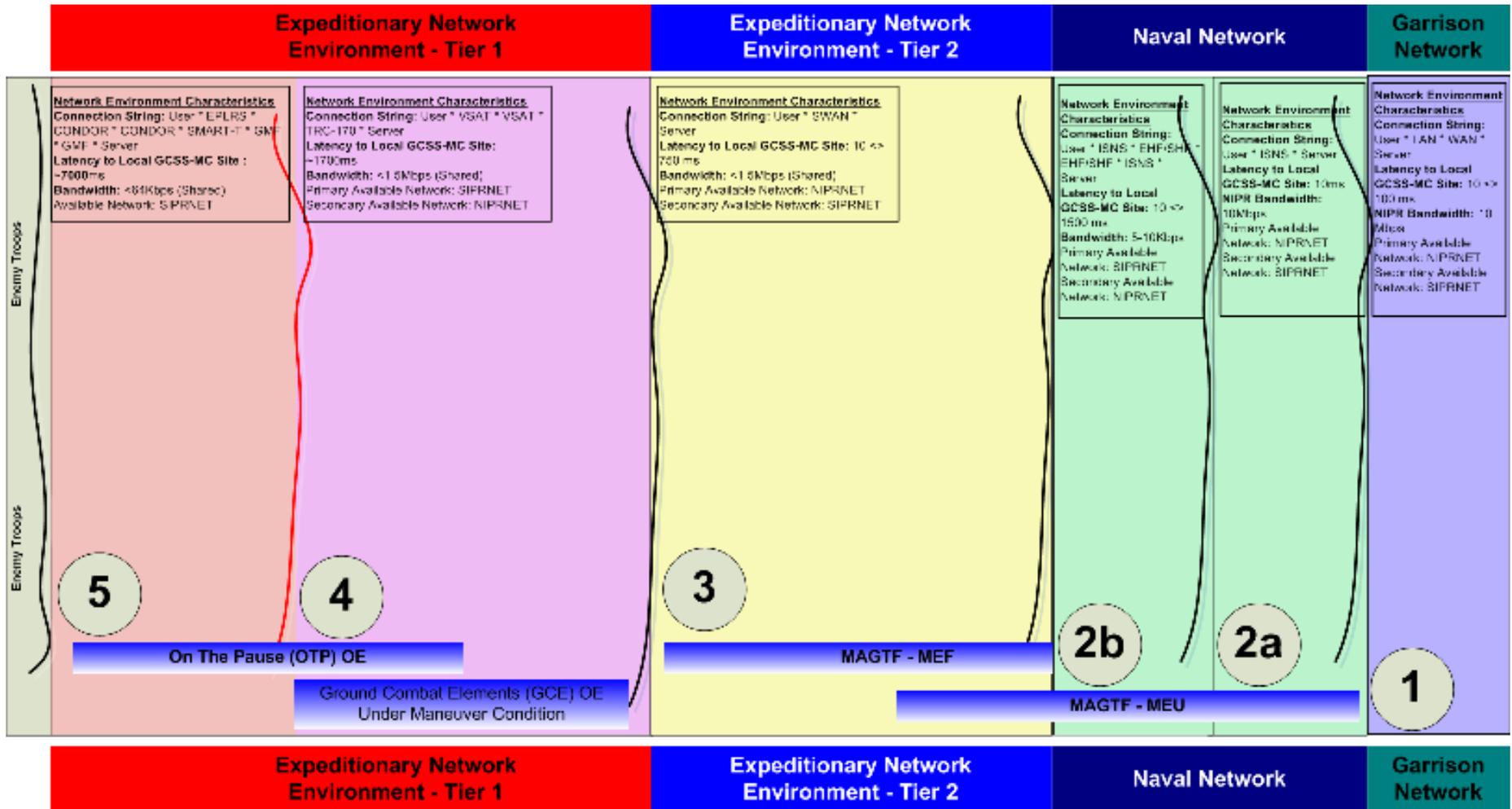
**MARINES**  
THE FEW. THE PROUD.

# USMC Tactical Communication Network Constraints

- **Disconnected**: Users experience breaks in connectivity and have to reconnect
- **Interrupted**: Users experience times when service is unavailable
- **Low Bandwidth**: The communication channel has a limited capacity to **transmit** data
- **High Latency**: Transactions in the system are characterized by **long** response times.



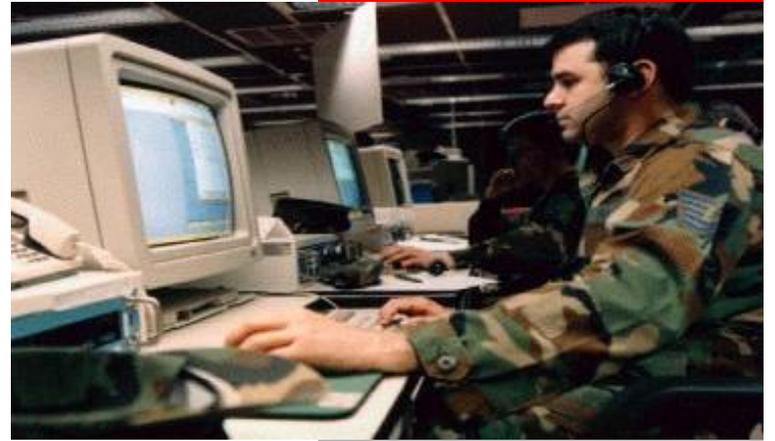
# USMC Tactical Communications Network



Presented at the GCSS-MC Solution Design Review – Sept. 2007



USMC Network Analyzed Early in the Program



# Approach to Meet the Challenges

(Approved by the Marine Corps)

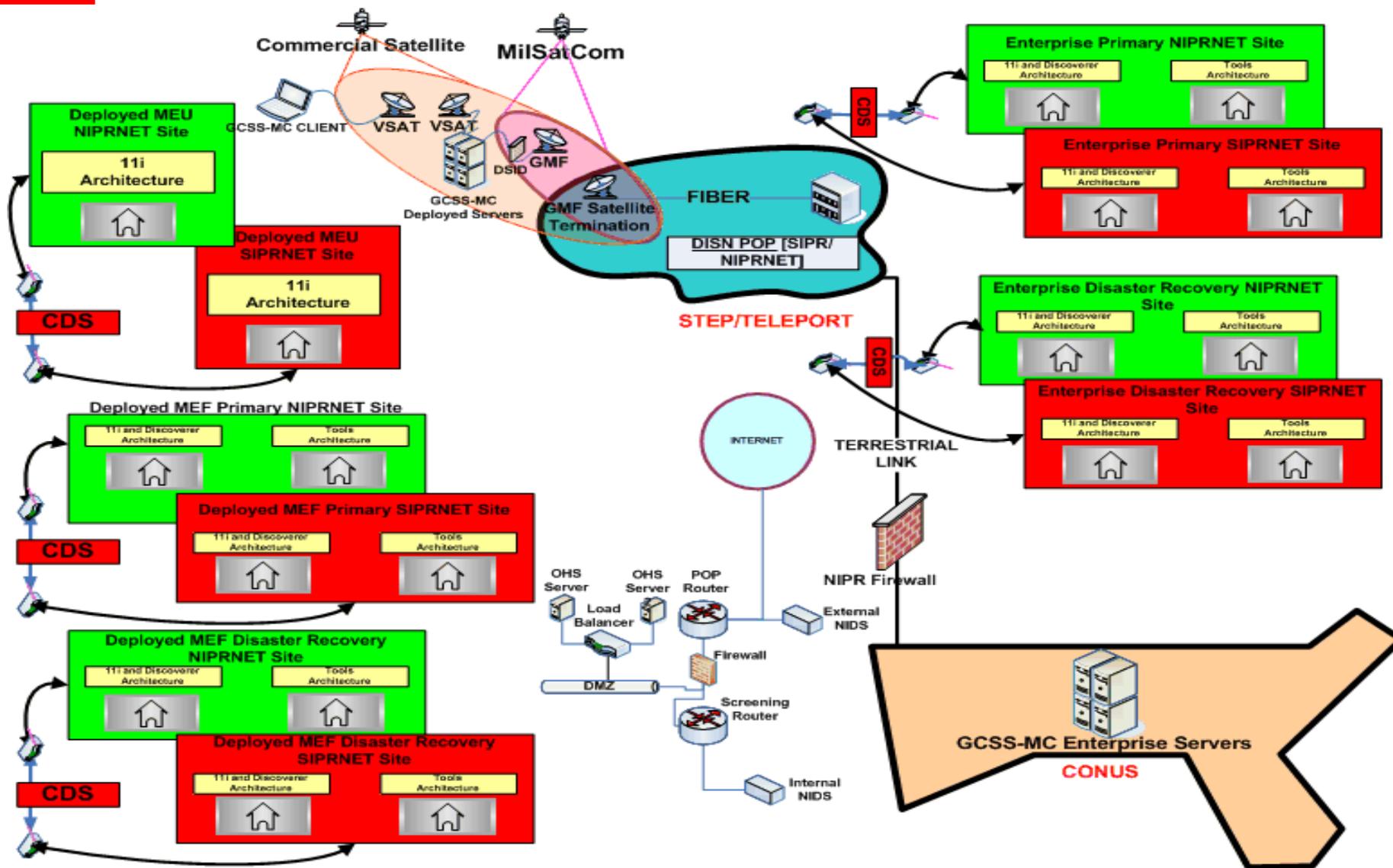
# Key Components of the Solution

- **Multiple Instance Architecture:** Mitigates Disconnected, Interrupted, Low Bandwidth, and High Latency network conditions
- **Data Synchronization (DS):** Provides the ability to synchronize data between a forward-deployed MAGTF instance (version of system) and the Garrison-based version, enablers of Multiple Instance Architecture
- **Cross Domain Solution (CDS):** Allows the secure transfer data between the NIPRNET and the SIPRNET, enablers of GCSS-MC for Warfighters under austere network conditions
- **Mobile Field Service (MFS):** Provides supply chain functionality in “tight” network spaces
  - A “skinny” application, rich in functionality but low on impact on space-constrained communication channels
  - Streamlined capabilities that meet the critical needs of the Warfighter
  - Enhanced by Oracle in 2008 to meet USMC needs

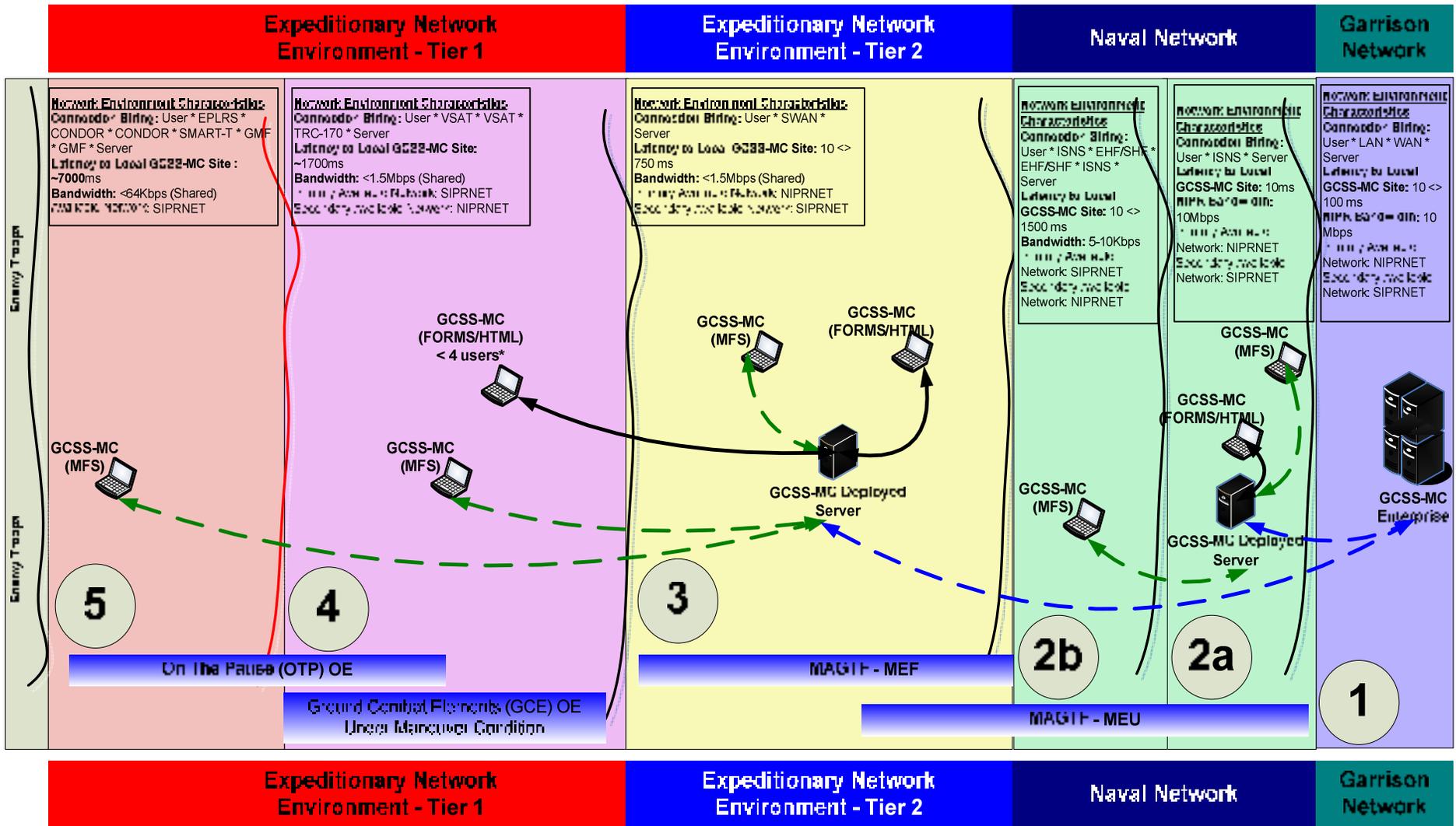


**MARINES**  
THE FEW. THE PROUD.

# GCSS-MC Multiple Instance Architecture



# GCSS-MC CONOPS Over the Tactical Network



Presented at the GCSS-MC Solution Design Review – Sept. 2007



# Oracle SOA / BPM Based Solution Architecture

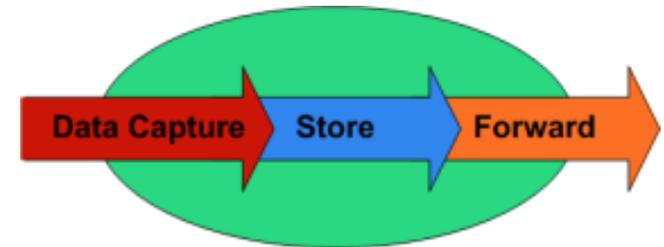
- Oracle e-Business Suite
- Oracle XML Gateway
- Oracle Service Oriented Architecture (SOA) Suite
  - Business Process Execution Language (BPEL) Process Manager
  - Business Activity Monitor (BAM)
  - Oracle Web Service Manager (OWSM)
- Oracle Advanced Queuing
- Third Party software: AgileDelta Efficient XML



Technology Approach to Meet the Challenges

# The Concept of Store and Forward

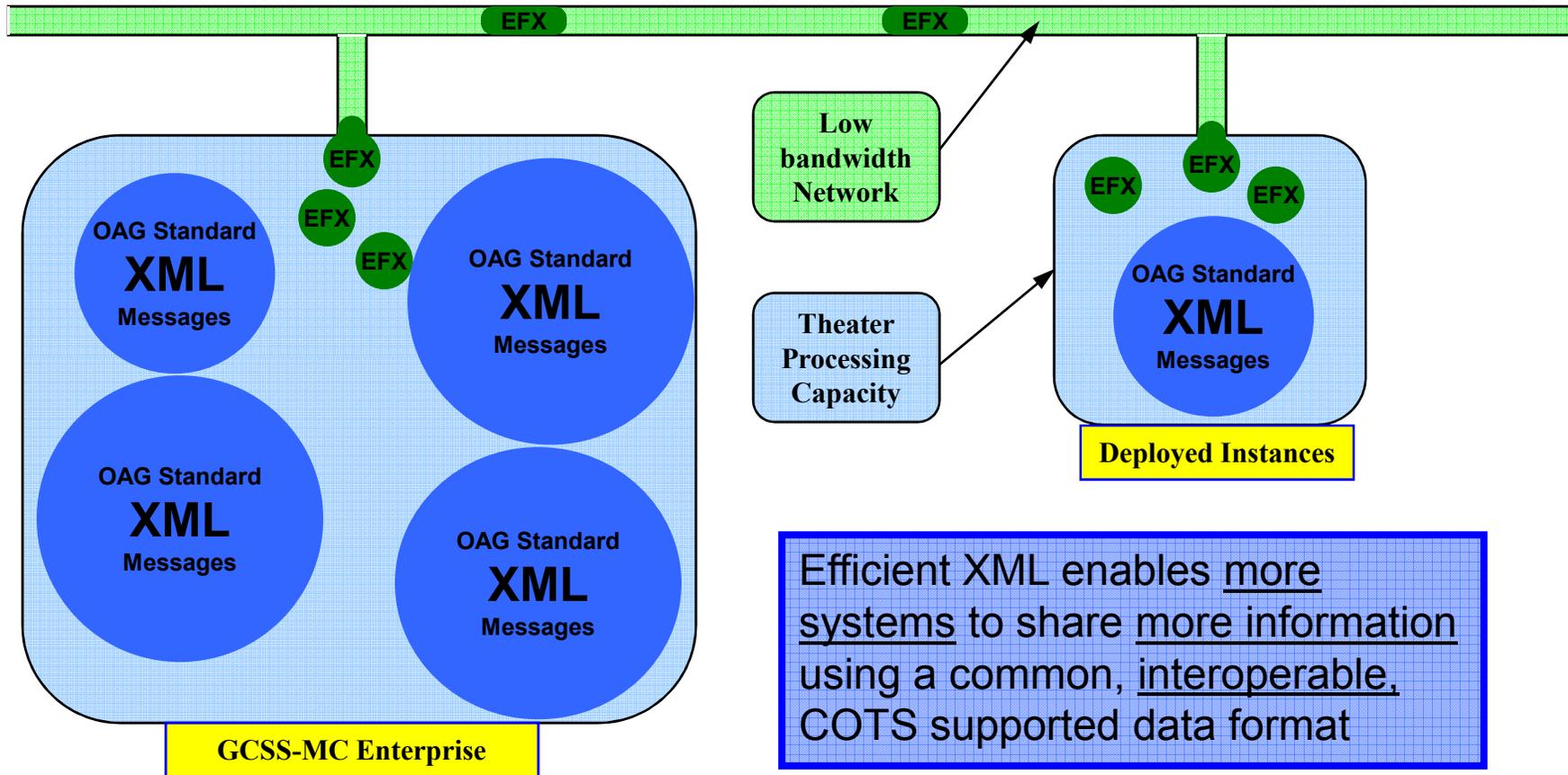
- Open Application Group (OAG) Standard Business Object Document (BOD) XML Messages
- Synchronizing Ordering
  - FIFO, Priority, and/or Commit\_Time
- Transaction Grouping
- Multiple Message Modes
  - Persistent messages
  - Buffered messages
- Time-based specification for consumption
- Enqueue, dequeue, and propagation
  - Single message or ARRAY of Messages
- Exactly one delivery
- Retry and reprocessing when disconnected or interrupted
- No distributed transactions required



# AgileDelta's Efficient XML (EFX) Technology

Extends reach of XML to systems with limited resources

Enables Data Synchronization over the USMC Tactical Comm Network



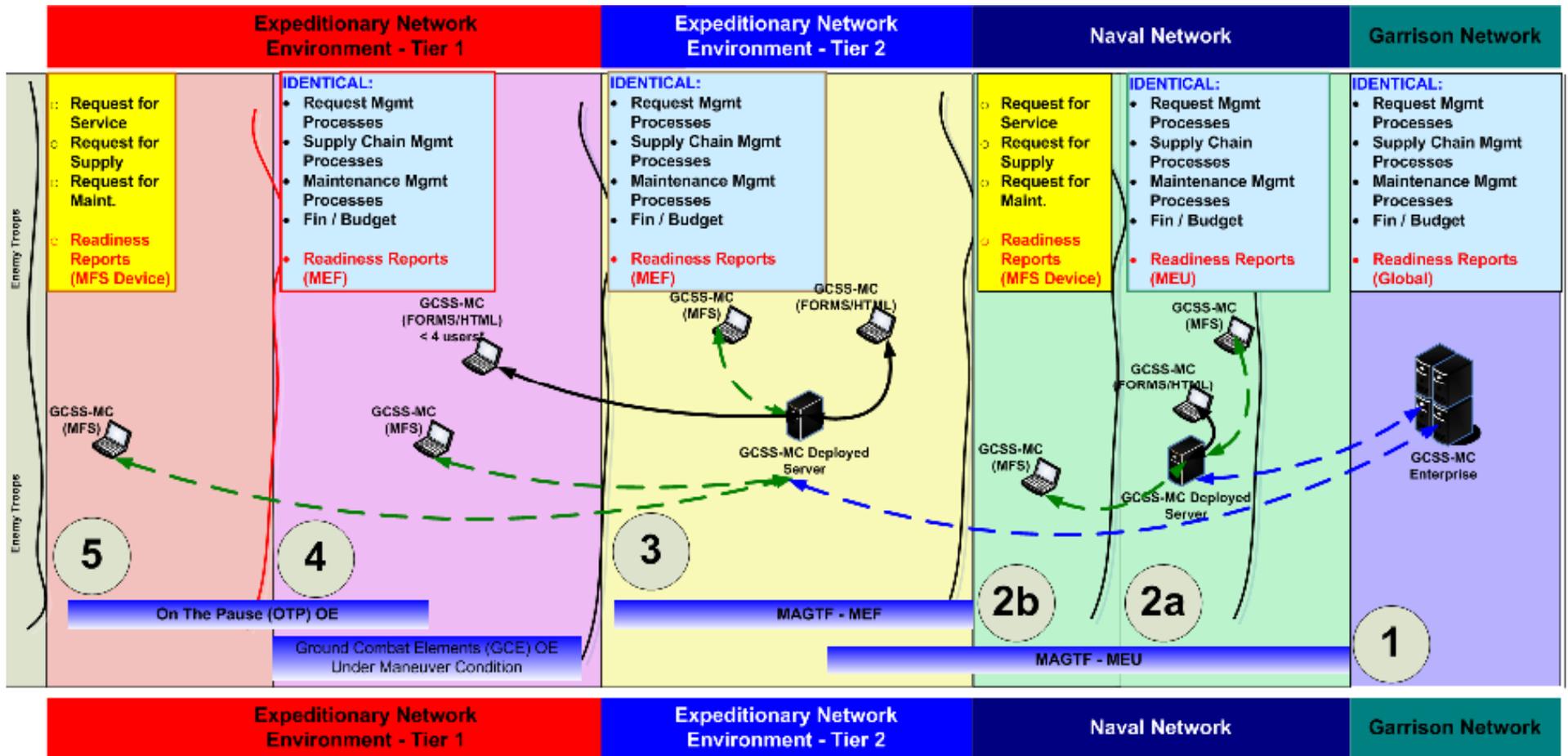
Efficient XML enables systems with limited bandwidth, memory, processing power and battery to use XML

eXML Reduces Network Taxing



**MARINES**  
THE FEW. THE PROUD.

# Identical Business Processes in Garrison and when Deployed



Global Combat Support / Readiness Reporting

# Which Data to Synchronize?

## Determined by Business Processes and Readiness Reports

- Principle: Operate over the USMC Tactical Comm Network
  - Data Group 1 – Data Needed to enable a global process
    - Examples: Purchase Orders / Sales Orders / Advanced Shipment Notice
  - Data Group 2 – Data Needed to enable a global readiness report
    - Examples: Operational Status of Install Base / On Hand Balances of Perpetual Inventory
  - Data Group 3 – Enterprise Managed Reference Data
    - Examples: Item Master / Task Organization (TCA) / AAC / Financial
- Principle: Establish a discipline that determines which transactions are critical in forward-deployed areas
  - Example: Service Requests (SRs) can only be acted on locally. It will not add to the success of the project by synchronizing voluminous SRs, notes, task descriptions, comments, which cannot be acted upon remotely from Garrison

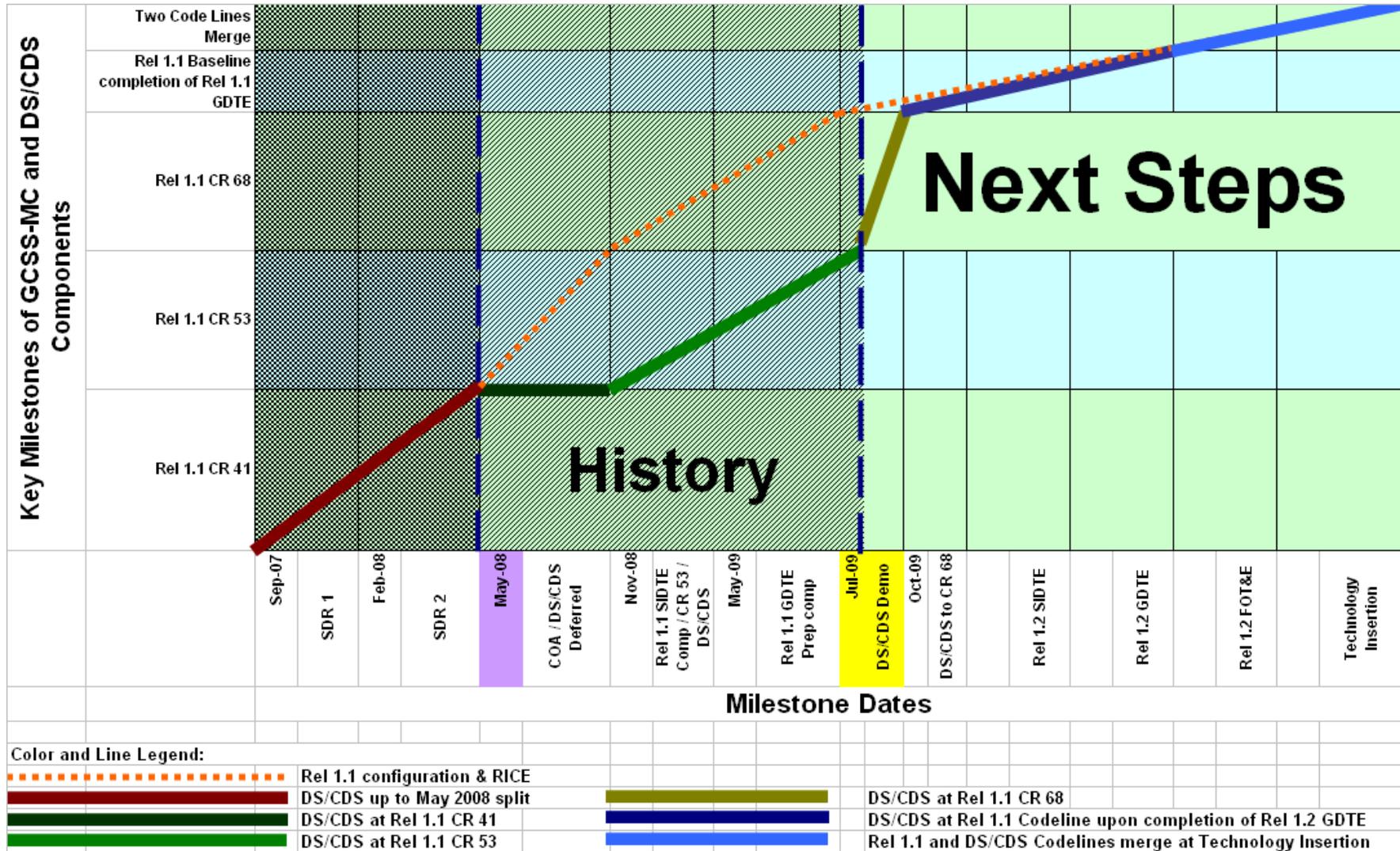


Sync What is Necessary to Enable GCSS-MC Global Processes

# DS/CDS Solution Maturation



# DS/CDS Maturity and Next Steps



**Risk Reduced As Overall GCSS-MC Solution Matures**



# Maturity and Stability of DS/CDS Components

- The maturity and stability of DS/CDS components are tightly linked to the configuration and RICE components of GCSS-MC/LCM Block 1 Release 1.1
- Oracle investment work since December 2008 has included
  - Comprehensive design review and update to Release 1.1 Change Request 53 (CR 53) baseline
  - Incorporation of pre-May 2008 Change Requests and resolution of all outstanding test issues
  - Error Handling Framework added to designs of all components
  - Reviews, standardization, and tuning of code
  - Technical and functional unit tests
  - Comprehensive integrated test of all 38 components in the current baseline



**MARINES**  
THE FEW. THE PROUD.

# DS/CDS Government Demonstration

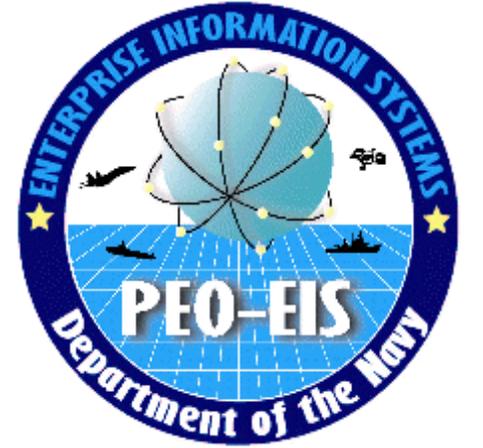
## July 15-16, 2009

- All 35 DS/CDS components successfully demonstrated
- Confirmed the technical maturity and stability of the DS/CDS baseline
- Validated the architecture that was approved at the Solution Design Review in September 2007



**MARINES**  
THE FEW. THE PROUD.

DS/CDS Components Successfully Demonstrated



# Questions and Answers



**MARINES**  
THE FEW. THE PROUD.

