



**Working Group 10E Outbrief:  
Refining a Reference Model for  
Network-Centric Ground Systems and  
Drilling Down into Emerging Standards  
and Implementation Tools**

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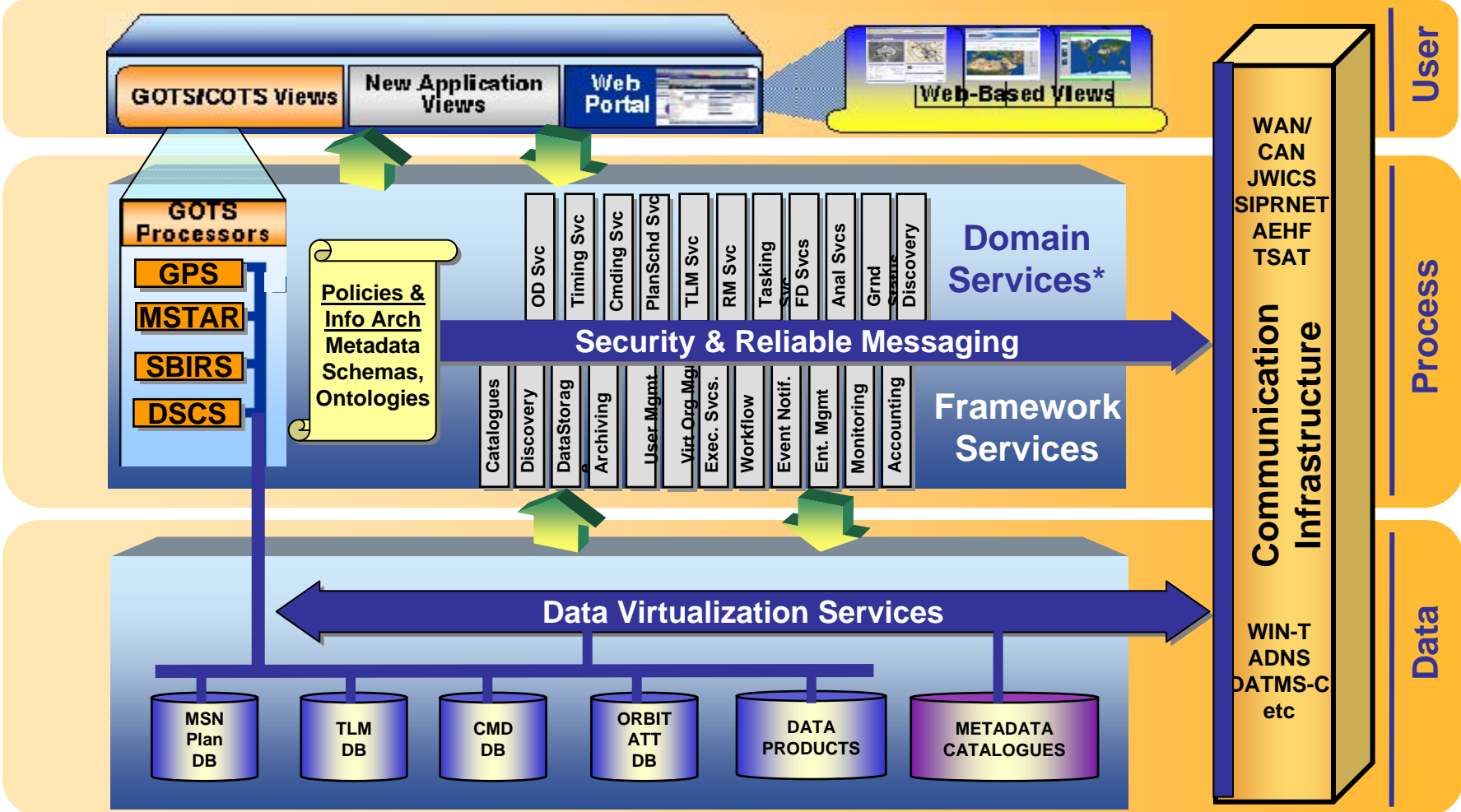
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# Working Group Goals

- **Review "abstract reference model"**
  - Examine existing prototypes, systems
- **Identify service categories**
  - Looking across example systems
- **Identify possible implementation vehicles**
  - Tools, standards, prototypes
  - DISR Baseline Release 07-3.0
- **Review maturity of implementation vehicles across service categories**
  - Identify where more work needs to be done
- ***Recruit participants and sponsors for OWS-6***
  - *Open Geospatial Consortium (OGC) Web Services Testbed-6*
  - *OWS-5 had many satellite ground system-related efforts*
  - *Opportunity for targeted efforts in key netcentric ground system areas*

# A Proposed Reference Model for a Netcentric Ground System Service Architecture



\*Domain Services listed are notional may be augmented in any concrete architecture. Heavily modified from USAF, Distributed Common Ground Architecture (DCGS-A).

# Populating the Specification Areas

<b>Applications</b>	(There are essentially an unbounded number of “applications” that could run as part of the application domain. <b>OGC WMS, WFS &amp; WCS</b> are listed here since they would be part of what an end-user sees and interacts with.)
<b>Job Submission/Execution Svcs</b>	<b>WSDL, SOAP, (WS-I Basic Profile), CORBA, JSDL, OGSA-BES (OGF HPC Basic Profile), OGC Web Processing Service</b>
<b>Discovery</b>	<b>UDDI, (WS-I Basic Profile), DDMS v1.3 (DoD Discovery Metadata Specification), WS-Discovery</b>
<b>Catalogues &amp; Registries</b>	<b>LDAP, OpenGIS Cat 2.0, OGC CSW, ebRIM, ebXML RS, EO Products Ext., NATO DFDD 2007-1 (DGIWB Data Feature Data Dictionary), NAS v1.8 (NSG Application Schema), NEC V1.8 (NSG Entity Catalog)</b>
<b>Metadata Schemas &amp; Ontologies</b>	<b>XML, CIM/GLUE, FGDC, GML 3.1, ISO 15836 (Dublin Core), ISO 19115 (metadata), ISO 19119 (services), ISO 19130 (sensors), OWL, OWL-S, SWRL, (many other ISO standards)</b>
<b>Messaging, Routing, Addressing</b>	<b>HTTP, WS-Addressing, WS-MessageDelivery, WS-Reliability, WS-ReliableMessaging</b>
<b>Event Notification</b>	<b>WS-Notification, WS-Eventing</b>

# Populating the Specification Areas

<b>Workflow/Transactions</b>	BPEL, WS-Coordination, (Kepler, Triana, Pegasus, ...)
<b>Data Management</b>	FTP, GridFTP, OGSA-DAI, (SRB, iRODS)
<b>State Management</b>	IETF RFC 2695 (HTTP State Management (cookies)), <b>WS-ResourceFramework, WS-Context, WS-I+, WS-MetadataExchange</b>
<b>Metadata Schemas &amp; Ontologies</b>	XML, CIM/GLUE, FGDC, GML 3.1, ISO 19115 (metadata), ISO 19119 (services), ISO 19130 (sensors), OWL, OWL-S, SWRL
<b>Portals and User Interfaces</b>	WS-RemotePortlets
<b>Security</b>	SSL/TLS, Kerberos, WS-Security, ID-WSF 2.0 (Liberty Identity Web Services Framework), <b>WS-Trust, SAML, XACML, GSI, Shibboleth, VOMS (Virtual Organization Management System), OpenID, OAuth</b>
<b>Policy &amp; Agreement</b>	WS-Policy, WS-Agreement, (iRODS)
<b>System Architecture</b>	OGF Open Grid Services Architecture, OGC Sensor Web Enablement (SWE), Community Sensor Model v2.A (CSM)
<b>System Management</b>	WS-DistributedManagement, <b>WS-Management, WS-Transfer, OGF CDDLM (Configuration Description, Deployment and Lifecycle Management)</b>

# Where We Are

- Basic technology for netcentric systems has been developed
- Further technology needs to mature before a dominant practice emerges and becomes widely adopted
- The non-technical issues surrounding netcentric systems and their acquisition need to be addressed

## -- And A Next Step

- *Prototypes and demonstrations of key technology with the Open Grid Forum (OGF) under the umbrella of the Open Geospatial Consortium's (OGC) Web Services Testbed (OWS)*

# The OGC-OGF Collaboration



- **Promote best practices and international standardization for distributed geospatial data processing capabilities that is:**
  - *Transparent* -- users is not aware of the infrastructure
  - *Interoperable* -- the resources work together
  - *Scalable* -- small local, to massive distributed platforms

# OGC-OGF to Collaborate on OWS-6

- **OWS = OGC Web Service Testbed**
  - Annual process where sponsors identify specific demonstration targets
  - OWS-5 recently finished (last week!)
- **OWS-5 Sponsors**
  - BAE Systems, Federal Geographic Data Committee, Google, Lockheed Martin, Northrup Grumman, NASA, NGA
- **OWS-5 Lead: J. Cook, Lockheed Martin**
- **~70 Participants**
- ***4x-5x Return on Investment***
  - *Strength of Collaboration*
- ***OWS-6 in Planning Process***
  - *“Whiteboard” session last week in St. Louis*
  - *Sponsors meeting, April 30, Herndon*



# OWS-5 NASA Sensor Web Demo

QuickTime™ and a  
TIFF (LZW) decompressor  
are needed to see this picture.

# Working Group Challenge!

## (Send info/comments to [lee@aero.org](mailto:lee@aero.org))

- **OGC & OGF have identified some key goals:**
  - Integrating OGC Web Processing Service (WPS) to grid "back-ends"
  - Integration of WPS with programming and workflow tools
  - Integration of OGC federated catalogues repositories with grid data mvmt tools
- ***How can we leverage OWS-6 to pursue ground system issues?***
  - *Ideas, Requirements, Participation, Sponsorship*
- **Address DISR gaps?**
  - Virtual Organization Mgmt
  - Delegation of Trust
  - Policy Mgmt & Enforcement
  - Service Level Agreements
  - Workflow
  - Co-Scheduling
  - Adv. Reservations
- **Technical Issues**
  - Service Level Agreements
  - Data Management/Data Repositories
  - Harmonize SOA ref. arch. (OASIS, OSOA)
  - Service Management
  - Data Grid Software, e.g., iRODS
  - Workflow, e.g., Kepler
- **Engage additional organizations**
  - EPA, NOAA, GEOSS, TACSAT, DCGS, Google, Homeland Security