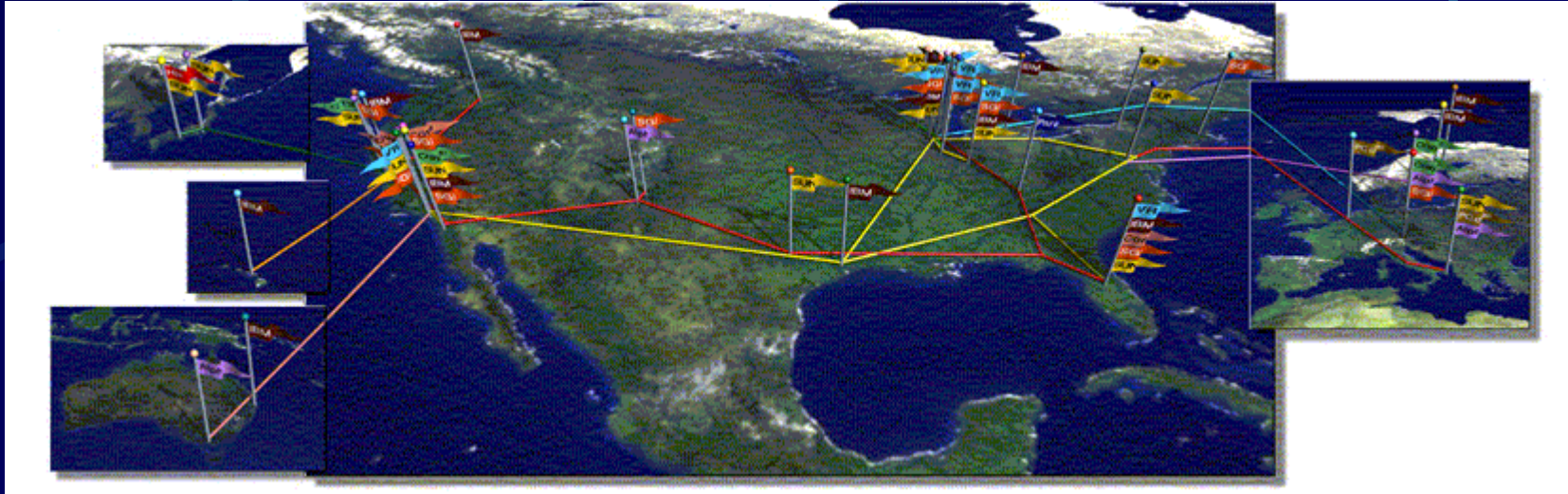


Grid and Web Service Standards **for Government and Defense Systems**

**A Break-Out Session and Extended Panel
Ground System Architectures Workshop
<http://sunset.usc.edu/gsaw/gsaw2004.html>**

**March 31, 2004 -- Manhattan Beach, California
Dr. Craig A. Lee, lee@aero.org
Computer Systems Research Department
The Aerospace Corporation**

Again, What is Grid Computing?



- **Distributed Computing and Resource Mgmt**
- **Resource Sharing – Virtual Organizations**
- **Service and Data Discovery, Workflow Mgmt**
- **Managing Distributed Access to Petabytes**
- **Security – Single Sign-on across Admin Domains**
- **Convergence of Grid and Web Services**

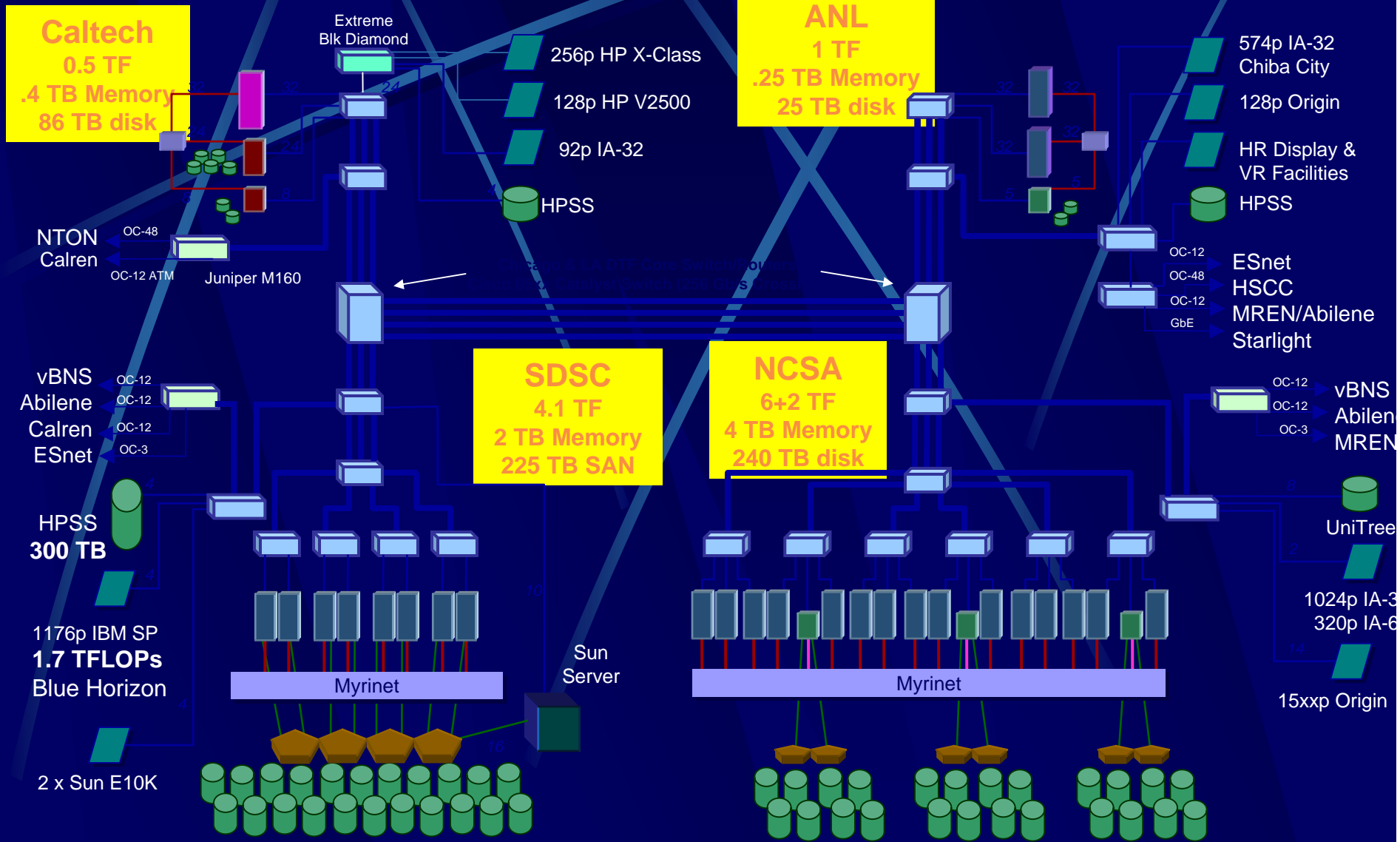
TeraGrid: 13.6 TF, 6.8 TB memory, 79 TB internal disk, 576 network disk

Caltech
0.5 TF
.4 TB Memory
86 TB disk

ANL
1 TF
.25 TB Memory
25 TB disk

SDSC
4.1 TF
2 TB Memory
225 TB SAN

NCSA
6+2 TF
4 TB Memory
240 TB disk



Extreme
Blk Diamond

256p HP X-Class

128p HP V2500

92p IA-32

HPSS

NTON
Calren

OC-48

OC-12 ATM

Juniper M160

SDSC

4.1 TF

2 TB Memory

225 TB SAN

NCSA

6+2 TF

4 TB Memory

240 TB disk

574p IA-32
Chiba City

128p Origin

HR Display &
VR Facilities

HPSS

ESnet

HSCC

MREN/Abilene

Starlight

OC-12

OC-48

OC-12

GbE

vBNS

Abilene

MREN

UniTree

1024p IA-32

320p IA-64

15xxp Origin

HPSS
300 TB

1176p IBM SP
1.7 TFLOPs
Blue Horizon

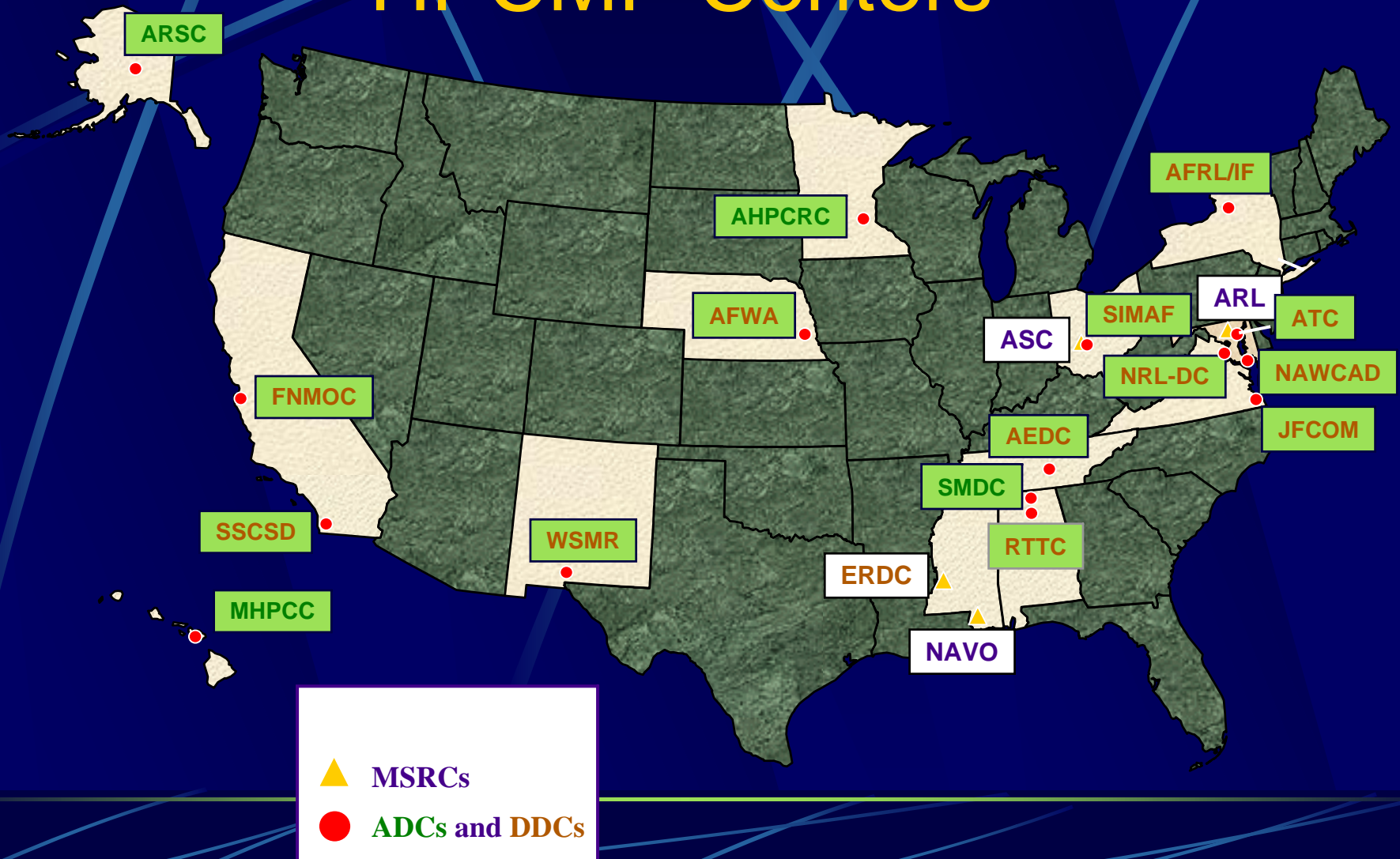
2 x Sun E10K

Sun
Server

Myrinet

Myrinet

DoD Modernization Program HPCMP Centers



Overview

- *Six talks covering system requirements, vendor activities and future directions for grid/web services*
- *NASA Ames, Aerospace presented many on-going grid project in the satellite arena*
 - *For example, Committee on Earth Observation Systems (CEOS) is an umbrella organization coordinating many satellite grid projects*
- *Oracle, IBM, DataSynapse presented current work in the commercial grid arena*
 - *Many large companies, e.g., financial institutions, adopting grid strategies*
- *ISI/USC presented future directions on grid computing and standards.*

Discussion

- Security, Security, Security
- Organizational barriers to widely integrated computing infrastructures
 - Enterprise-level grids allow some issues to be resolved by top-down policy
- Some vendors feel that security is solved but the real issue is scalability
 - *How widely can we deploy it*
- Integration of domain-based security models, e.g., X.509 certificates, with multi-level security
- Protection and Survivability
- Integration of wired and wireless infrastructures

Conclusions

- Grid and Web services will be key tool for ground system design and deployment
- "Cross-pipe" interoperation, reuse, commonality
- Convergence of grid and web services underway
 - Web Services Resource Framework (WSRF) provides web service infrastructure appropriate for grid computing
 - Scalable deployment of service and resource discovery, scheduling, management, and security
 - Allows services and state (data) to be managed separately or together
- Important ramifications for component architectures, event notification, reliability

Shameless Plug

- Standards are needed:
- *Global Grid Forum,*
www.ggf.org

