



LIGO/LSC Grid Computing Activities

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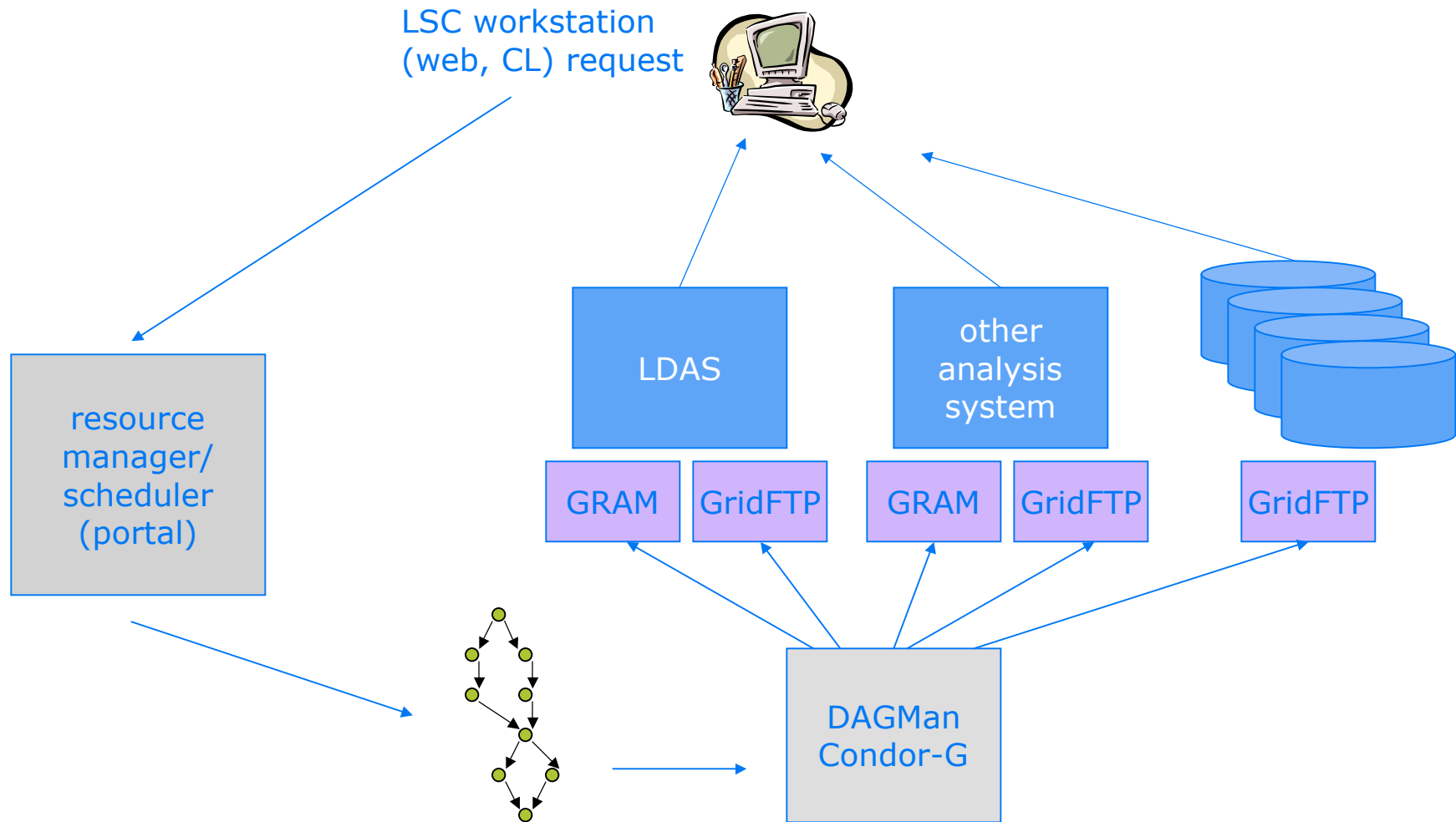
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SC2001

- Goal: Thinly wrap LDAS with standard Grid services & begin to explore virtual-data aspects
 - » Globus Resource Allocation Manager (GRAM)
 - » GridFTP
 - » Globus Grid Security Infrastructure (GSI)
- Resources leveraged:
 - » LDAS at Caltech
 - » LDAS at UWM
- People:

SC2001 Demo





SC2002

- Goal:
- Resources plan to leverage:
 - » LDAS at Caltech
 - » Linux cluster at Caltech
 - » LDAS at UWM
 - » Linux cluster at UWM
 - » Linux cluster at UTB
 - » Linux cluster at ISI
 - » Linux cluster at NCSA
- People



Security: Authentication

- Nature of LIGO Laboratory/LSC makes strong case for Public Key Infrastructure (PKI)
 - » Composed of geographically distributed members from existing sites and institutions
 - » Individual, site-specific policies already in place need to be respected
 - » Virtual Organization (VO)
 - » Provides LIGO/LSC scientists with single identity/credential used anywhere within LIGO/LSC Grid
- 3 primary pieces of PKI
 1. Digital certificates for users, hosts, services
 2. Certificate Authority (CA)/Registration Authority (RA)
 3. Authentication & Authorization Infrastructure – Globus GSI



Security: Authentication

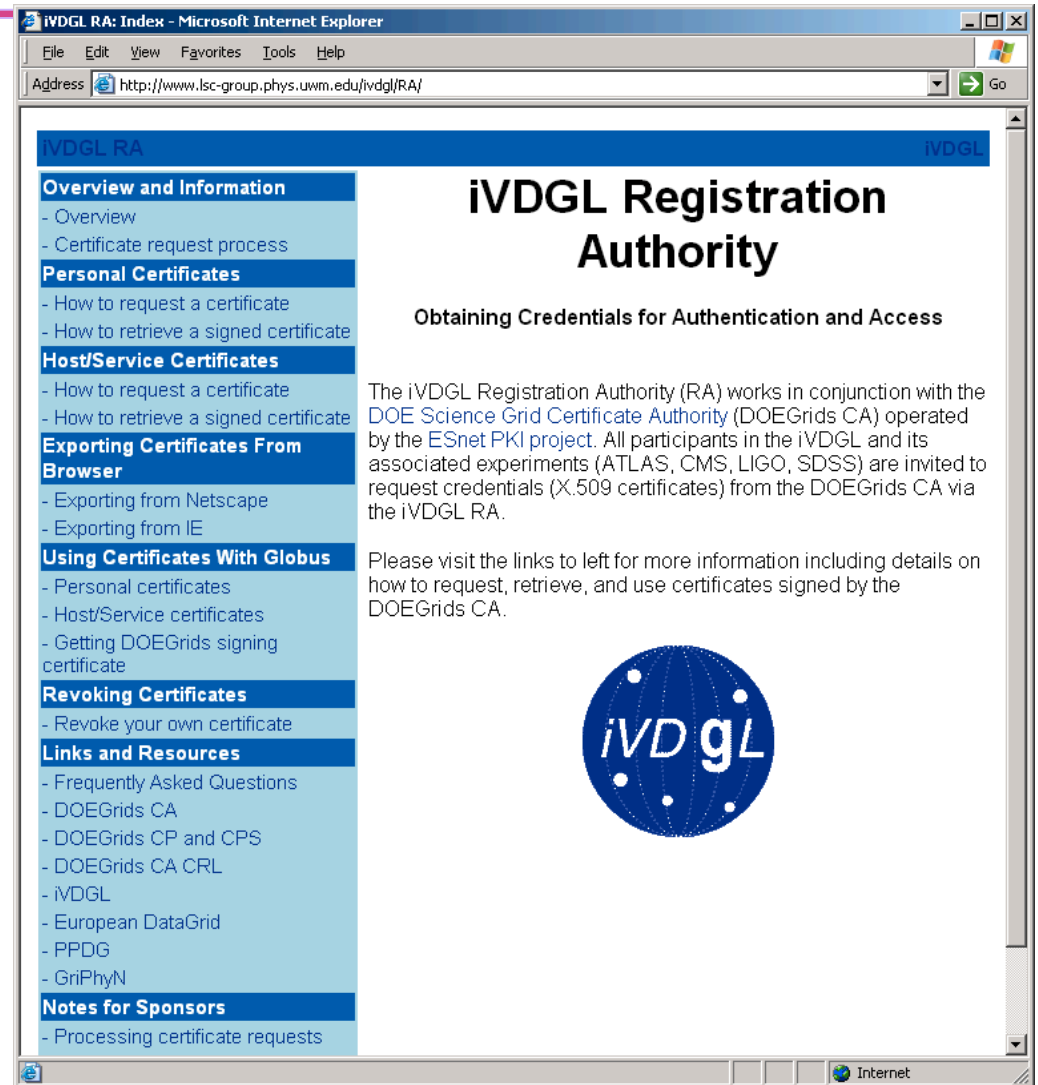
- Leverage iVDGL work
- Use DOEGrids CA as LIGO/LSC certificate authority





Security: Authentication

- Leverage iVDGL Registration Authority (RA)
 - » LIGO/LSC contribute back to iVDGL
 - » Koranda serves as iVDGL RA Point of Contact and on DOE PMA
 - » Use chain of verification for granting certificates
 - » Keeps LIGO Laboratory in loop





Adopted at UWM Tier2 Center

The screenshot shows a Microsoft Internet Explorer browser window displaying the Medusa user manual. The address bar shows the URL: http://www.lsc-group.phys.uwm.edu/beowulf/medusa/user_manual/connecting_with_grid_tools.html. The page title is "Medusa: The 300-Node Beowulf" and the breadcrumb trail is "UWMLSC > Beowulf Systems > Medusa".

The main content area is titled "Connecting with Grid Tools" and includes a search box, a "Links and Resources" sidebar, and a "Contents" section. The "Contents" section lists the following topics:

1. The basics of Grid Computing security
2. Downloading the LSC Grid software
3. Installing the LSC Grid software
4. Using the Grid Tools
 - o Generating a proxy certificate
 - o Using the GSI-enabled SSH client
 - o Using the GSI-enabled FTP client

The "The basics of Grid Computing security" section explains that digital certificates are used for authentication instead of passwords. It states: "When computing 'on the Grid' you use a **digital certificate** rather than passwords to **authenticate** to resources. That is, if you want to login using SSH or connect with FTP or otherwise communicate with a server you present a digital certificate instead of typing in a password to prove who you are. Your digital certificate serves as your **electronic credentials** across the entire Grid." It also notes that special versions of SSH, FTP, and other tools are required to handle digital certificates.

There are three primary advantages to using digital certificates for authentication:

1. You only need one credential (digital certificate) to authenticate on the Grid. The common and troublesome practice of having different passwords on many different resources is eliminated.



Security: Authorization

- Investigating Globus CAS



Integration of PKI into LDAS

- Long term goal
- Both authentication and authorization
- Shortest path is leverage work of LBL team created python version of Globus
 - » SWIG wrapping
 - » Target Tcl rather than python
 - » Provide Tcl hooks into security (GSI) module first, then others
 - Dr. Igor Yashukin begun looking in detail at this path



Data Replication to Tier 2 Sites

- LDR details...
- Mention nice WAN performance between UWM/CIT
- Mention need for better WAN to MIT, perhaps PSU (still determining), and UTB