Managing Grid Credentials

Jim Basney <jbasney@ncsa.uiuc.edu>
http://www.ncsa.uiuc.edu/~jbasney/
Senior Research Scientist
Grid and Security Technologies
National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

Credential Issuers

- Offline Certificate Authority
- Online Certificate Authority
- Online Credential Repository

Globus Simple CA

- Included in NMIR5
- Provides a simple offline certificate authority
- Users email certificate requests that CA operator signs and returns
- Integrated with MyProxy
- http://www.globus.org/security/simple-ca.html

Other Offline CA Options

- OpenCA
  - Full-featured, open source, OpenSSL-based offline CA
  - http://www.openca.org/
- Commercial CAs

KCA

- Included in NMIR5
- Online certificate authority for Kerberos sites
- Authenticate with Kerberos ticket to retrieve certificate with same lifetime as ticket
- http://www.citi.umich.edu/projects/kerb_pki/

CACL

- Online certificate authority supporting username + password authentication
- Users retrieve long-lived certificates
- Used by SDSC and NCSA for TeraGrid
- http://www.npaci.edu/CA/

Globus Certificate Service

- Online certificate authority with no identity verification
- Third-party ID verification is over-rated!
- No need to duplicate ID verification already performed when setting up authorizations
- http://gcs.globus.org:8080/

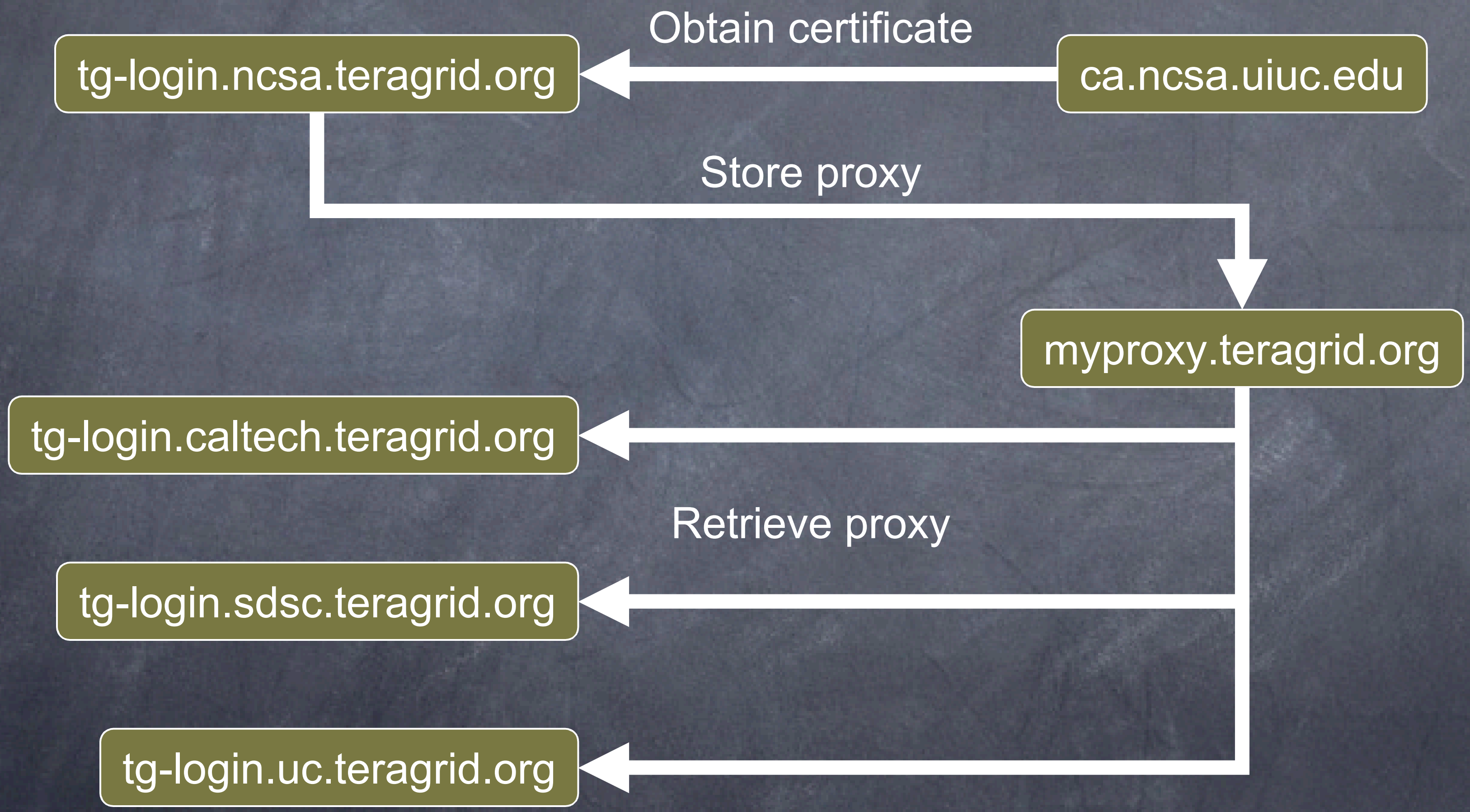
CAcert Online CA

- Free, comunity, non-profit CA
- Uses web of trust to recruit registration authorities for optional identity verification
- http://www.cacert.org/

MyProxy Online Credential Repository

- Included in NMIR5
- Stores proxy and end-entity credentials, encrypted with user-chosen passphrase
- Users retrieve proxy credentials via delegation — keys never leave repository
- http://myproxy.ncsa.uiuc.edu/

MyProxy and Credential Mobility



Obtain certificate

tg-login.ncsa.teragrid.org

ca.ncsa.uiuc.edu

Store proxy

myproxy.teragrid.org

tg-login.caltech.teragrid.org

Retrieve proxy

tg-login.sdsc.teragrid.org

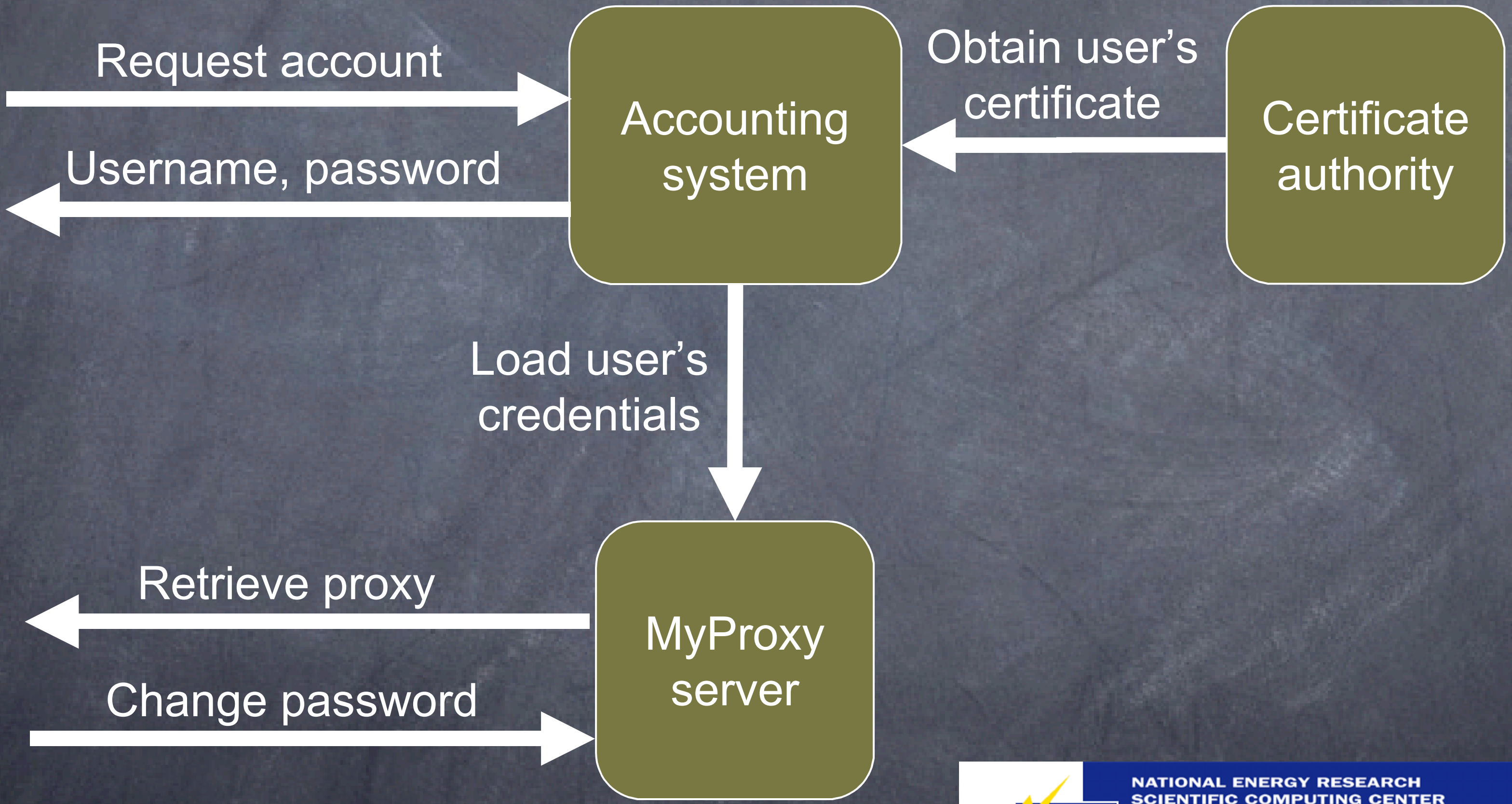
tg-login.uc.teragrid.org

TERAGRID

Credential Distribution via MyProxy

- Integration with Globus Simple CA enables myproxy-admin-adduser command
- Load user credentials into the repository and distribute username + password
- Eliminate certificate request step
- Users retrieve proxies from MyProxy when needed

Credential Distribution via MyProxy



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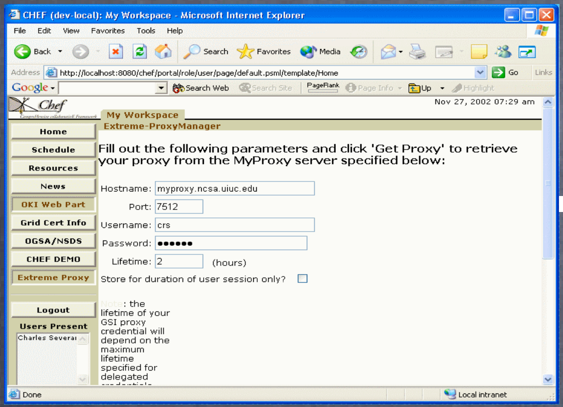
MyProxy and Grid Portals



Nov 27, 2002 07:29 am

My Workspace

Extreme-ProxyManager

Fill out the following parameters and click 'Get Proxy' to retrieve your proxy from the MyProxy server specified below:

Hostname: myproxy.ncsa.uiuc.edu

Port: 7512

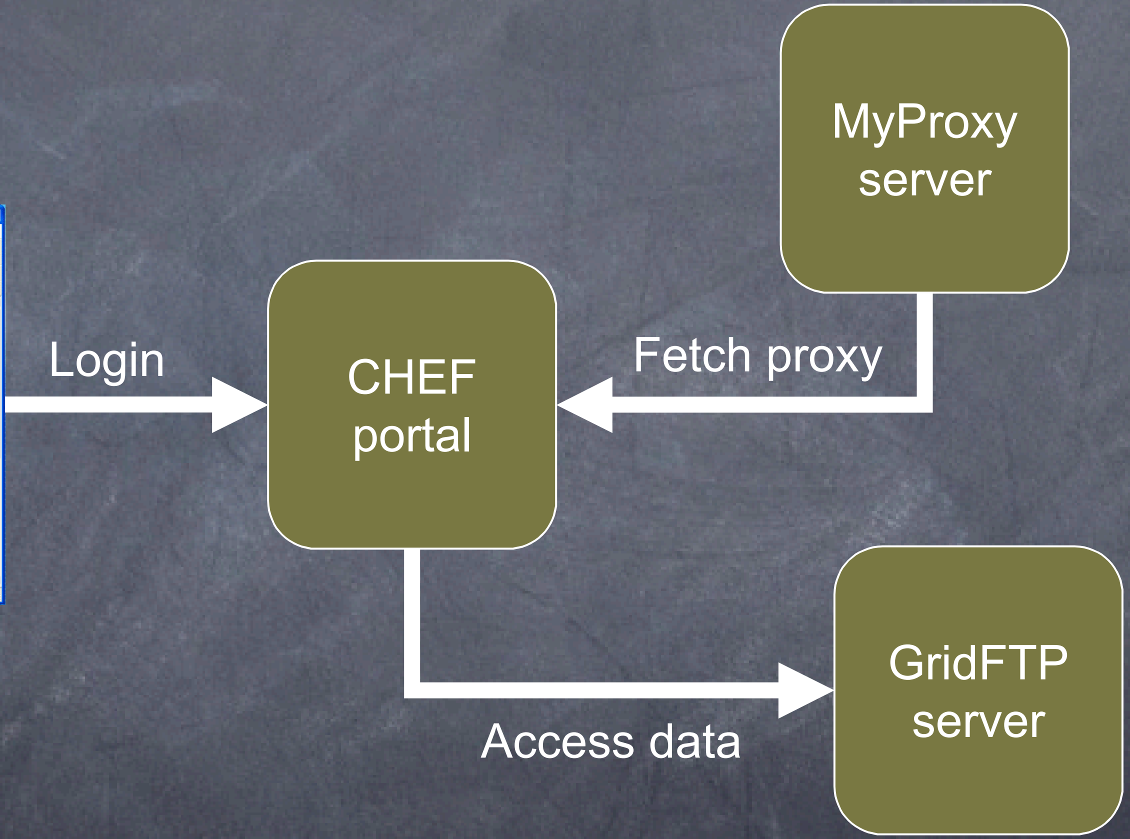
Username: crs

Password: ●●●●●●

Lifetime: 2 (hours)

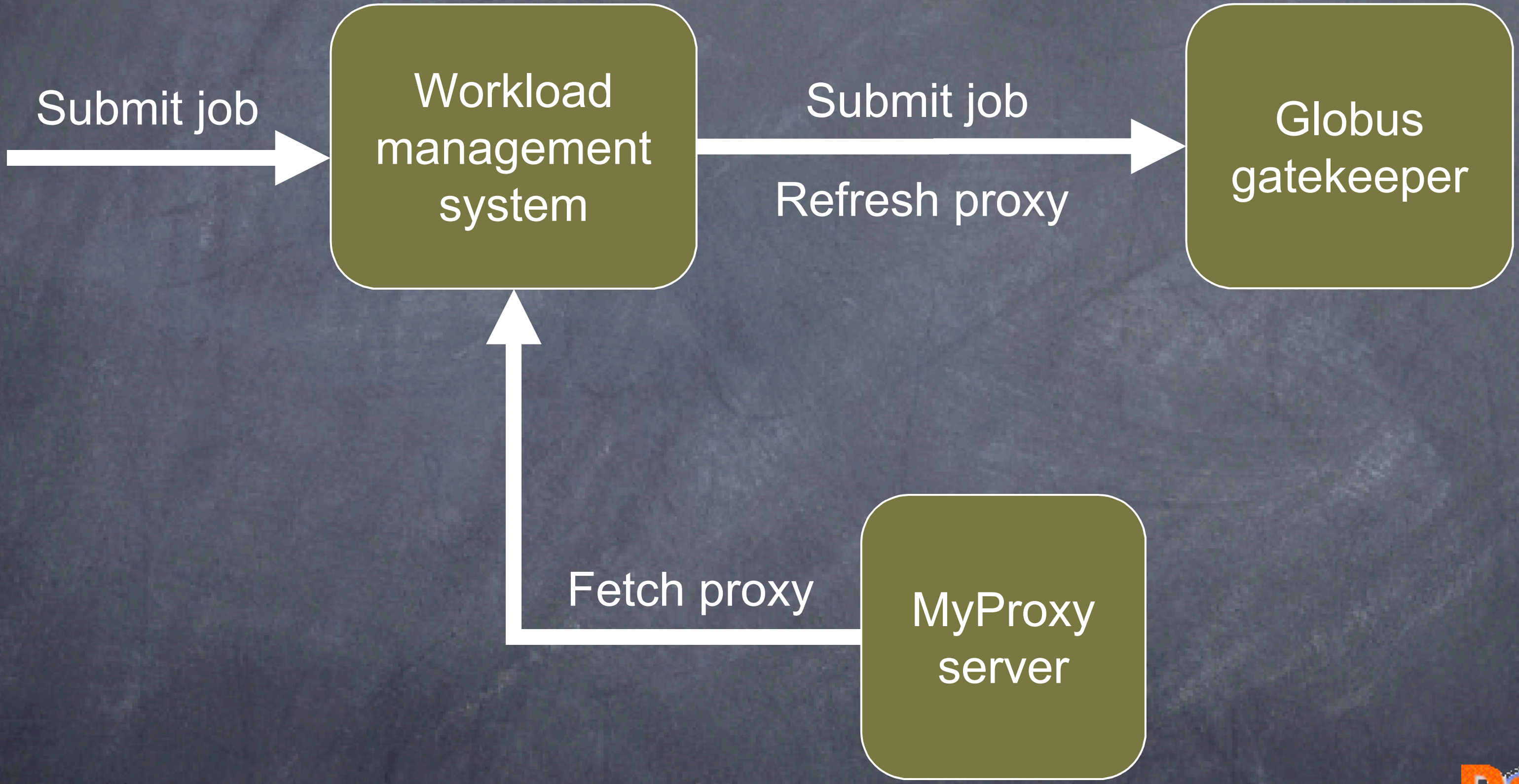
Store for duration of user session only? □

Note: the lifetime of your GSI proxy credential will depend on the maximum lifetime specified for delegated



NEESgrid

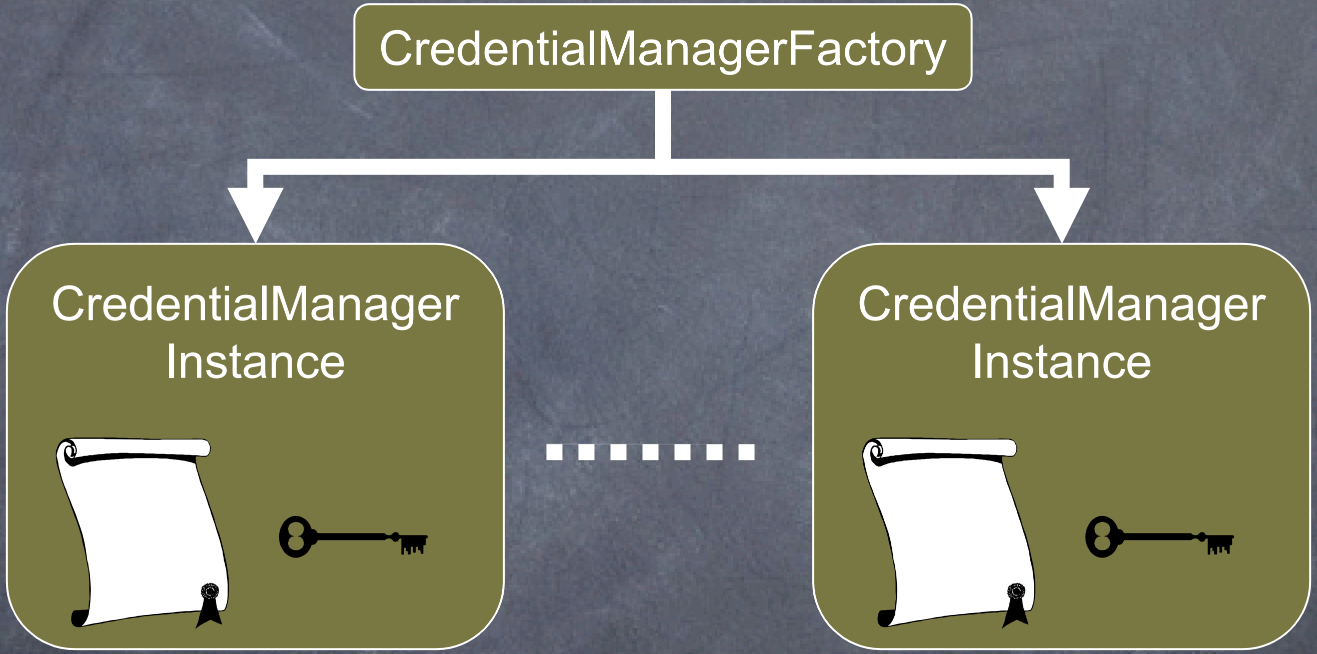
MyProxy and Credential Renewal



MyProxy Credential Renewal with Condor-G

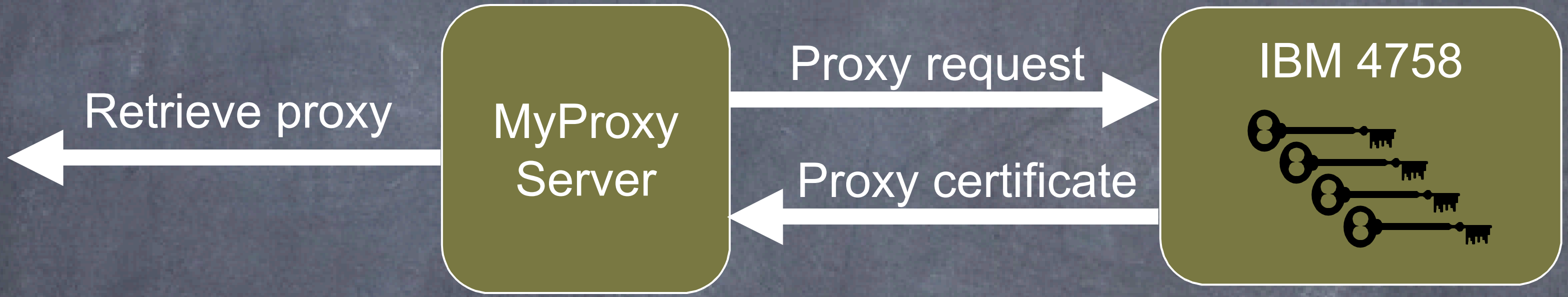
- Support added in Condor-G 6.7.0
- Include MyProxy information in Condor-G job submission file
- Condor-G retrieves fresh proxies on demand from MyProxy and delegates them to running jobs

MyProxy for OGSI



http://myproxy.ncsa.uiuc.edu/ogsa/

Hardware-Secured MyProxy



M. Lorch, J. Basney, and D. Kafura, "A Hardware-secured Credential Repository for Grid PKIs," 4th IEEE/ACM International Symposium on Cluster Computing and the Grid, April 2004.

Grid Logon

- Initialize grid security environment with secure password protocol
- Retrieve proxy credentials, CA certificates, CRLs, and authorization credentials
- Proposed work: http://www.ncsa.uiuc.edu/~jbasney/grid-logon.pdf

SACRED

- IETF proposed standard for
  online credential repositories
- RFC 3767:
  Securely Available Credentials Protocol
- Open source implementation in progress by NCSA MyProxy team and Brigham Young University Internet Security Research Lab
- http://sacred.sf.net/

One-Time Passwords

- Captured passwords represent a significant ongoing security risk.
- Goal: Limit lifetime of vulnerable credentials
- Integrate with grid security via online certificate authorities and credential repositories
- MyProxy OTP support in progress
  (early version available)

Digital Signatures

- Long-lifetime signing keys
- Integration with existing software (PKCS11, CryptoAPI)?
- Key management issues
- MyProxy support for digital signatures is planned (August 2004)

Portal Authentication

- MyProxy
- KX.509/KCA and KCT
- Shibboth
- WebISO / Cosign / Pubcookie