Some Technology Perspectives from LIGO

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Preparing for aLIGO

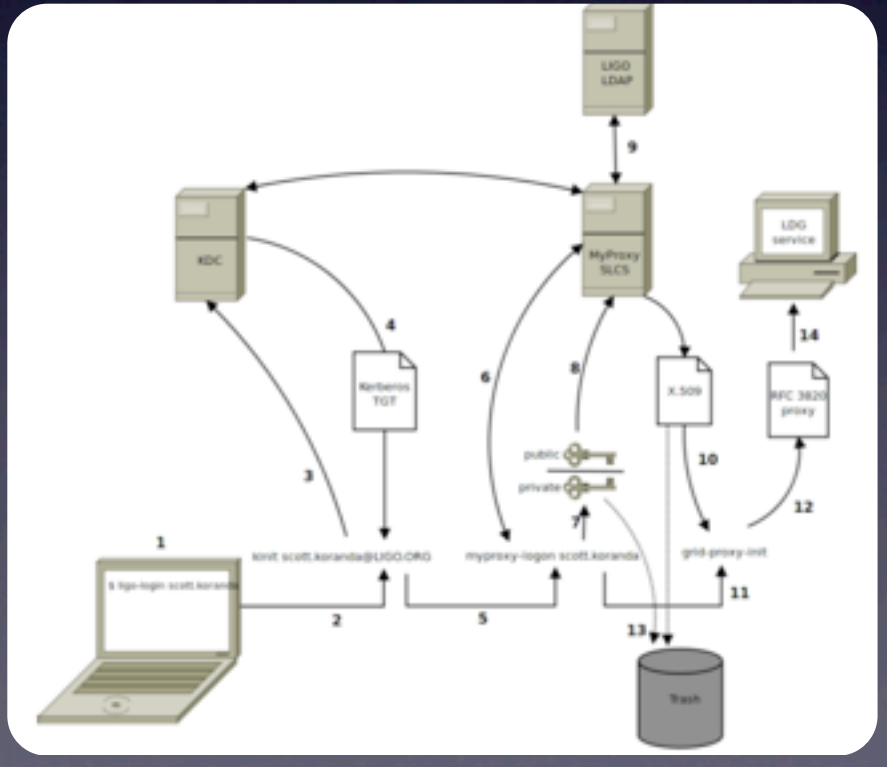
- Robust online and offline data handling and analysis capabilities are required
  - Online system:
    - Pipelines generating transient alerts and data quality information within seconds of data acquisition
    - Careful attention to interfaces between systems and grids/clouds through close collaboration
  - Offline system:
    - Re-processing of data for transients including deeper searches
    - Enhanced data quality generation
    - Searches for continuous and stochastic signals
    - Parameter estimation, model selection and simulations
- Also, new collaborations between physicists and astronomers which will require complex authentication, authorization across international boundaries

Simplifying Software Installation

- Experience with LIGO Data Grid:
  - ~2000 heterogeneous, local administrators choose the operating system: software deployment, configuration, support HELL
  - ~2004 settled on Fedora Core 4 as operating system and adopted *rpm* for software distribution; best effort support for other platforms. Better.
  - ~2008 upgraded to CentOS 5 and Debian as supported platforms. Software distribution via *rpm* and *deb*. Deployment, configuration, support much easier at data centers
  - ~2010 LIGO-centric Virtual Data Toolkit being delivered in *rpm* and *deb*. Simplifying getting grid tools to users. THANK YOU!
    - CA certificate bundle has been maintained in *yum* and *apt* repositories for LIGO. This has been excellent. THANK YOU AGAIN!
  - NEXT: Ubuntu, MacOSX, ... Chromium, iPad

Simplifying Authentication/Authorization

- Users hate certificates. Administrators hate certificates. Who likes certificates?
- Users want easy, single-sign-on. Current LIGO approach is to knit together existing technologies and tools: Kerberos, Grouper, Shibboleth, MyProxy, GridShib .....



Workflow Technologies

- Online, low-latency and offline analyses will bring different demands
- Condor has been at the core of our architecture, will remain at the core
- GlideinWMS look like it will play a central role in getting our users onto non-LIGO OSG resources