

The Virtual Data Toolkit

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Overview

- What is the Virtual Data Toolkit (VDT) all about?
 - What, who, how, why.
- OGSA / GT3 plans + activities
 - for the VDT
 - for Condor-G

What is the VDT?

- A packaging of software
 - Grid software (Globus, Condor-G, ...)
 - Virtual data software (Chimera)
 - Utilities and Libraries
- An easy installation mechanism
 - Pacman: installs and configures it all
 - RPM: for some of the software

Who makes the VDT?

- Grid Physics Network (GriPhyN)
 - Constructs the VDT
- International Virtual Data Grid Laboratory (IVDGL)
 - Testing and hardening

Very tight collaboration between
GriPhyN and IVDGL

Who makes the VDT? (2)

- **Core VDT Team @ UW-Madison:**
 - Miron Livny: The boss
 - Alain Roy
 - Carey Kireyev
 - Hiring one more soon
- **VDT Testing**
 - Xin Zhao—leader
 - Several others from U of Chicago, Caltech, UW-Milwaukee ...
- **National Middleware Initiative (NMI)**
 - Support for builds & testing

Who uses the VDT?

- GriPhyN, PPDG, iVDGL collaborators
 - USCMS: In use today
 - USAtlas: In use today
 - LIGO: In use today
 - GRID3: In use today
 - SDSS: Will use soon
 - D0: Planning to use it soon
- European Data Grid
 - Uses subset of software
 - Uses just RPMs
- LCG

Versions of the VDT

- Version 1.1.11 (Pacman)
 - Globus 2.2.4
 - Condor-G + Condor
 - MyProxy
 - US RLS
 - Fault Tolerant Shell
 - More: GSIOpenSSH, KX509, MonaLisa, VDT System Profiler, Chimera, Netlogger, PyGlobus, ClassAd library, ...
- Version 1.1.8-13 (RPM)
 - Same Globus
 - Almost same Condor-G
 - Same MyProxy
 - EDG RLS
 - Same FTSH

Why are there differences?

- Difference in version numbers?
 - No good reason
 - Plan to unify version numbers soon.
 - Unify when both are using Globus 2.4?
- Condor-G: Newest version *just* released, after most recent RPM release, before VDT 1.1.11
- Difference in RLS: US & EDG use different versions

Pacman Installation

- Goal:
 - Type a single command
 - Everything downloads
 - Everything installs
 - Everything is configured
 - No questions asked
- We're close:
 - A few questions if you're root
 - Basic configuration, may need changing

Pacman Installation (2)

- Download Pacman

- `http://physics.bu.edu/~youssef/pacman/`

- Install VDT

- `cd <install-directory>`

- `pacman -get VDT-Server`

- `pacman -get VDT-Client`

- `ls`

- | | | | |
|----------------------|----------------------|----------------------------|-----------------------|
| <code>condor/</code> | <code>globus/</code> | <code>post-install/</code> | <code>setup.sh</code> |
|----------------------|----------------------|----------------------------|-----------------------|

- | | | | |
|-------------------|-------------------|-----------------------|-------------------|
| <code>edg/</code> | <code>gpt/</code> | <code>replica/</code> | <code>vdt/</code> |
|-------------------|-------------------|-----------------------|-------------------|

- | | | | |
|--------------------|--------------------|------------------------|------------------------------|
| <code>ftsh/</code> | <code>perl/</code> | <code>setup.csh</code> | <code>vdt-install.log</code> |
|--------------------|--------------------|------------------------|------------------------------|

- Use

Pacman post-installation

- Post-install directory:
 - Notes on configuration choices made
 - Instructions for editing configuration
- Configuration scripts:
 - Globus configuration (different from EDG)
 - Condor configuration

RPM Installation

- Subset of whole VDT
 - Globus
 - Condor-G
 - MyProxy
 - Fault Tolerant Shell (in use?)
- Nice RPMs:
 - We repackage Globus
 - A dozen Globus RPMs, not hundreds
- No configuration (LCFGng instead)
- No post-installation help

Testing

- VDT team has test suite
- Interaction with LCG testing group
- Working with NMI* to leverage:
 - NMI test suite
 - Stress testing
 - Application testing (CMS pipeline)
 - Being developed right now
 - NMI test infrastructure

* NMI = NSF Middleware Initiative
– <http://www.nsf-middleware.org>

Testing today

- NMI:
 - Builds Globus/Condor
 - Verifies basic functionality
- VDT:
 - Tests installation
 - Test suite:
 - Covers more functionality
 - Expanding functionality right now

VDT Test Suite Samples

- Create a proxy?
- Globus submit:
 - Fork job
 - Condor vanilla job
 - Condor standard job
- Put/Get file with `globus_url_copy`
- Condor-G submit:
 - Fork job
 - Condor standard job
- More in active development
 - Tie into contributors test suites

VDT Provides Support

- Send us questions or problems
 - We will solve them if we can
 - We will interact with the developers, if necessary
 - We will accept patches, and write them as applicable
- Scalability of support
 - Two full-time VDT people today
 - Third VDT person soon
 - Interaction with software component developers for more support

Interaction with EDG

- EDG get Globus, Condor-G, MyProxy RPMs from VDT
- We do what we can to solve problems in VDT asap
 - This may mean patches
 - Release skew –vs- contributors is ok.
 - Long term version codebase skew –vs- contributors is not ok.
 - So VDT will work w/ contributors to get the changes integrated back into the original packages

Examples

- **MyProxy**
 - Maarten Litmaath (LCG) noticed MyProxy buffer overflow
 - Had trouble getting resolved
 - Talked to VDT support
 - VDT worked with developer, got fix to NMI & into VDT
- **GridFTP logging**
 - Improper date logging
 - Reported to VDT
 - Reported to Globus
 - Fixed, in Globus 2.4

VDT : What's Coming?

- Short term: Move to Globus 2.4
 - When will you be ready?
 - When will US partners be ready?
 - 2-3 month time frame likely
- Provide early access to Globus 3
 - November/December: early Pacman version
 - 6-12 months for US adoption
 - You?

Globus 3

- Moving to GT3 is insufficient
 - Condor-G & GT3: work in progress
 - RLS moving to GT 3 by ...
 - Current EDG software with GT3?
 - VDS moving to GT in 12 (?) months
- Therefore, two versions of VDT:
 - GT 2.x based
 - GT 3.x based—early adopters

What is Condor-G ?

A job submission facility to the grid to ---

- queue your jobs
- monitor and report on their progress
- add fault tolerance to your jobs
- provide semantic guarantees about your jobs, even in the face of failures
- implement a job execution policy
- perform resource planning (select which site to use)

Condor OGSA Plan

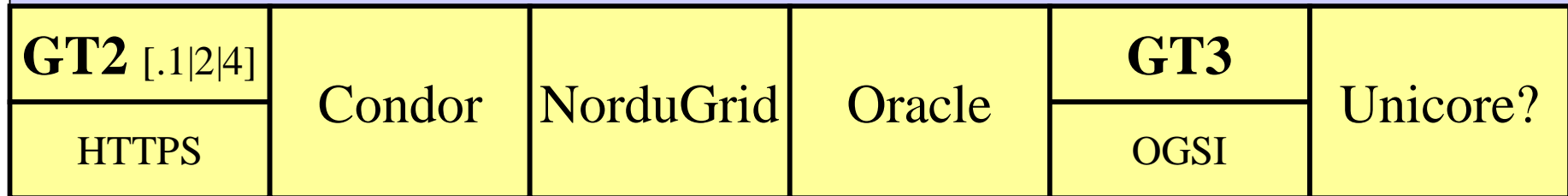
- First Step: Condor-G use GT3 services as a client
- Second Step: Present Condor(-G) services as OGSI grid services

Condor-G: A choice of underlying middleware

Job Description (Job ClassAd)



Condor-G



Fabric (compute/storage resources)

Condor+GT2

- Original releases of GT2 lacked mechanisms to permit fault recovery, safe submission
 - Condor-G could not sit on top of Globus
- So Condor and Globus teams worked together to add
 - Globus Jobmanager Restart
 - Two-phase commit during job submission
 - Resynchronize I/O streams
 - More...

Condor+GT3

- Much better this time around
- But some bumps in the road...
 - Must like the smell of coffee.
 - Must like sewing.
 - No mechanism to inform GT3 job service of a new URL for GASS file transfer
 - Required if the client restarts
 - Was added into GT2, missing from GT3

Next Step

Job Description (Job ClassAd)

OR

CEDAR

SOAP

Condor-G

GT2 [.1|2|4]

Condor

NorduGrid

Oracle

GT3

Unicore?

HTTPS

OGSI

Fabric (compute/storage resources)

VDT

Incremental Approach

- First a web service interface.
 - SOAP over HTTP into Condor daemonCore library.
- Next identify Condor components as grid independent services.
 - Starting work w/ eScience group in London.
 - OGSI interface.

Where do you learn more?

- <http://www.griphyn.org/vdt>
- Support:
 - vdt-support@ivdgl.org
 - Alain Roy: roy@cs.wisc.edu
 - Miron Livny: miron@cs.wisc.edu