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

```
condor/   globus/   post-install/   setup.sh
edg/      gpt/      replica/        vdt/
ftsh/     perl/     setup.csh       vdt-install.log
```

- 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 ?

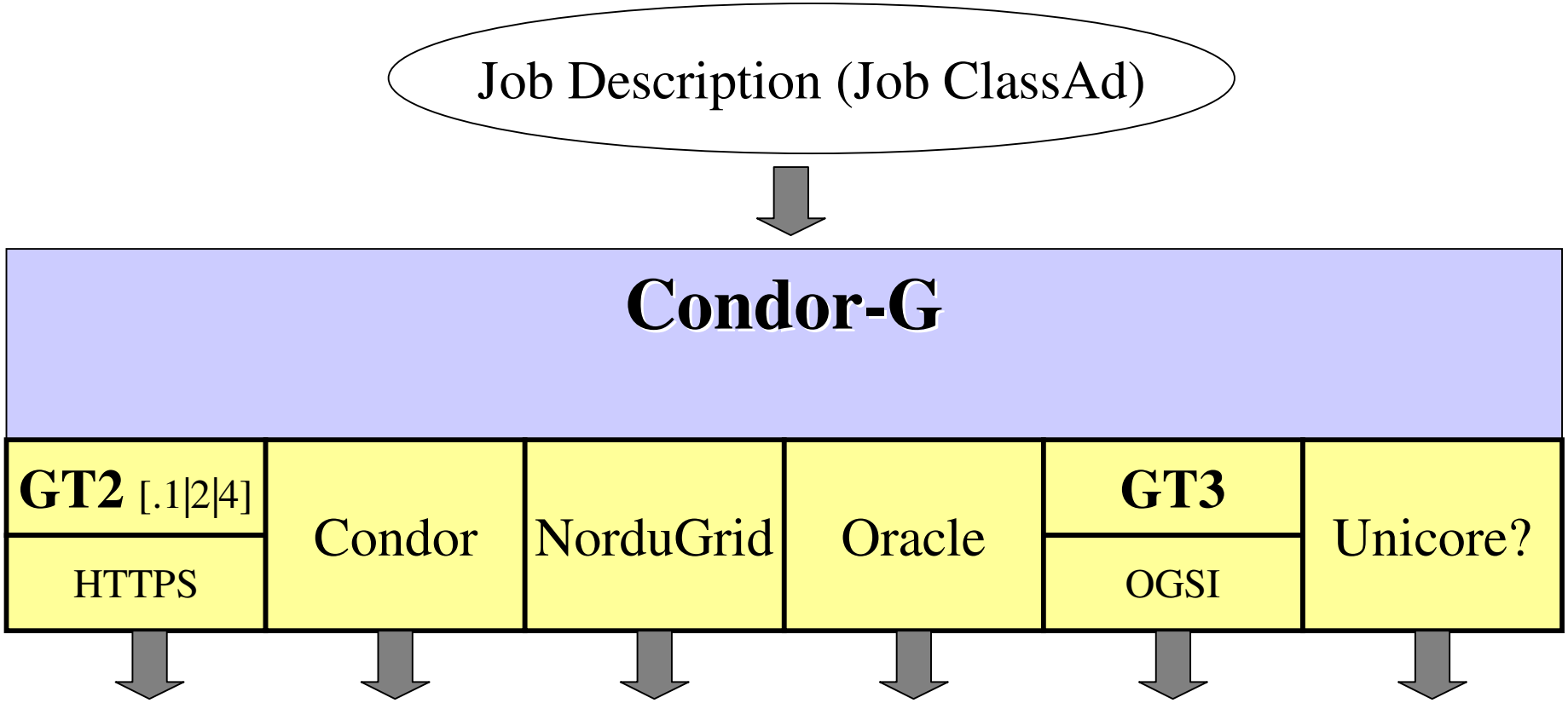
A job submission facility to the grid to ---

- 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



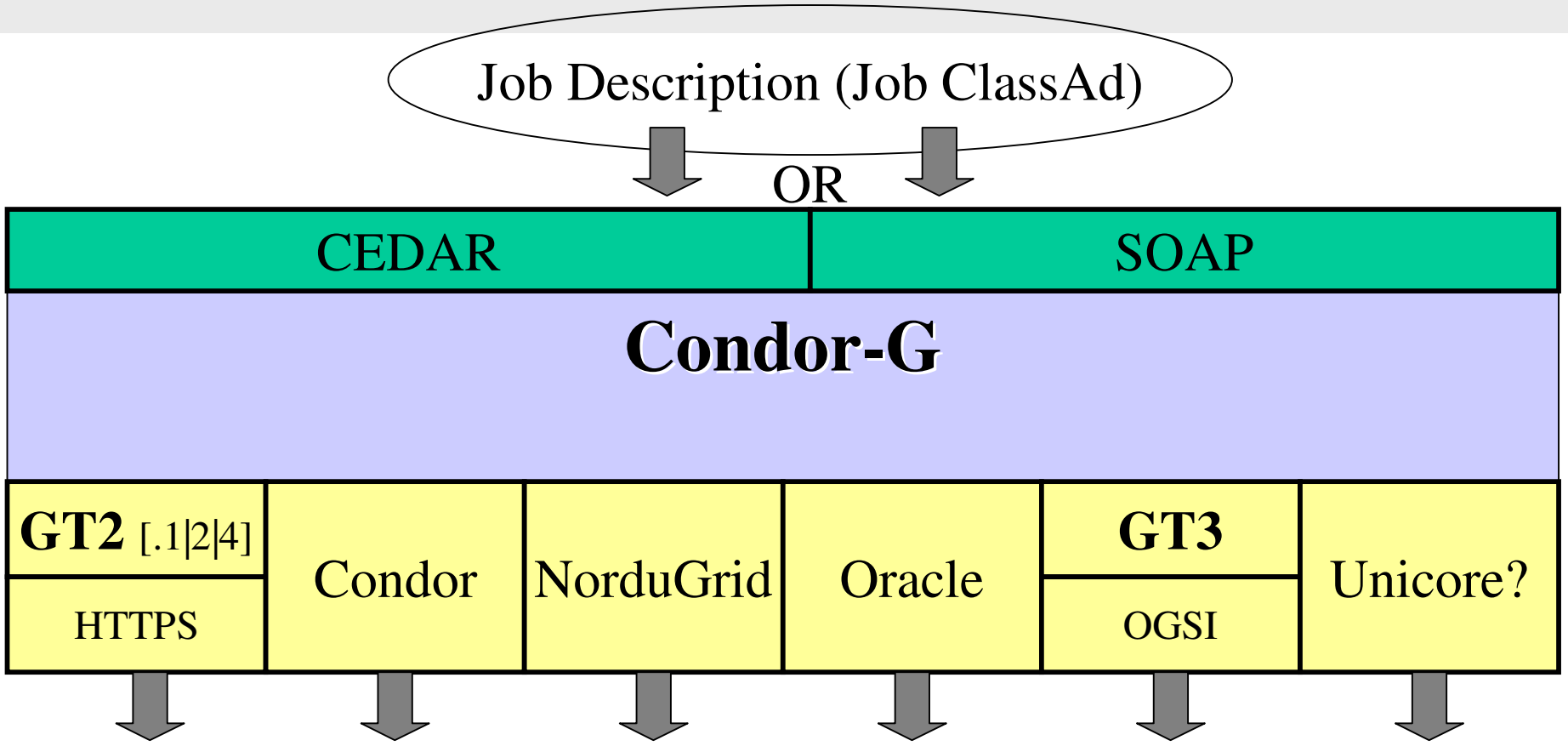
Condor+GT2

- 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



Fabric (compute/storage resources)

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