Sustainable DCI Operations scalable in size, time, and complexity

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GridKa, 08.09.2011, Karlsruhe, Germany
Sustainable DCI Operations

• Agenda
  • The DGSI project
  • Interoperation, Federation, Operation
  • Implementation Technology
  • Standardization in OGF & IEEE
  • Rational for a federated DCI future
The DGSI Project

- DGSI – D-Grid Scheduling Interoperability targets:
  - #1: Interoperation of multiple technologies
  - #2: Federation of Grids & Clouds
  - #3: Operation, sustainable & scalable
    - Scalable in size: interoperability of “regions”
    - Scalable in time: interoperability of “versions”
    - Scalable in complexity: interoperability of “technologies and concepts”
Interoperation of multiple technologies

- MSS* Meta Sched.
- GridWay* Meta Sched.
- (WMS) Meta Sched.

5 different types

- gLite
- Globus
- Unicore

*examples
Federation Mode 1: Activity Delegation

*DFP = DCI Federation Protocol
Federation Mode 2: Resource Delegation

- MSS Meta Scheduler
- Gridway MetaSched
- C3WSS Meta Scheduler

Unicore

Globus

gLite-CE

Local Scheduler

Local Scheduler

Local Scheduler

DFP

DFP

DFP

*DFP = DCI Federation Protocol
Federation of Grids & Clouds

Combination of EDGeS bridge with DGS I Federation methods:
AD Activity Delegation
RD Resource Delegation
Dynamically configured by negotiation, SLAs & policies.
DCI Operations: sustainable & scalable

- Operation, sustainable & scalable
  - Scalable in size: interoperability of “regions”
  - Scalable in time: interoperability of “versions”
  - Scalable in complexity: interoperability of “technologies and concepts”
Operation, sustainable & scalable: interoperability of regions

*DFP = DCI Federation Protocol
Operation, sustainable & scalable: interoperability of versions

*DFP = DCI Federation Protocol

Globus 4.1

MS-vers.1.2

Local Scheduler

Globus 4.2

MS-vers.2.3

Local Scheduler

MS-vers.5.0

Local Scheduler

MS
- vers.1.2

Globus 4.1

Local Scheduler

MS
- vers.2.3

Globus 4.2

Local Scheduler

MS
- vers.5.0

Globus 5.0

Local Scheduler

*DFP = DCI Federation Protocol
Operation, sustainable & scalable: interoperability of versions

*DFP = DCI Federation Protocol
Interoperability of concepts: ISF & DGSI

HPC Cloud

Service Grid

Resource Delegation

DFP virtually moves resources
Interoperability of concepts: ISF & DGSI

CERN compute center
- HTC Computing
- HPC Computing Cluster

Platform ISF
Shared computing infrastructure

Federation Broker Instance

Resource Delegation

DFP
virtually moves resources

Globus 4.1

Local Scheduler

MS-vers.1.2

Platform Computing

07.09.2011
Implementation Technology

Activity Delegation

Resource Delegation

DGSI: Delegation methods
Implementation Technology

Activity Delegation

Resource Delegation

DGSI: Delegation methods
The 4 reasons why Standards matter

Or why Standards* rock!

Thijs Metsch, Senior Software Engineer
08-09-2011, GridKa School 2011, Karlsruhe

*Industrial, Programming language, SDOs, ...
PORTABILITY
“Transport” / Format Definition
Funding Program Interests

Data / Methodology portability?
Compute power?

World's No.1 on TOP500 List

Source: http://www.fujitsu.com/img/KCOM/top/kcom-main-number1.jpg
INTEROPERABILITY
DUH??
…IT ISN'T EASY…
# of Standards to solve a Prb. ???

Complexity/Simplicity of your problem

# of stds
# of Standards to solve a Prb. ???

NO ANSWER HERE...

Complexity/Simplicity of your problem
http://xkcd.com/927/

http://nighthacks.com/roller/jag/entry/xkcd_on_standards
Interoperability is hard! Creating/Using a Standard is not necessary going to solve the problem…

Protipp: Do it right!
How? Depends 😊 - there is no recipe (but learn from the past – which standards and their processes are good which bad etc.)
Occi
Open Cloud Computing Interface
INTEGRATION
Devices & location
(Some) Startups: plug’ it together?
INNOVATION
If technology thrills you…
…and you like **working** in groups…
…join a group and…
…create cool standards & technology.
Don’t forget: share it...
…and write it in you CV!
The time is now…

Time for Standards

Thank you…