

The Globus Toolkit : Introduction

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Content

- What is Globus Toolkit?
- Basic Services
 - Security Infrastructure
 - Information Management
 - Resource Management
 - Data Management
- Conclusion

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Globus Toolkit™

- An open source software toolkit addressing key technical problems in the development of Grid enabled tools, services, and applications.
 - Offer a modular “bag of technologies”
 - Enable *incremental* development of grid-enabled tools and applications
 - Implement standard Grid protocols and APIs
 - Make available under liberal open source

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Layered Architecture

The architecture is layered as follows:

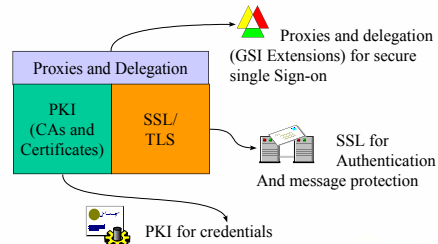
- Applications** (Top layer)
- High-level Services and Tools** (Second layer): Includes DRM, Cactus, MPICHG2, globusrun, PUNCH, Nimrod/G, Grid Status, and Condo-G.
- Core Services** (Third layer): Includes GASS, GridFTP, Metacomputing Directory Service, Globus Security Interface, Replica Catalog, GRAM, and I/O.
- Local Services** (Bottom layer): Includes Condo, Fork, LSF, PBS, SGE, Linux, AIX, TCP, UDP, and Solaris.

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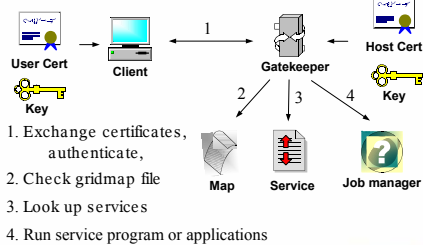
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Grid Security Infrastructure (GSI)



Secure Remote Startup



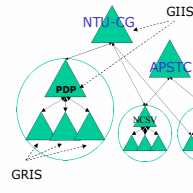
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Grid Information Service

- Provide access to static and dynamic information regarding system components
- A basis for configuration and adaptation in heterogeneous, dynamic environments
- Requirements and characteristics
 - Uniform, flexible access to information
 - Scalable, efficient access to dynamic data
 - Access to multiple information sources
 - Decentralized maintenance

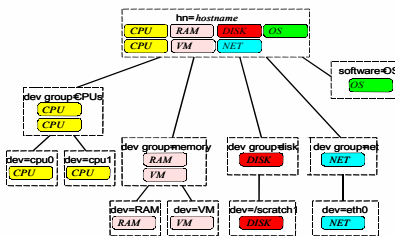
Logical MDS Deployment



Grid Resource Information Service (GRIS)
 Provides resource description
 Modular content gateway

- Grid Index Information Service (GIIS)
 - Provides aggregate directory
 - Hierarchical groups of resources
 - Supports efficient queries against information which is spread across multiple GRIS servers

GRIS Information



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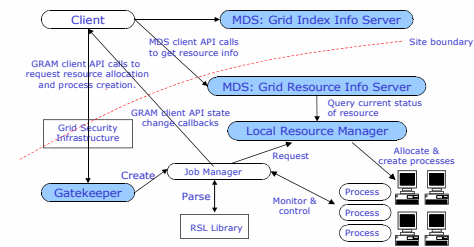
Resource Management Service

- Resource Specification Language (RSL) parser
- Grid Resource Allocation and Management (GRAM)
 - client API: simple client
 - myjob API: parallel job bootstrapping
 - jobmanager API: server infrastructure
 - gatekeeper: root security & dispatch svc

Resource Management Service

- A layered architecture allows application-specific resource brokers and co-allocators (e.g. DUROC)
 - control API: client
 - runtime API: job startup barriers, etc
 - Bootstrap API: parallel job bootstrapping

GRAM Components



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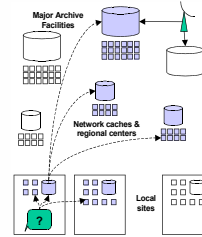
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Data Management Services

- Data transfer and access
 - **GASS:** Simple, multi-protocol file transfer tools; integrated with GRAM
 - **GridFTP:** Provides high-performance, reliable data transfer for modern WANs
- Data replication and management
 - **Replica Catalog:** Provides a catalog service for keeping track of replicated datasets
 - **Replica Management:** Provides services for creating and managing replicated datasets

Data Grid

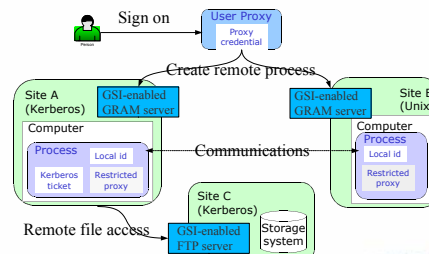
- Data request may
 - Access local data
 - Compute locally
 - Compute remotely
 - Access remote data
- Scheduling subject to local & global policies
- Local autonomy



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Create Processes at A and B that Communicate & Access Files at C





Conclusion

- Globus Toolkit™: APIs, SDKs, and tools which implement Grid protocols & services
 - Provides basic software infrastructure for suite of tools addressing the programming problems.
 - Provide the solution of resource sharing & corodination by introducing the dynamic, multi-institutonal virtual organization, and virtual data.
 - Implement the protocols & services to facilitate interoperability and shared infrastructure

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Useful Links

- APSTC, Sun Microsystems
 - <http://apstc.sun.com.sg>
- Global Grid Forum (GGF)
 - <http://www.gridforum.org/>
- The Globus Project
 - <http://www.globus.org>

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Thank You

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