OGSA - Basic Services

Reference: Joshy Joseph & Criag Fellenstein,

Grid Computing – On Demand Series, Pearson Education, IBM press, 2011

OGSA Services Overview

- Common Management Model (CMM)
- Service domains
- Policy
- Security
- Provisioning and resource management
- Accounting/metering
- Common distributed logging
- Monitoring
- Scheduling
- Distributed data access and replication

Open Architecture

OGSA – Open Grid Services Architecture

Applications & systems built on standards

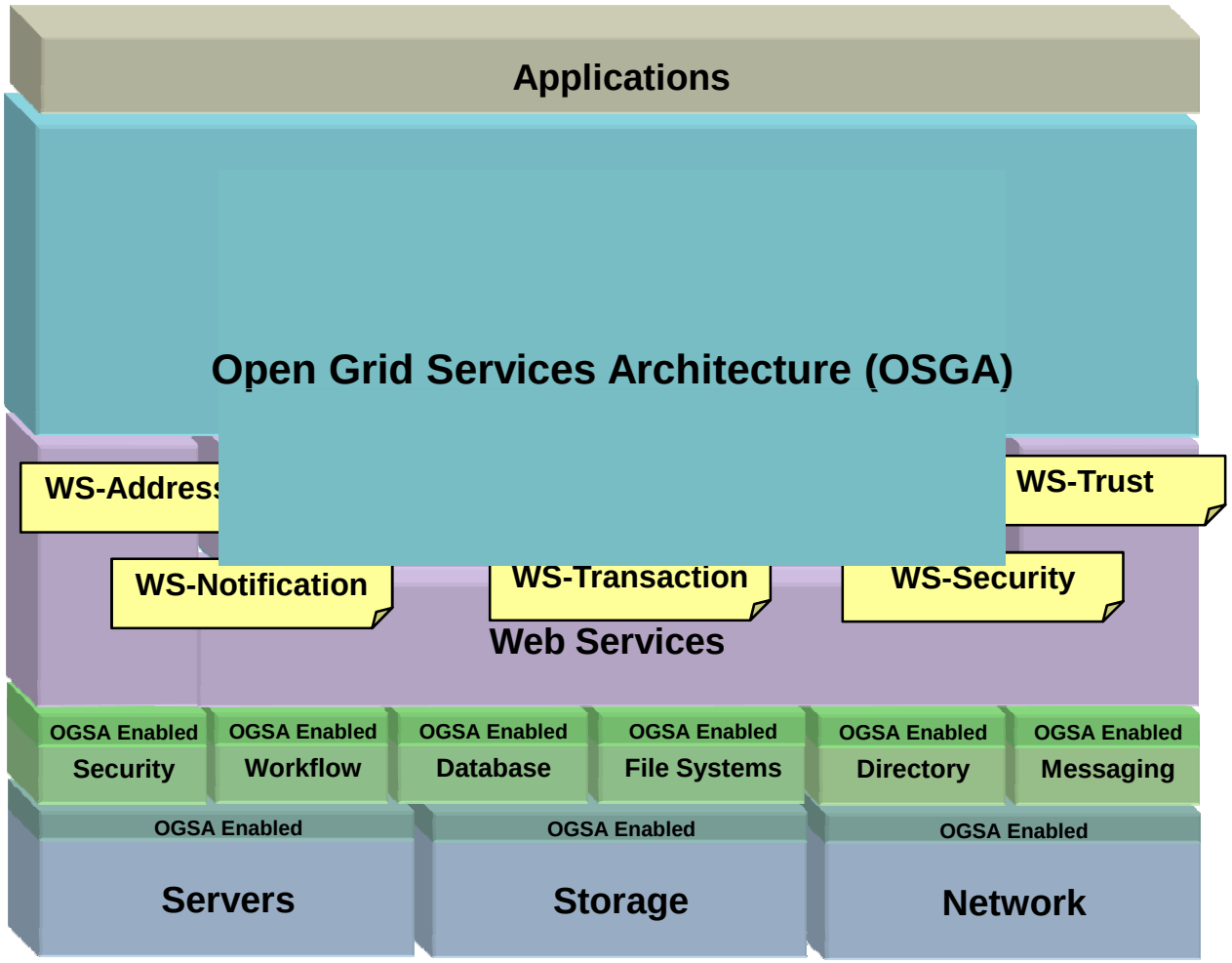
Open and value-added vendor implementations

Open architecture for interoperability

Support for web services on a variety of platforms, languages and protocols

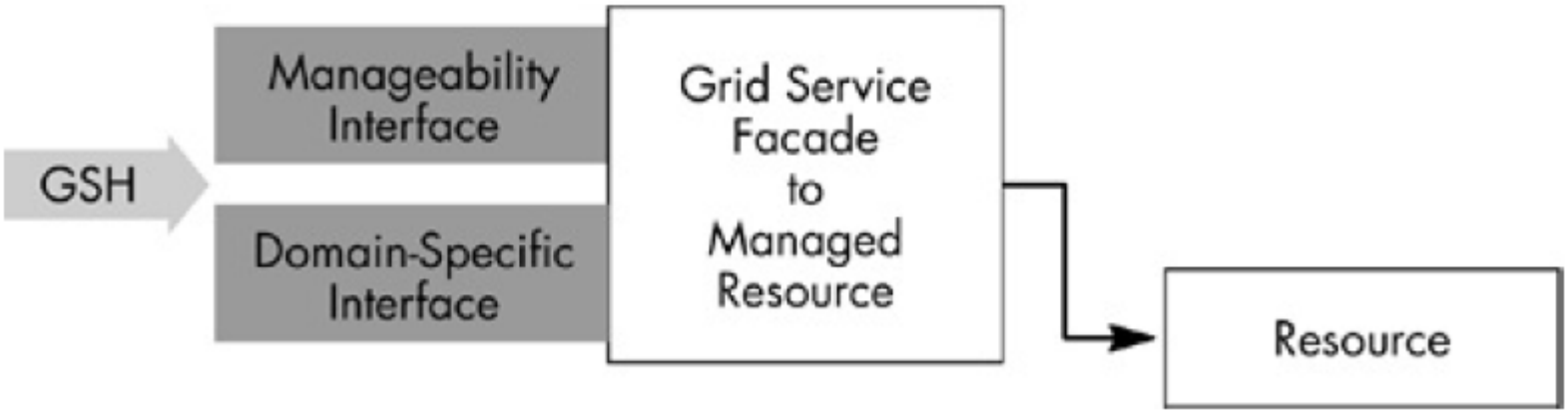
Enabled “general purpose” middleware

Enabled Hardware and Operating System Platforms



Common Management Model (CMM)

- The Open Grid System Architecture (OGSA) **Common Management Model (CMM)** is an abstract representation of real IT resources such as disks, file systems, operating systems, network ports and IP addresses.
- The CMM is a "single" model for management that can be utilized with and extended for multiple grid resource models.

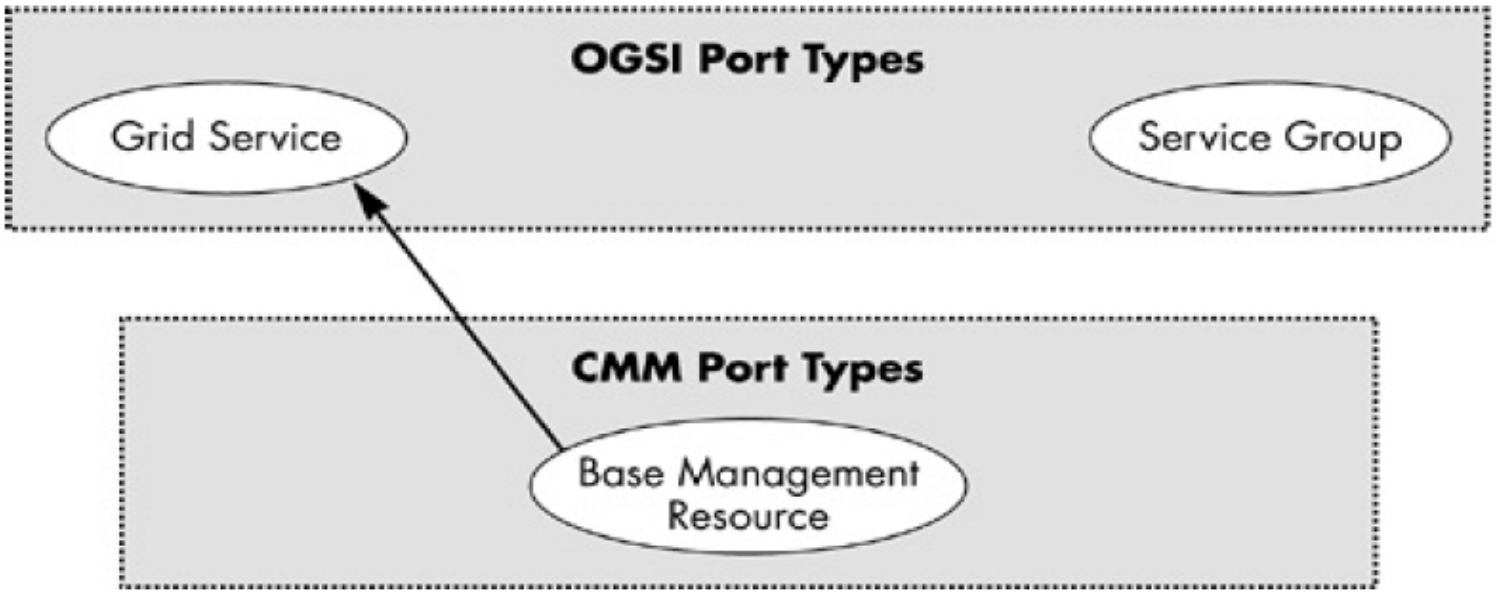


Common Management Model (CMM)

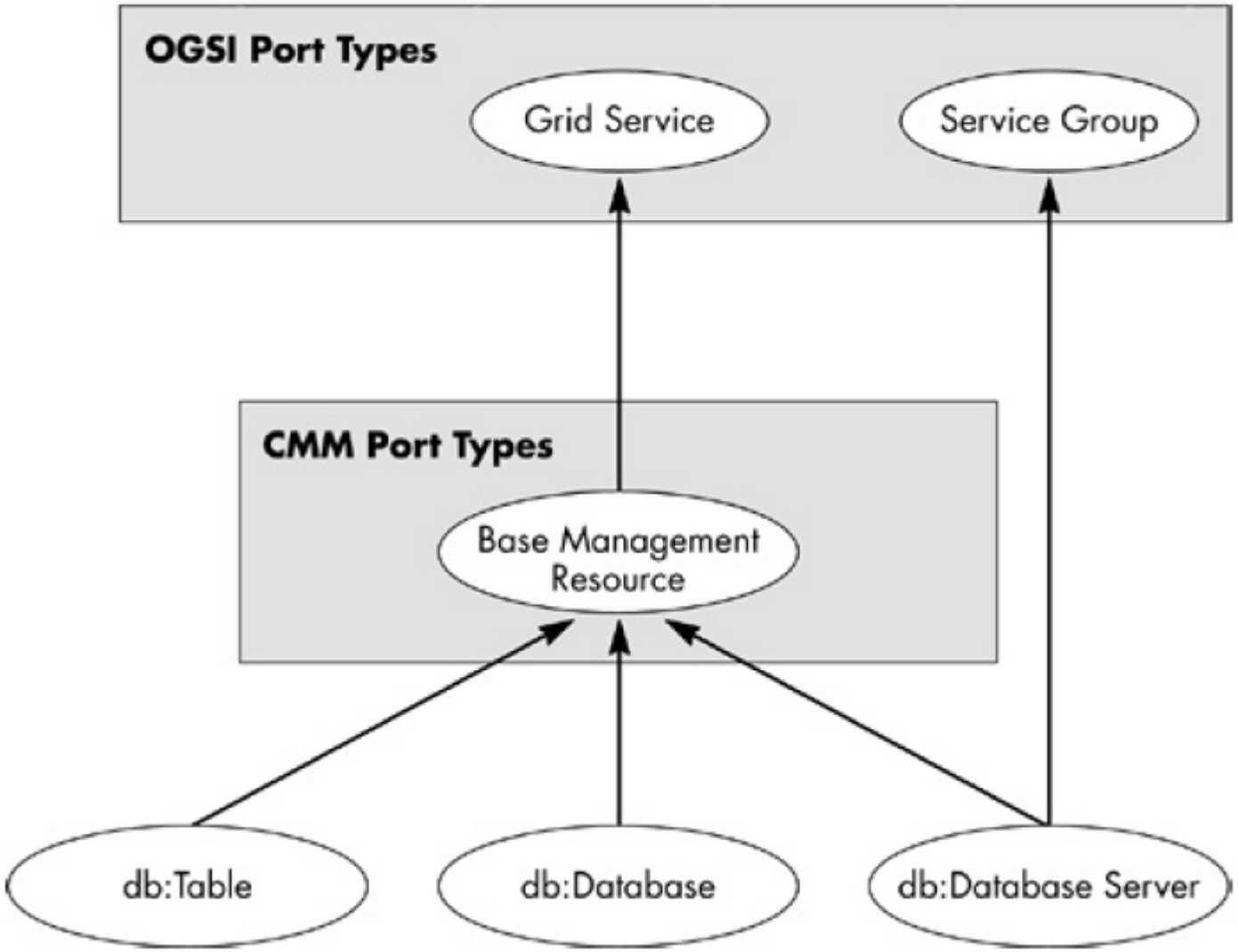
- **Manageability Interfaces:** It exposes a set of canonical interfaces and behaviors common to all the CMM services.
- **Domain-Specific Interfaces:** domain-specific interfaces are tightly coupled to the domain in which these resources are defined.
- The OGSA CMM specification defines three aspects of manageability:
  - An XML schema (XSD) for modeling the resource manageability information
  - A collection of manageability portTypes
  - Guidelines for modeling resource

CMM Port Types

- **GridService port type** is the core interface and is present in all grid services, and it provides a set of common behaviors and operations. The other interface defined by
- **BaseManageablePortType:** The behaviors represented by this port type include resource lifecycle data, relationships to other resource types and data, searchable resource properties, and resource groups to which this resource instance belongs within the respective environment.

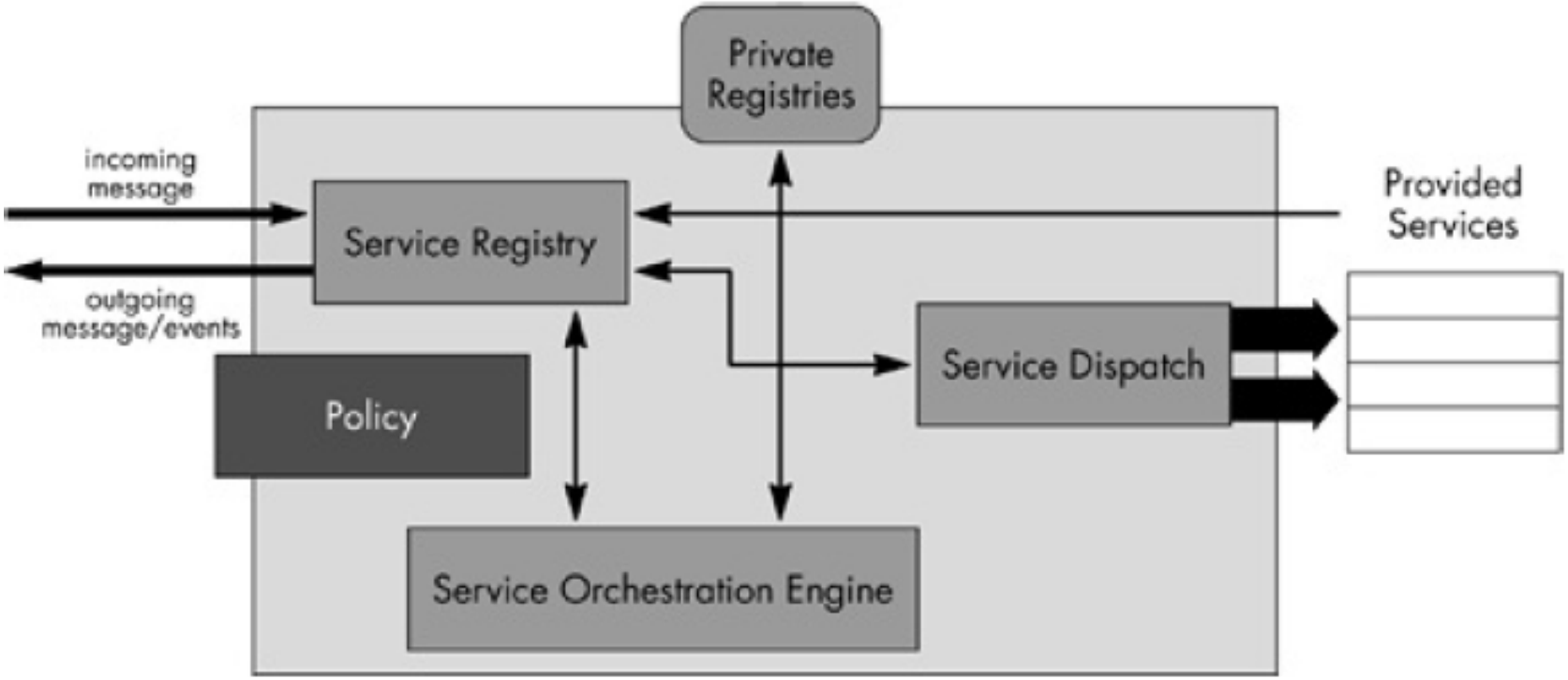


Example ManageablePortType



Service Domains

- High-level abstraction model to describe the behaviors, attributes, operations, and interfaces to allow a collection of services to function as a single unit.



Service Domains: Components

- Service Registration and Collection
- Service Routing and Selection
- Service interoperation and transformation
- Flexible service composition
- Automatic service orchestration
- Note:Uses OGSI ServiceCollection port Type.

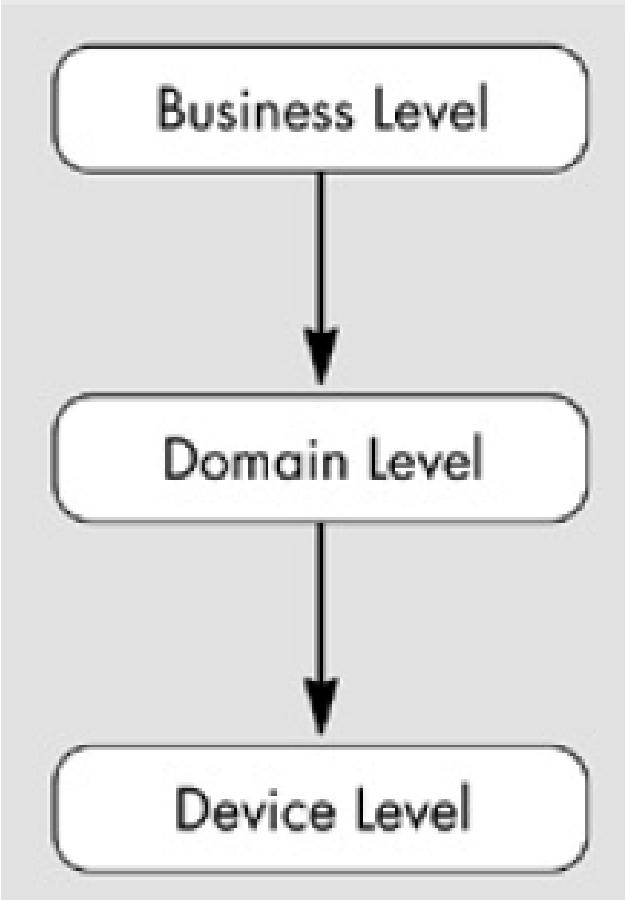
Service Domains: behaviours

- Filter
- Selection
- Topology
- Enumeration
- Discovery
- Policy

Policy Architecture

- Provides a framework for creating, managing, validating, distributing, transforming, resolving, and enforcing policies in distributed environment.

- **Levels of Policy Abstraction**

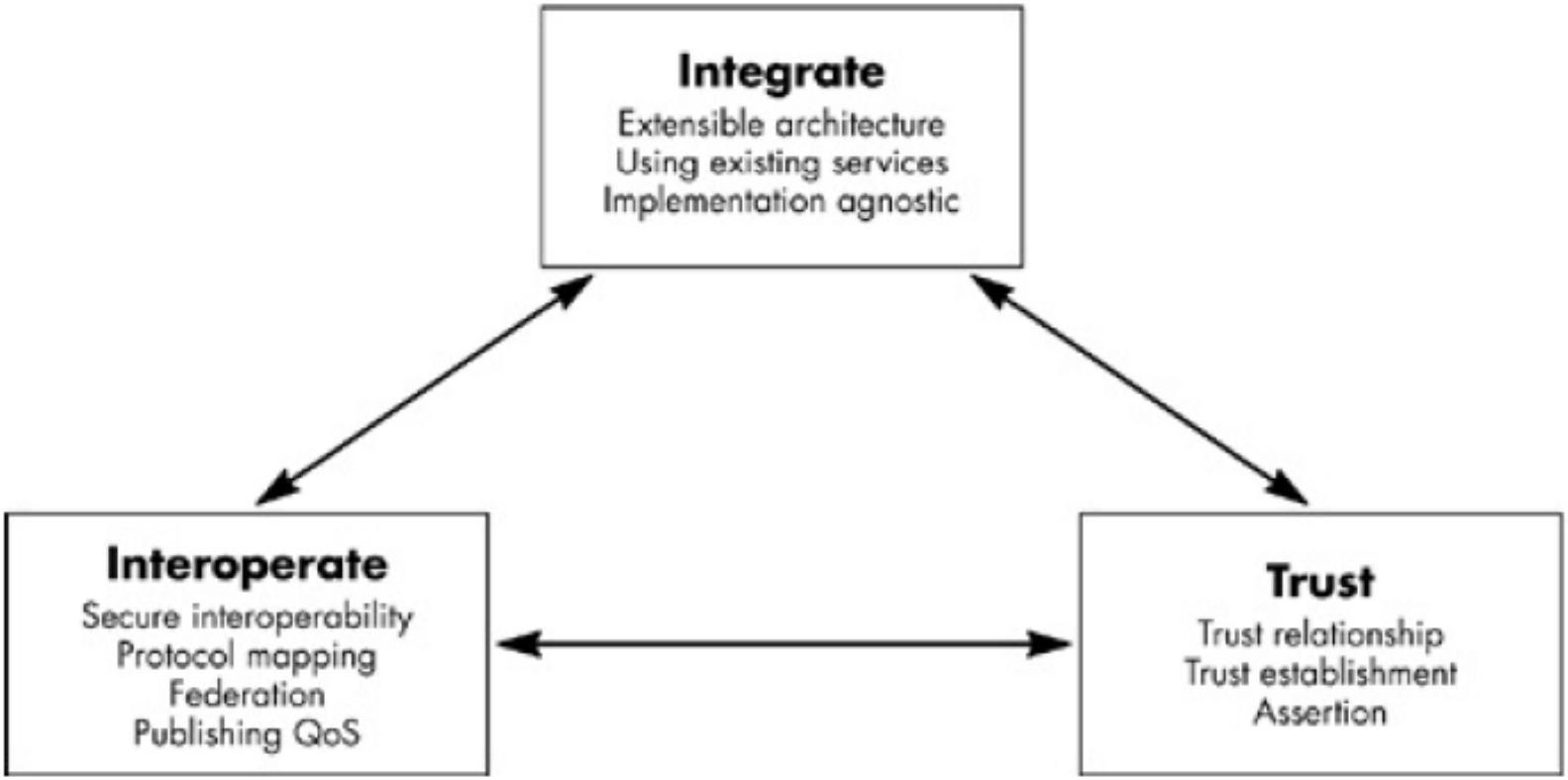


Policy Architecture

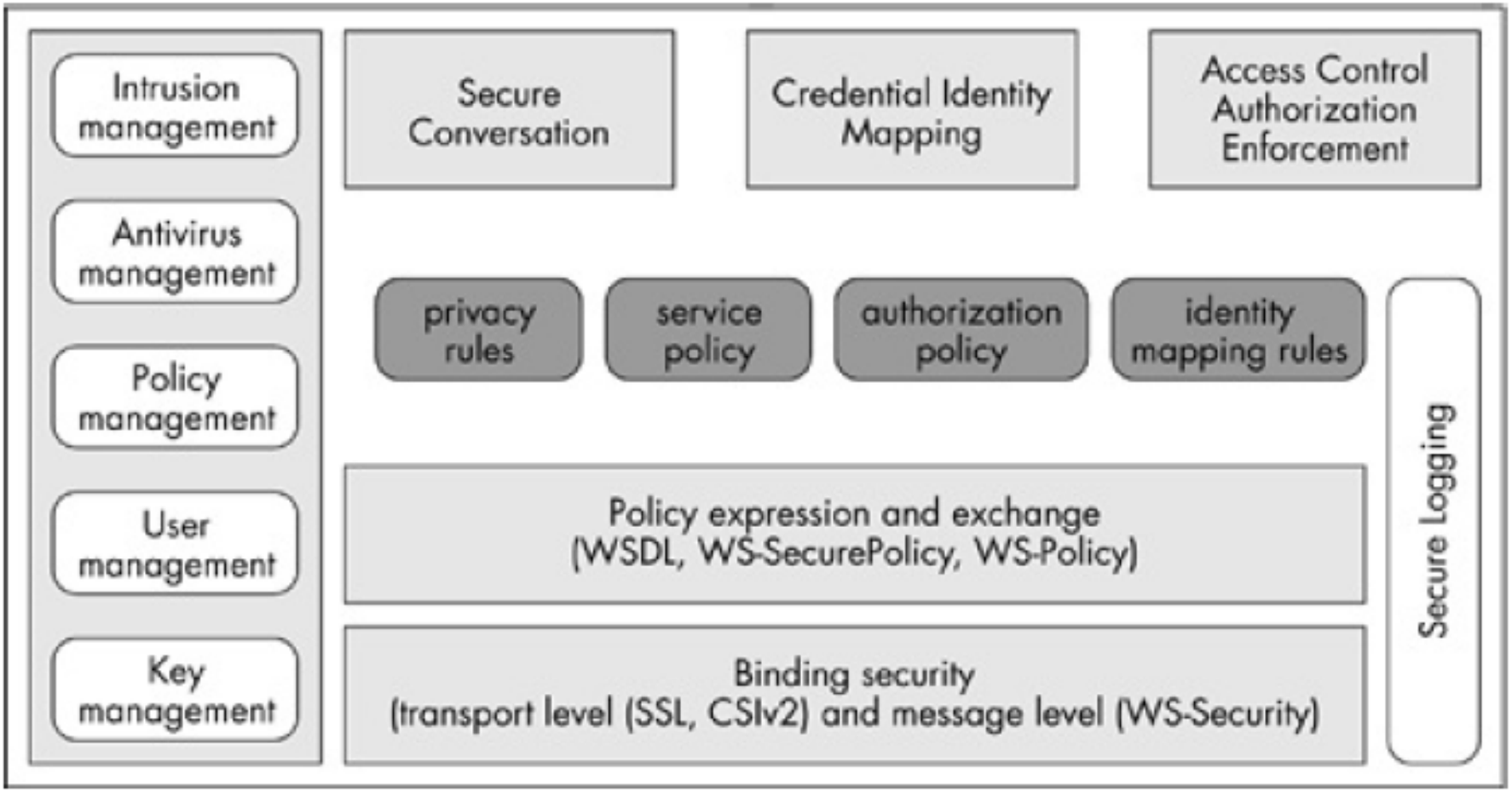
- PolicySet
- PolicyRule
- PolicyGroup
- PolicyCondition
- PolicyAction

Security Architecture

- Resource sharing among heterogeneous virtual organization participants is a complex process because of the challenges faced in **integration, interoperability and trust relationship**



OGSA Architecture- *Security Architecture*



Metering and Accounting

- There is a general requirement that resource utilization should be monitored for cost allocation, capacity analysis, dynamic provisioning, grid-service pricing, fraud and intrusion detection, and/or billing.
- **Metering Service Interface**
  - Metering subsystems are used for measuring the resource consumption and aggregating their own respective utilization measurements
- **Accounting Service Interface**
  - Accounting services can make use of the rated financial information retrieved through rating services in order to calculate user subscription costs over a specific period of time, per use (i.e., On Demand), or on a monthly basis
- **Billing/Payment Service Interface**
  - These services work in collaboration with the accounting service to collect the payments

Common Distributed Logging

- **Common Distributed Logging** capability can be viewed as typical messaging applications where message producers generate log messages, which may or may not be consumed by the interested message consumers over a period of time
- Messages can be
  - Informational
  - Trace
  - Error
  - debug
- Separates implementation from service
- Decoupling helps to provide a clear separation of the roles of the log producers and log consumers.

Distributed Data Access an Replication

- The **complexity** of **data** access and management on a grid arises from the **scale**, **dynamism**, **autonomy** and the **geographical distribution** of the data sources.
- These **complexities** should be made **transparent** to grid **applications** through a layer of **grid data virtualization services**.
- Data Grid should provide the following services.
  - Data access service.
  - Data replication.
  - Data caching service
  - Metadata catalog and services
  - Schema transformation services
  - Storage services

Summary of OGSA Services

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