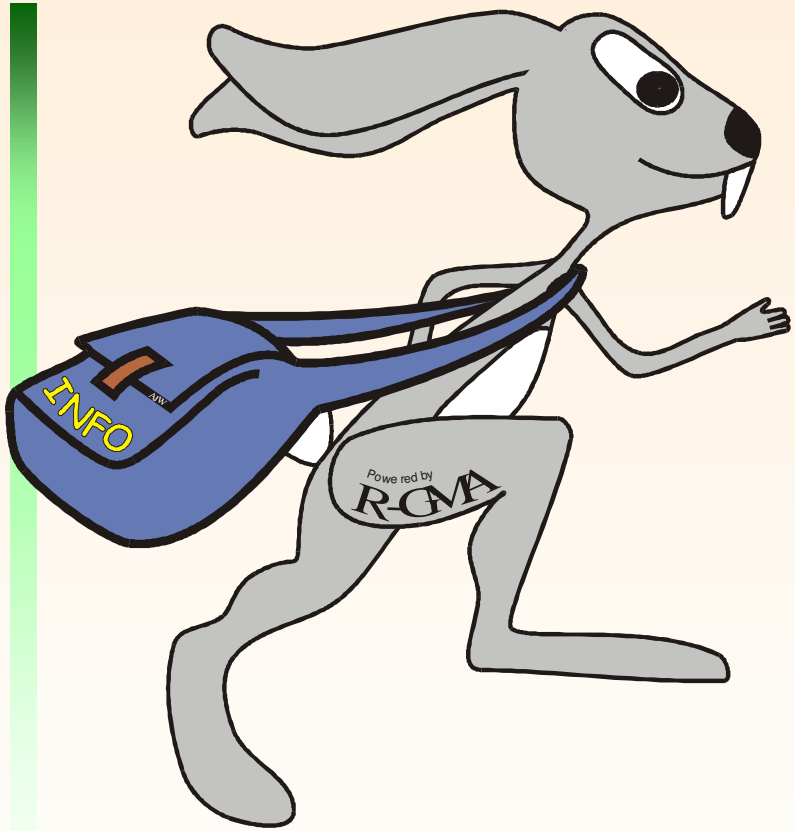

OGSA Notification and RGMA

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Notification in the Grid

- Allows asynchronous communication between a client and a server
- Either direct or through intermediary services (messaging, filtering, archival, …)
- More resilient to faults (no hang-ups)
- Better scalability

Use of Notification in RGMA

- Registry:
  - Producers notify relevant Consumers
- Streaming:
  - No need for permanent connection from Consumer to Producer
  - Producer sends notification message to all subscribed Consumers
  - Need reliable Notification Framework implementation
- Other: Consumer/producers, Replication, …

OGSI basics

- PortType = interface
- Every Grid service implements The GridService portType
  - similar to Object class in Java
  - lifecycle management
  - introspection
- Service Data
  - part of service instance state
  - exposed to service requestors for query, update and change notification (like java beans properties)
- Grid Service Handle GSH
  - a permanent network pointer to a particular Grid service instance
  - Should be resolved to a GSR in order to acccess instance

OGSI Notification Pattern

- NotificationSource portType:
  - Allows clients to subscribe to Notification messages.
  - Notification can be associated with any (authorised) SDE.
- NotificationSink portType :
  - Defines a single operation for delivering a notification message to the service instance that implements the operation
- Notification Subscription portType:
  - Defines the relationship between a single NotificationSource and NotificationSink pair.

NotificationSource portType

- Service Data Declarations
  - A set of QNames of service data elements to which a requestor may subscribe for notification of changes.
  - A set of SDE that may be used by clients as a parameter
  - each SDE imply the subscription semantics and notification message that result from the subscription
- Operations
  - Subscribe(SubscriptionExpression, Sink, ExpirationTime)

NotificationSink PortType

- Operation
  - Deliver Notification(Message).
  - This operation is input only, it does not return an output or faults.

[Note: A Web service implementing the NotificationSink portType is not required to be a Grid service.]

NotificationSubscription portType

- Service Data Declarations
  - Current subscriptionExpression managed by this subscription instance
  - The NotificationSink to which this subscription is delivering messages
- Clients use the GridServicePortype operations to manage the subscription (for example subscription.destroy())

GT3 implementation

- OGSI defines abstract interfaces – a pattern or a template.
- OGSI notification: open ended interfaces for executing queries and subscribing to notification.
- Service instance : interface + binding + implementation
- GT3 framework allows to provide own query and notification engine.
- GT3 notification : SOAP binding + Java implementation.

Demo based on GT3 implementation

- Window1:
  - GT3 Container of Factories for creating different Grid service instances.
- Window2:
  - NotificationCounter service instance.
    - keeps the value of an integer as its state.
    - Also has a SDE named CounterState.
    - Implements NotificationSource portType
- Window3:
  - A StatusListener service that receives Notification messages whenever the SDE CounterState