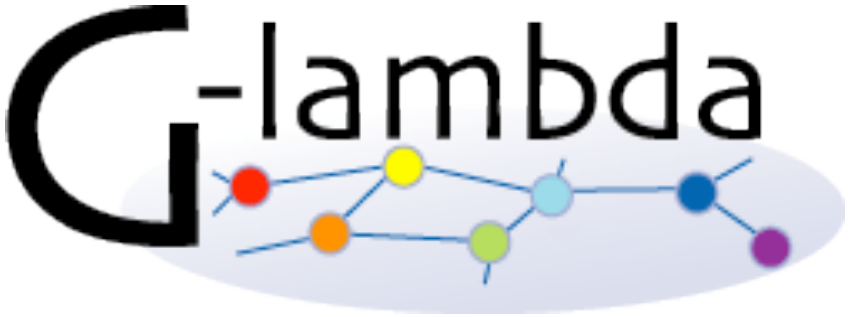
G-lambda architecture

G-lambda project

http://www.g-lambda.net/



G- lambda project (http://www.g-lambda.net/)

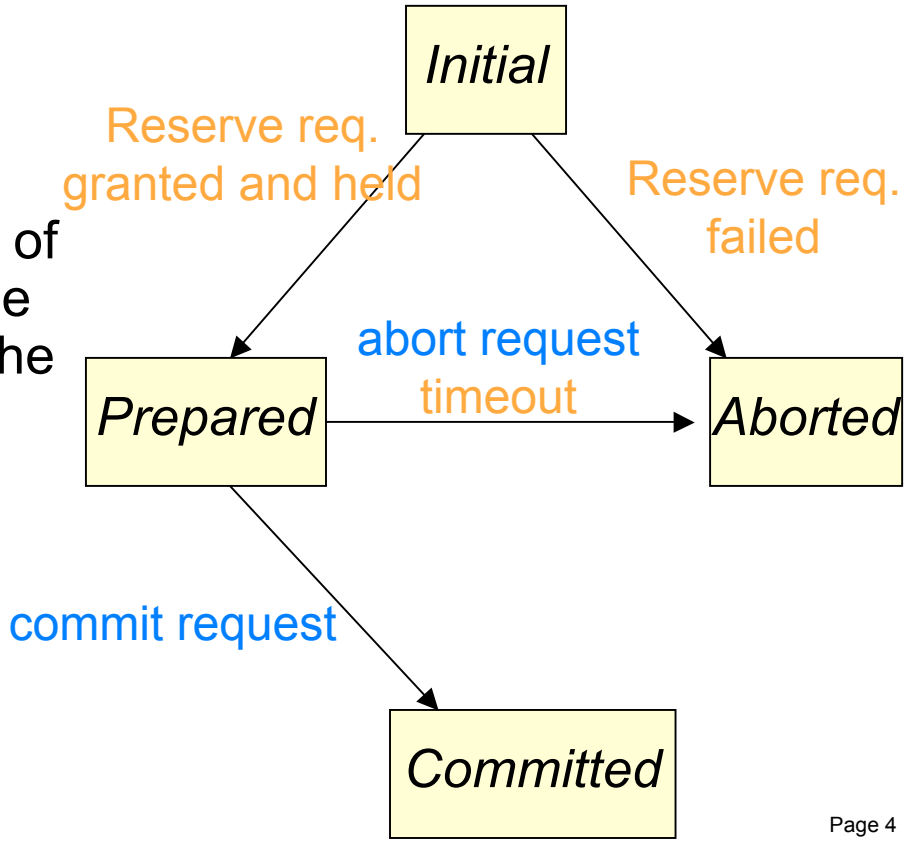
- Joint project of KDDI R&D labs., NTT, NICT and AIST.
- The goal of this project is to define a standard web services interface (GNS-WSI) between a Grid resource manager and a network resource service from a network resource manager provided by commercial network operators.

G-lambda architecture

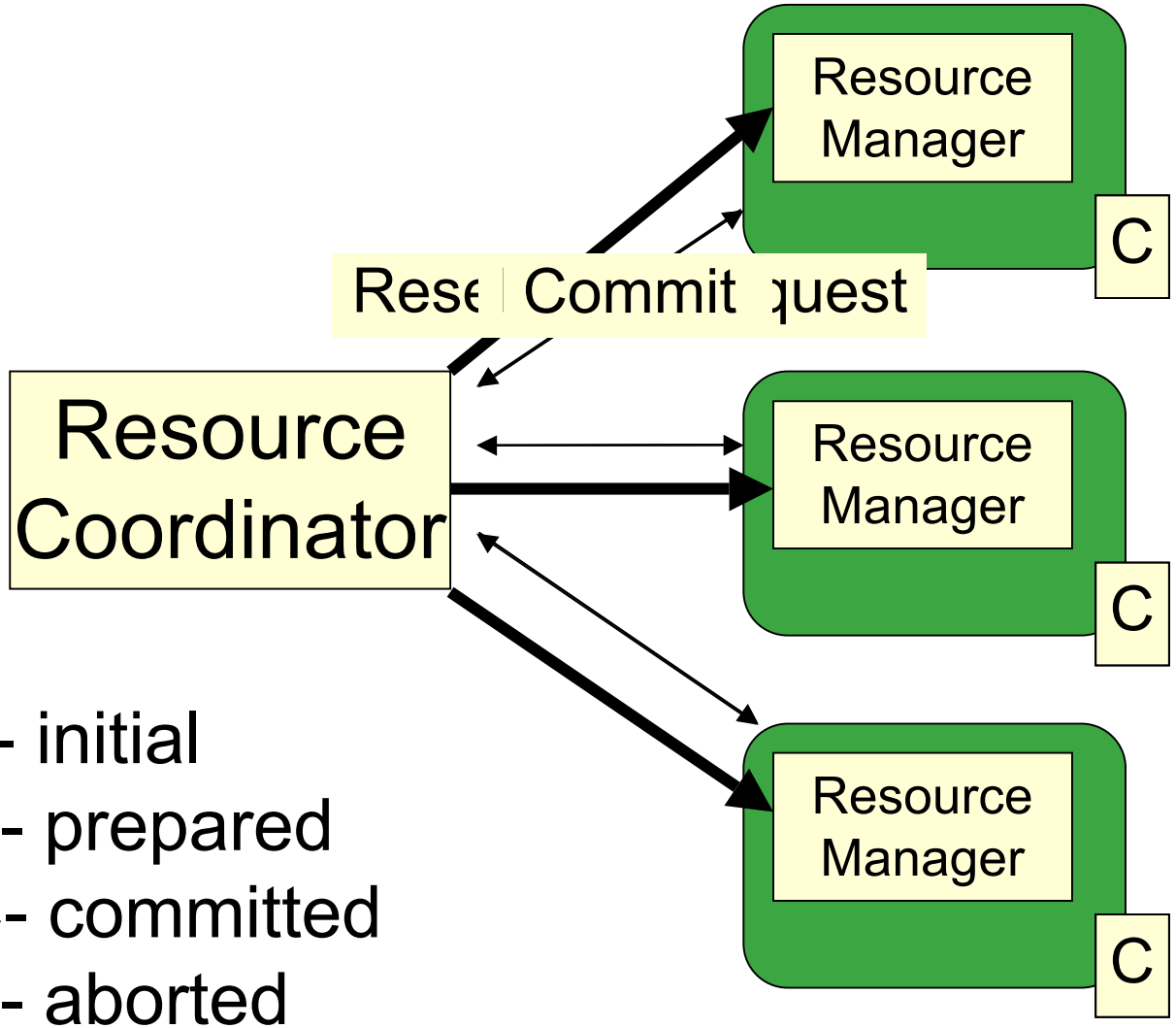
- GNS-WSI is a web-services interface and uses WSRF.
  - We believe Web Services is the way to make the interface well defined, and applicable to enterprise use.
    - We agree that the advantage and disadvantage of WSRF is debatable
  - Here I will discuss on the functionality of the interface, apart from the discussion on the web services
- GNS-WSI functionality
  - Basic operations: reserve, cancel and modify
    - Resource information query functions to be extended
  - 2-phase commit protocol
  - Per-request hierarchical architecture
  - Authentication policy: delegation and agency
  - Resource discovery and policy based information service

2-phase commit

- Reservation is made in two phases
  - Reservation request granted and held
  - Commit to the held reservation
- Introduces flexibility for booking multiple resources
  - If anybody says “no” to a reservation request, something of your reservation may need to be changed before committing in the 2nd phase
- Modification of existing reservation can be handled properly

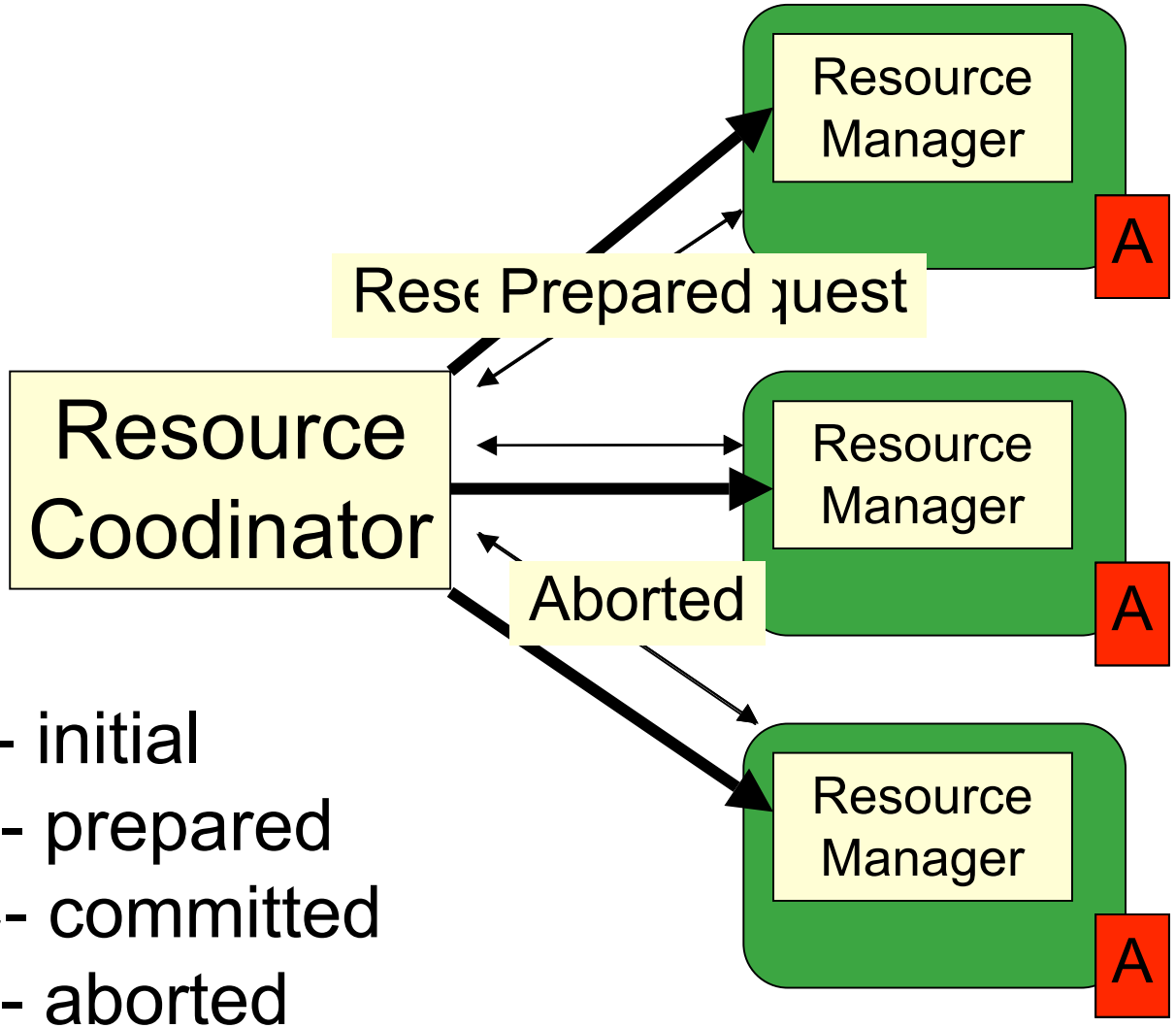


2-phase commit (success case)



- I - initial
- P- prepared
- C- committed
- A- aborted

2-phase commit (fail case)



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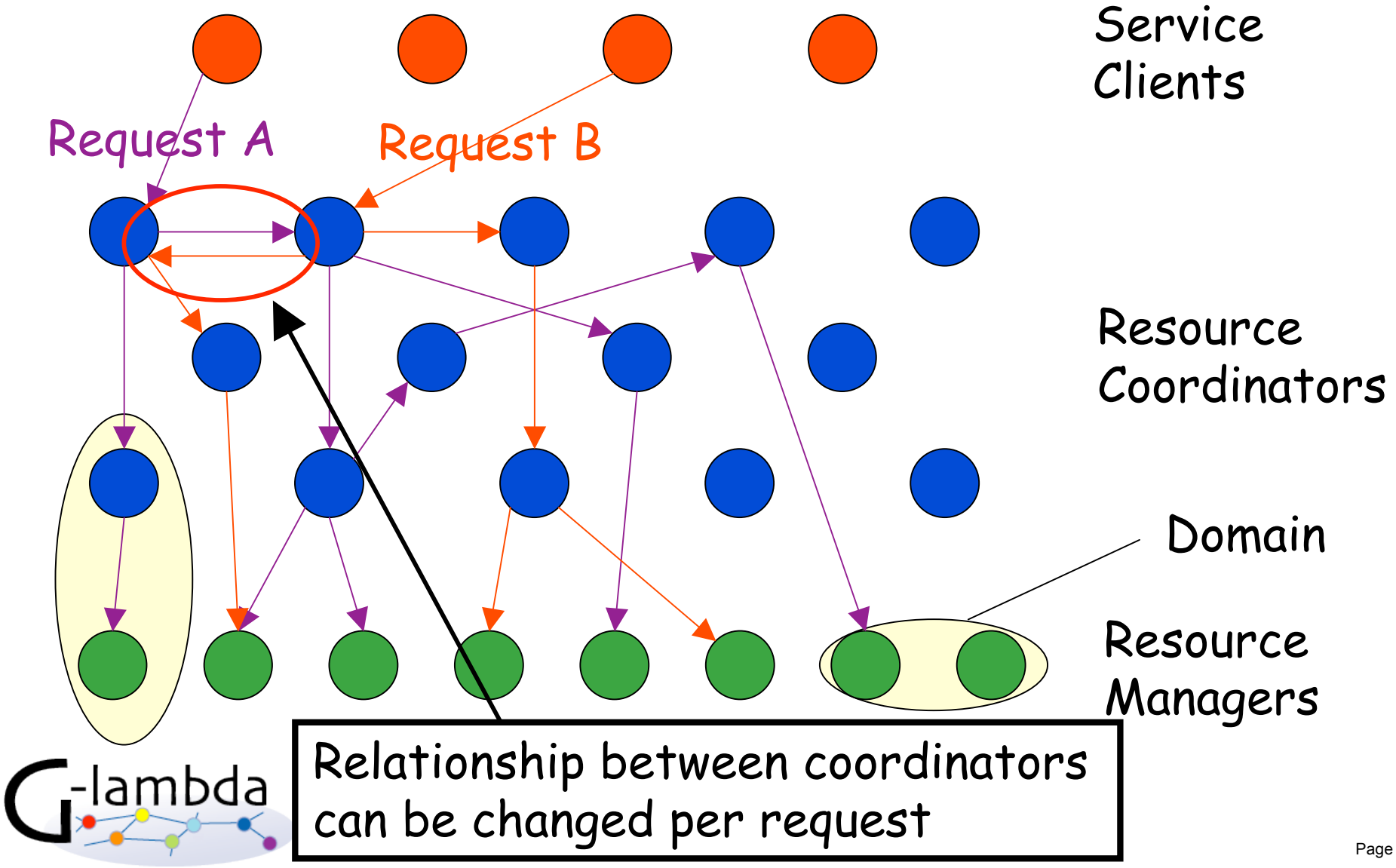
Per-request hierarchical (tree) architecture



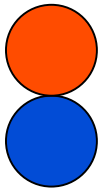
Combined components (under discussion in GL)

- A component can have one or some of client, coordinator and resource manager functions. Possible combinations would be:

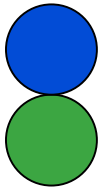
Service Client

Resource Coordinator

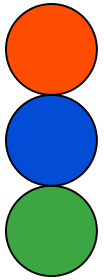
Resource Manger



One component is both Client and Coordinator



One component is both Coordinator and Manager



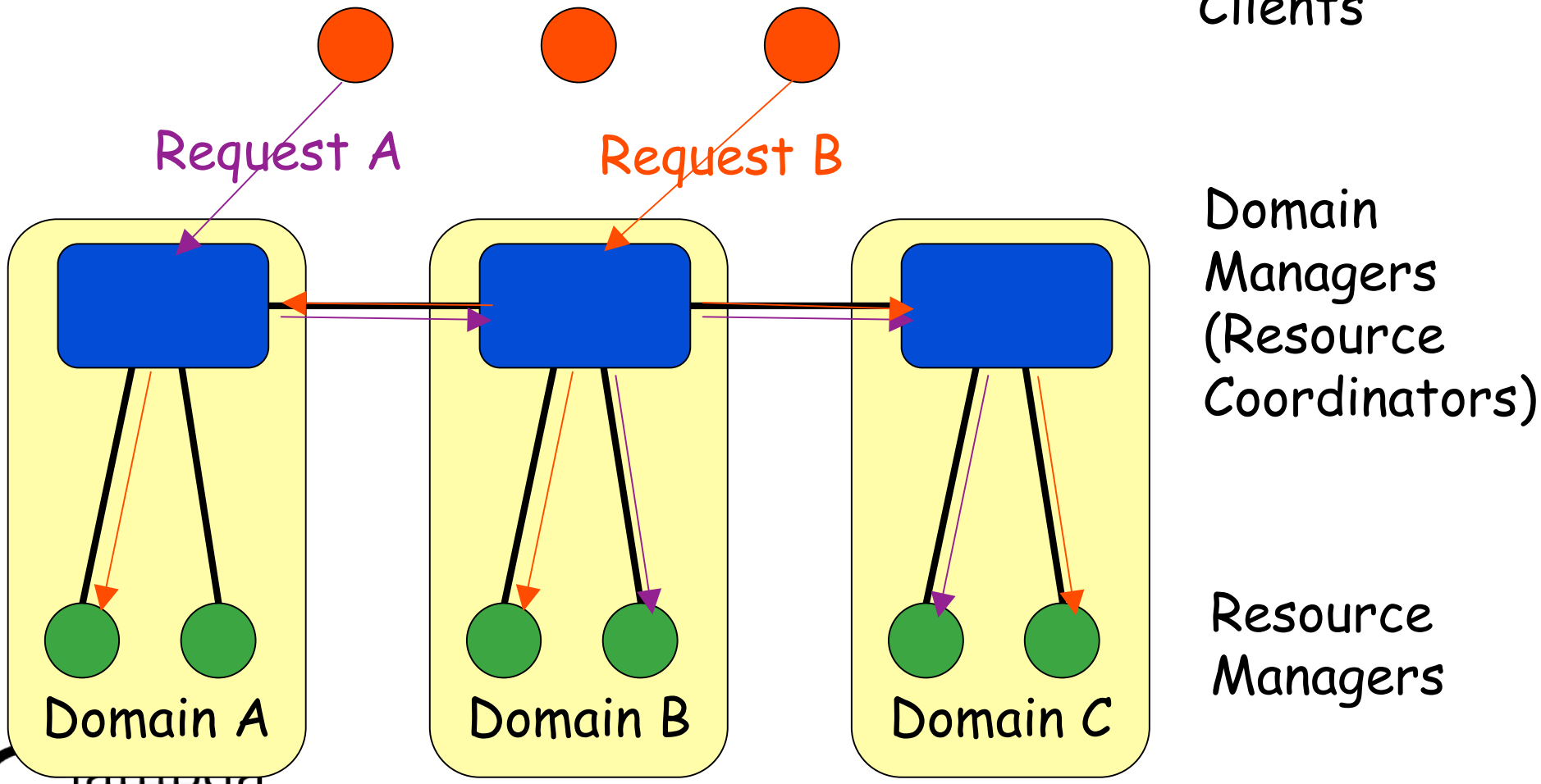
One component is Client, Coordinator and Manager

Combined components may Be considered as a domain

A model with maximum flexibility

Per-request hierarchical model can support Chain-model

- Chain model



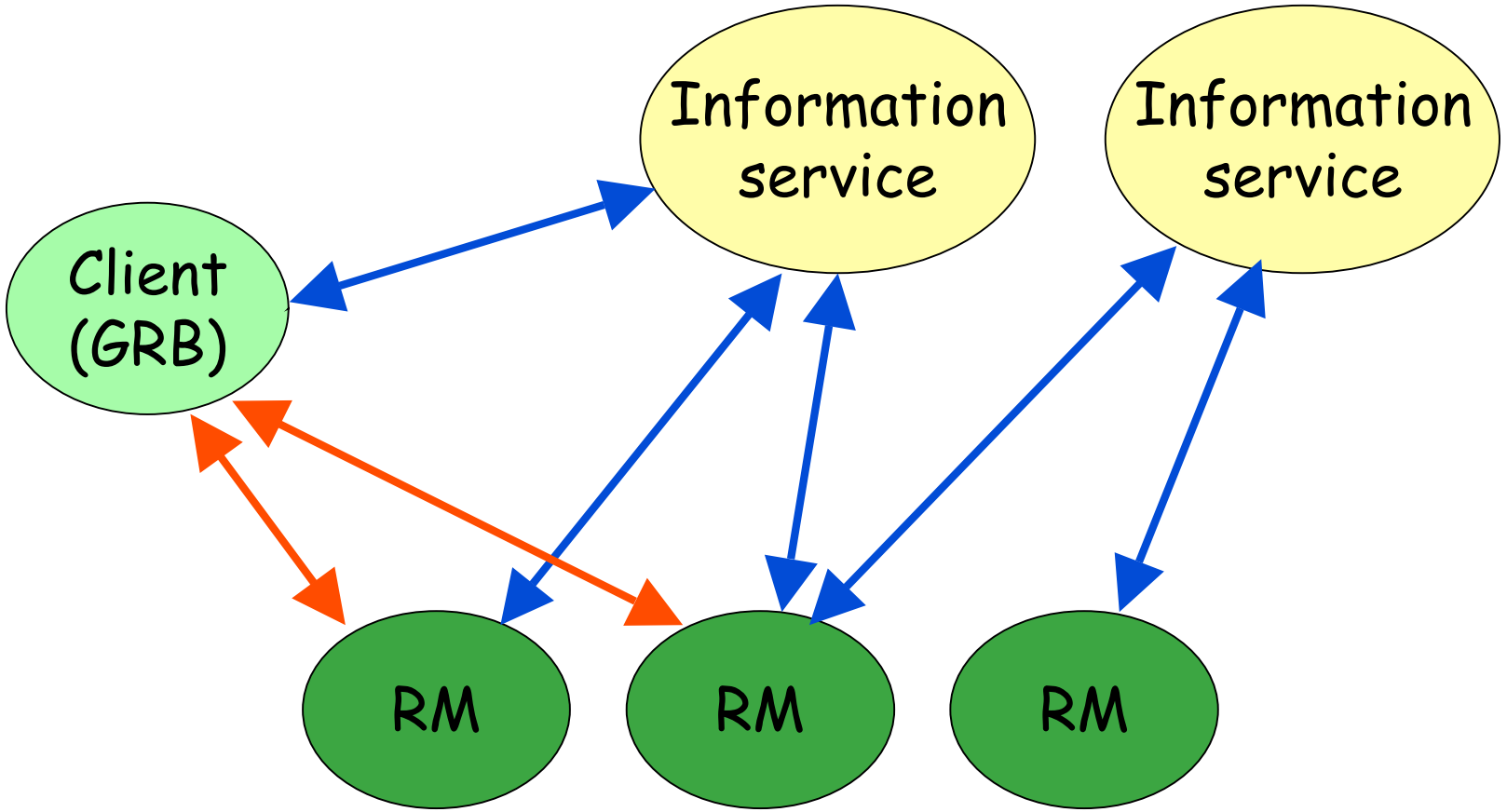
Resource discovery, policy and AAA

- Functions of GNS-WSI are being defined considering the requirements of commercial network services.
- Network operators may not want to disclose all the topology and availability information of their network
  - Abstracted topology (paths virtualization)
  - Policy based information service
- AAA are very important
  - Two authentication models
  - Policy-based authorization
  - Accounting functions (under discussion)

Resource discovery and policy-based information service

- **(logically) centralized information service model which provides all the information of the resources may not be acceptable**
  - **Resource managers can provide information of their resources directly to a client or via information services**
  - **The static information such as supported end points and media types may be provided through information services**
- **Policy based information service**
  - **Information is provided to requesters based on policy**
  - **Depending on the contract with users, the information provided to the users may be different. e.g. Inquire of availability of all the resources may not be supported**
  - **The topology inside a domain may not be disclosed**
    - **Network operators may be not willing to disclose such information**

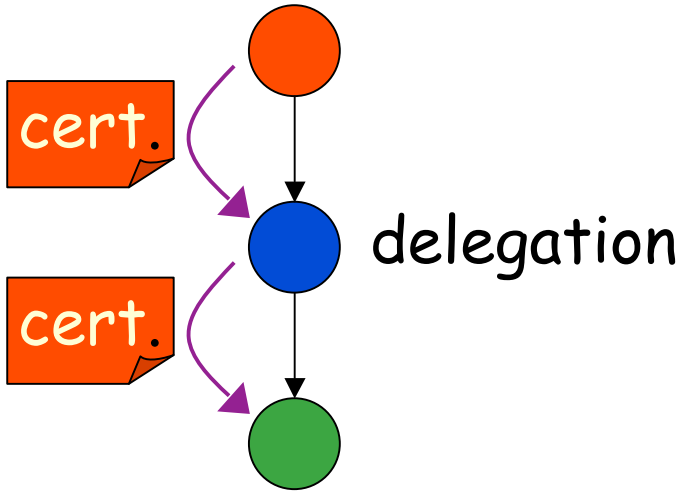
G-lambda information service model



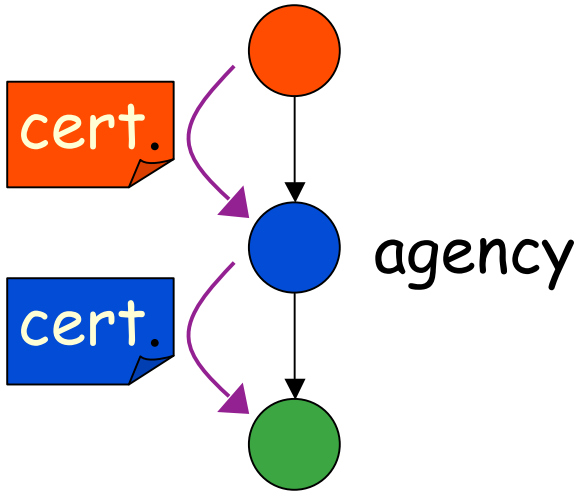
Resource managers provide their information directly to a client or via IS according to their own policy. The information provided to clients may vary according to the contract.

Authentication policy: delegation and agency

- Resource coordinator can either delegate the authentication certificate it receives from a client, or use its own certificate
  - Delegation: Resources are used in the name of the client
  - Agency: Resources are used in the name of the coordinator



delegation



agency

G-lambda

Subjects we are currently discussing

- **Parameters of the interface**
  - **In addition to the basic parameters we used in last year's demo, we are discussing on additional parameters (some may be mandatory and some may be optional) such as:**
    - **Bandwidth and media type parameters**
    - **SLA parameters**
    - **AAA parameters**