# Federated ESBs and Service Federation Management

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# Agenda

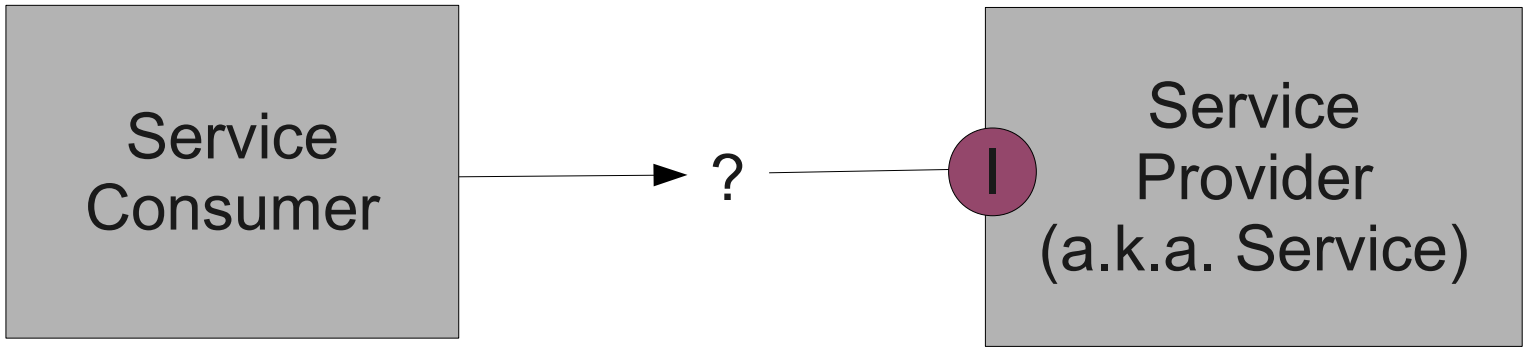
- What are you doing?
- The Story So Far
- What is Service Federation Management?
- Interlude / Example Scenario / Demo
- Some nitty-gritty...

# What are you doing?

- How many people have some integration in your enterprise?
- How many people are using an Enterprise Service Bus?
  - IBM WebSphere ESB, Message Broker, DataPower?
- How many people are using a Registry product?
  - IBM WebSphere Service Registry and Repository?
- Anyone already doing ESB or Service Federation?

# The Story So Far – What is SOA?

- **Service Oriented Architecture**
- Evolution of Tightly-Coupled Systems
- Tightly defined re-usable chunks of (business?) functionality

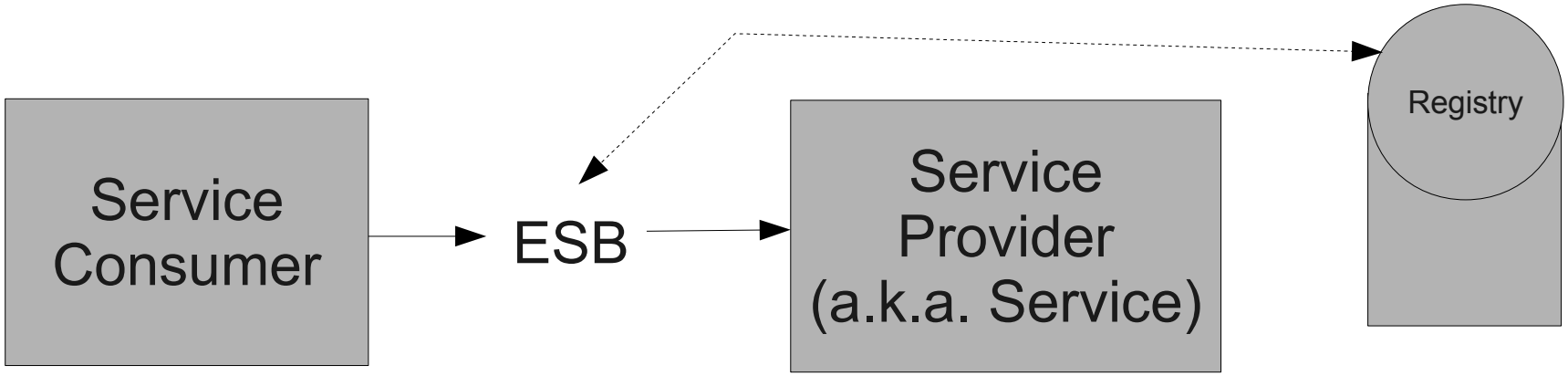


# The Story So Far – What is an ESB?

- An "Enterprise Service Bus":
- Architecture and Technology for Building Re-usable Services
- Provides data transformation, aggregation, augmentation, etc.
- IBM has some products to help with this:
  - WebSphere DataPower
  - WebSphere ESB
  - WebSphere Message Broker

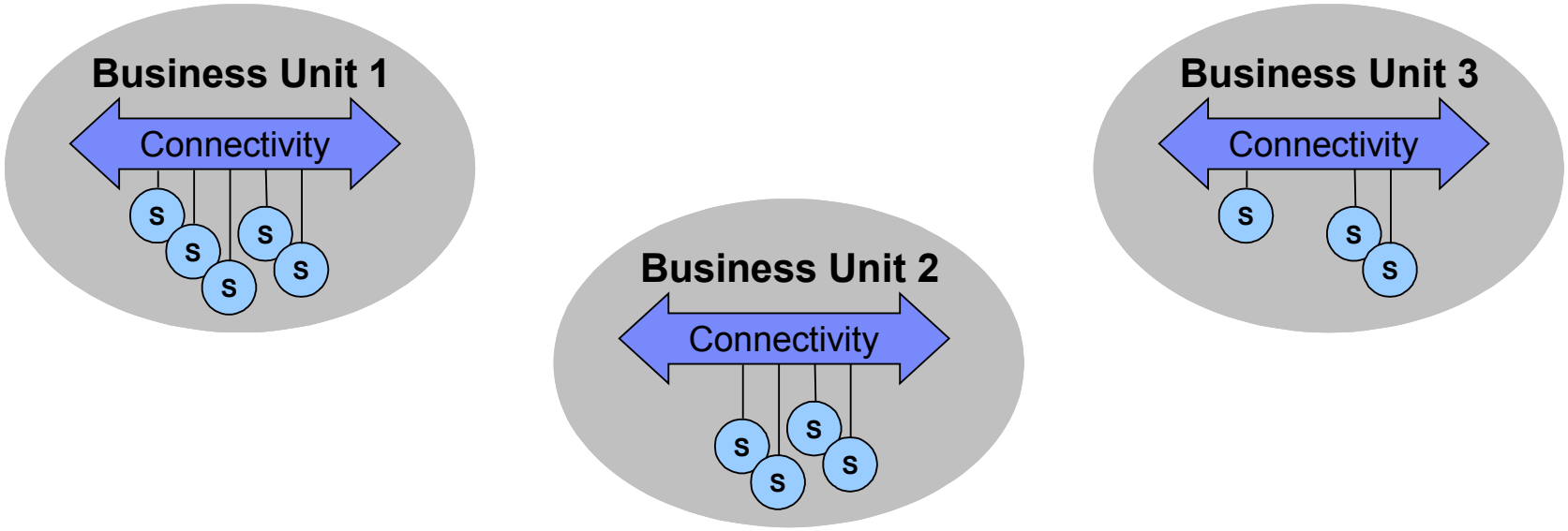
# The Story So Far – What is a Registry?

- Services need managing, especially as we build lots of them
- We can use a registry to store information about where and what services are
- ESBs (or humans) can interrogate the registry
- IBM has WebSphere Service Registry and Repository for this



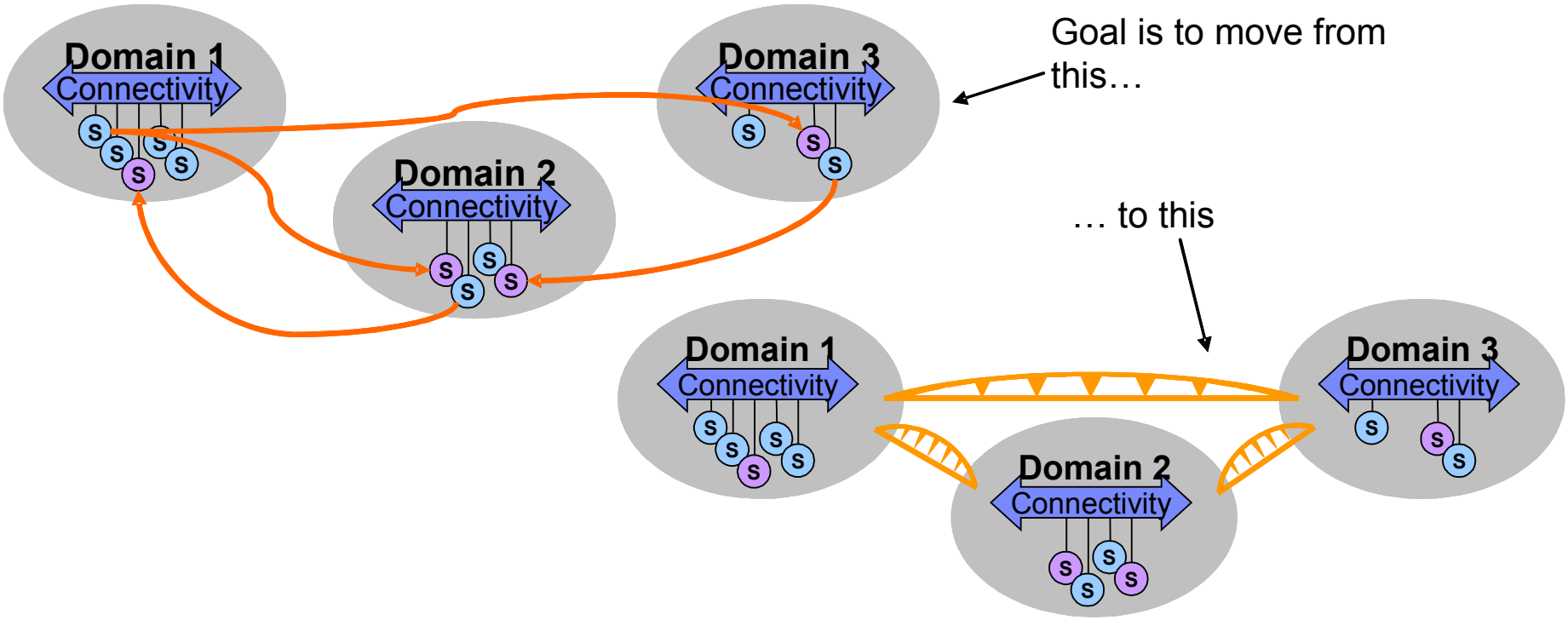
# The Story so Far - Domain-isation

- Large Enterprises typically have multiple domains (LOBs / geography / business unit / project)
- Often these each have their own ESB / registry
- Decoupled domains make inter-domain reuse harder



# The Story so Far - SFM

- Service Federation Management aims to make this easier by building bridges between domains
- This is what we call ESB Federation



# Why is Federation Hard?

Must consider connectivity aspects end-to-end

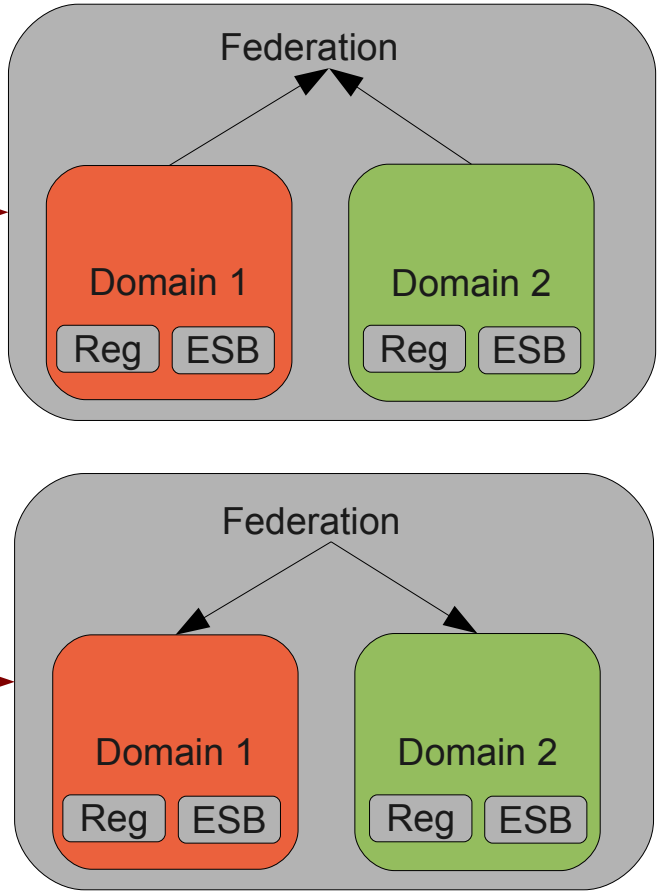
- Visibility
  - ‘Advertise’ services in different domains
- Management
  - Coordinate management and monitoring for all domains
- Security
  - Propagate, map and audit identities across domains
- Governance
  - Enable enforcement of policies across domains

# Objectives of SFM

- **Promote re-usability of services between domains**
- Allow business/IT to get a better view of domains, services shared, etc.
- Address governance, security, management between domains

# Federation Approaches

- Reactive (bottom-up)
  - M&A, independent business units
- Proactive (top-down)
  - Enterprise level planning
- Mixed (meet-in-the-middle)

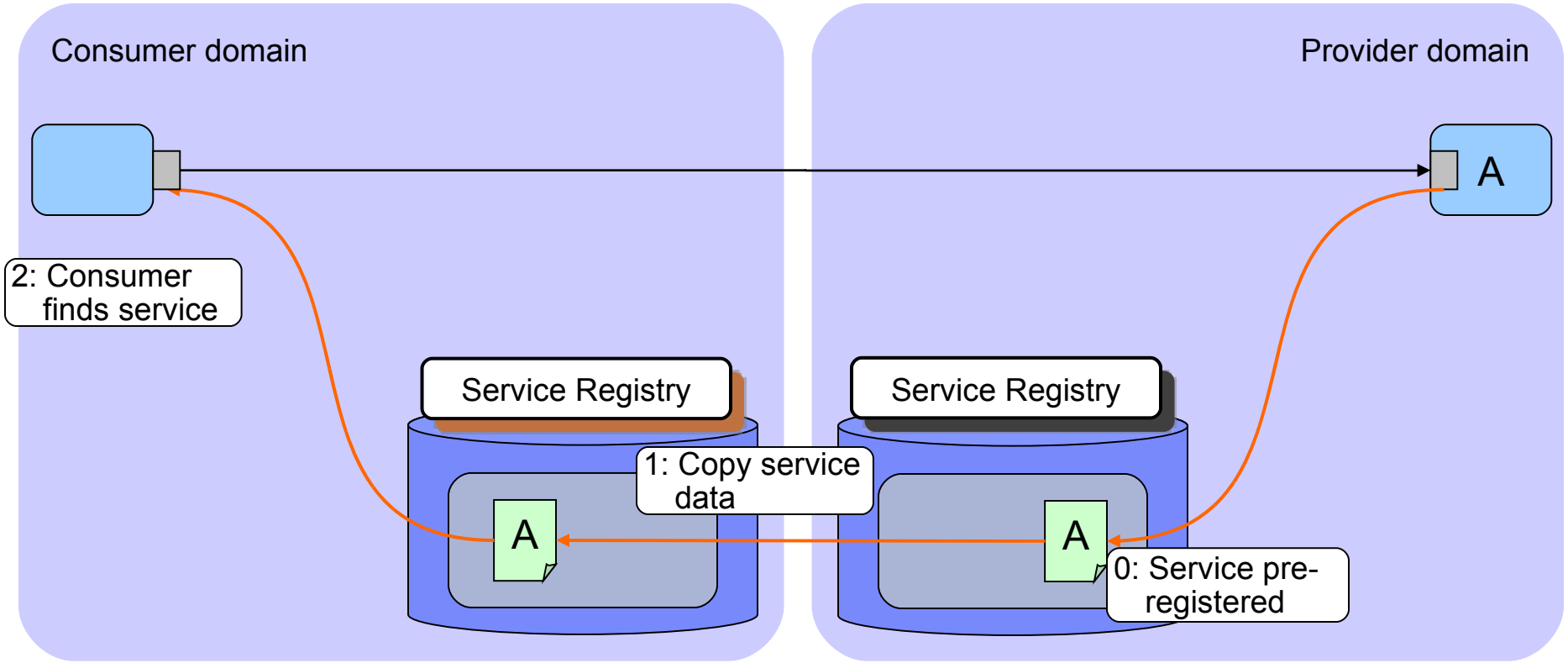


# What is SFM?

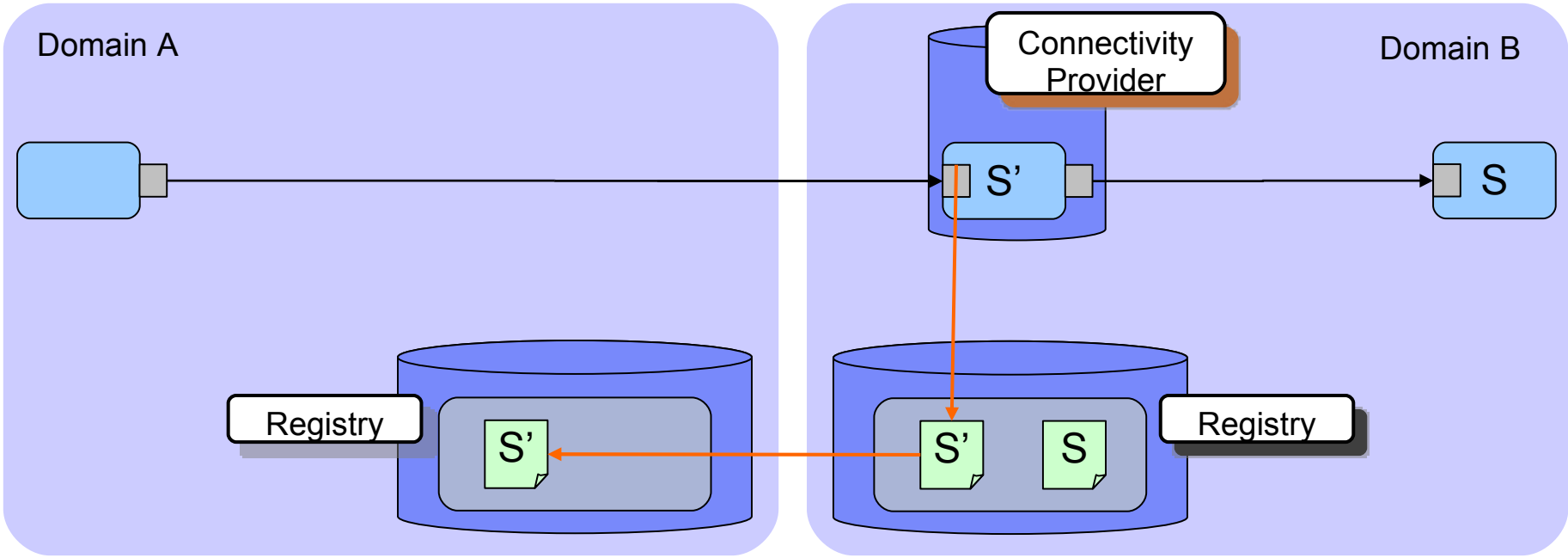
# What does SFM do?

- In version 1:
- Service Federation Management allows the exposure of a service from one domain into another by sharing WSRR information
- Federates information about services, not infrastructure
  - Does **not** link ESBs together at a bus level
- It can also create proxy services on ESBs (connectivity providers) to create enforcement points
- No explicit (proxy) service implementation is needed

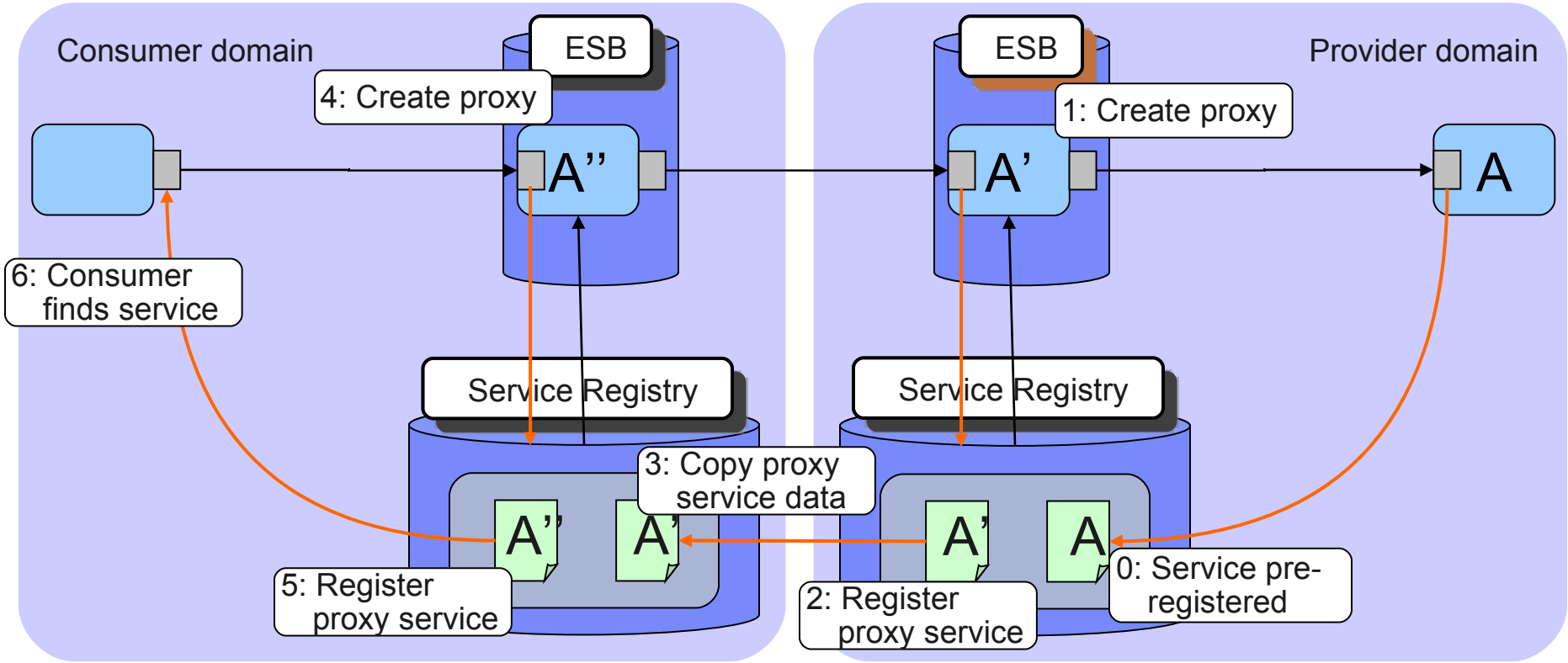
# Visually...


Consumer domain
Provider domain
A
2: Consumer finds service
Service Registry
Service Registry
1: Copy service data
A
A
0: Service pre-registered

# Visually...


Domain A
Connectivity Provider
Domain B
S'
S
Registry
S'
S'
S
Registry

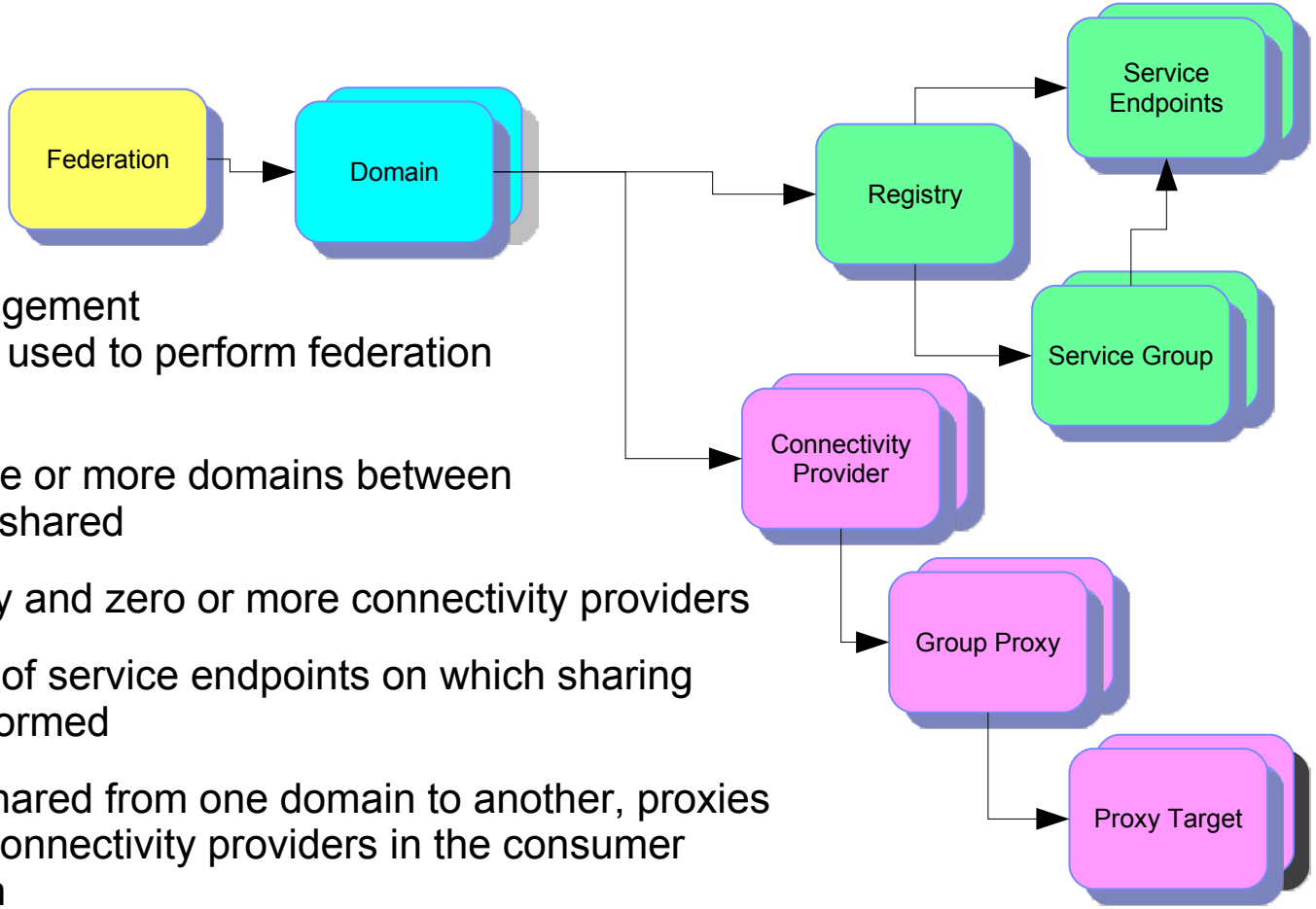
# Visually...


Consumer domain
ESB
4: Create proxy
A''
ESB
Provider domain
1: Create proxy
A'
A
6: Consumer finds service
Service Registry
Service Registry
3: Copy proxy service data
A''
A'
A'
A
5: Register proxy service
2: Register proxy service
0: Service pre-registered

# What does SFM not do?

- Data Transformation
  - That's the job of the ESB
- Other service aggregation / routing / augmentation etc.
  - That's the job of the ESB
- Not for intra-domain sharing
  - Within the scope of an ESB and a single WSRR instance, typically using SLAs
- Not a new programming model
  - All tasks are administrative

# Some terminology...




Service Connectivity Management
defines a model that is used to perform federation (amongst other things)

A federation consists of one or more domains between which services can be shared

Each domain has a registry and zero or more connectivity providers

A registry contains groups of service endpoints on which sharing operations can be performed

When a service group is shared from one domain to another, proxies can be created in the connectivity providers in the consumer and/or provider domain

For each proxy, a group proxy is created for the service group and, within that, a proxy target created for each service endpoint in the group

# What types of server are we concerned with?

- Registry Server a.k.a WSRR
  - One per domain
- Federation server a.k.a WSRR
  - One per federation
- Connectivity server a.k.a WESB, WMB, etc...
- SFM Console, typically residing on Business Space

# Typical usage

- Ensure Web Services to be shared are in domains' WSRR
- Define domains
- Define federation
- Create a service group of services
- Share by dragging from one domain to next
- Proxies created automatically if needed

# Example Scenario

# Some nitty-gritty...

# Functionality - 4Q09

- In the first release of SFM, we provided the ability to easily share services between service domains within a single trust domain
  - Create a federation from a number of service domains - and later add or remove domains as needed
  - Group services within a domain into service groups
    - Decide which service groups should be shareable
  - Share group(s) from one domain to another
    - Optionally creating proxy in provider domain, or consumer domain, or both
    - Proxies can be used to enforce HTTPS for SOAP services

# Product Support - 4Q09

WSRR v7.0 Feature Pack for Service Federation Management

- Console – runs as a Business Space widget
- Support for SCM protocol to discover and share services in WSRR

Support in WESB v7.0 and WMB v7.0

- Allows creation of service proxies
- Proxy capability
  - SOAP v1.1 or v1.2 (but no mapping between versions)
  - HTTP or HTTPS - can enforce HTTPS, or force to HTTP or leave services as-is

# SFM Implementation - 4Q09

***WebSphere Service Registry & Repository v7 Feature Pack***

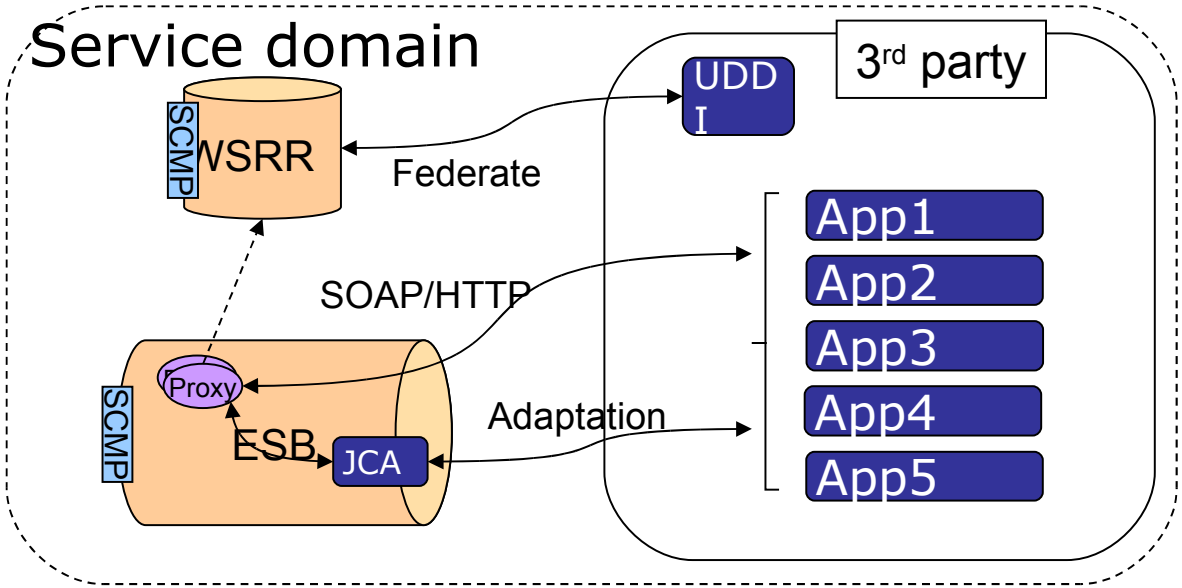
- New OWL schema defining the required objects to support SFM
- ***SFM Console***
  - A Business Space application which manages a set of Domains, Service Groups, and Federations
- ***Service Connection Management Protocol (SCMP) plugin***
  - A RESTful protocol implemented by the SFM Console and the ESB runtimes
  - Enables discovery of services
  - Enables creation of proxies to services in other Domains
  - Defines connectivity providers, domains, federations, service groups and proxies

***WebSphere ESB v7***
***WebSphere Message Broker v7***

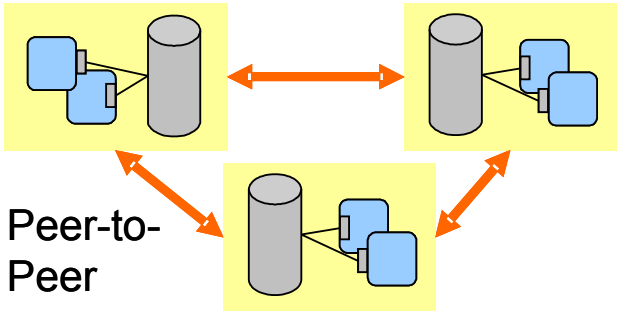
- Support via Proxy Gateway in WESB and ServiceFederationManager (similar to SOAP listener) in WMB
- WMB Execution Group = WMB Connectivity Provider

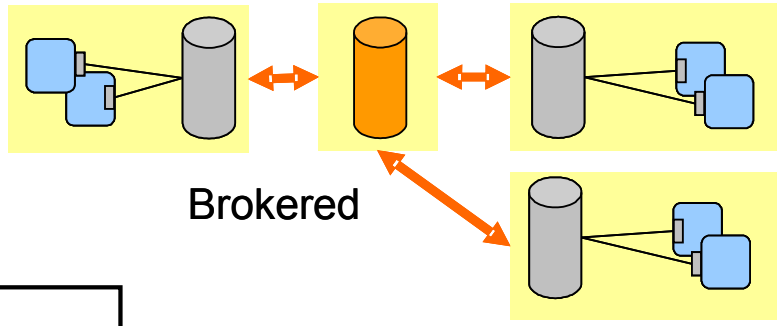
# Sharing Services with 3rd Party Systems

- Wrap 3rd party environment with SCMP-enabled products
  - WSRR federates with 3rd-party UDDI registry to capture 3rd party SOAP/HTTP services
  - IBM ESB provides platform for proxies
  - IBM ESB could adapt 3rd party native APIs

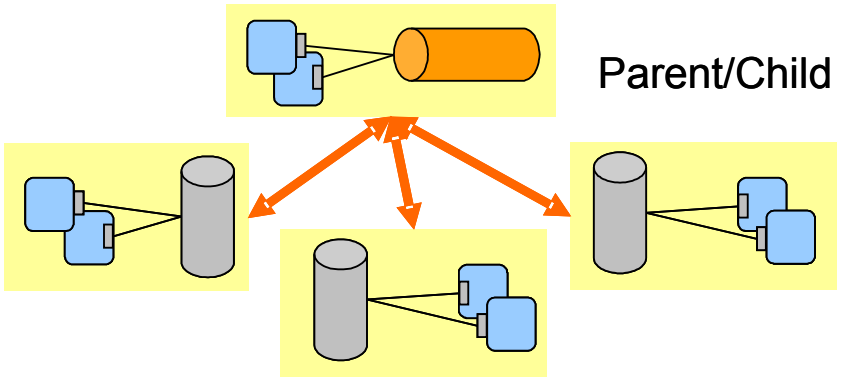


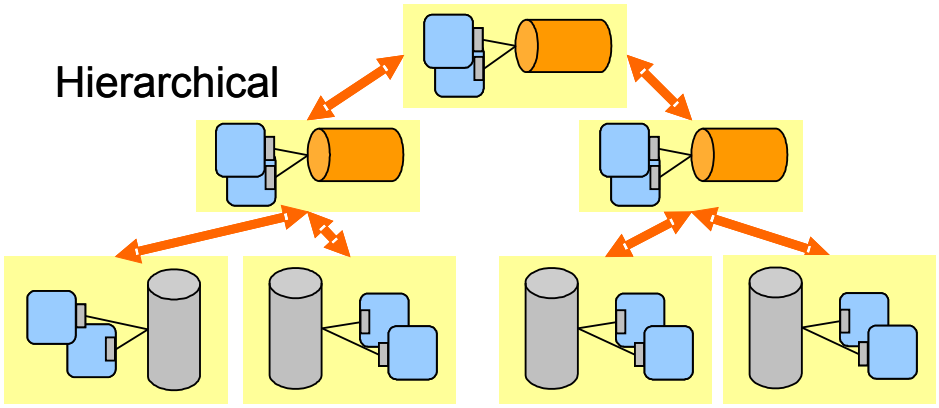
# Alternative Topologies for SFM...




And ***more …***



# High-level Installation - WSRR

- WSRR already installed in each domain
- Install SFM Feature Pack on WSRR
- SCMP enable by configuration through WSRR console
  - Load Business Models, Plug-ins
- Now ready for use as federation server, domain server and/or registry server

# High-level installation - others

- WebSphere ESB
  - Minor Configuration steps
- WebSphere Message Broker
  - Minor Configuration steps
- Now ready for use as connectivity server
- Install SFM Console (and SFM Coordinator) on top of Business Space
  - e.g. WebSphere ESB, WebSphere Application Server (w/ Business Space), etc..

# Recap

- Multiple domains drive a need for ESB Federation
- One way to implement ESB Federation is with SFM
- V1 of SFM supports:
  - Management of Endpoint Info between WSRRs
  - Automatic Creation of Proxies for Services
- Value is in:
  - Single View of Federation
  - Sharing w/o Manual Configuration
  - Proxy Creation w/o Coding

# Further thoughts

- ESB federation still comparatively new...
- SFM still comparatively new...
- Looking for feedback, e.g.
  - What proxy patterns / protocols / etc. you may want
  - Federation patterns you may need
- SFM Development Team in Hursley looking for feedback
  - Via me... (andrew.ferrier@uk.ibm.com)
  - Via SFMFBK@uk.ibm.com
- Questions? Thoughts?