

GlobalGridForum

Leading the pervasive adoption of grid computing
for research and industry

INFOD Session GGF14

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INFOD-WG

28-30 June, 2005 (GGF14 in Chicago)

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Agenda

- Overview (Dieter Gawlick, Chris Kantarjiev) – 15 minutes
- Since GGF13:
 - Specification (Cecile Madsen) – 15 minutes
 - Use Cases (Steve Fisher, Stephen Davey) – 30 minutes
 - Issues (Steve Fisher) – 10 minutes
 - Relationships (Susan Malaika) – 10 minutes
- Next Steps (Susan Malaika) – 5 minutes

Overview

Dieter Gawlick, Chris Kantarjiev

What is it?

- **Information Dissemination** supports timely and efficient dissemination of information customized according to consumers' needs.
- It is assumed that the information (a message) to be disseminated is created in response to an **event** and an objective is to disseminate information as soon as it becomes available.

History and Status

- The INFOD group was formed in 2003
 - Currently having weekly phone calls
 - A 3 day F2F was held immediately prior to GGF13
 - Very useful meeting as we now all seem to be going in same direction
 - Further F2Fs are planned
- Oasis WS-Notification activities are tracked to ensure consistency across INFOD and WS-Notification specifications
- Do join us INFODers 😊
 - Providing a Use Case is a good way to contribute

Active Group Members

- **Vijay Dialani**
- **Abdeslem Djaoui**
- **Steve Fisher**
- **Dieter Gawlick**
- **Chris Kantarjiev**
- **Cecile Madsen**
- **Susan Malaika**
- **Shankar Mallikarjun**
- **Shailendra Mishra**

INFOD Motivation

- *Event based systems* are becoming more common
 - sensor based computing where sensors produce messages as a result of events
 - message publishing from computing resources to help monitor and debug grid systems
- Standards are being developed to describe interfaces that help support *message based systems*, e.g.,
 - WS-Notification in Oasis, which describes interfaces for message publishers and brokers, to publish and filter messages; and for subscribers and consumers to express interest and consume messages
- INFOD pushes the envelop by
 - Support creation of messages based on events or even state changes
 - Support publishers in the dissemination of messages
 - Supports matching of publishers and consumers

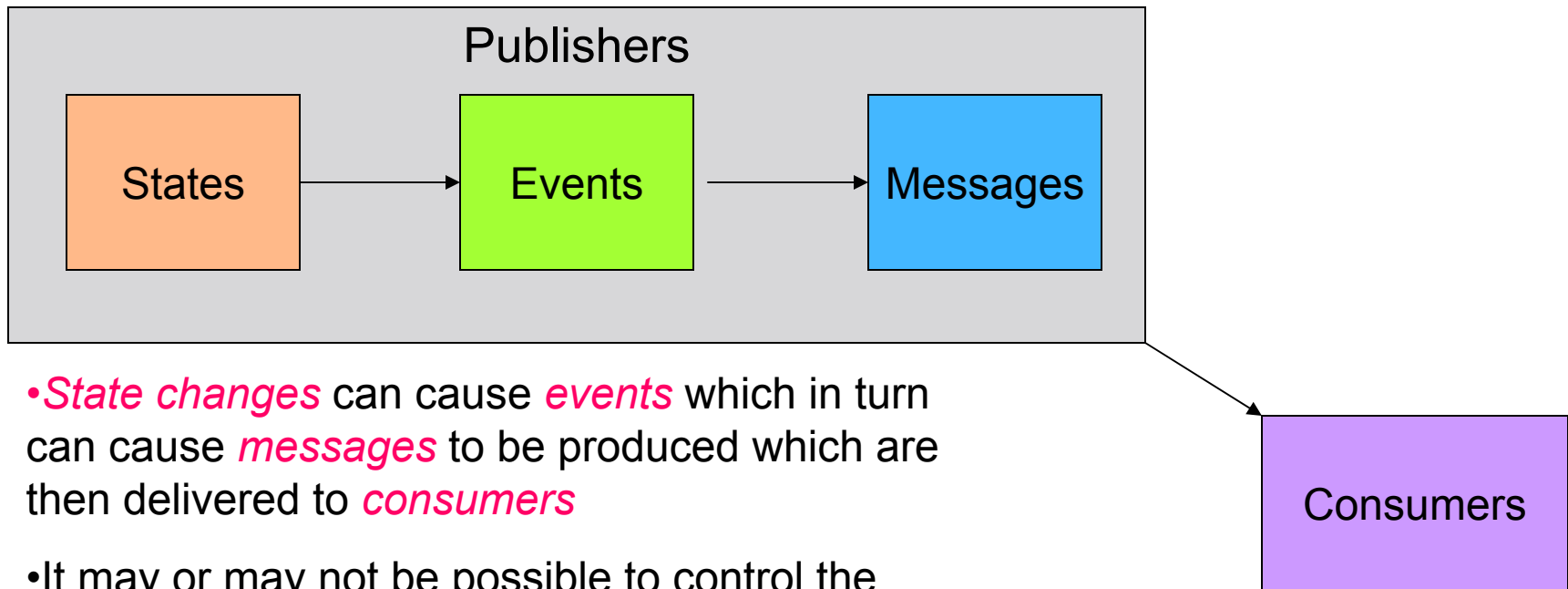
Publishers, consumers and subscribers

- **Publishers** detect events and produce messages as required
- **Subscribers** can express interest in messages on behalf of potential **consumers** through subscriptions
 - Subscriptions are not a prerequisite for information dissemination to take place
- Dissemination can occur as soon as the information becomes available, or it can be deferred
- **Information Dissemination makes it possible for INFOD objects(e.g., publishers, subscribers, and consumers) to play a part in defining events and messages, and in determining who consumes messages**

Some INFOD capabilities

- Message subscribers and consumers have increased control, e.g.,
 - subscribers can define dynamically what constitutes events that cause messages to be published
 - subscribers can define dynamically what should appear in messages
 - Consumers can limit messages received
- Message publishers have increased control, e.g.,
 - publishers can target specific consumers
- Message filters and transformations can be applied flexibly, e.g.,
 - filters can be applied at various stages

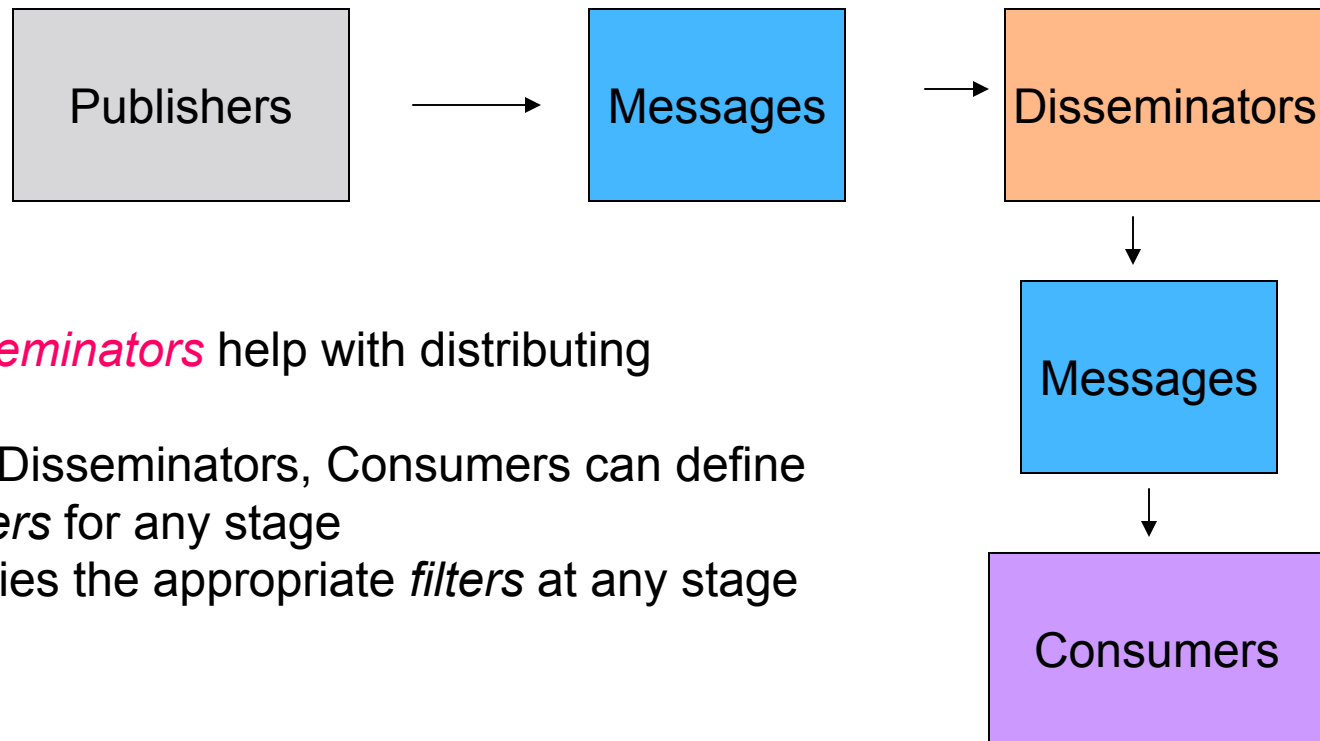
INFOD Message Creation



- *State changes* can cause *events* which in turn can cause *messages* to be produced which are then delivered to *consumers*

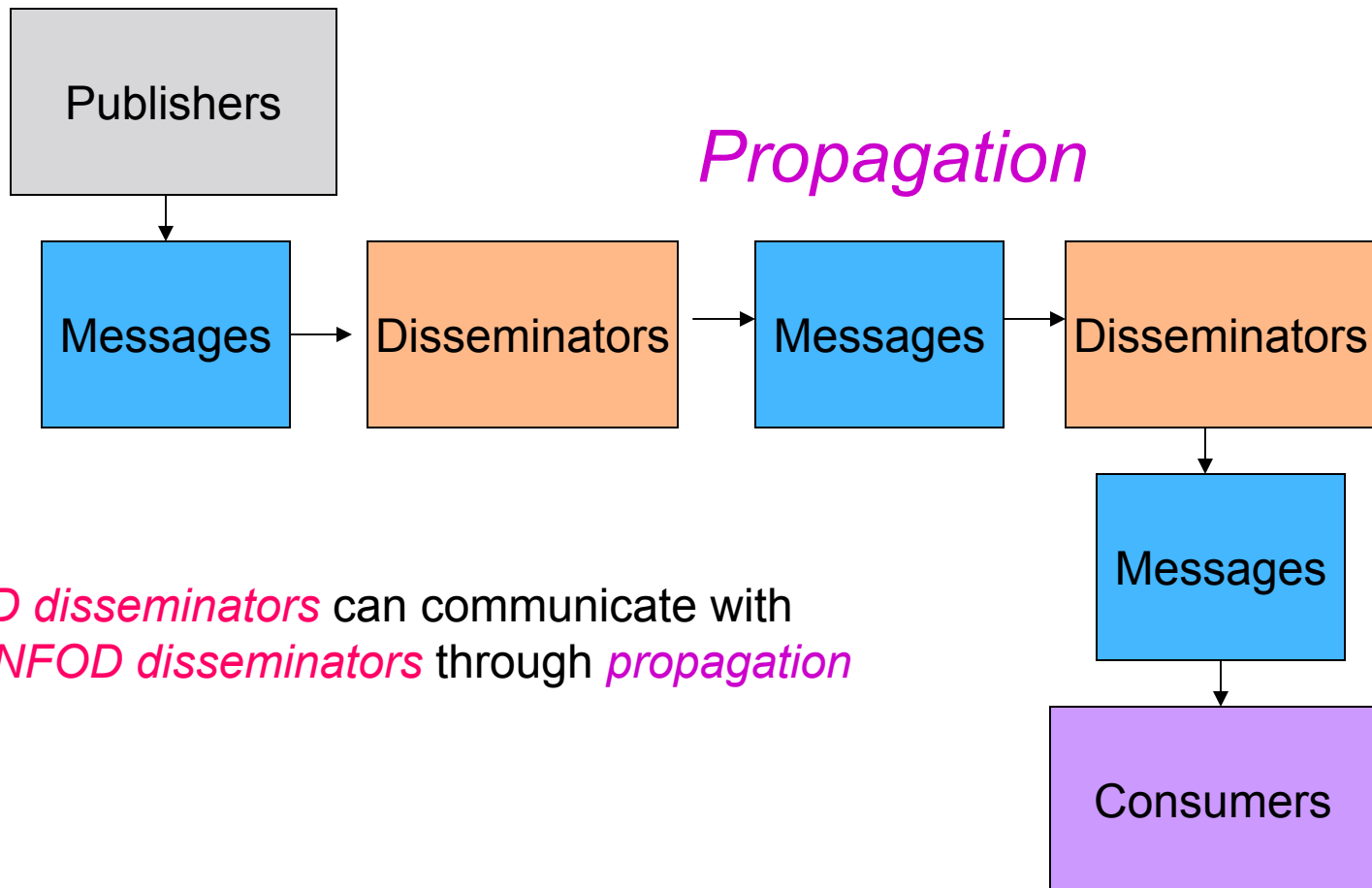
- It may or may not be possible to control the creation of messages based on events or even state

INFOD Disseminators



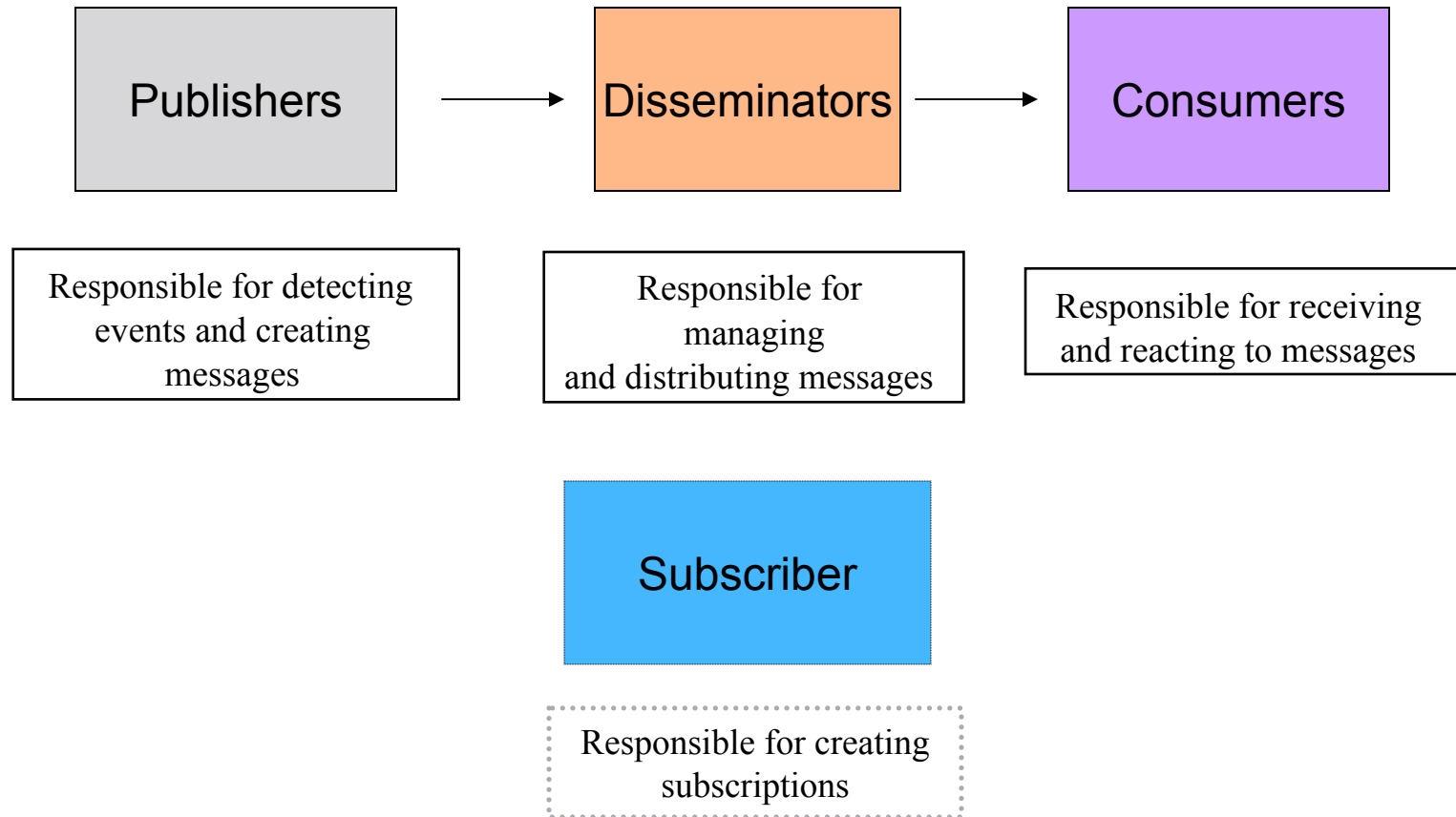
- **INFOD disseminators** help with distributing messages
- Publishers, Disseminators, Consumers can define message *filters* for any stage
- **INFOD** applies the appropriate *filters* at any stage

INFOD Propagation



- *INFOD disseminators* can communicate with other *INFOD disseminators* through *propagation*

INFOD Objects



INFOD Registry

- Contains information about all objects
 - Name
 - Properties
 - Application specific
 - Operational
 - Relations
- This is the core of the matching
 - Subscribe to all publishers who ‘understand by request’ and ‘are trustworthy’
 - Send message to people in reporting directly or indirectly to Larry and are currently on duty
 - Accept messages only from publishers ‘I trust’
 - Send messages only to consumers ‘who are entitled to see them.’

Specification

Cecile Madsen

Specification Topics

- Interfaces
- Players: Interface composition
- To-dos (being worked on)

Interfaces

- Registry Interface
- Disseminator interface now split into
 - GetData interface
 - Consume interface
 - Propagate interfaces
- Consume interface
- NotifyUpdate interface

Registry Interface

- Registry advertizes available INFO objects
- Objects are publishers, publication_types, subscriptions, consumers, disseminators, ...
- Operations:
 - createXXX
 - dropXXX

getData Interface

- Pull scenario support
- Context is disseminator or consumer
 - consumer gets data from disseminator
 - end-user gets data from consumer
- Operations:
 - getDataForBrowse
 - getDataForConsumption

Consume Interface

- Push scenario support
- Context is disseminator or consumer
 - publishers who publish data to disseminators
 - publishers who publish data to consumers
 - disseminators who publish data to consumers
- Operation:
 - consume

NotifyUpdate Interface

- push scenario support for infod metadata (infod objects, not infod data)
- Context is publisher, disseminator, consumer
 - publisher to discover new consumers
 - disseminator to discover new subscriptions
 - consumers to discover new publishers
- Operation:
 - NotifyUpdate

Players: Interface Composition

- Publisher
 - May optionally implement the NotifyUpdate interface
- Disseminator
 - Implements the Consumer and GetData interfaces
 - Implements xxx interface for propagation
- PO Box (push/pull consumer)
 - Implements the Consumer and GetData interfaces
- Consumer (push consumer)
 - Implements the Consumer interface

To-dos being worked on

- Finalize INFOD objects
- NotifyUpdate interface
- Staging of INFOD specs
- Relationships to other specs: WSN, OGSA, DAIS, Identity Management, Vocabulary Management, Operational Characteristics

Use Cases and Issues

Steve Fisher and Stephen Davey

Use Cases

- Revised Template
- Created R-GMA Network Monitoring Use Case
- Introducing
 - SensorNet Use Case
 - NextGrid Animation Use Case
 - DAIS Third Party Delivery

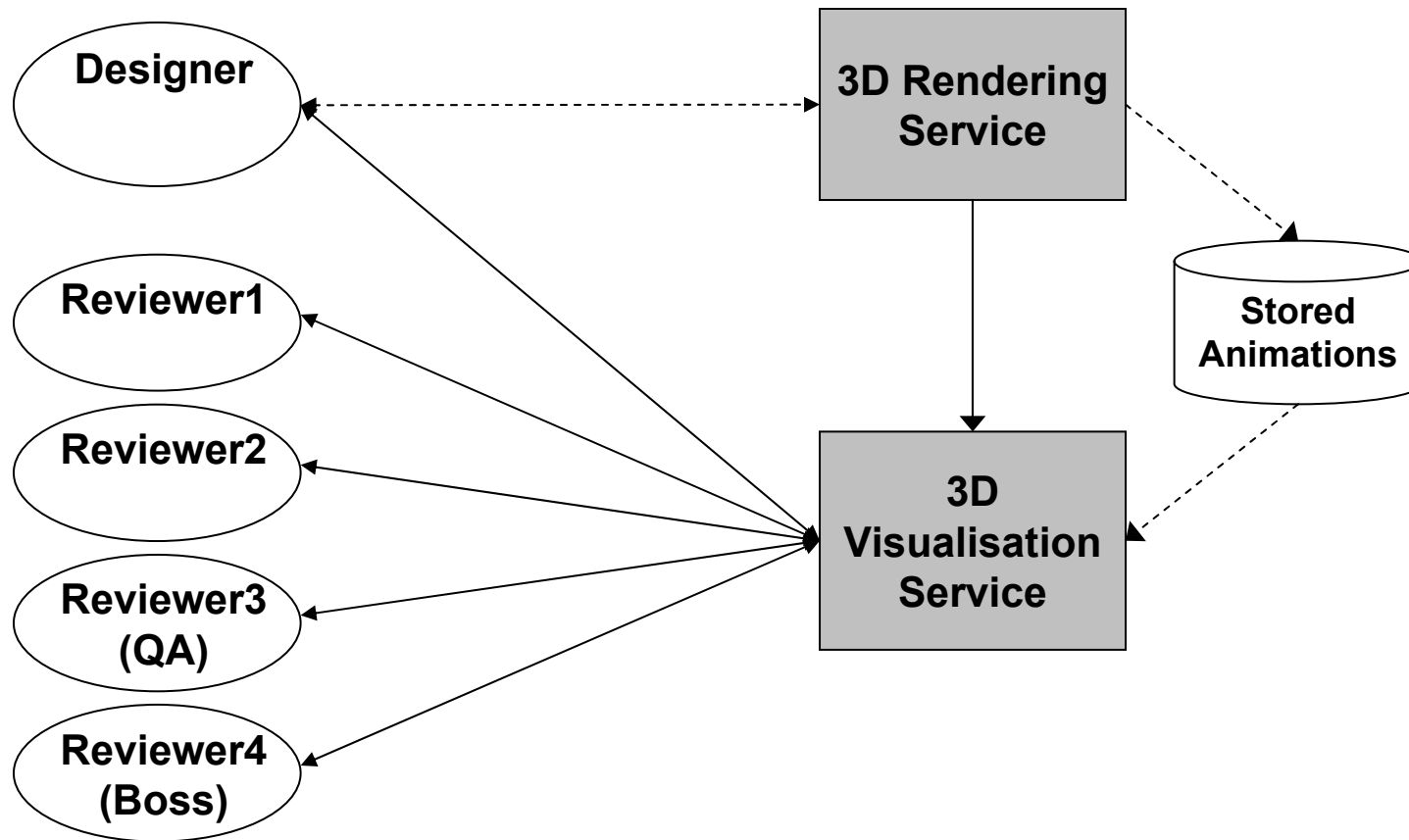
NextGrid Animation Use Case

- Based on the NextGrid Digital Media use case.
- Nowadays, almost all films and commercials use computer graphics animations.
- Designers can use several software applications for creating 3D scenes like 3D Studio Max and Maya.
- These applications can build a 3D environment or just a single scene and render it.
- A close online collaboration between the client and the designer is required in order to obtain results close to the client's needs.

NextGrid Use Case Scenario

- The Designer has submitted animation rendering jobs to the Grid.
- Designer and Reviewers are interested in knowing when those jobs have been finished.
- The Designer and Reviewers want to be informed as soon as each animation is completed.
- Project Manager / Boss wants to be notified if any of the animations from a particular designer have not been completed by a certain deadline.

Actors & Components

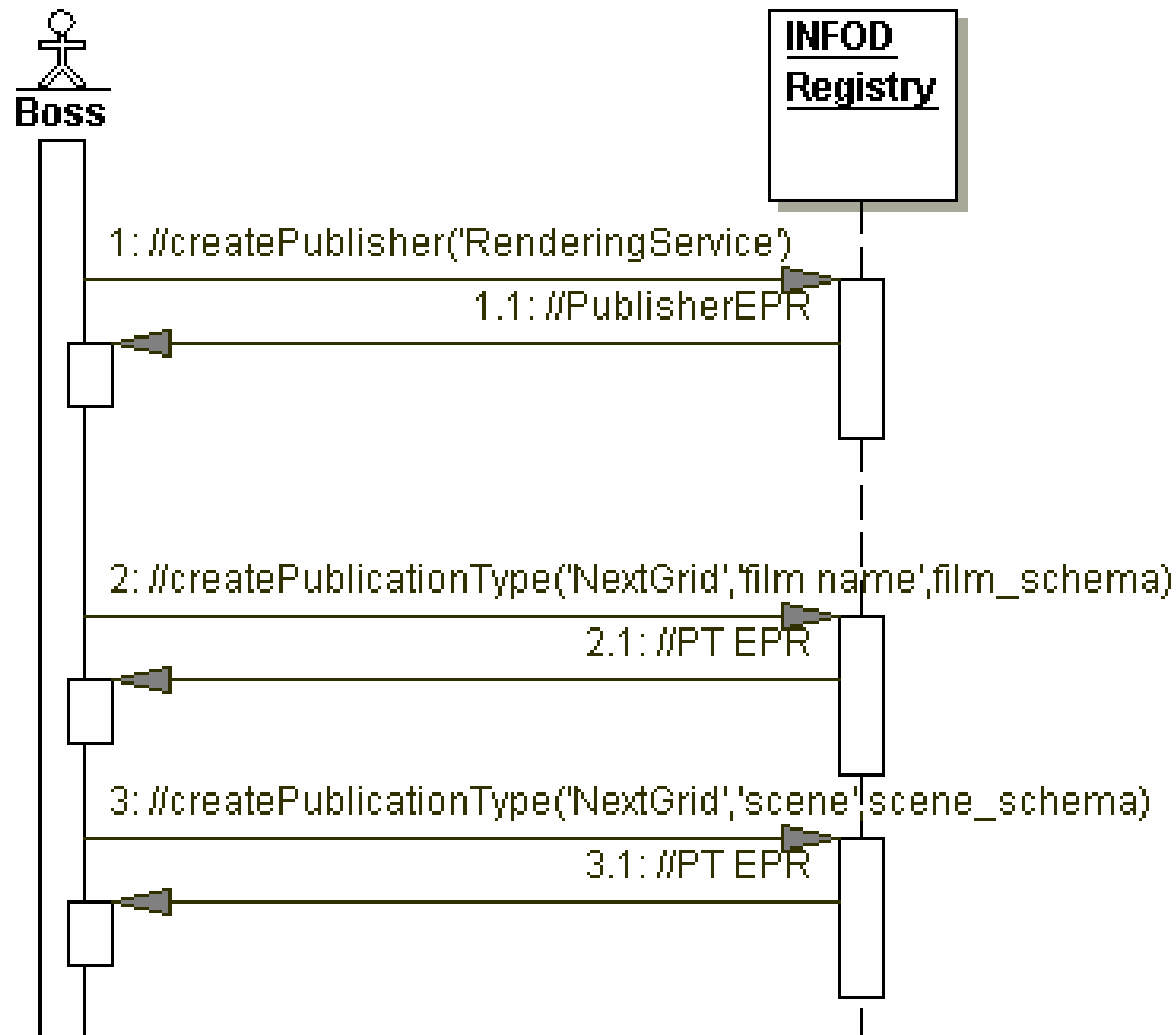


- The Actors are the Designer and the Reviewers.
- The Publisher is the Rendering Service and the Disseminator is the Visualisation Service.

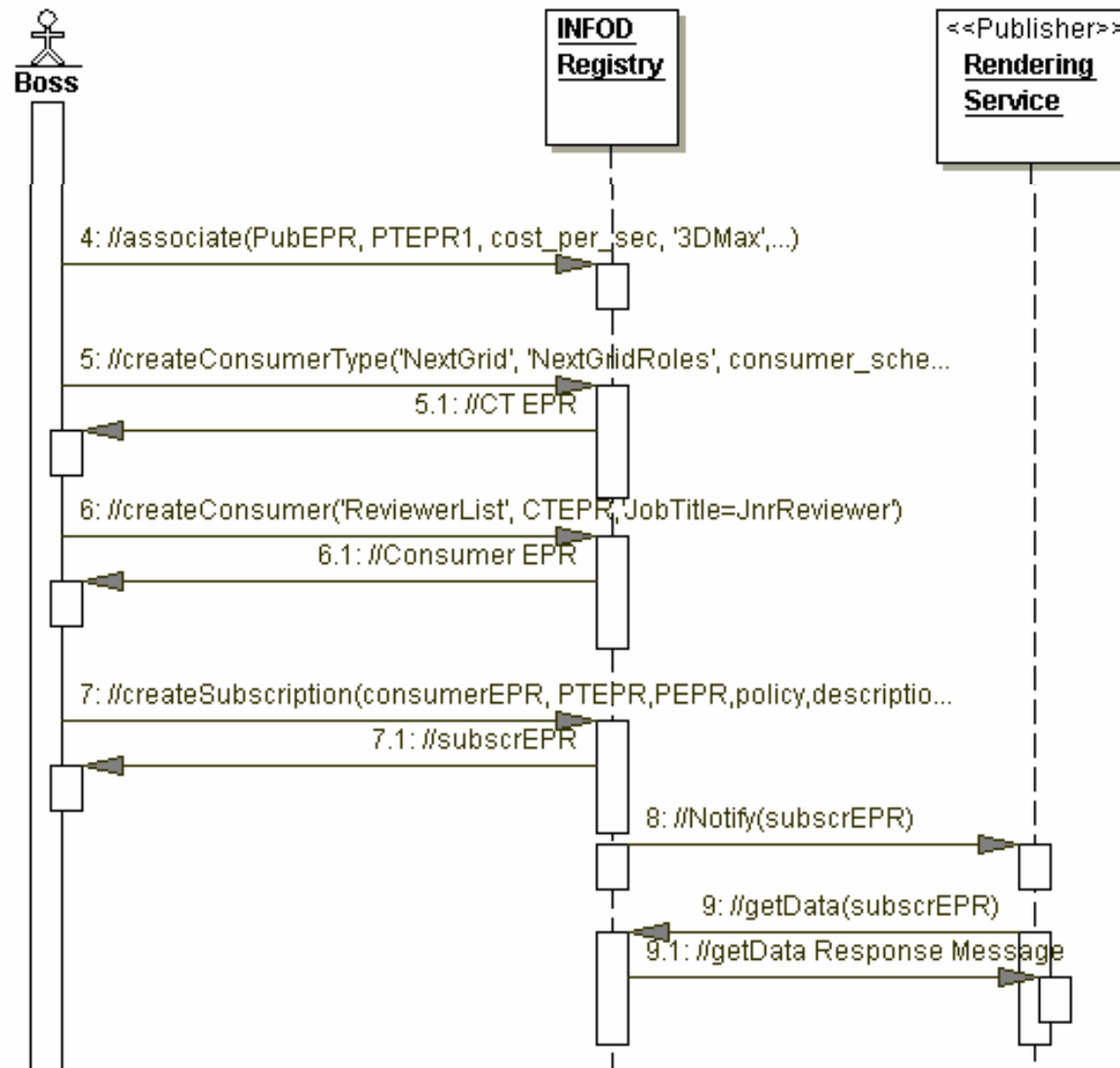
Scenario steps

- Publications defining film name, scenes, designer, status, target completion times, actual completion times etc, need to be created and stored.
- The Project Boss wants to be notified if any of the animations from this particular designer do not get completed by a certain deadline.
- Step 1: Boss subscribes to all animations that don't get completed within 30 minutes of submission.
- Step 2: Rendering Service examines subscriptions.
- Step 3: Designer submits job and a 30 minute timer is started.
- Step 4: If the timer reaches 30 minutes before the job is completed then a non-event message (i.e. a missed deadline) is generated by the Rendering Service for the relevant consumer (via the Visualisation Service disseminator).

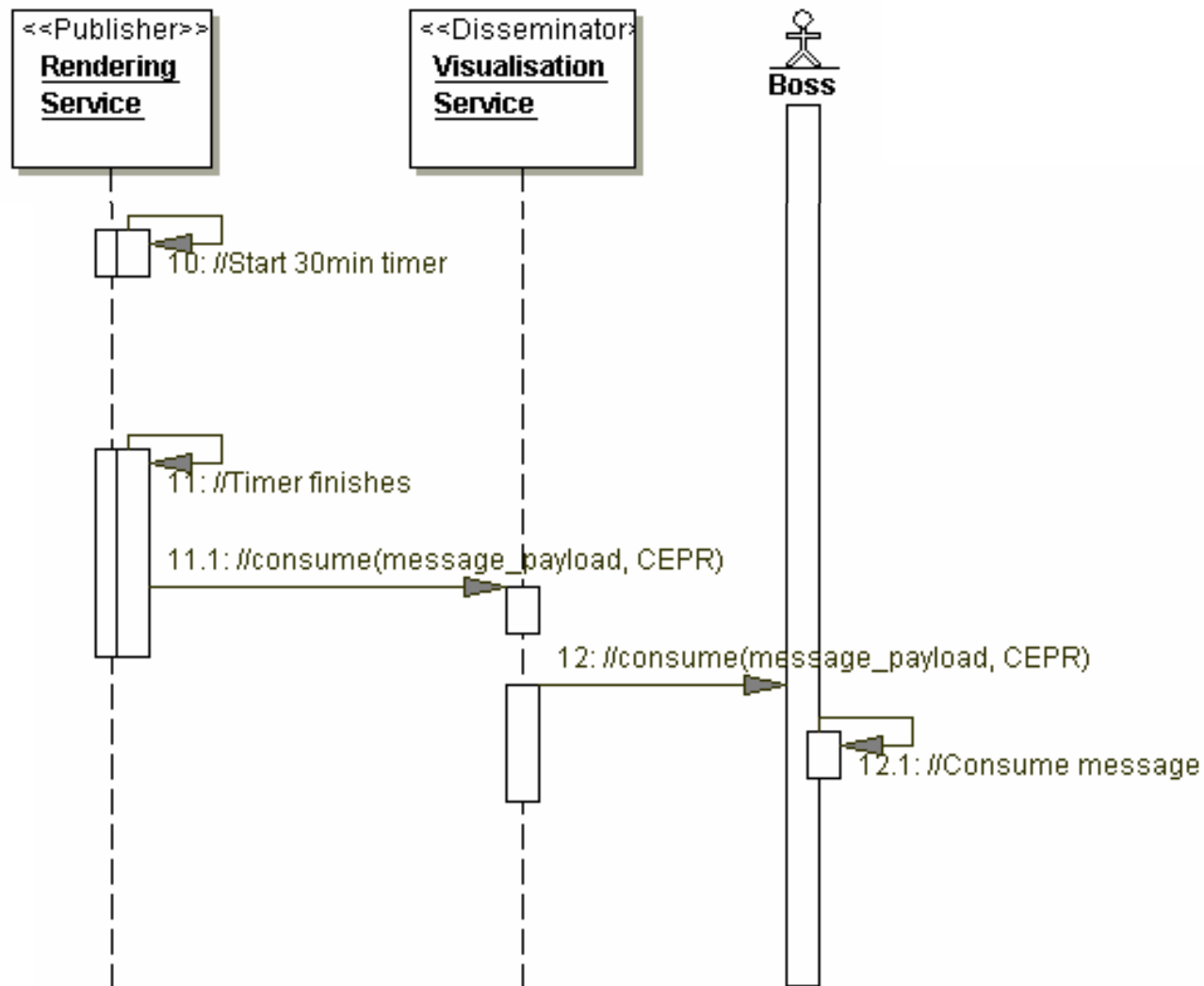
Sequence Diagram (1)



Sequence Diagram (2)

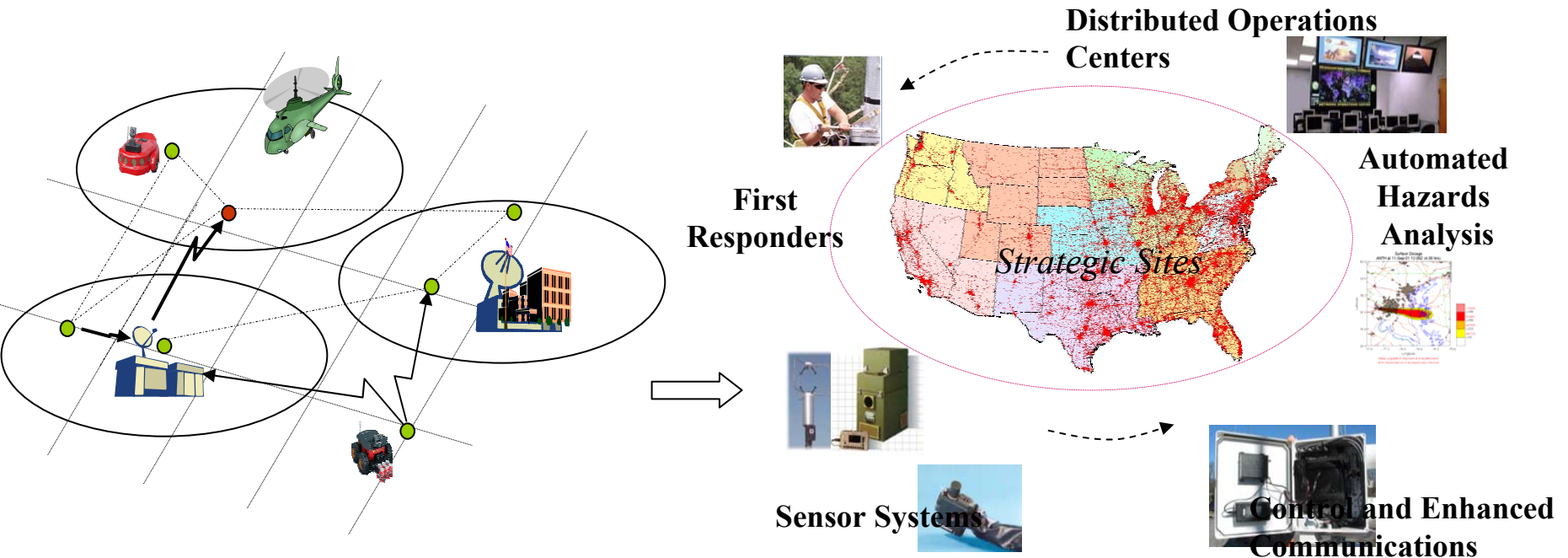


Sequence Diagram (3)



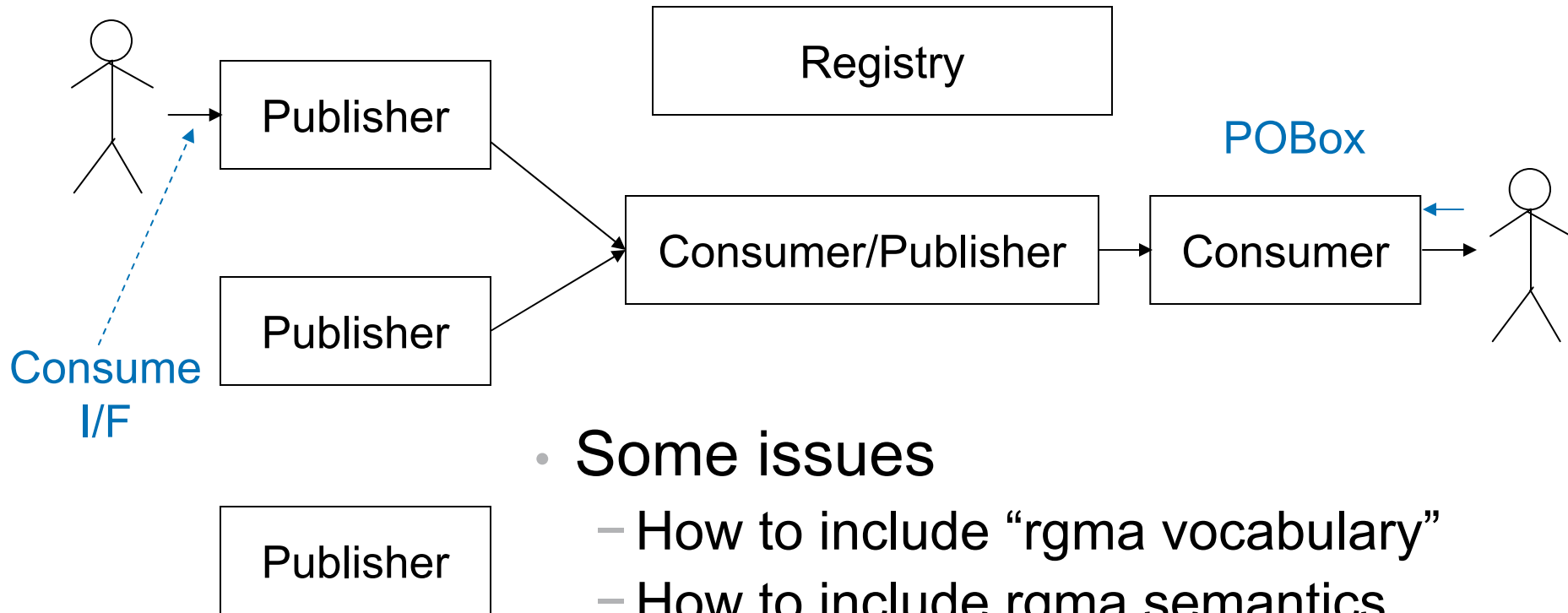
SensorNet

To catch big fish you need a big net – Ancient Proverb



Ubiquitous Sensing for Protection and Utility

R-GMA (NM) Use Case



- Some issues
 - How to include “rgma vocabulary”
 - How to include rgma semantics
 - How to inject data into INFOD
 - How to get information out of INFOD

Some INFOD Calls implied by scenario

– Note

- These are all calls on the Registry
- Registry (specialised) is the heart of INFOD

- PTEPR = createPublicationType('NetworkTCPThroughput', 'rgma', 'create table...') for each table
- PEPR = createPublisher('site1') at each site
- associate(PEPR, PTEPR, 'RP=5min', 'rgma', 'incomplete - NMIdSource = xx...')
- createSubscription(ConsumerEPR, PTEPR, PEPR, policy, 'rgma', description, 'select ...')

– Note

- Matchmaking between associations and subscriptions is vocabulary dependent

Some Issues

- We are keeping a more careful eye on issues
 - High level ones include:
 - We are a long way from having 2 implementations
 - We have not yet addressed any security concerns
 - The scope of INFOD is not yet fully defined e.g. can it encompass R-GMA or not
 - Should explicit transforms be included
 - What is mutable
 - How do we cope with multiple vocabularies
 - How do we break the spec into manageable pieces

Relationships and Next Steps

Susan Malaika

Relationships Summary

- Reviewing latest OGSA architecture document
- Reviewing latest DAIS specification
- Reviewing latest WSN specifications

GGF14 Sessions of Interest

- INFOD 4:30pm on Tuesday
- Data Area session at 6:30pm on Tuesday
- OGSA-D 7:30am on Wed – Data Transfer
- OGSA-D 9:00am on Wed – Overview
- OGSA-I : 7:30am on Thu

General WSN Comparison

- There are three distinct stages in the Publishing process
 - (1) Observation of the Situation and its noteworthy characteristics;
 - (2) Creation of the NotificationMessage artifact that captures the noteworthy characteristics of the Situation; and
 - (3) Distribution of copies of the NotificationMessage to zero or more interested parties.
- Stages (1) and (2) happen largely outside of the scope of the WS-Notification architecture; WSN does not restrict the means by which these stages must occur. WSN refers to an entity that performs stages 1 and 2 as a Publisher
- INFOD enables subscribers to influence (1) and (2) by explicitly permitting subscribers to refer to predefined or application defined situations and to cause the publisher to execute processes (usually pre-installed) that issue messages that correspond to the subscribers requirements

Actions from GGF13 Status

Two INFOD F2F meetings were held since GGF13

Actions: From GGF13

INFOD Registry relationship to other registries:

Information Dissemination specific registry

Partitioning of the specification:

- Proposal being written up

Implementations

- Not certain yet

Next Steps

Work on Use Cases

Complete RGMA; Sensornet, Nextgrid Animation, and DAIS third party delivery use cases

Work on Specification

Apply Issues to the specification

Review specification support of use cases

Splitting Specification

Continue compiling and managing single issues list

Revise Charter

Volunteers needed

INFOD F2F

