Schedule …

Tuesday, April 13   Quiz corrections

Wednesday, April 21   Deadline for project reports
Project demos

.

Quiz# 2 - Answers

INSE 7110 – Winter 2004
Value Added Services Engineering in Next Generation Networks
Week #10

Statistics …

Number of copies: **17**

A+ (30.5 – 35):   2   (Around 10%)

A- (26 – 30):   10   (Around 60%)

B + (21.5 – 25.5):   5   (Around 30%)

Statistics …

Questions for which the lowest marks were given:

- Questions for which the answers go a bit beyond professor's lectures notes.

- Question 2 (Sequence diagrams)

- Equivalence of Parlay / Web services business roles and TINA-C business roles.

Question 2: Legacy based architectures …

Note:

1. **There is a difference between re-using IN and inter-working with IN**

2. **The question was on re-using and not inter-working**

3. **Some "consolation" points were given to those who misunderstood**

ERICSSON ⚏

The first issue   ...

Communication between NGN switches and SCPs.

- Next generation switches do not support SS7
- INAP is ASN.1 based while some Internet Telephony protocols (e.g. SIP) are text based

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Tentative solutions …

Three main approaches

- First: Put the burden on the SCP side
    - IP transport
    - support of text based protocol (if SIP)

- Second: Put the burden on the NGN switches sides (e.g. support of SS7

- Third: Gateways

The second issue ...

Call models

- – IN call models were built explicitly for circuit switched telephony
- – NGN "call models" were built without IN in mind

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Tentative solutions

The call model issue: Two main approaches

- Integrated call model

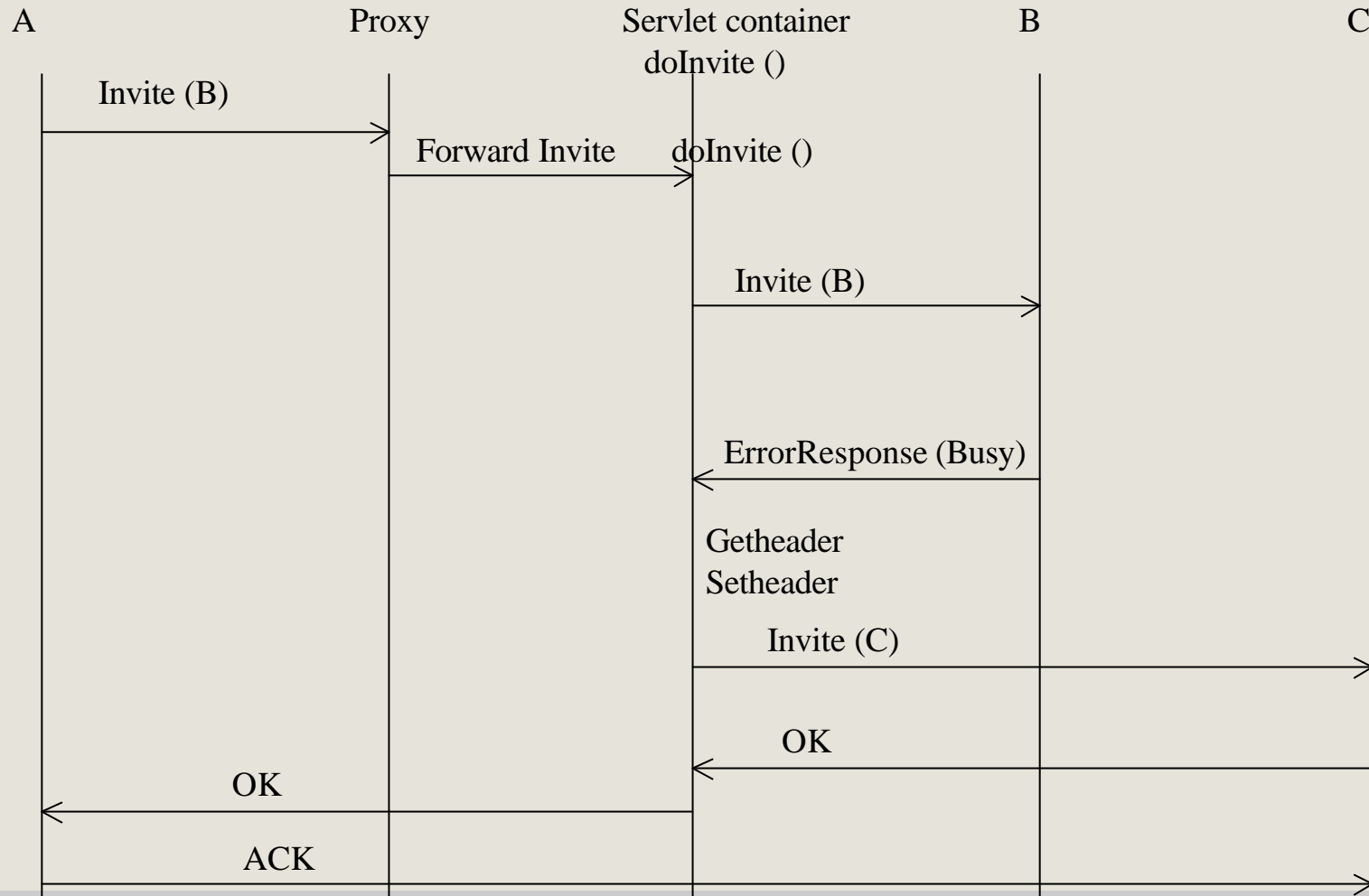- Call models (I.e. H.323/SIP and IN) running in parallel and interacting

.

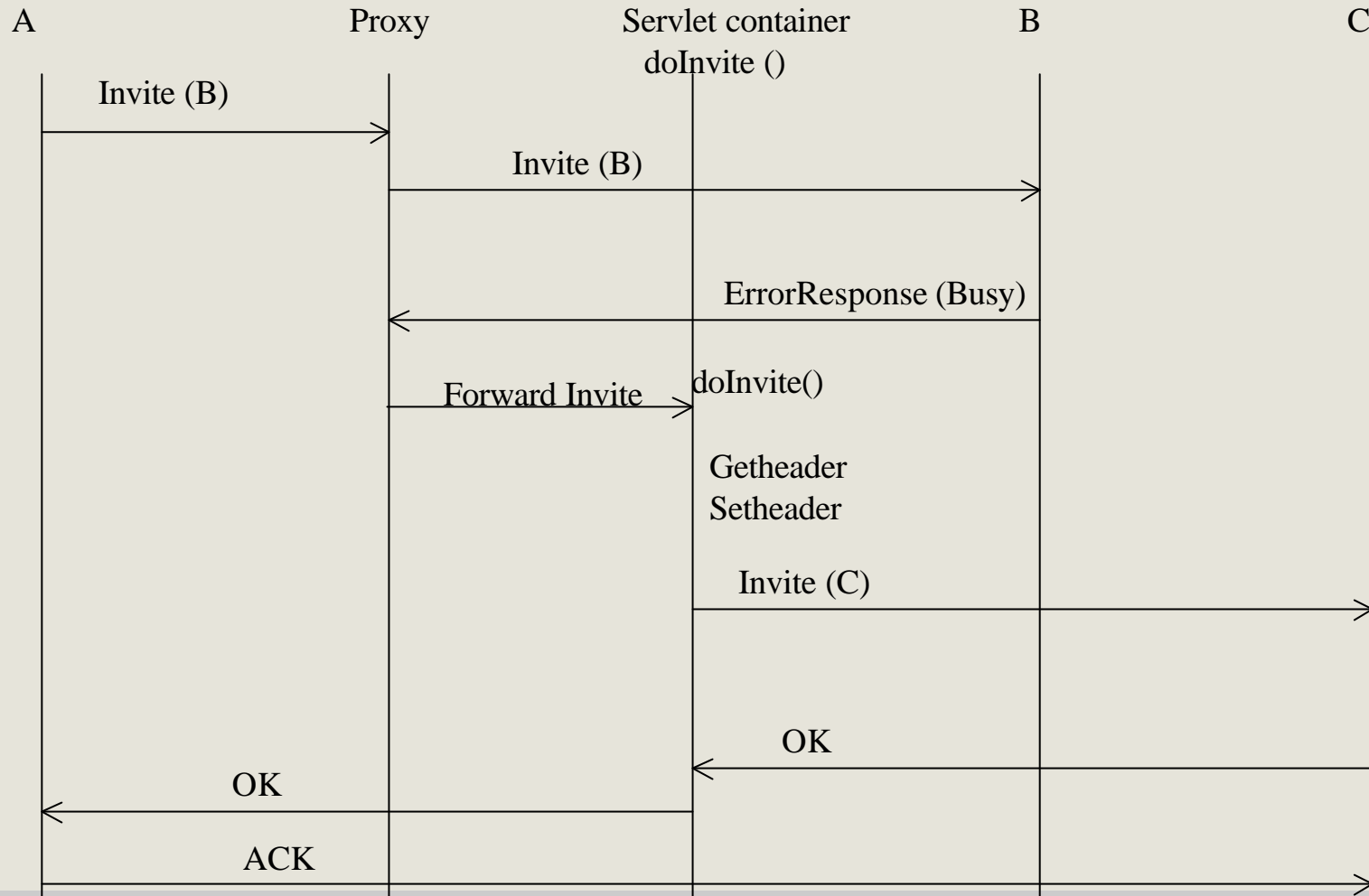# Question #2 – Signaling protocol specific architectures

The two methods:

- DoInvite

- DoErrorResponse

Tolerated answers: Getheader, Setheader or more
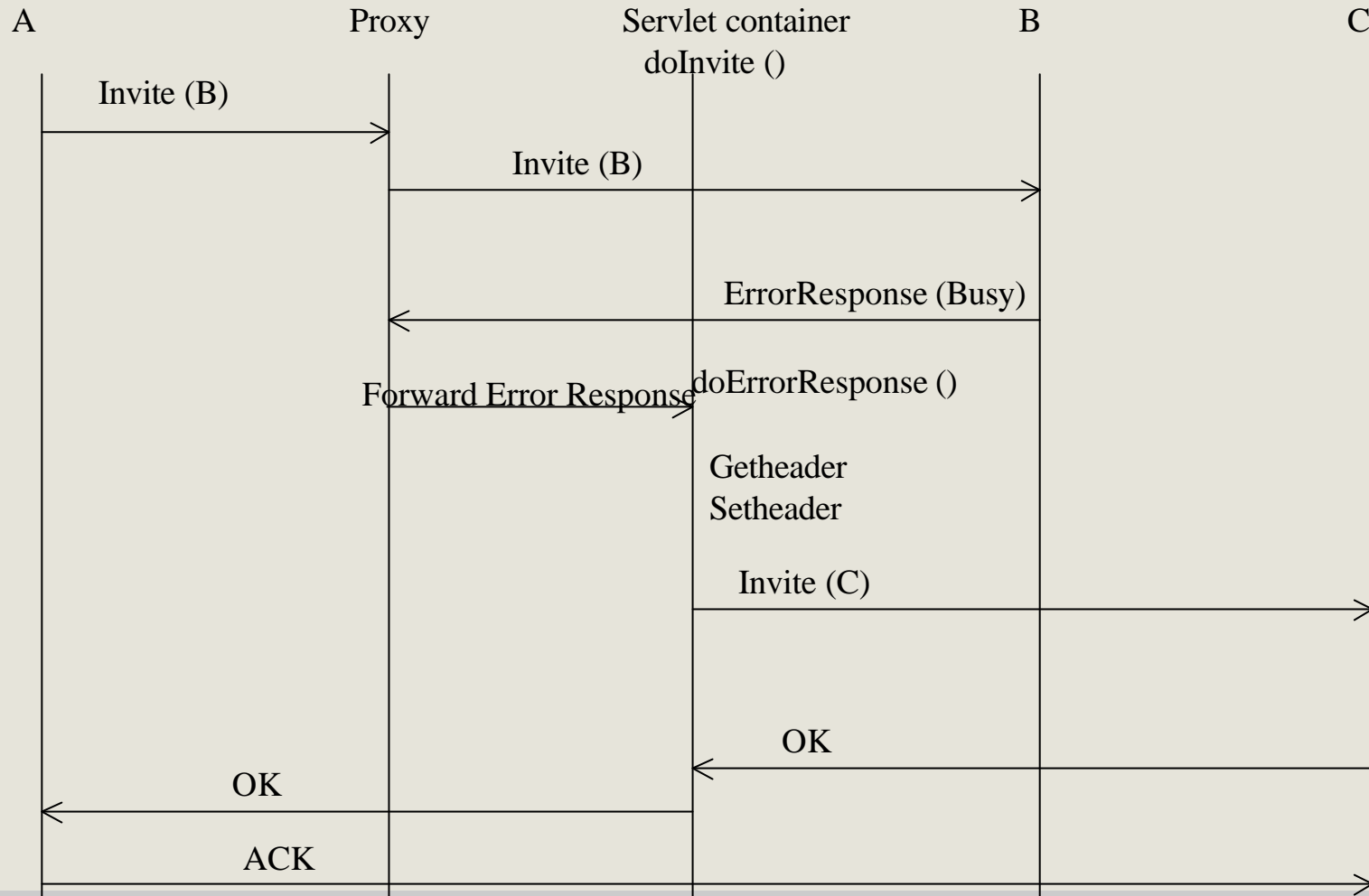generally any pair of SIP servlet methods

Question #2 – DoInvite () Based – solution 1

Question #2 – DoInvite () Based – solution 2

A | Proxy | Servlet container doInvite () | B | C

Invite (B) — A → Proxy

Invite (B) — Proxy → B

ErrorResponse (Busy) — B → Proxy

Forward Invite — Proxy → Servlet container   doInvite()

Getheader
Setheader

Invite (C) — Servlet container → C

OK — C → Servlet container

OK — Servlet container → A

ACK — A → C

Question #2 – DoErrorResponse () Based – solution

A	Proxy	Servlet container doInvite ()	B	C

Invite (B)

Invite (B)

ErrorResponse (Busy)

Forward Error Response doErrorResponse ()
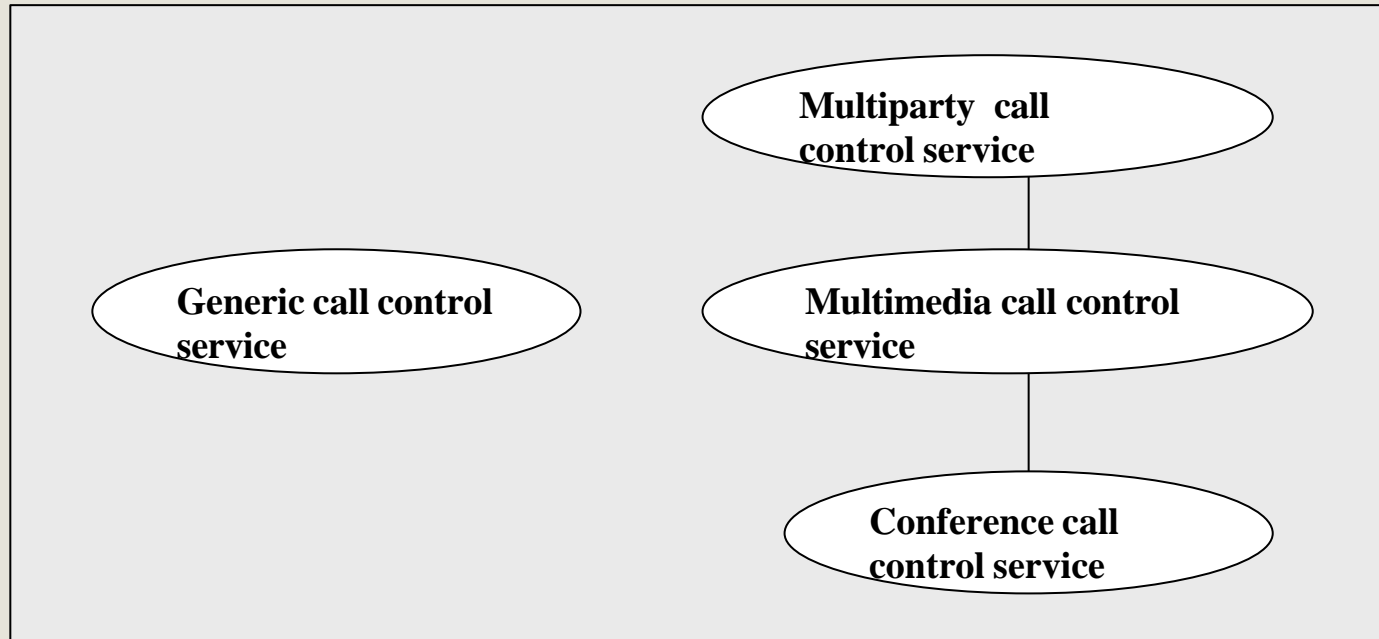
Getheader
Setheader

Invite (C)

OK

OK

ACK

Question 3

- Roles
  - Client application
    - Consume/use the services (e.g. network capabilities)
    - Equivalent to end users in TINA-C.
  - Enterprise operator
    - The entity that subscribes to the services
    - Subscriber in TINA-C
  - Framework operator
    - Entity that handles the subscriptions
    - Equivalent to the retailer in TINA-C

Question 3

– Two types of APIs

– Services APIs

- Expose the network capabilities (e.g. call control, presence)

– Framework APIs

- Make the use of the service APIs secure, accountable and resilient (e.g. security, registration, authentication)

Question 3

A diagram containing the following labeled ellipses: "Multiparty call control service", "Generic call control service", "Multimedia call control service", and "Conference call control service". The Multiparty call control service connects to Multimedia call control service, which connects to Conference call control service.

Question #3 ...

Specificities:

- Only architecture that aims at service creation by end-users

Prime target: Un-trusted parties

– Direct use

– Use via a graphical user interface

- Higher level of abstraction

- Mapping done by middle ware

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Question 3

Lightweight, efficient easy to implement

Easily verifiable for correctness

Executable in a safe manner

Easily writeable and parsable

Extensible

Signaling protocol independence

Question 4

- **Extensible Mark Up Language (XML)**

- **Web Service Description Language (WSDL)**

- **Simple Object Access Protocol (SOAP)**

- **Universal Description Discovery and Integration (UDDI)**
- **Putting it together**

Question 4

TINAC Broker

Broker
(Human + agent)

TINA-C
Consumer/
End-user

TINA_C
Retailer

Requestor
(Human + agent)

Provider
(Human + agent)
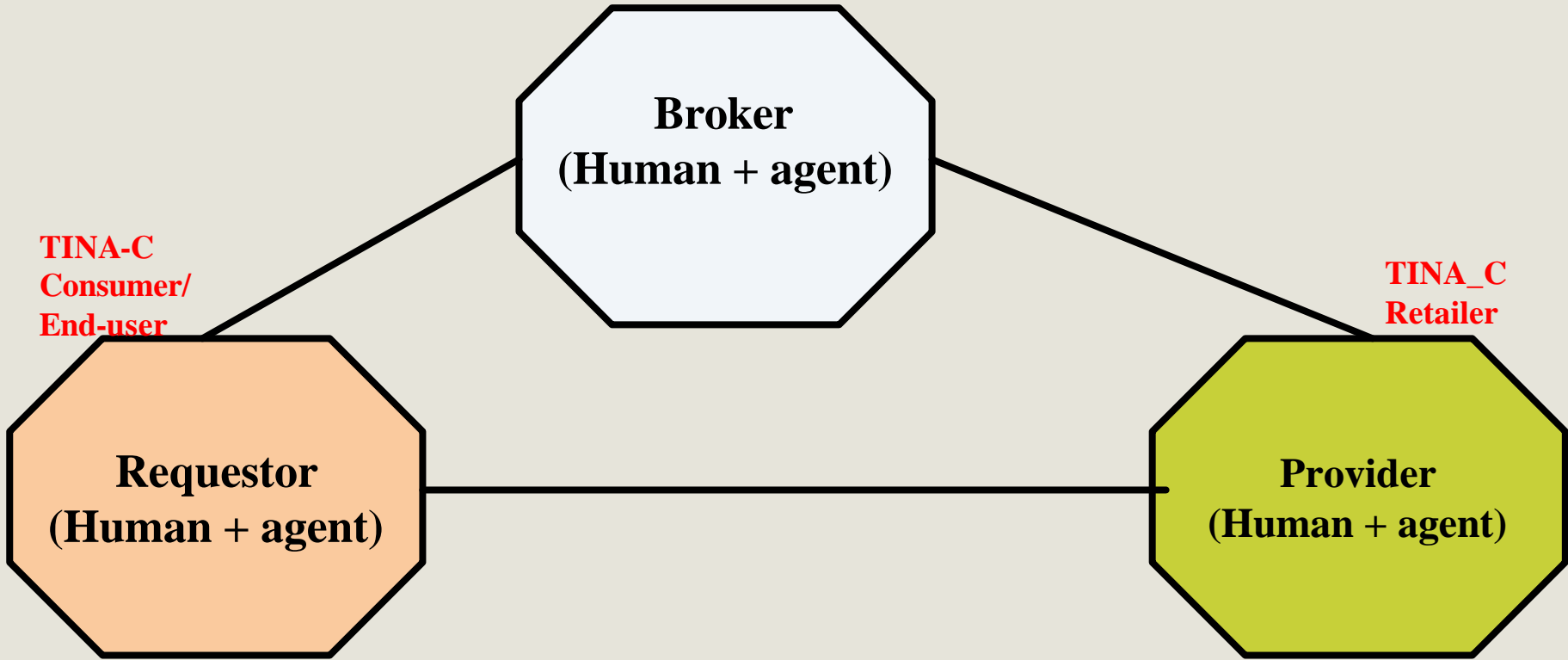
Question 4

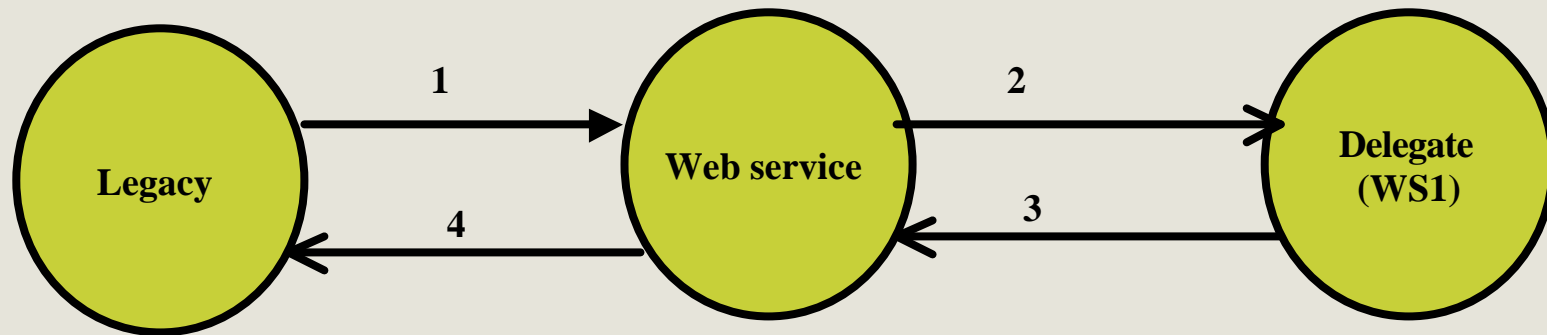## The adapter pattern
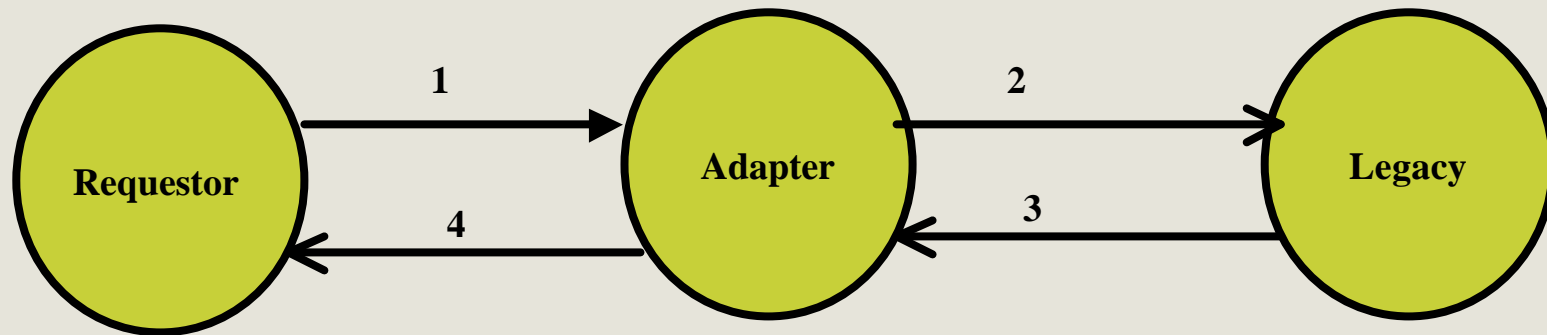
Question 4

The gateway pattern
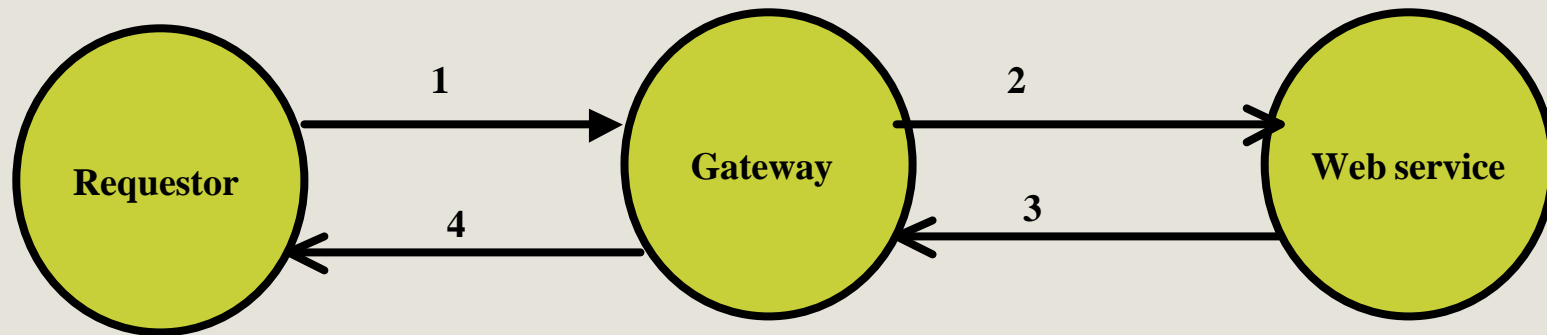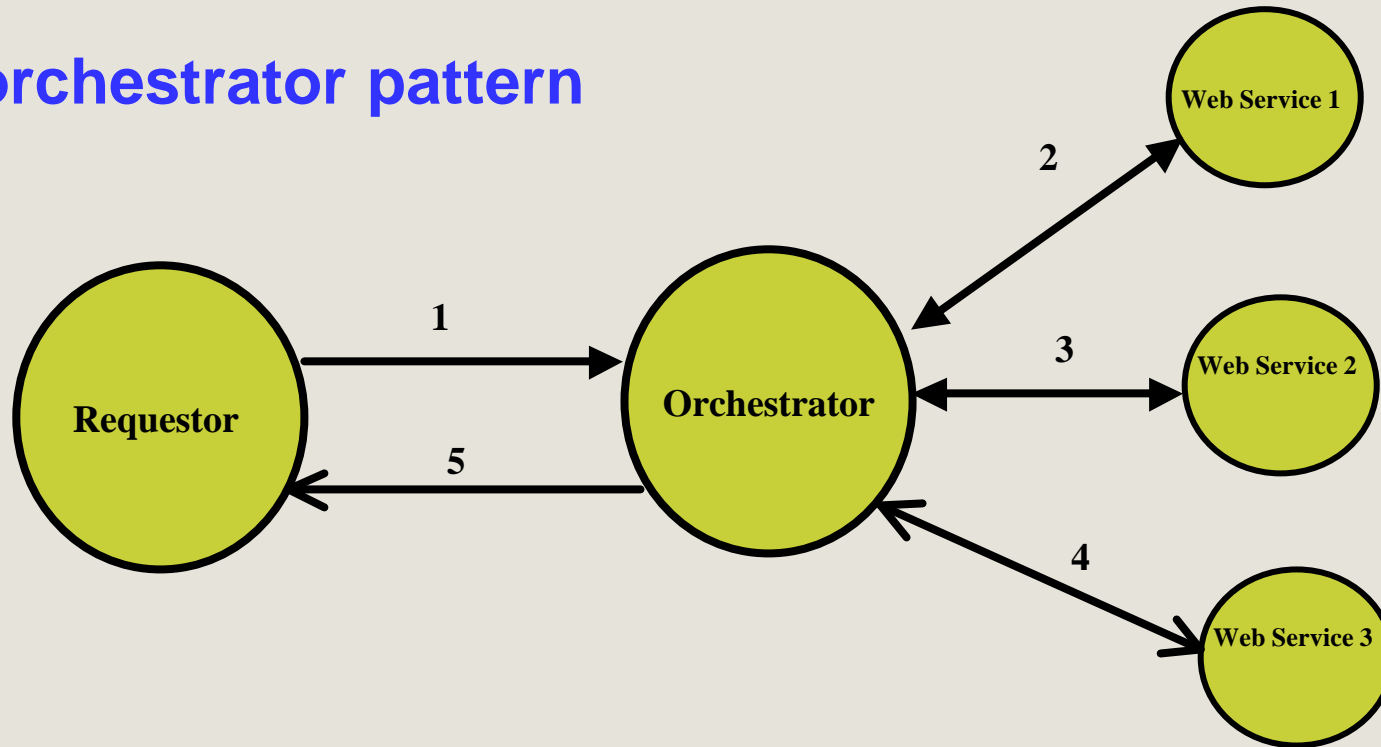
Question 4

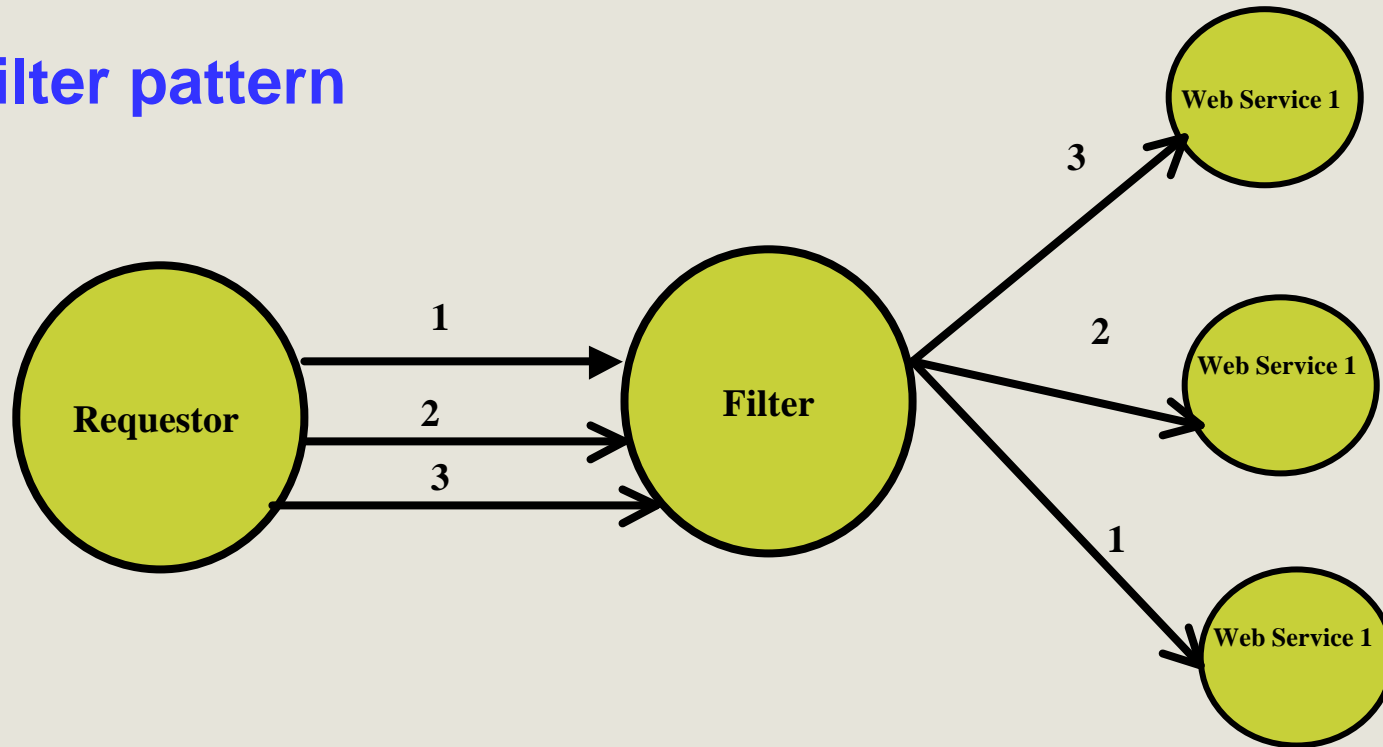## The proxy pattern
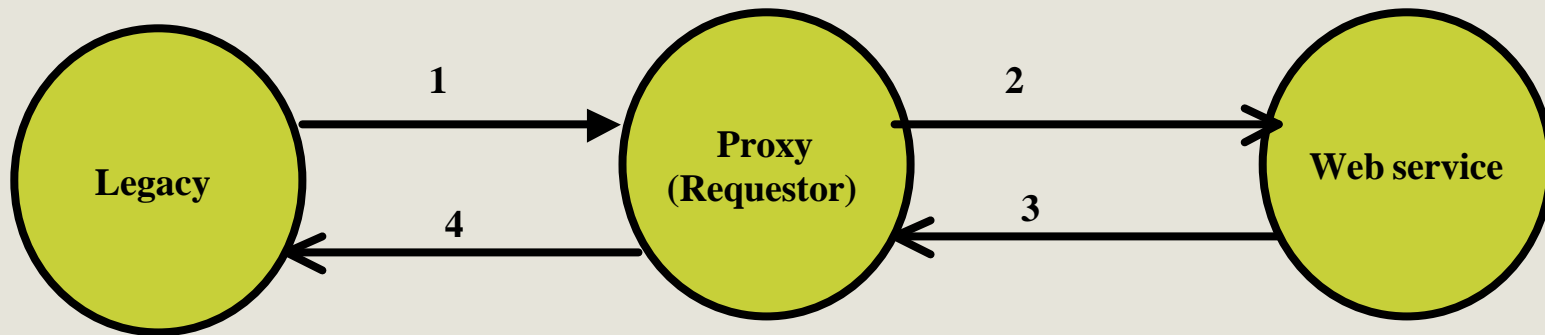
Question 4

The delegate pattern

Question 4

The orchestrator pattern
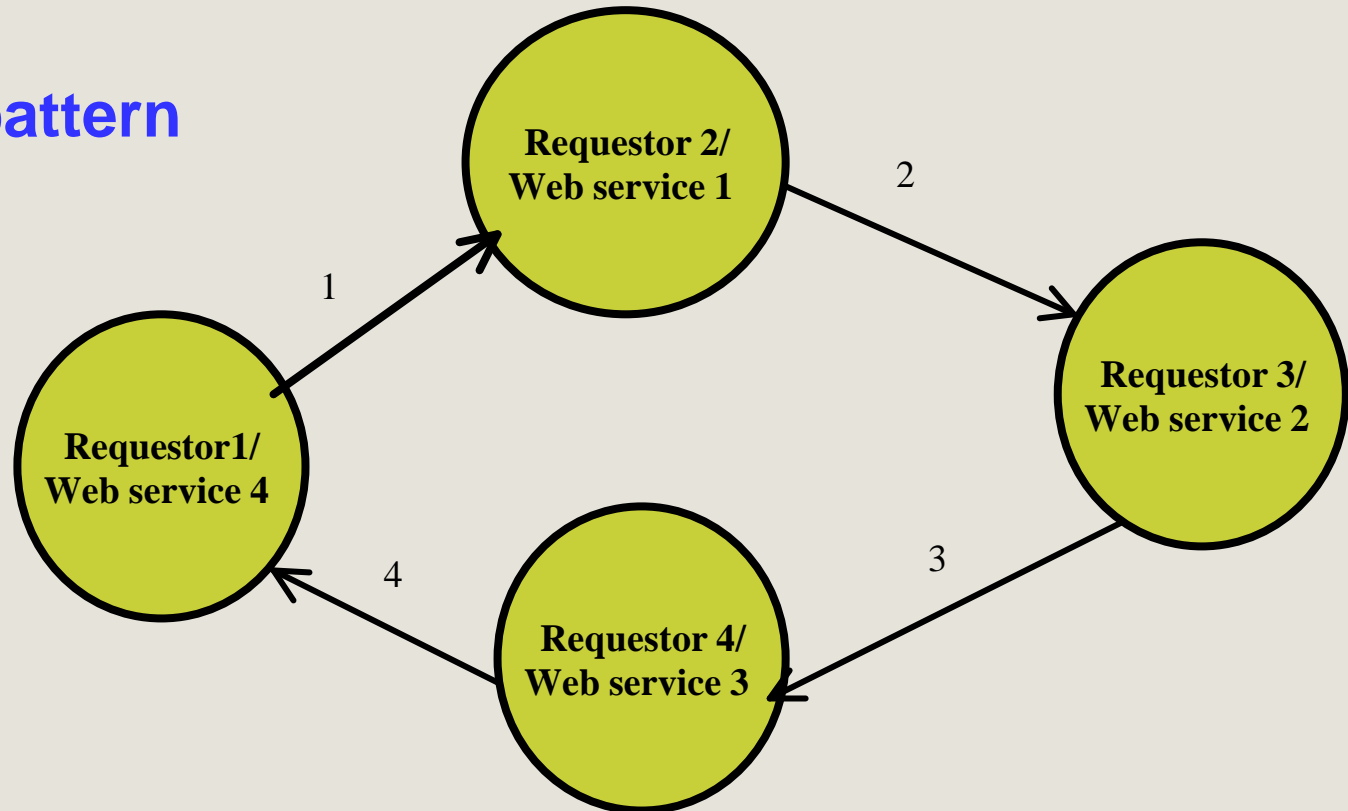
Question 4

The filter pattern

Question 4

The workflow pattern

Question 4 …

Service locators

- Interact (on behalf of service requestor with UDDI and/or catalogues to find service(s) meeting specific criteria
- May be deployed by providers to direct to her/his services
- May be deployed by an independent party
- Accessible via a standardized API

- Catalogues
  - Standardized way for service providers to provide more details about their services (e.g. closing hours of an outlet)
  - Kept in service provider domain
  - Accessible via a standardized API by:
    - Service requestors
    - Service locators