



CS544 EA
Integration
Messaging

Messaging

- Remote invocation is synchronous
 - The caller waits for a response
 - Similar to a phone call
- **Messaging is asynchronous**
 - Just send a message, no waiting for a reply
 - Similar to an email, message is stored in “middleware”
 - Can be picked up at any point

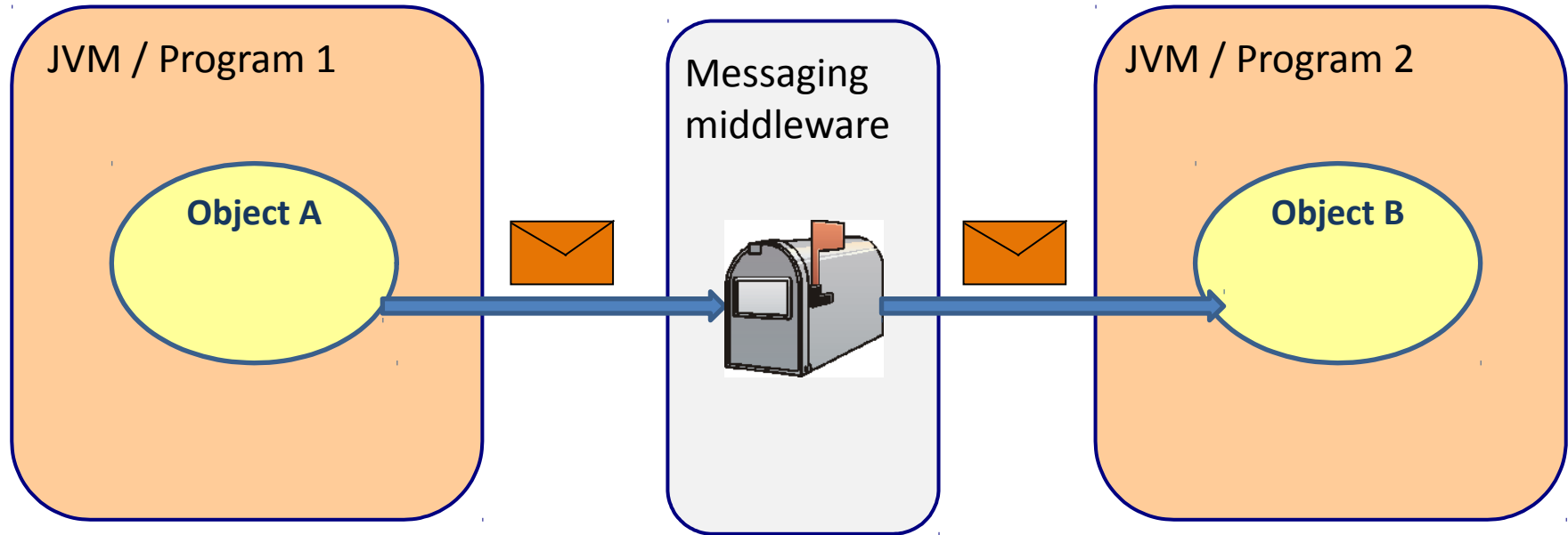
Middleware

- There are many **messaging protocols** and types of messaging middleware
 - Java Messaging Service (JMS)
 - Advanced Message Queuing Protocol (**AMQP**)
 - Others: MQTT, DDS, XMPP, OpenMAMA, ...
- But the essence is the same, sending messages

We'll work with AMQP
in the following examples

Visually

- 3 programs, on different host machines

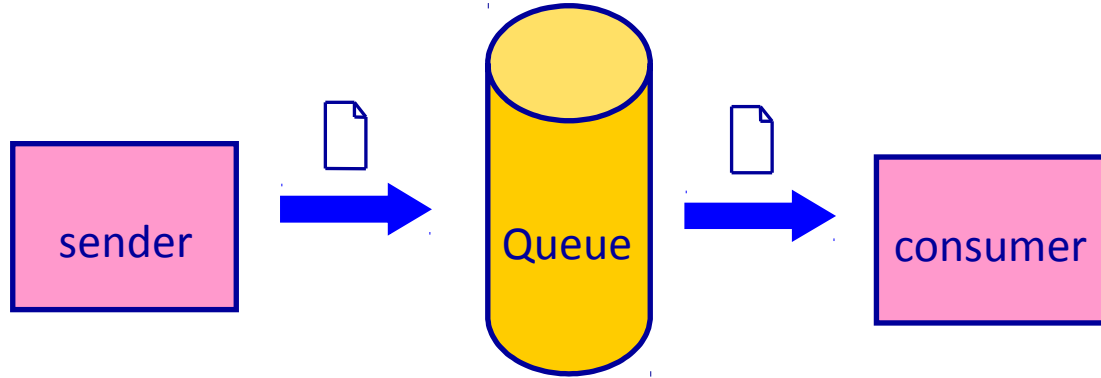


Model by Prof. Rene de Jong

PTP or Pub/Sub

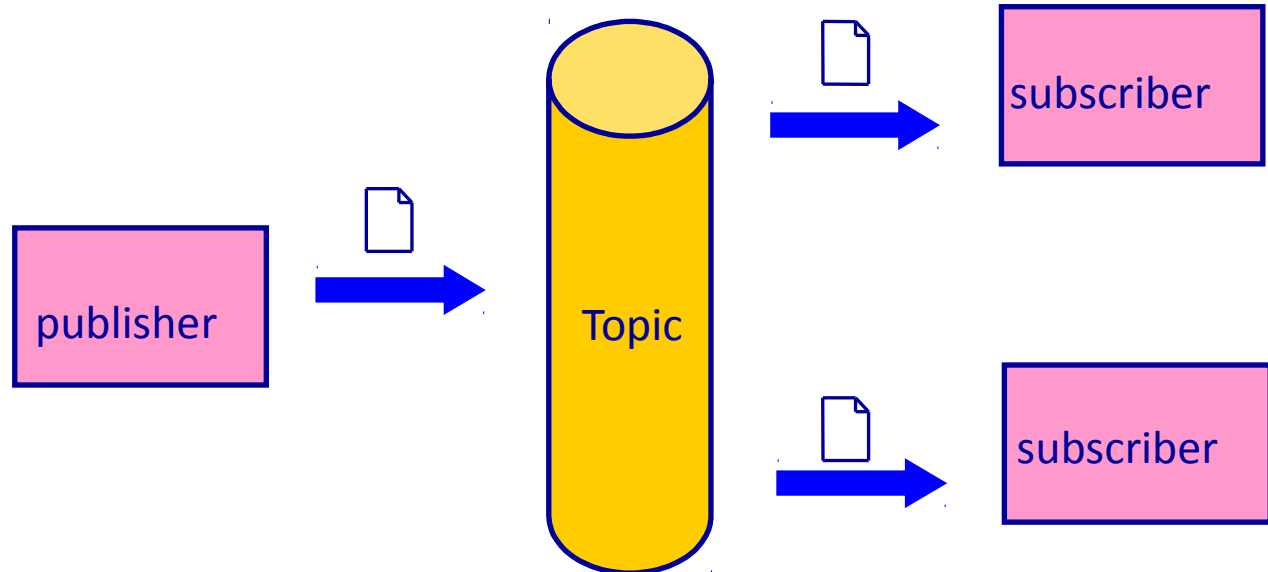
- Messages can be sent:
 - **Point to point** (like an email to one person)
 - In JMS such a 'mailbox' is called a **queue**
 - **Publish / Subscribe** (like a mailing list)
 - In JMS such a 'mailbox' is called a **topic**

Point-To-Point



Visually

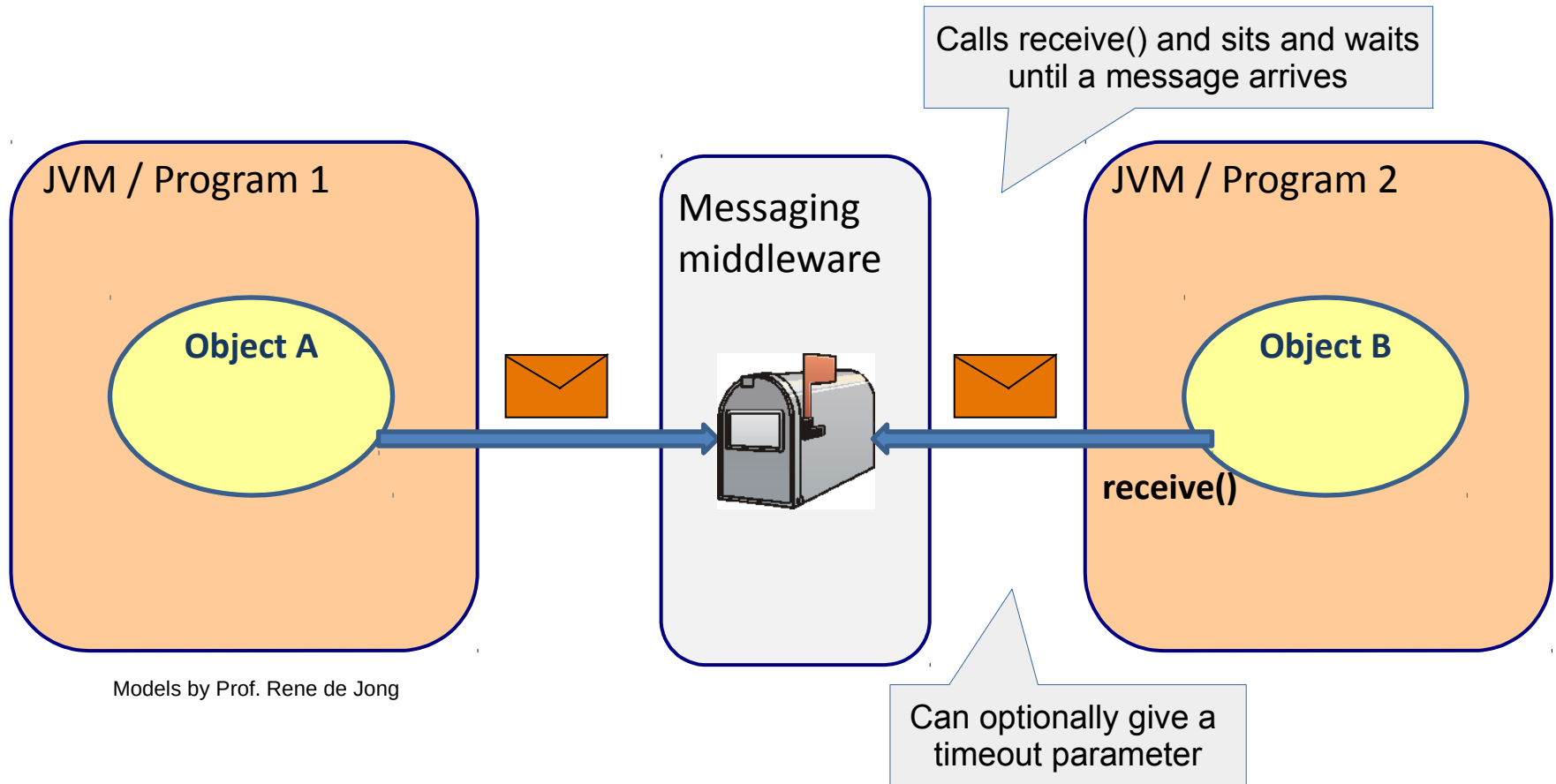
Publish / Subscribe



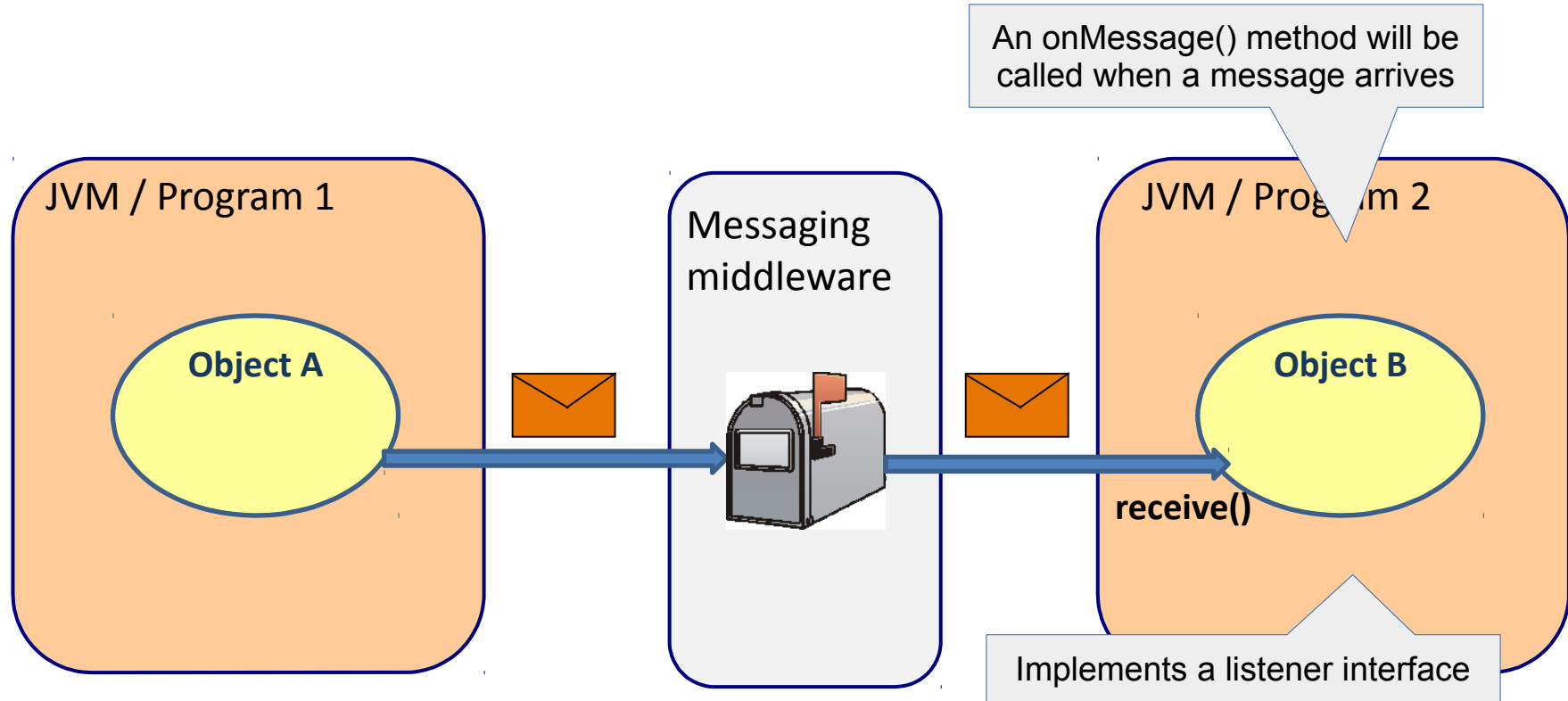
Receiving

- While sending is always asynchronous
- There are **2 types of receivers**:
 - Asynchronous receivers
 - Synchronous receivers

Synchronous Receiver



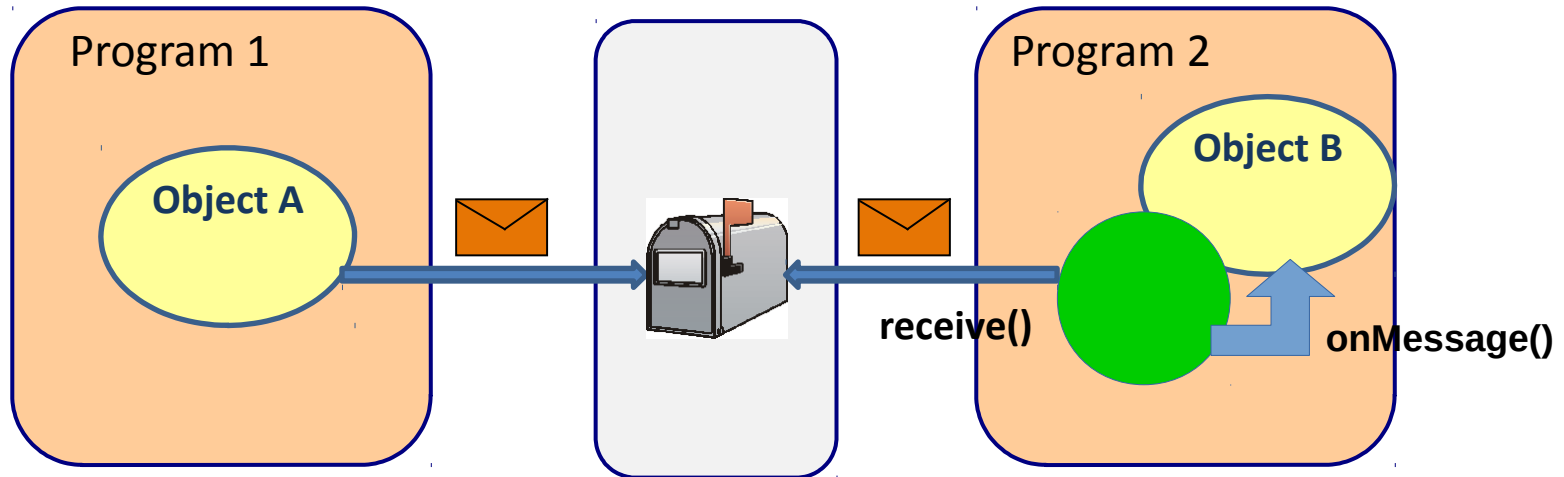
Asynchronous Receiver



Models by Prof. Rene de Jong

Spring JMS Template

- JMS does not have delivery (some others do)
 - To fix this Spring synchronously calls receive
 - Then calls onMessage() when a message arrives



Key Messaging Concepts

- Messaging protocols are asynchronous
- Require a middleware server
- Can be sent PTP or Pub/Sub
- Can be picked-up synchronously or asynchronously