



## CCM: The CORBA Component Model

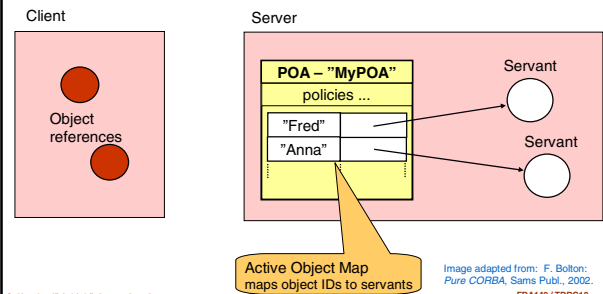
- Portable Object Adapter (POA) revisited
  - CORBA Objects
  - CORBA Component Model
- Szyperski: Component Software 2e, Chapter 13.3*

Christoph Kessler, IDA,  
Linköpings universitet, 2007.

## Portable Object Adapter (POA) revisited



- CORBA object = Object ID + servant instance + mapping



C. Kessler, IDA, Linköpings universitet.

Image adapted from: F. Bolton:  
Pure CORBA, Sams Publ., 2002.  
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## Configuring a POA



| POA policy type          | Allowed values                                                           | RootPOA policy                      | Child POA default pol.              |
|--------------------------|--------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| ThreadPolicy             | ORB_CTRL_MODEL (multithr.)<br>SINGLE_THREAD_MODEL                        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| LifeSpanPolicy           | TRANSIENT<br>PERSISTENT                                                  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| IdAssignmentPol.         | SYSTEM_ID<br>USER_ID                                                     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| IDUniquenessPol.         | UNIQUE_ID<br>MULTIPLE_ID                                                 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| RequestProcessingPolicy  | USE_ACTIVE_OBJECT_MAP_ONLY<br>USE_DEFAULT_SERVANT<br>USE_SERVANT_MANAGER | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| ServantRetentionPolicy   | RETAIN<br>NON_RETAIN                                                     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| ImplicitActivationPolicy | NO_IMPLICIT_ACTIVATION<br>IMPLICIT_ACTIVATION                            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

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## Configuring a POA, continued



- Remark: Not all theoretically possible combinations make sense / are permitted.
- RootPOA: The default POA when the server comes up
- Customized child POA's can be created with different policies

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4

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## Life span of CORBA Objects



Controlled by POA life span policy

- **Transient objects**
  - Lifetime bounded by
    - ▶ lifetime of server process that created it
    - ▶ and of its POA
  - Usually, short-lived
- **Persistent objects**
  - Lifetime unbounded
  - Its creating server can be stopped and restarted multiple times
  - Dormant when its POA is destroyed; reactivated when its server is restarted and POA is reinstantiated
  - State stored in a database

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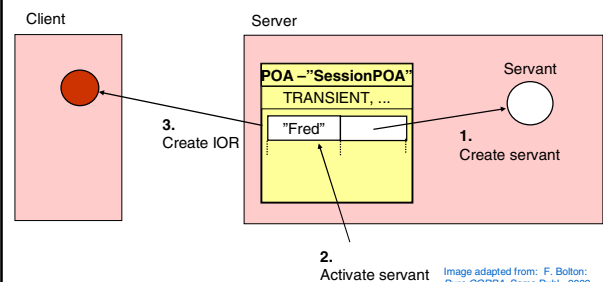
5

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## Types of CORBA Objects (1)



- **Session objects**
  - usually short-lived, non-persistent



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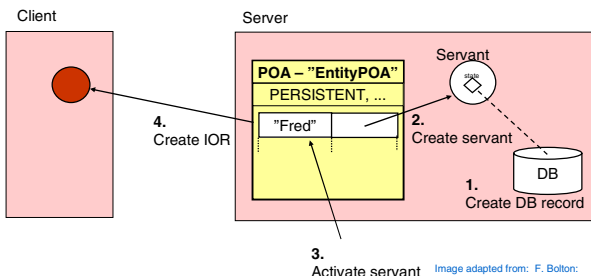
6

Image adapted from: F. Bolton:  
Pure CORBA, Sams Publ., 2002.  
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## Types of CORBA Objects (2)

### ■ Entity objects

- usually long-lived, persistent



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7

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## Types of CORBA Objects (3)

### ■ Factory Object

- Create, find and destroy other objects
- Perform steps 1, 2, 3 (, 4) as above for session / entity objects
- Can itself be a session or entity object

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8

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## CORBA Component Model (CCM)

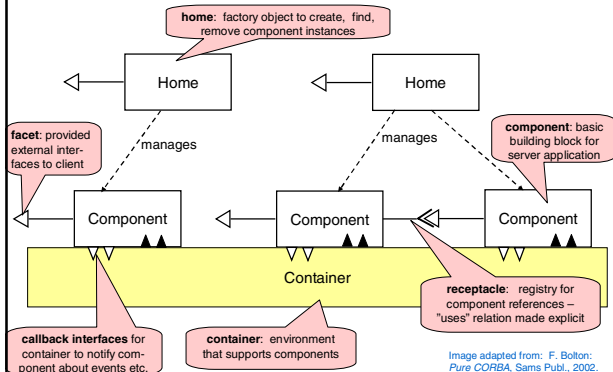
- Abstraction of CORBA object with its environment
- Container
  - Abstraction of POA functionality
    - Life cycle management
  - Provision of CORBA Services for enterprise applications
    - security, transaction, event service
    - Simplified interfaces covering most commonly used features
- Support for ready-made components
  - Configuration and assembly
- Separate component logic and CORBA functionality
  - e.g., hide house-keeping code (POA object creation, life cycle management for CORBA objects etc.)
- EJB look-and-feel
  - Basic components: Fully EJB compatible

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9

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## CORBA Component Model Architecture



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10

Image adapted from: F. Bolton: Pure CORBA, Sams Publ., 2002.

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## CORBA Component Model

- Basic components: Fully EJB compatible and interoperable
- Extended components: beyond EJB, e.g. ports
- Ports: Special sorts of interfaces, grouped together
  - Facets
  - Receptacles
  - Event sources
  - Event sinks
- Configuration interfaces with setters and getters
- Extended IDL (Component IDL, CIDL)
  - New elements: component, interface, home, finder, factory ...

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11

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## CORBA Component Categories

- Session components** (cf. EJB stateful session beans)
  - transient state, transient identity
- Service components** (cf. EJB stateless session beans)
  - no state, no identity
- Entity components** (cf. EJB entity beans)
  - persistent state
  - persistent identity, automatically visible to clients
- Process components**
  - persistent state
  - persistent identity, not automatically visible to clients

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12

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