The Five Types of Enterprise JavaBeans

Session EJBs
- Extension of a J2EE client, not shared
- When client terminates, association with Session EJB is lost
- Two types:
  - Stateful -- conversational state maintained across method calls
  - Stateless -- no conversational state maintained

EJB Types
Entity EJBs

- Represents a business object (customer, order, products, etc.)
- Has persistent state
- Shared by J2EE clients
- Has a unique identifier called a primary key
  - Finder methods and query language used to locate entity EJB instances
- Can have relationships to other entity EJBs
- Two kinds of persistence strategies
  - Container managed
  - Bean managed

Message Driven EJBs

- Processes asynchronous messages from JMS
- Messages can originate from any J2EE client, EJB, or web component, or any JMS application
- Clients do not directly access Message Driven EJBs
The EJB Contracts

- **Client/Server Contract**: Defines factory, finder, business methods for a client to interact with an EJB.
- **Component Contract**: Defines call-back methods for the EJB container to manage EJB instances.
- **Deployment Descriptor Contract**: Defines XML deployment descriptor information.
- **Interoperability Contract**: Defines interoperability protocols between containers.

J2EE/EJB Contracts

✓ **Client/Server Contract**
  - Defines factory, finder, business methods for a client to interact with an EJB.

✓ **Component Contract**
  - Defines call-back methods for the EJB container to manage EJB instances.

✓ **Deployment Descriptor Contract**
  - Defines XML deployment descriptor information.

✓ **Interoperability Contract**
  - Defines interoperability protocols between containers.

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Two Java Interfaces define methods for remote client access

- **Home Interface**
  - Provides factory and finder methods

- **Remote Interface**
  - Defines business methods

Client/Server Contract:
EJB Home/Remote Interfaces
Client/Server Contract:
Defining Local EJB Client Access via Interfaces

✓ Two Java Interfaces also define methods for local client access
  - LocalHome Interface
    - Provides factory and finder methods
  - Local Interface
    - Defines business methods

✓ Some requirements for Local Access
  - Client and local EJB must run in the same JVM
  - Can be a web component or another EJB
  - Location is not transparent
  - Often an EJB with a relationship to another EJB

The Container/EJB Contract
The Container/EJB Contract (cont.)

- Session Bean Component Contract
  - Methods for lifecycle, activation/passivation, and business logic
- Entity Bean Component Contract
  - Methods for lifecycle, persistence, and business logic
- MessageDriven Bean Component Contract
  - Methods for lifecycle and message queue processing

EJB Delegation: From Client/Server Contract to Component Contract
EJB Clients

- Overview
- JSP/Servlets
- CORBA Clients
- Applets, Applications, COM+
- EJBs as Clients
Steps for a Client to Access an EJB

- Locate the Home or Local Home Interface via JNDI
- Create or find an EJB instance
- Use reference to EJB instance to invoke business methods defined in the remote or local interface
- Remove EJB instance (if necessary)

The JSP - EJB Connection