DEPLOYMENT DIAGRAMS

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- Deployment diagrams are used to visualize the topology of the physical components of a system.
- The purpose of deployment diagrams can be described as:
  - Visualize hardware topology of a system.
  - Describe the hardware components used to deploy software components.
  - Describe runtime processing nodes.

Definitions

- Deployment diagram is a structure diagram which shows **architecture** of the system as deployment (distribution) of software artifacts to **deployment targets**.

- **Artifacts** represent concrete elements in the physical world that are the result of a development process. Examples of artifacts are executable files, libraries, archives, database schemas, configuration files, etc.

- **Deployment target** is usually represented by a node which is either hardware device or some software execution environment. Nodes could be connected through communication paths to create networked systems of arbitrary complexity.

UML deployment diagram nodes and edges

- Node/deployment target
- Artifact
- Manifests
- Deployment specification
- Deploy

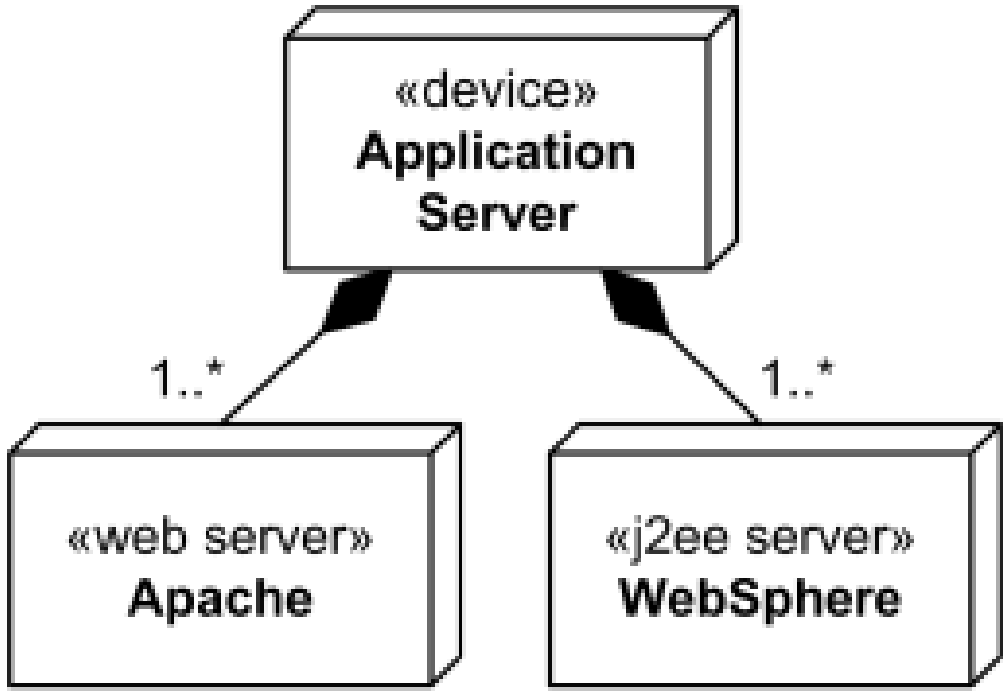
Node

- **Node** is a deployment target which represents computational resource upon which artifacts may be deployed for execution.
- Node is shown as a perspective, 3-dimensional view of a cube.
- **Node** is specialized by:

➢Device

➢Execution environment

Hierarchical Node



Artifact

- An artifact is a classifier that represents some physical entity, a piece of information that is used or is produced by a software development process.
- Some real life examples of UML artifacts are:

1. text document
2. source file
3. script
4. binary executable file
5. archive file
6. database table

Device Node

- A **device** is a node which represents a physical computational resource with processing capability upon which artifacts may be deployed for execution.
- A **device** is rendered as a node (perspective, 3-dimensional view of a cube) annotated with keyword «**device**».
- Examples:

➢Mobile device

➢Application server

«mobile device»
smartphone

«application server»
IBM System x3755 M3

Execution environment node

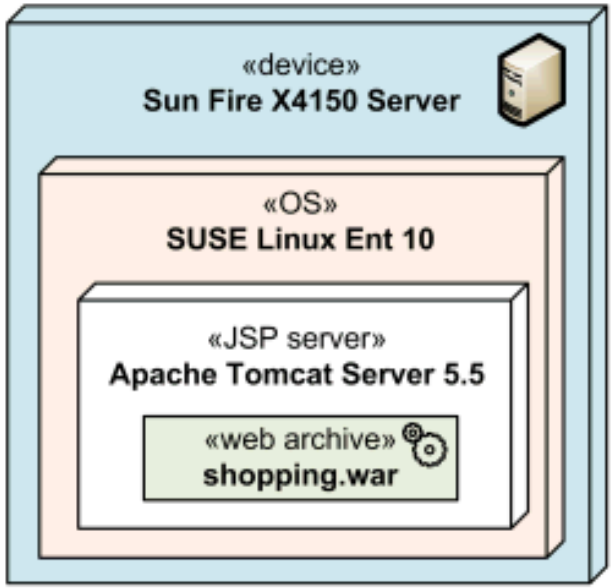
- An **execution environment** is a (software) node.
- Execution environment is notated the same way as a node (perspective, 3-dimensional view of a cube), annotated with the standard UML stereotype «**executionEnvironment**».
- Examples:

➢«OS»

➢Webserver

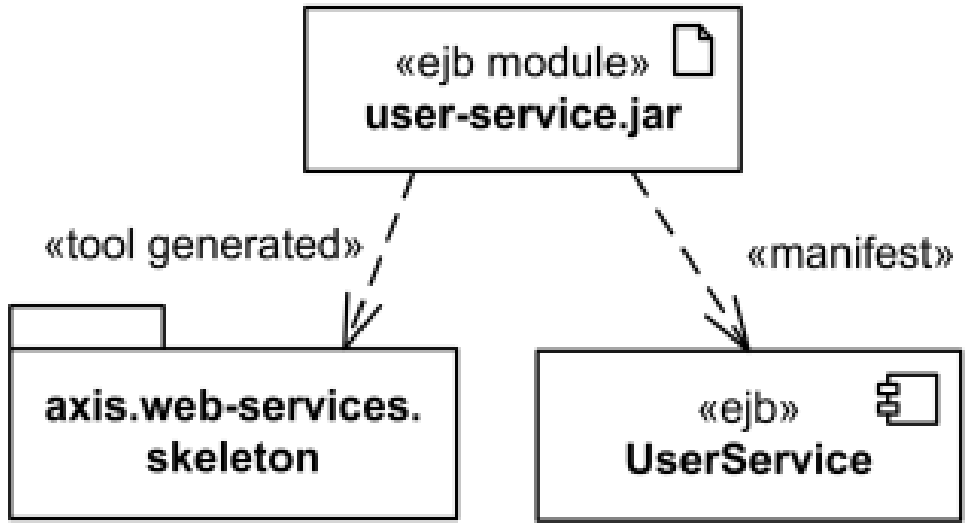
➢Web browser

➢database

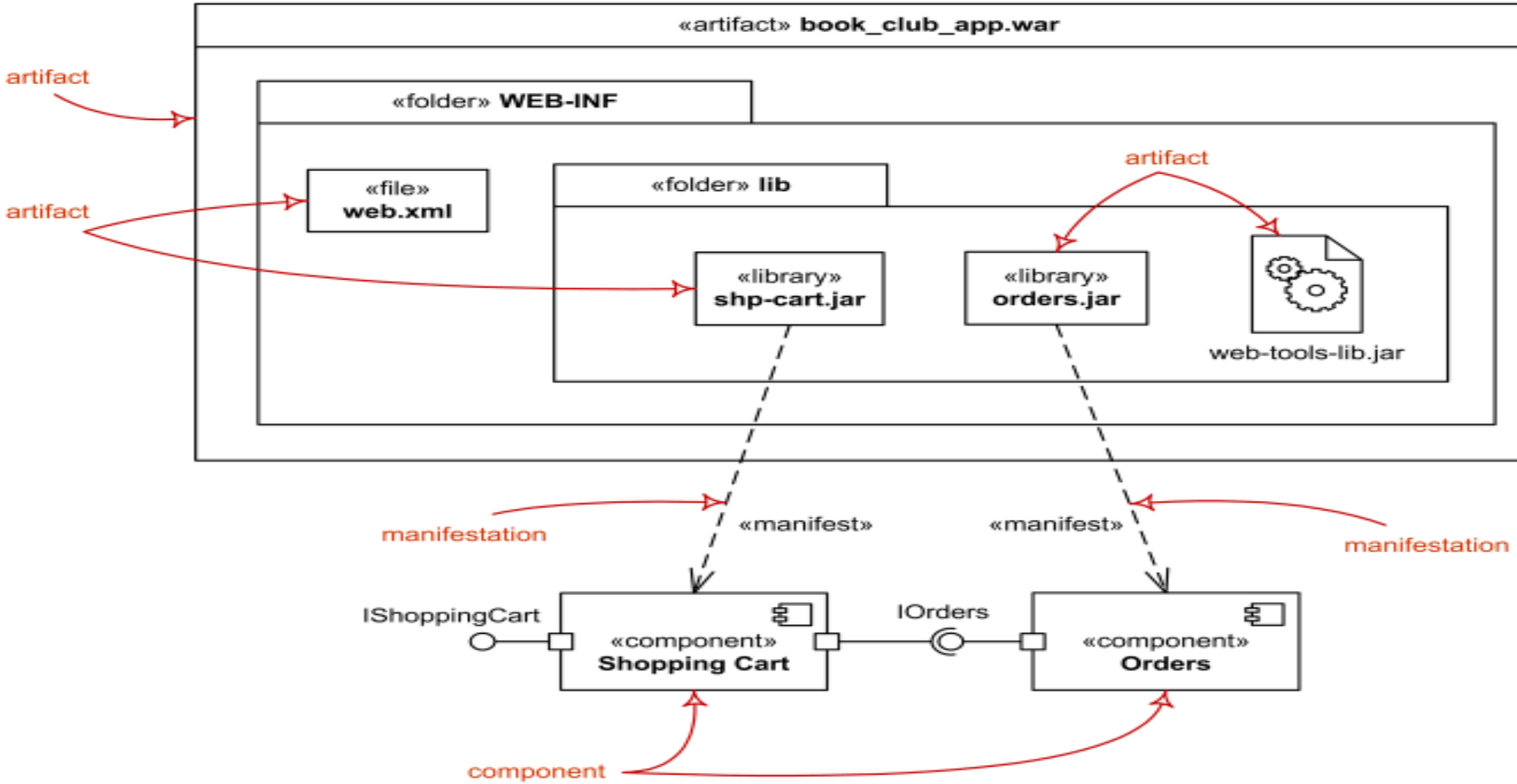


Manifests

- **Manifestation** is an abstraction relationship which represents implementation of one or more model elements by an artifact.
- It is used to implement a component.
-



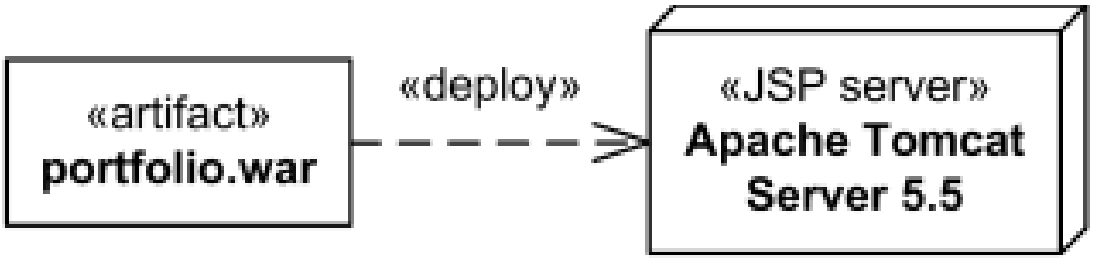
intermediate diagram is **manifestation diagram** to be used to show manifestation



Manifestation of components by artifacts.

Deployment

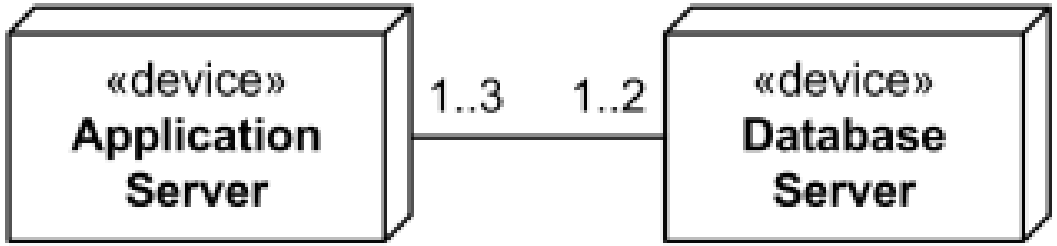
- A deployment is a dependency relationship which describes allocation (deployment) of an artifact to a deployment target.
- and is labeled with «**deploy**»

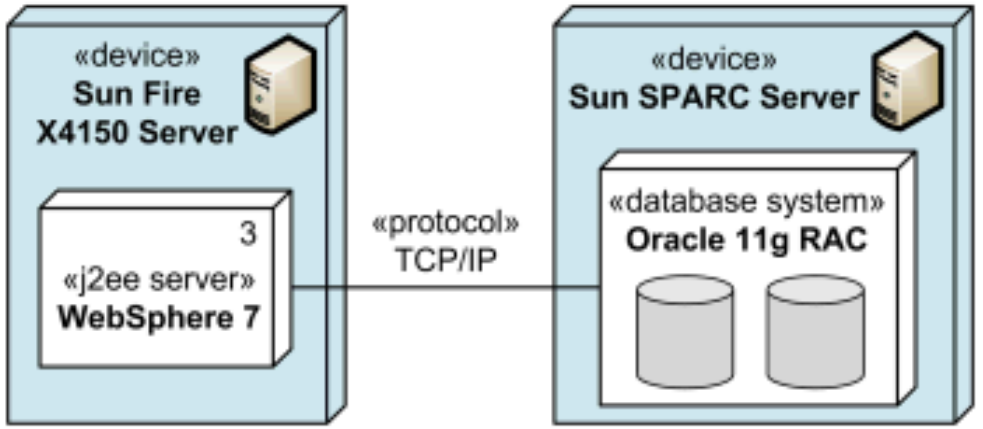


J2EE web application archive portfolio.war deployed on Apache Tomcat JSP server.

Communication Path

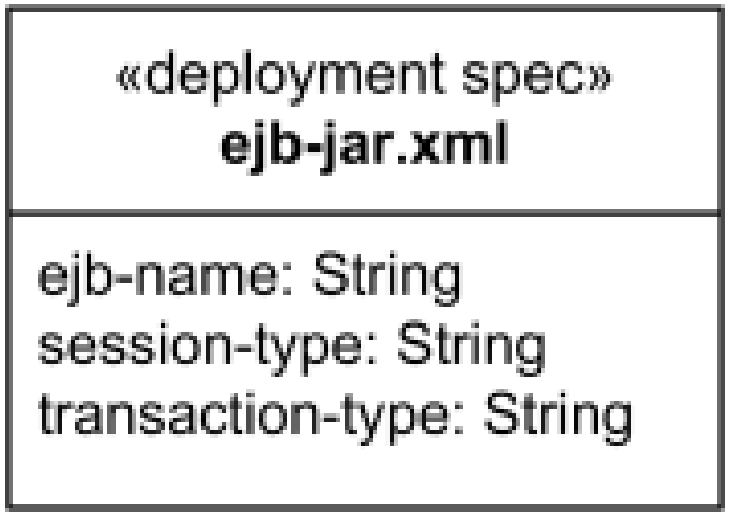
A communication path is association between two deployment targets, through which they are able to exchange signals and messages.

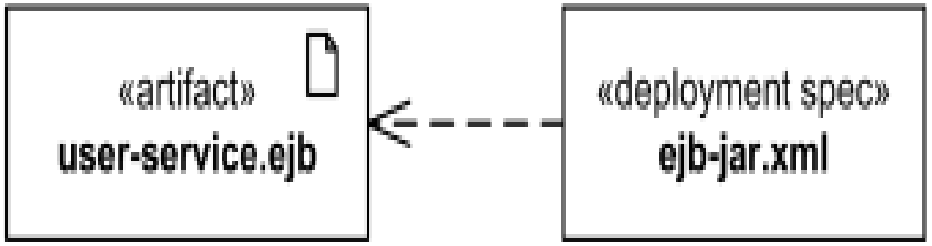


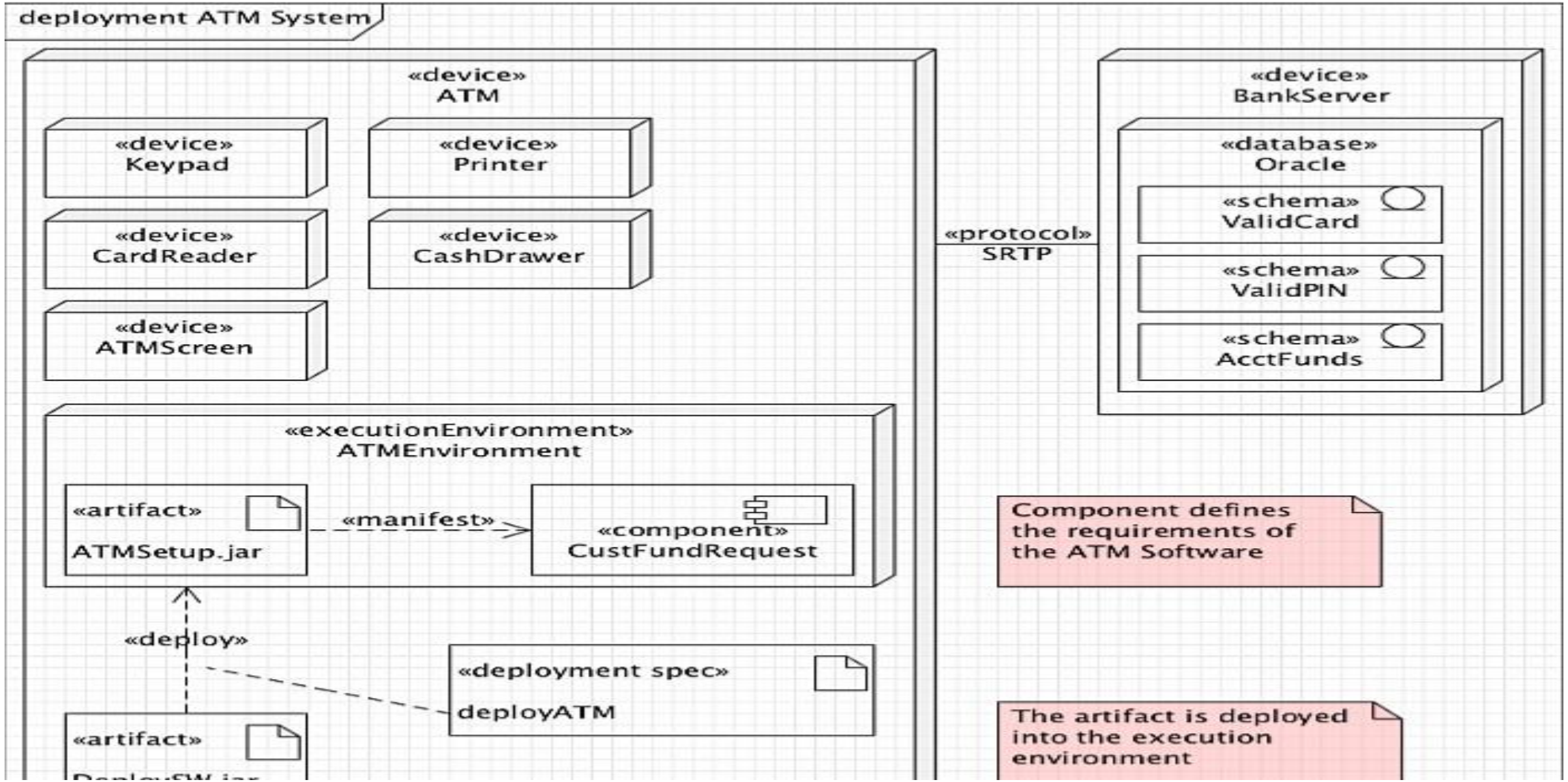


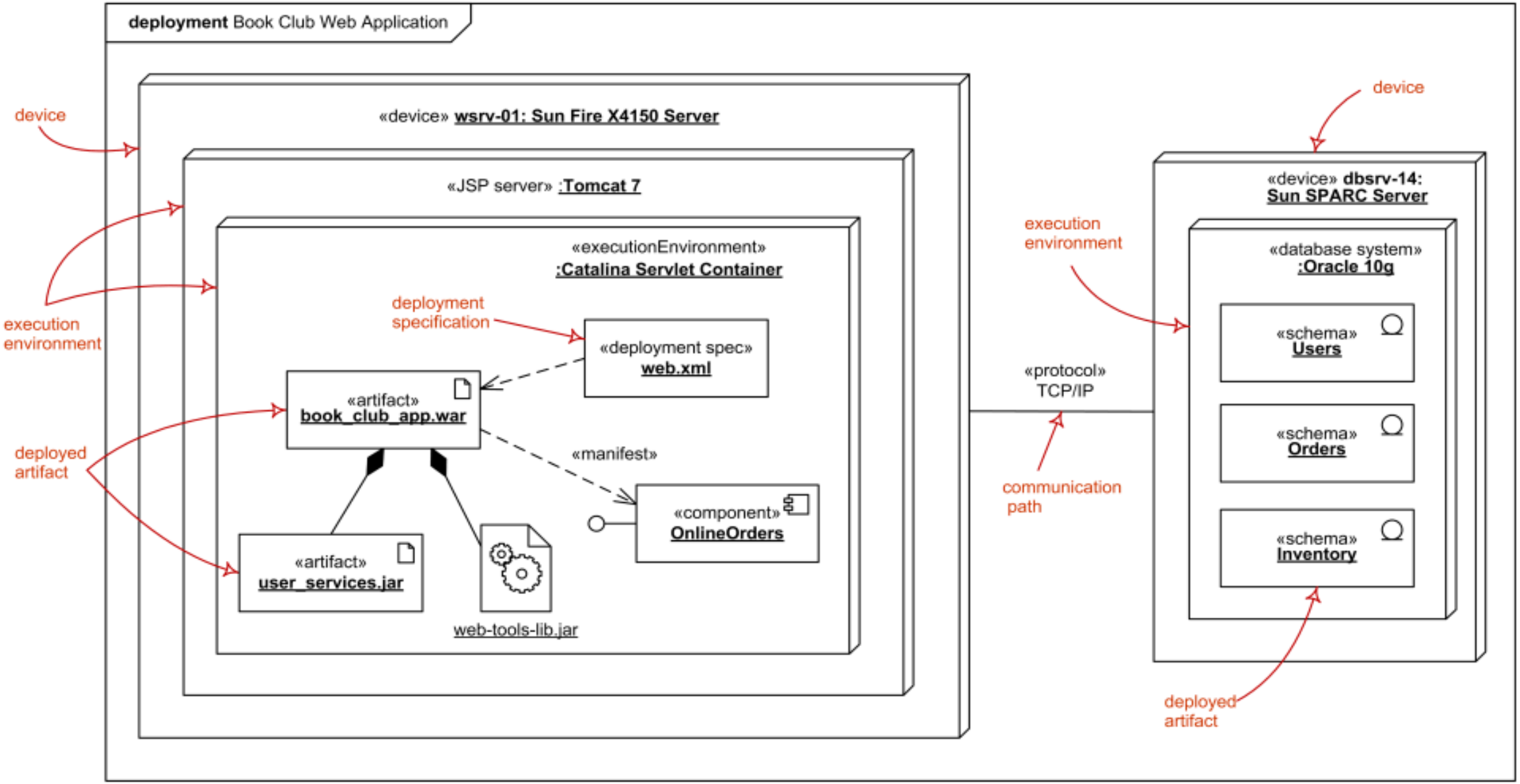
Deployment Specification

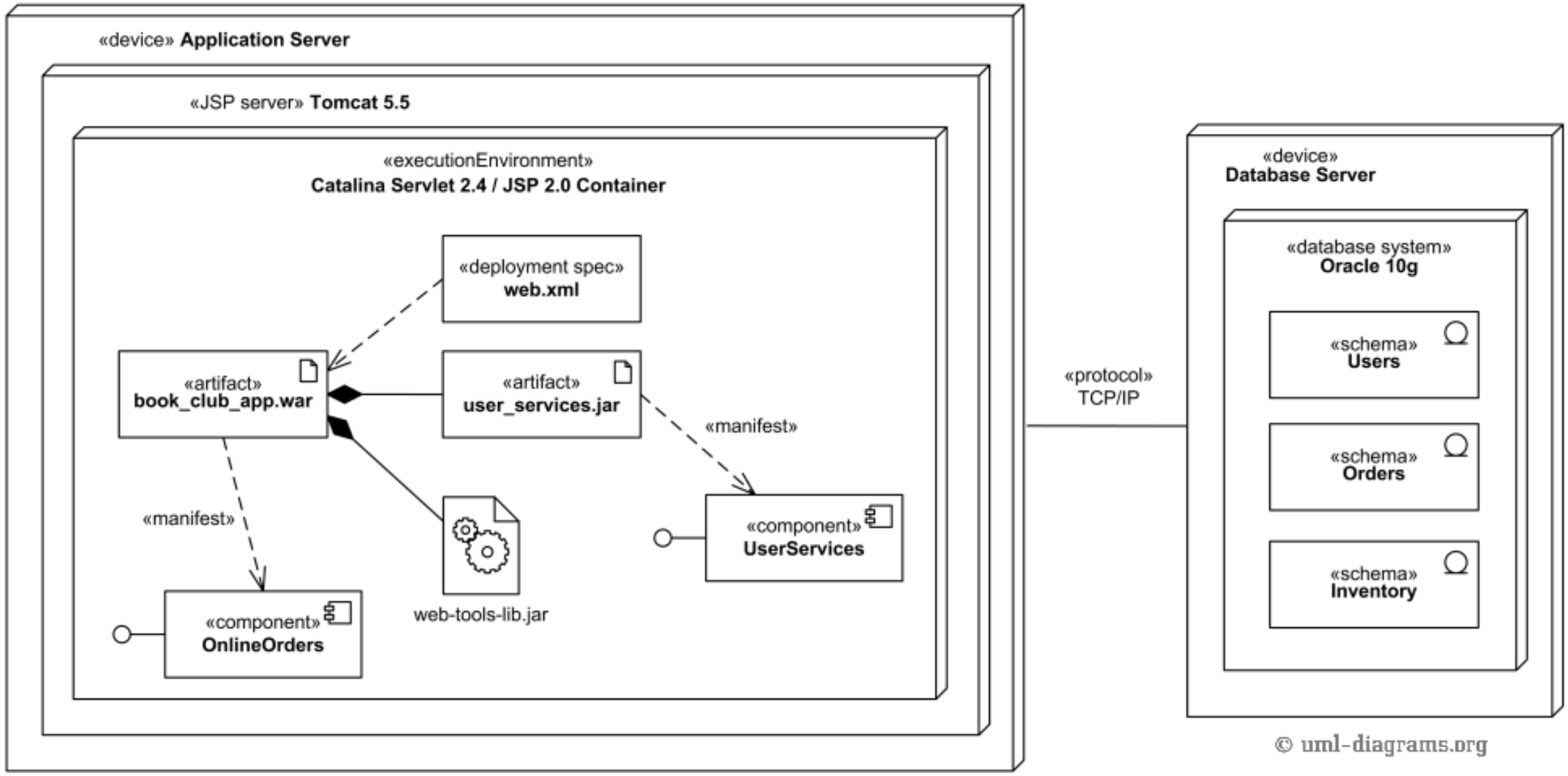
- A deployment specification is an artifact that specifies a set of deployment properties that determine execution parameters of a component artifact that is deployed on a node.
- A deployment specification is a general mechanism to parameterize a **deployment relationship**






deployment ATM System
«device»
ATM
«device»
Keypad
«device»
Printer
«device»
CardReader
«device»
CashDrawer
«device»
ATMScreen
«executionEnvironment»
ATMEnvironment
«artifact»
ATMSetup.jar
«manifest»
«component»
CustFundRequest
«deploy»
«deployment spec»
deployATM
«artifact»
«protocol»
SRTP
«device»
BankServer
«database»
Oracle
«schema»
ValidCard
«schema»
ValidPIN
«schema»
AcctFunds
Component defines
the requirements of
the ATM Software
The artifact is deployed
into the execution
environment


deployment Book Club Web Application
device
«device» wsrv-01: Sun Fire X4150 Server
«JSP server» :Tomcat 7
«executionEnvironment»
:Catalina Servlet Container
execution environment
deployment specification
«deployment spec»
web.xml
«artifact»
book_club_app.war
«manifest»
deployed artifact
«component»
OnlineOrders
«artifact»
user_services.jar
web-tools-lib.jar
«protocol»
TCP/IP
communication path
device
«device» dbsrv-14:
Sun SPARC Server
execution environment
«database system»
:Oracle 10g
«schema»
Users
«schema»
Orders
«schema»
Inventory
deployed artifact


«device» Application Server
«JSP server» Tomcat 5.5
«executionEnvironment»
Catalina Servlet 2.4 / JSP 2.0 Container
«deployment spec»
web.xml
«artifact»
book_club_app.war
«artifact»
user_services.jar
«manifest»
«manifest»
«component»
UserServices
«component»
OnlineOrders
web-tools-lib.jar
«protocol»
TCP/IP
«device»
Database Server
«database system»
Oracle 10g
«schema»
Users
«schema»
Orders
«schema»
Inventory
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Deployment diagram fro library management system