WebSphere Application Server architecture – stand-alone

Unit objectives

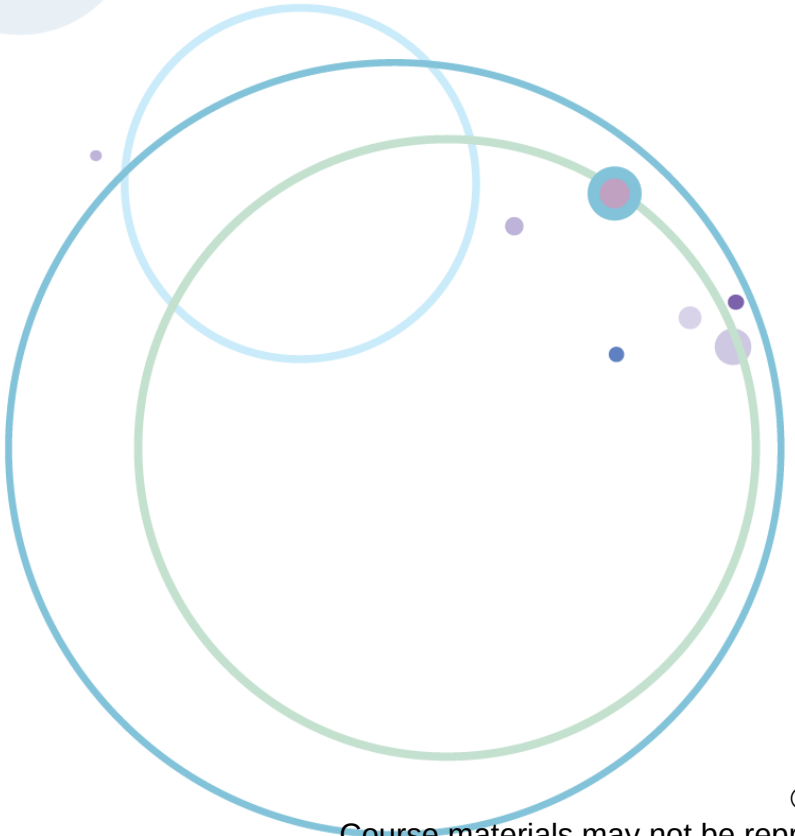
After completing this unit, you should be able to:

- Describe a typical e-business application architecture
- Describe the architectural differences between WebSphere Application Server packages
- Describe what is running in a WebSphere Application Server node
- Describe the architectural implications of the web server plug-in
- Describe the use of Java Database Connectivity (JDBC) providers and data sources

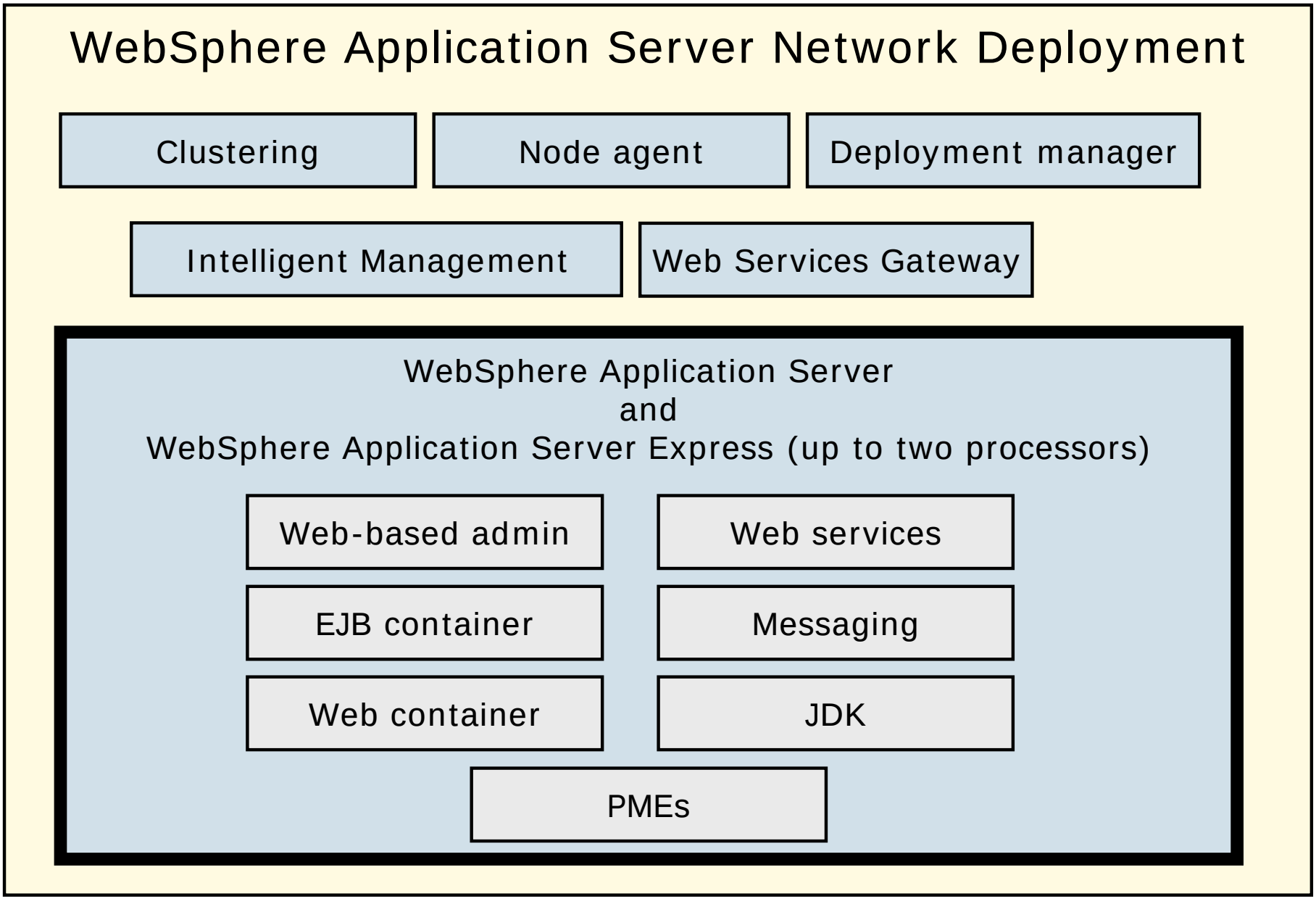
Topics

- Architecture runtime
- Architecture administration
- Profiles

Architecture runtime

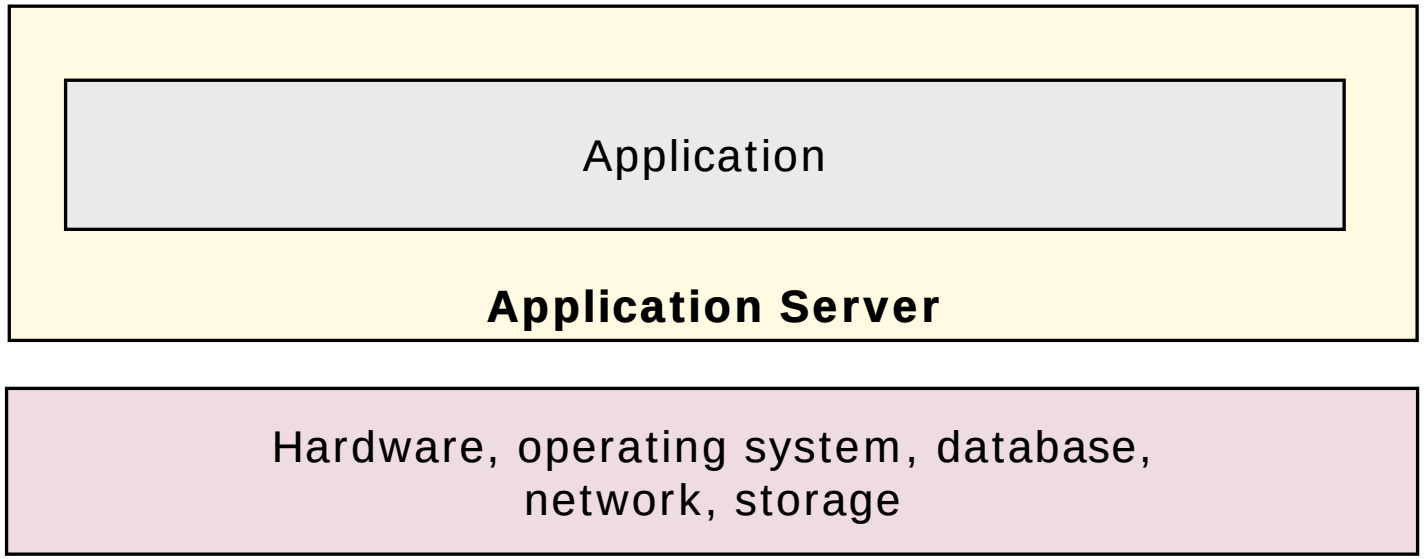


Version 8.5 packaging

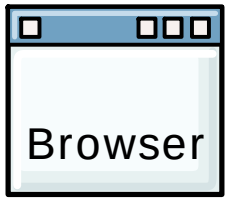


WebSphere Application Server basics

- WebSphere Application Server
  - Is a platform on which Java based business applications run
  - Is an implementation of the Java Platform, Enterprise Edition (Java EE) specification
  - Provides services (database connectivity, threading, workload management) that the business applications can use

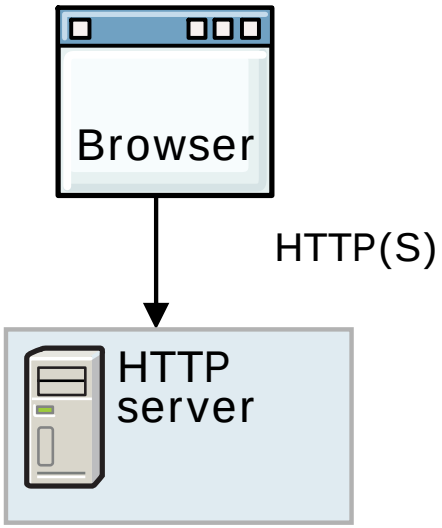


WebSphere architecture runtime (1 of 10)



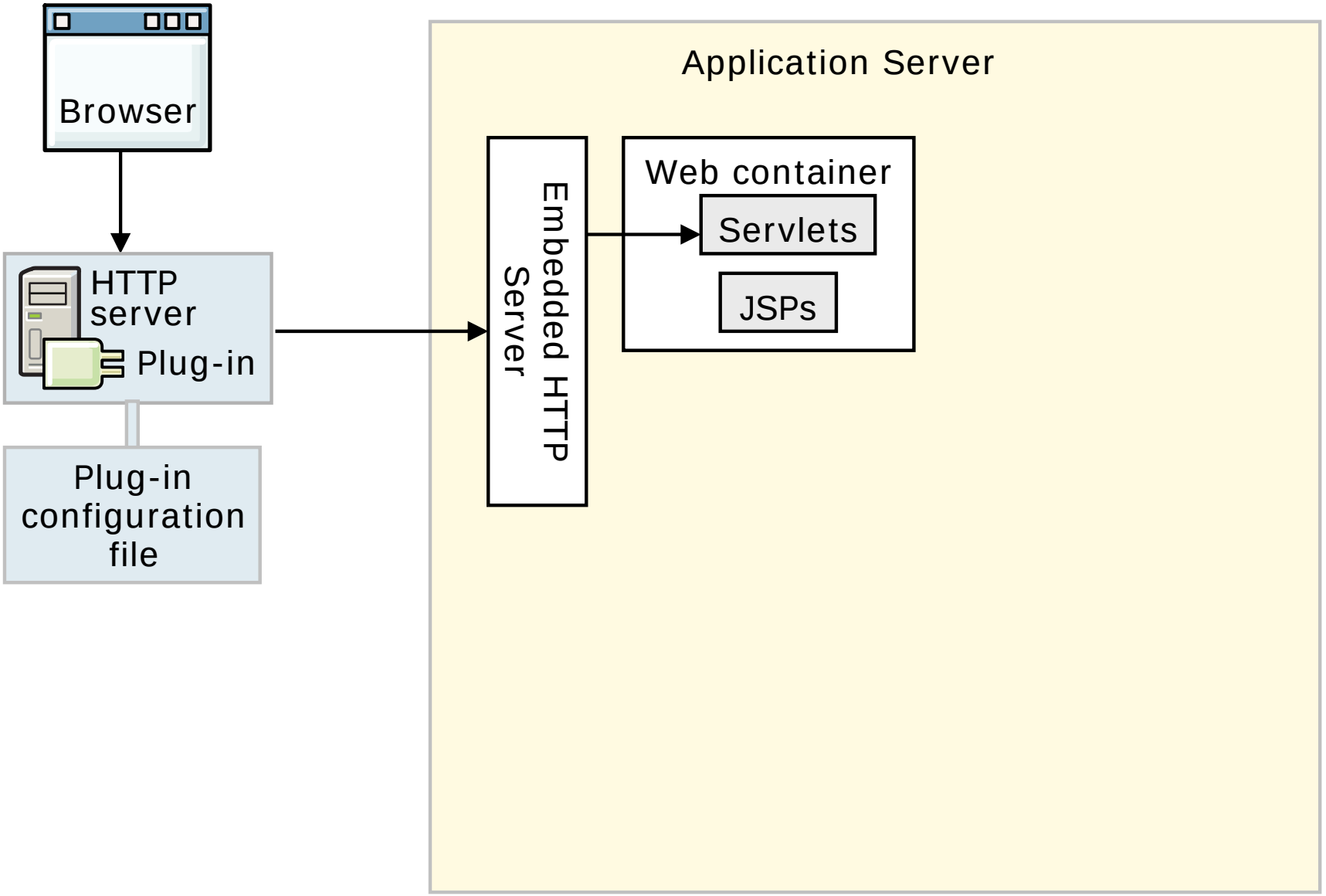
Legend	HTTP/S	RMI/IIOP	SOAP	JDBC

WebSphere architecture runtime (2 of 10)

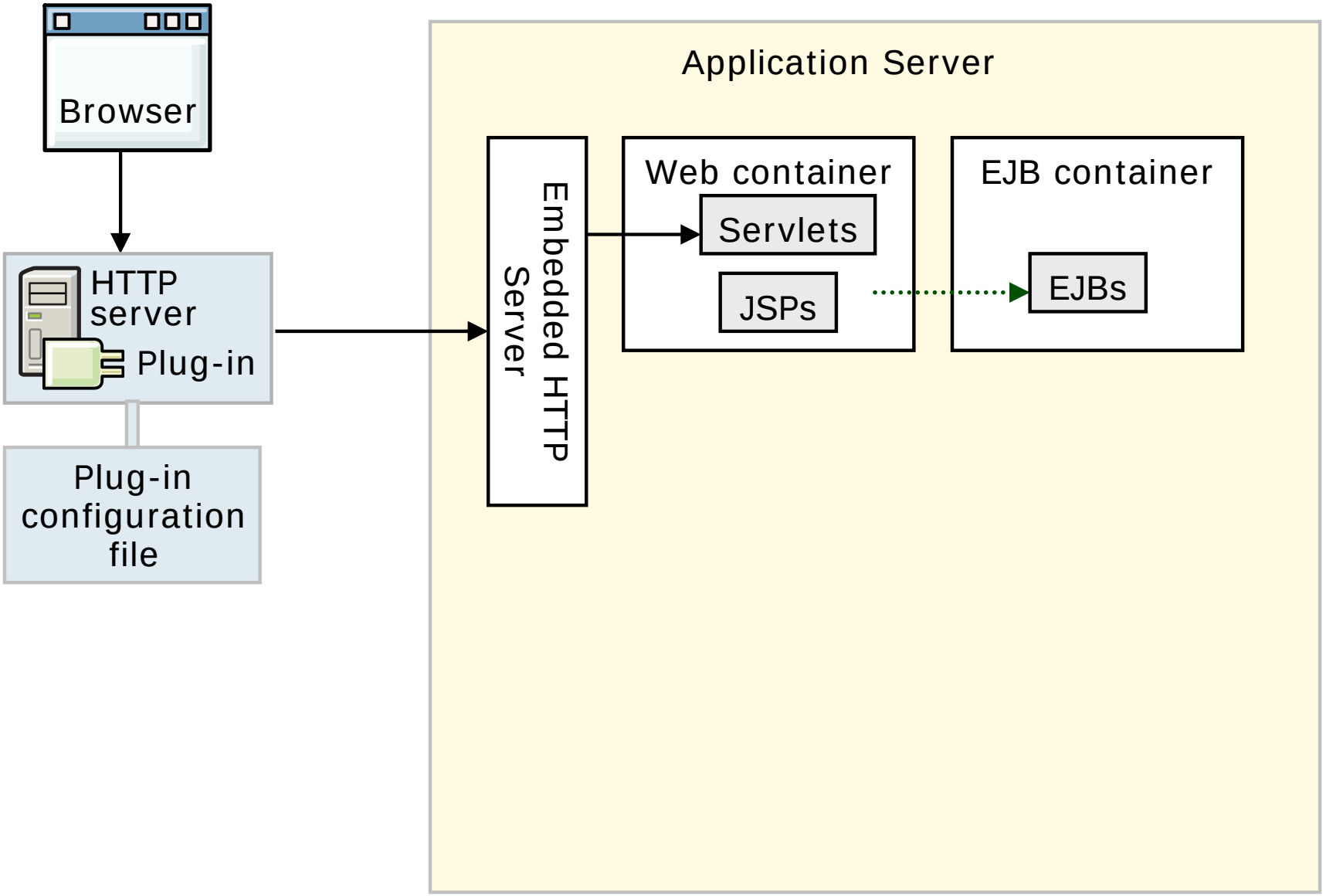


Legend	HTTP/S	RMI/IIOP	SOAP	JDBC

WebSphere architecture runtime (3 of 10)

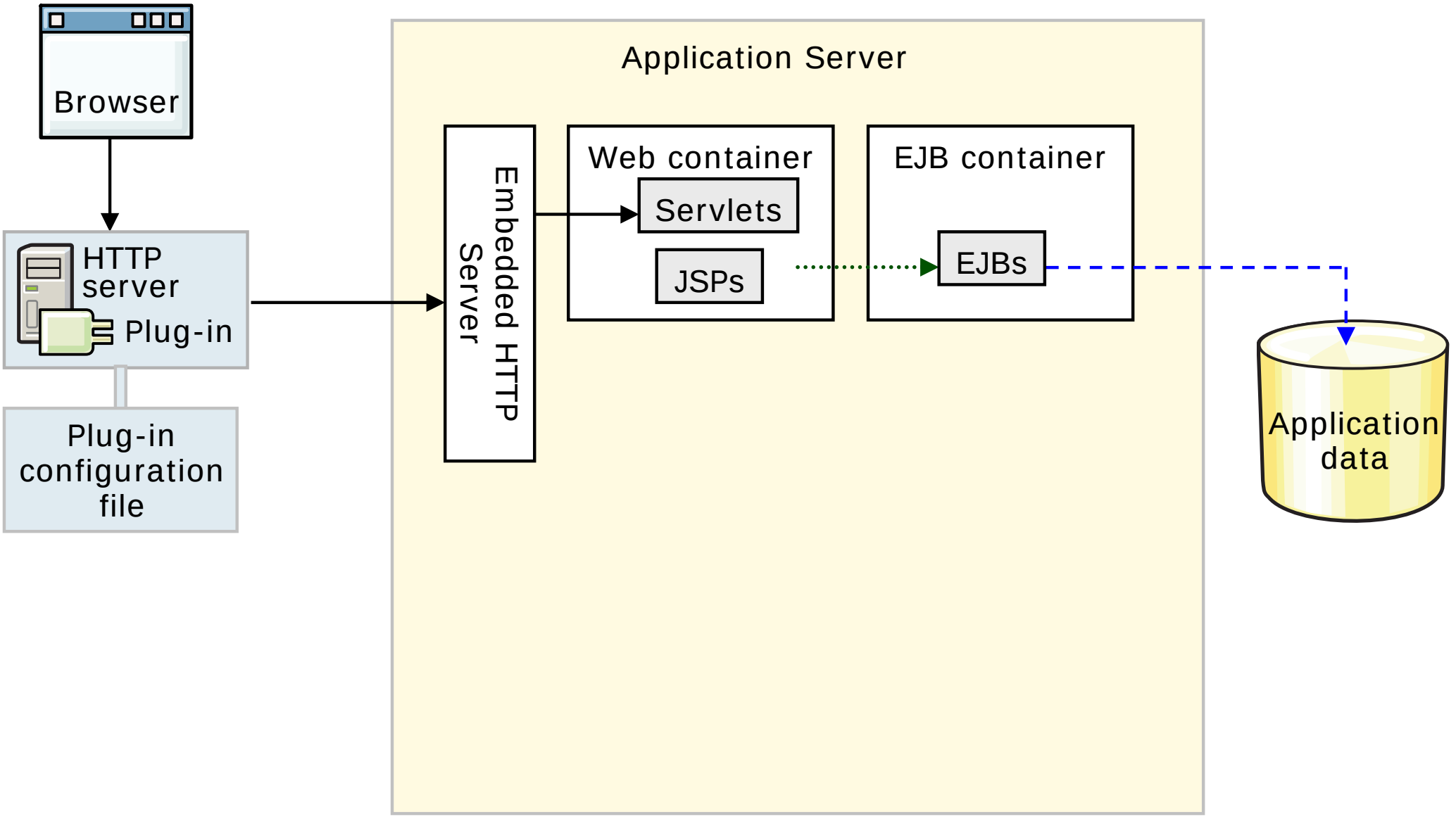


WebSphere architecture runtime (4 of 10)

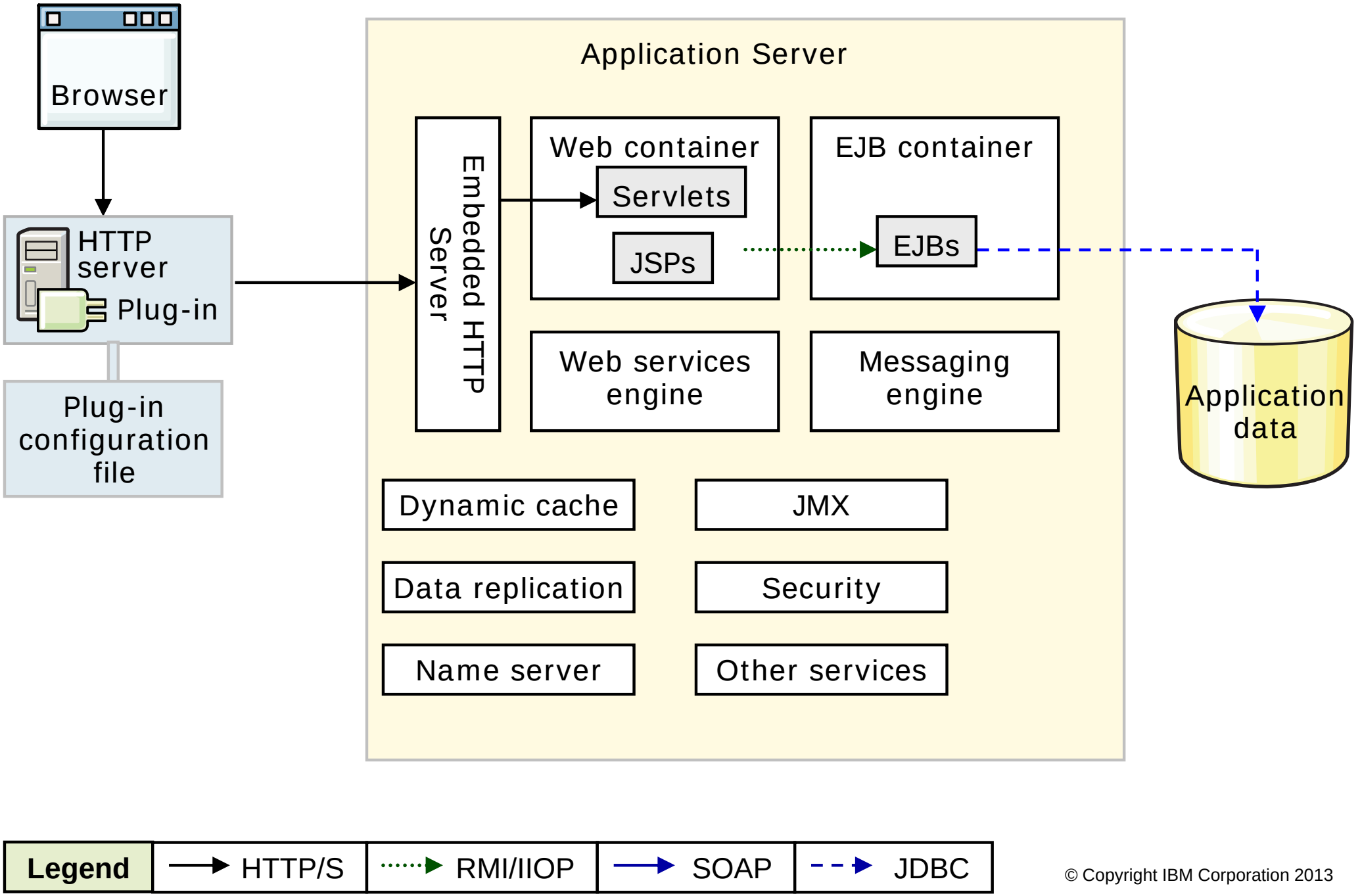


Legend	HTTP/S	RMI/IIOP	SOAP	JDBC

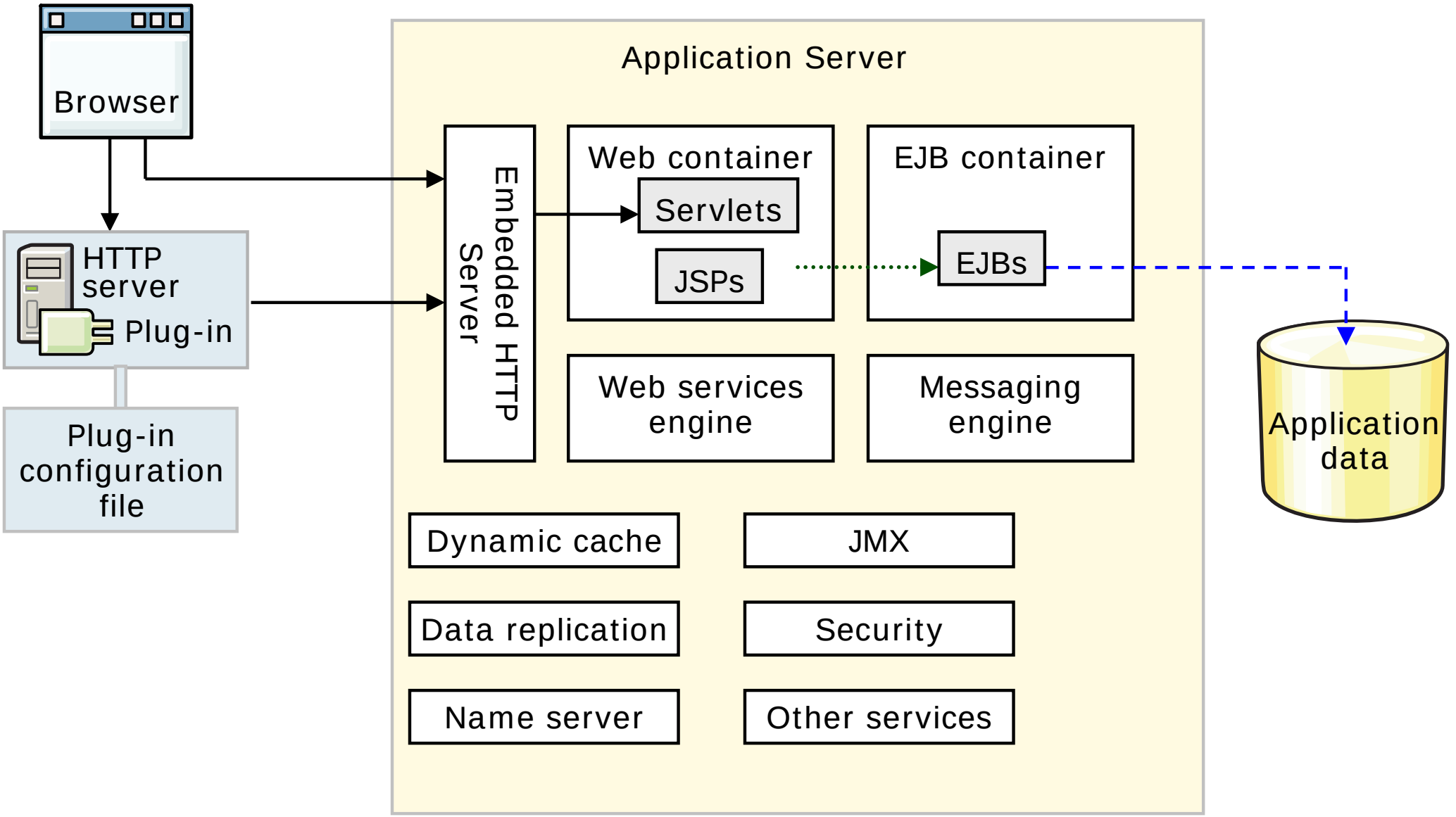
WebSphere architecture runtime (5 of 10)



WebSphere architecture runtime (6 of 10)

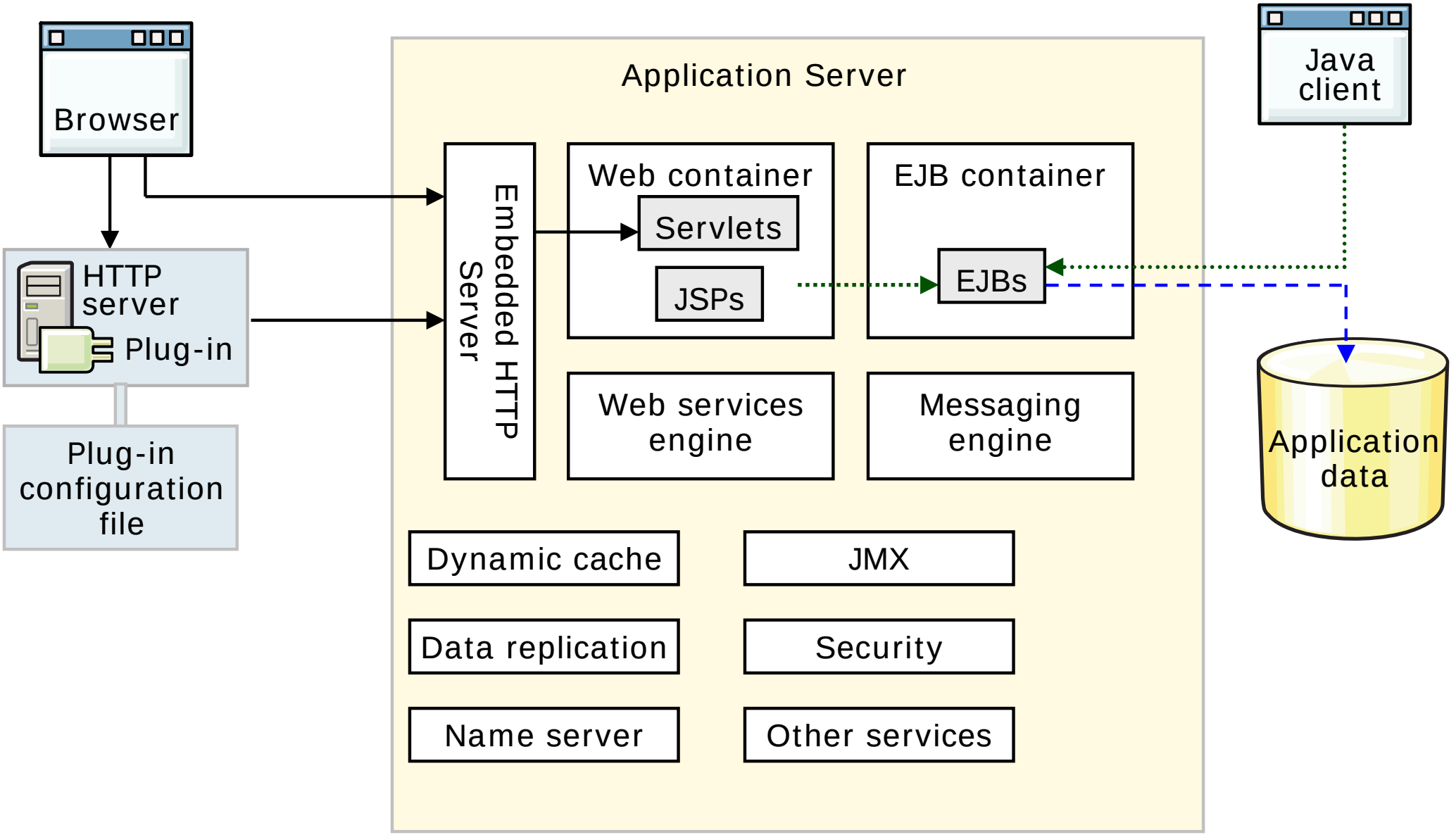


WebSphere architecture runtime (7 of 10)

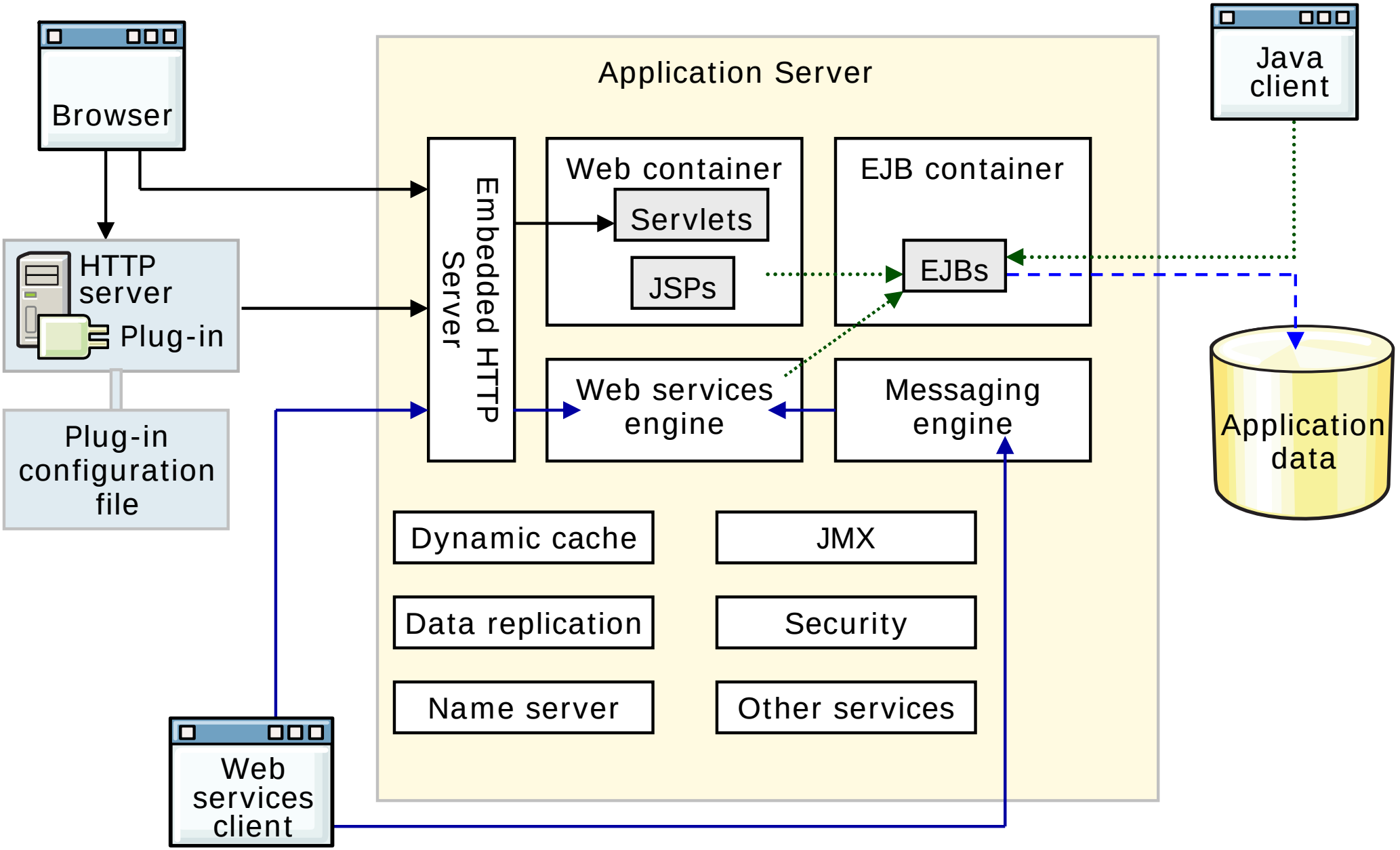


Legend	HTTP/S	RMI/IIOP	SOAP	JDBC

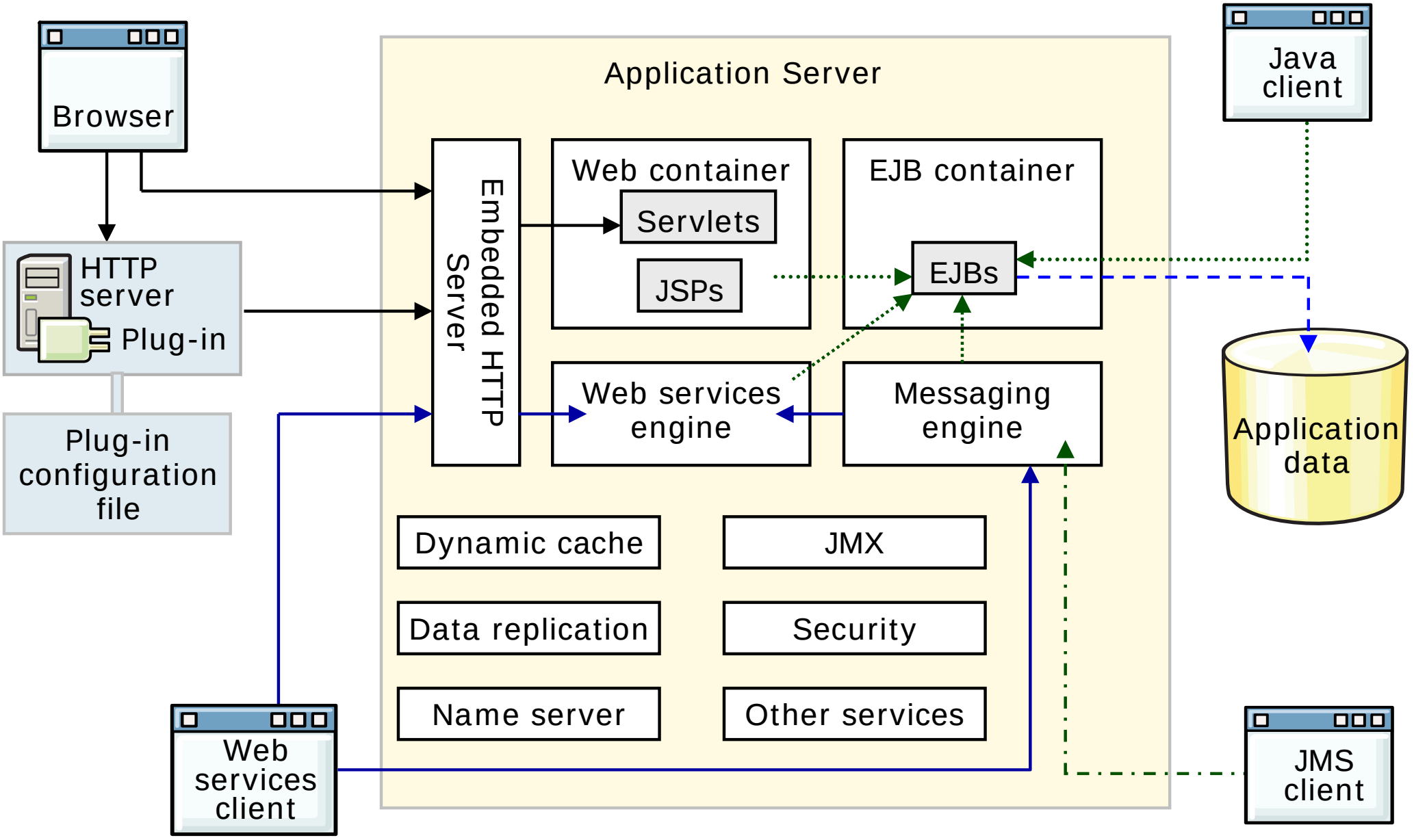
WebSphere architecture runtime (8 of 10)



WebSphere architecture runtime (9 of 10)

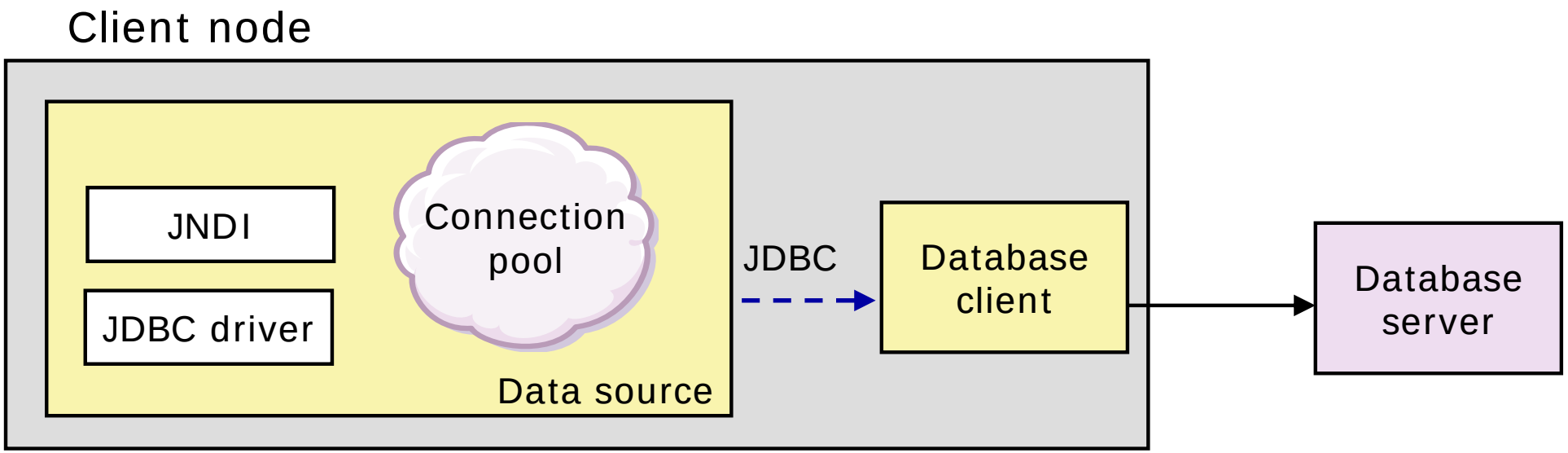


WebSphere architecture runtime (10 of 10)



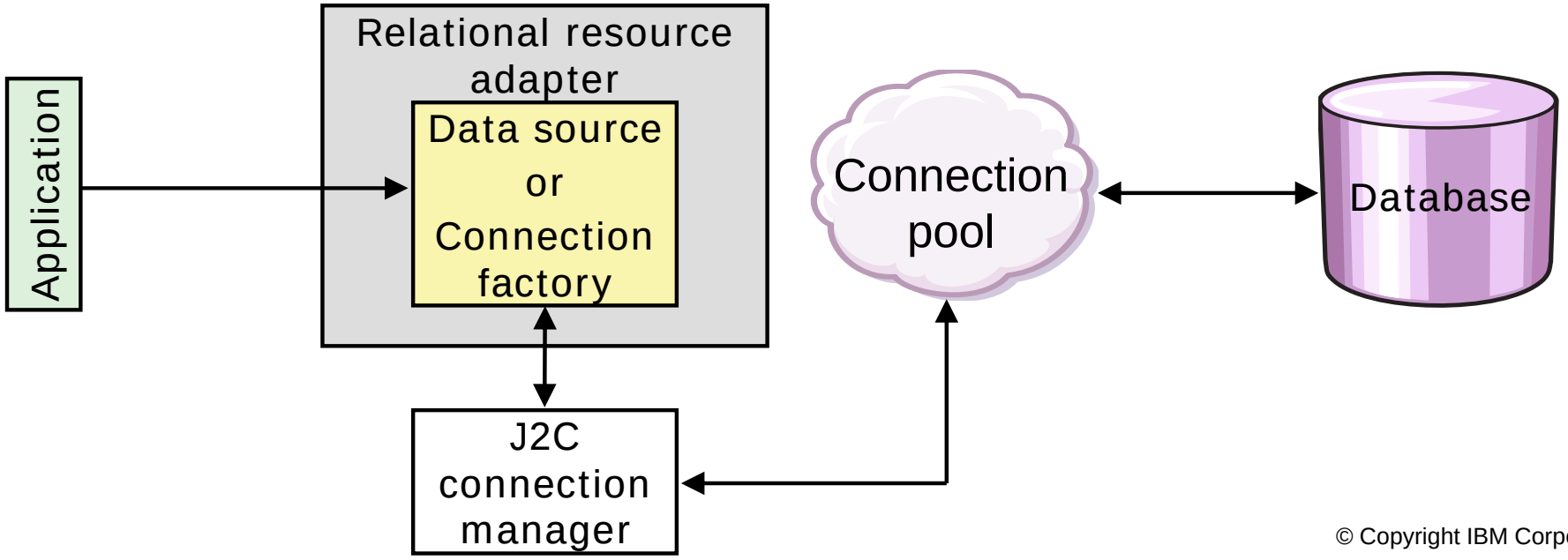
JDBC providers

- Provide the JDBC driver implementation for database access
  - Type 2 JDBC drivers (thick): require the database client software on the client node to connect to the database server
  - Type 3 JDBC drivers (net protocol): require server-side code to map net protocol to native database
  - Type 4 JDBC drivers (native protocol): connect directly to the database by using its native protocol
- XA drivers support transaction recovery



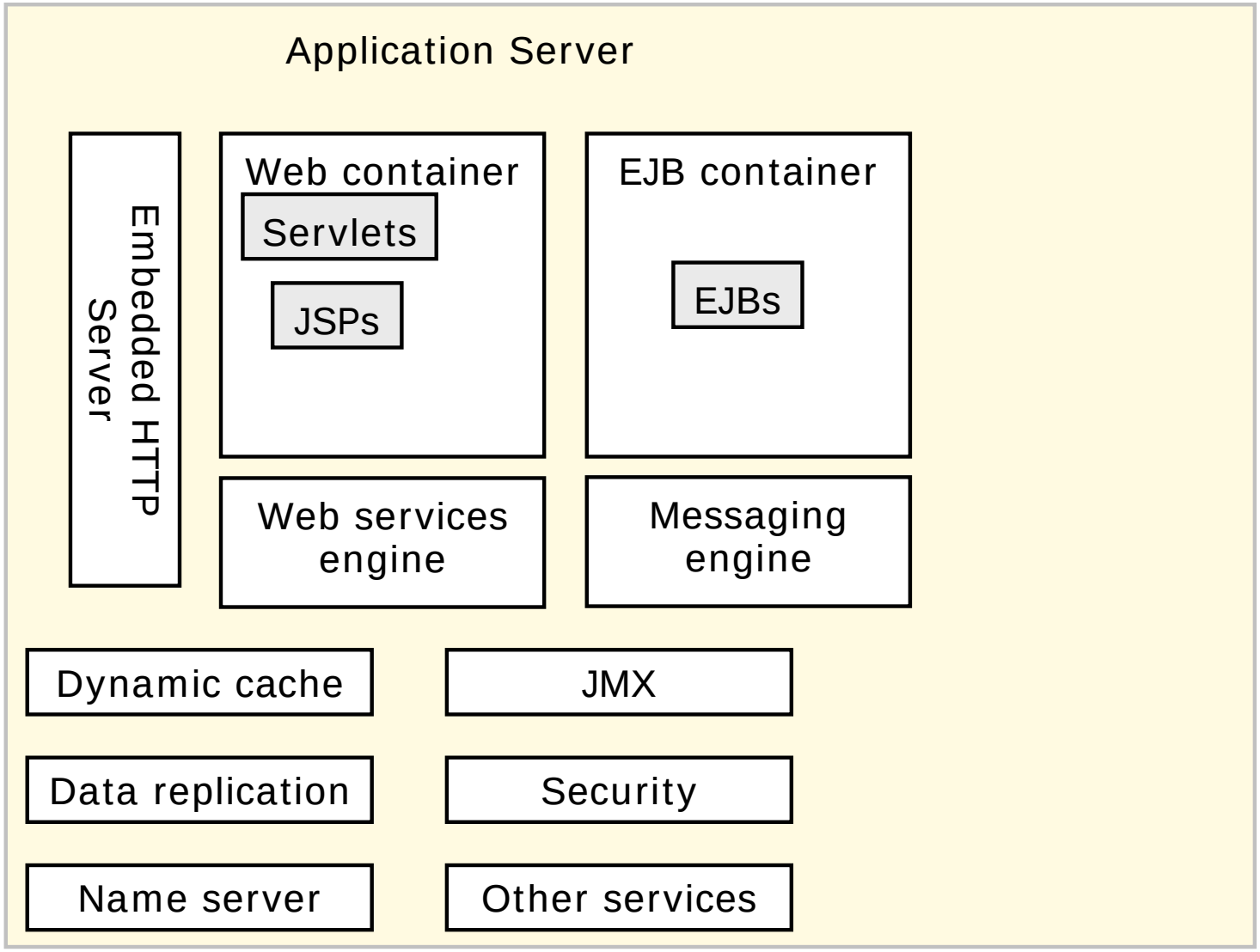
Data sources

- Data sources can improve performance and portability for database access
  - Standard and XA data sources
- Two parts provide connection pooling:
  - J2C connection manager
  - Relational resource adapter
- Connection factories are similar to data sources
  - Typically connect to external resources that are not databases

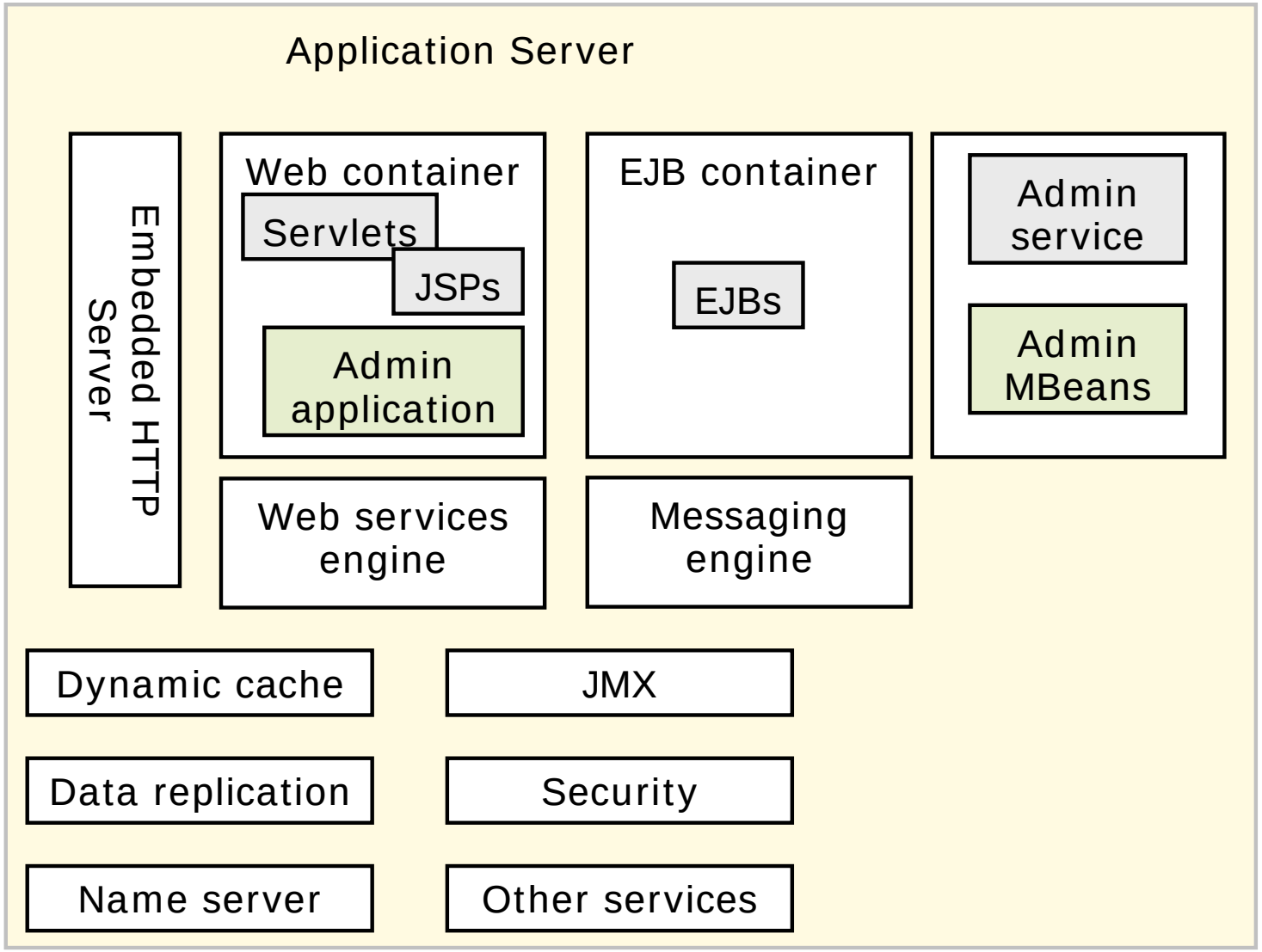


Architecture administration

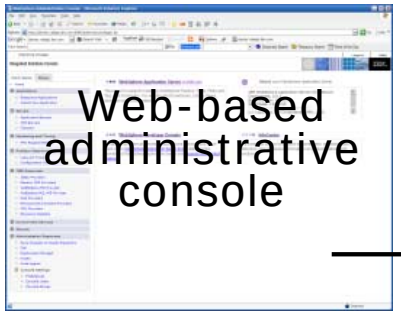
WebSphere architecture administration (1 of 4)



WebSphere architecture administration (2 of 4)



WebSphere architecture administration (3 of 4)



Application Server

Embedded HTTP Server

Web container

Servlets

JSPs

Admin application

EJB container

EJBs

Admin service

Admin MBeans

Web services engine

Messaging engine

Dynamic cache

JMX

Data replication

Security

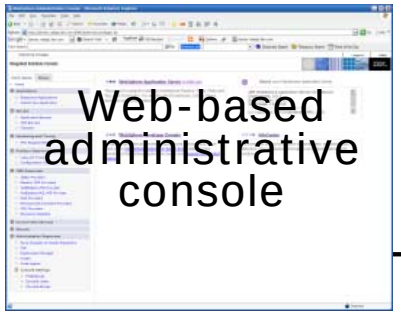
Name server

Other services

XML configuration files

Legend HTTP/S RMI/IIOP SOAP/HTTP File I/O

WebSphere architecture administration (4 of 4)



Web-based administrative console

Application Server

Embedded HTTP Server

Web container

Servlets

JSPs

Admin application

EJB container

EJBs

Admin service

Admin MBeans

Web services engine

Messaging engine

Dynamic cache

JMX

Data replication

Security

Name server

Other services

wsadmin command-line client

C:\> wsadmin

XML configuration files

Legend

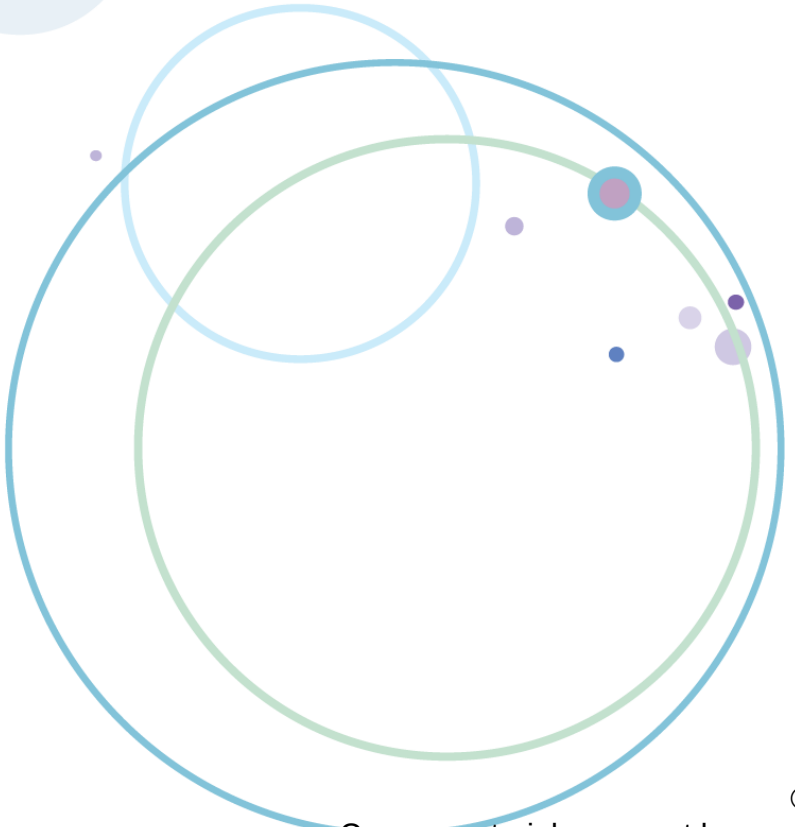
HTTP/S

RMI/IIOP

SOAP/HTTP

File I/O

Profiles

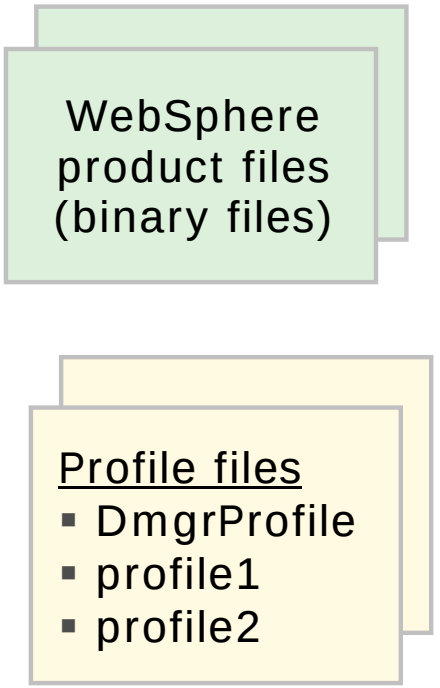


WebSphere profile overview

Profiles are sets of files that represent a WebSphere Application Server configuration

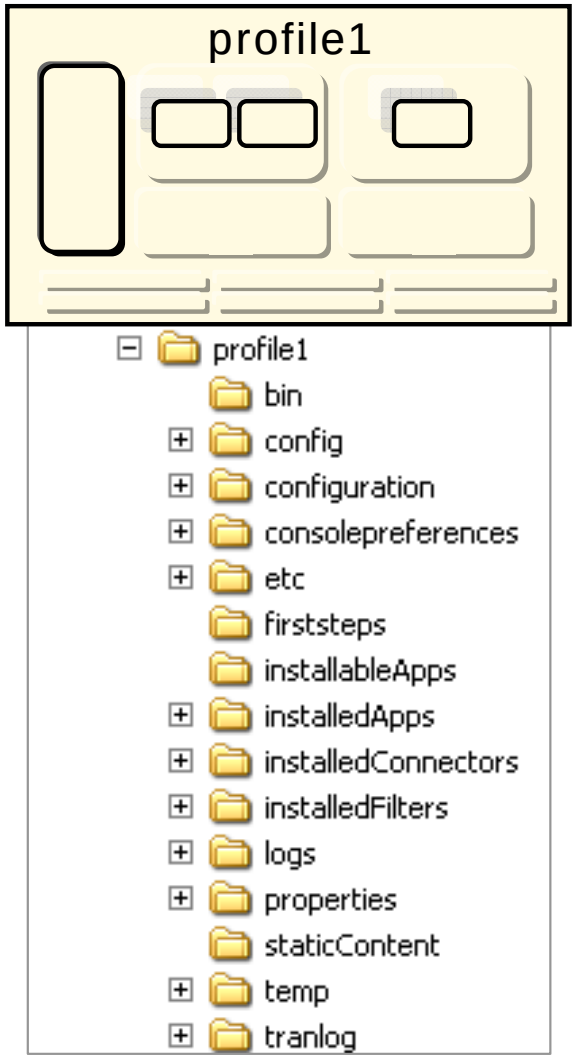
WebSphere Application Server files are split into two categories:

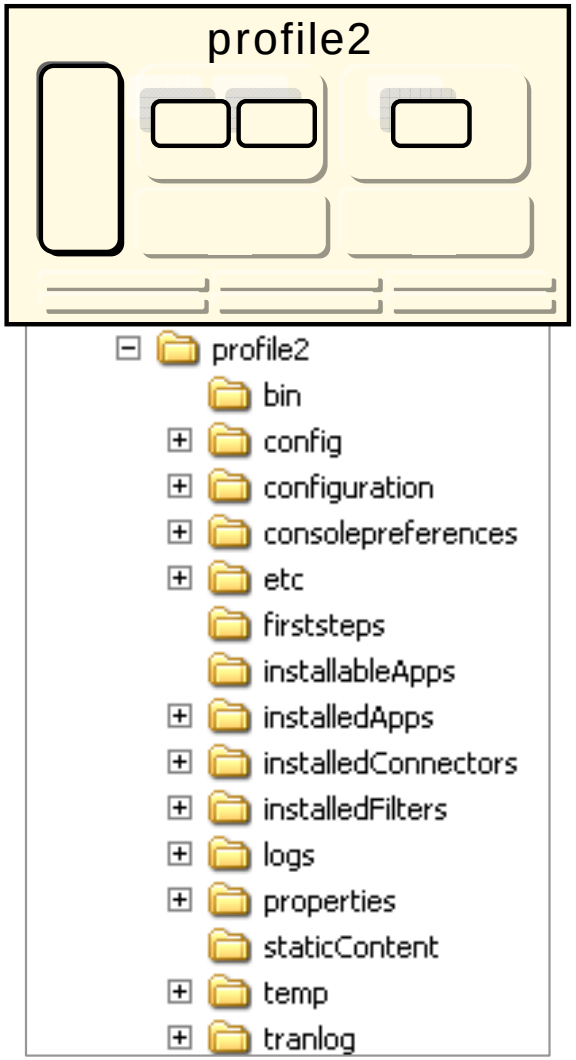
- Product files
  - Set of shared read-only static files or product binary files
  - Shared among any instances of the WebSphere Application Server product
- Profiles (configuration files)
  - Set of user-customizable data files
  - Files include WebSphere configuration, installed applications, resource adapters, properties, and log files

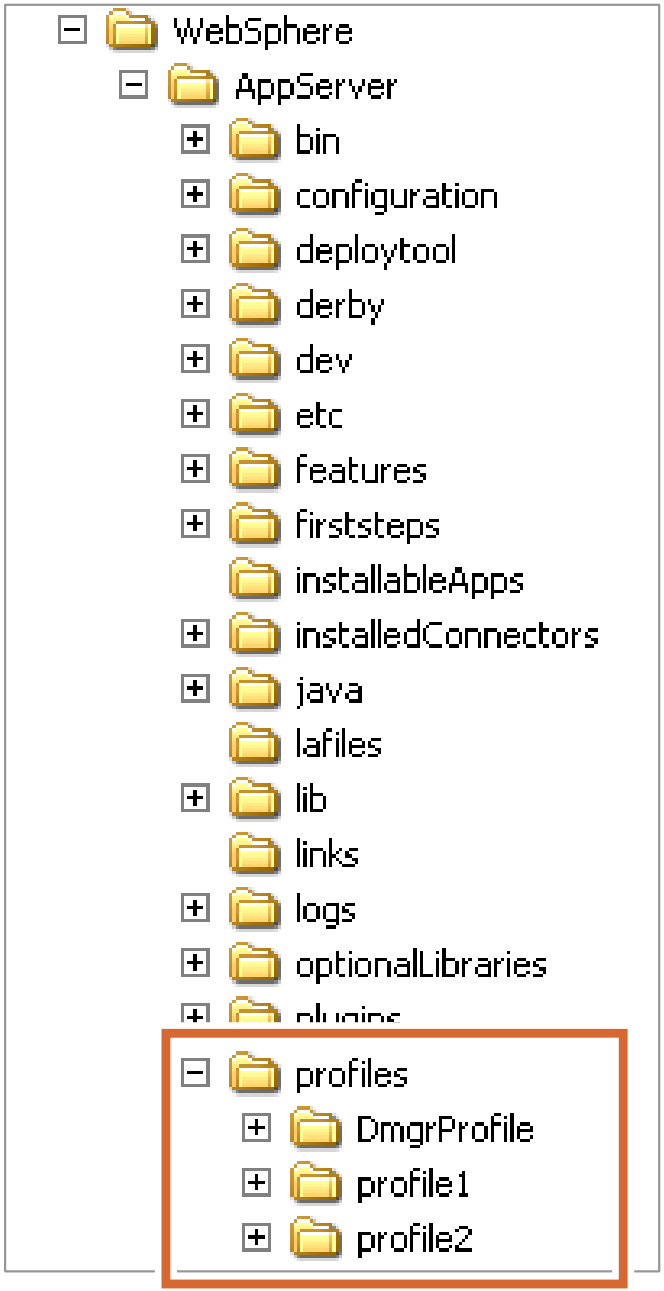


WebSphere profile benefits

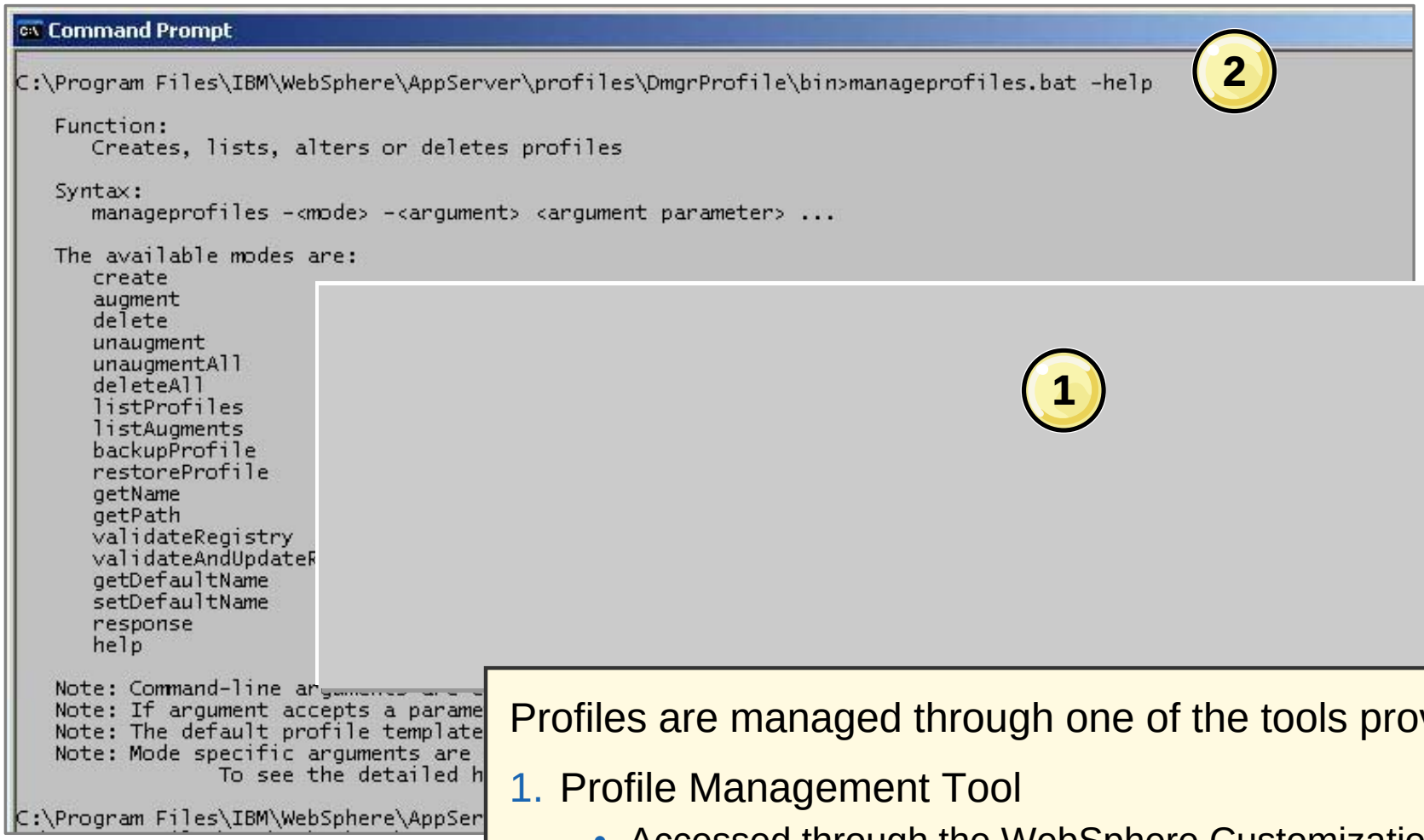
- Benefits of profiles:
  - Each profile uses the same product files
  - Simpler than multiple WebSphere installations
  - Less disk space
  - Simplifies application of product updates







Managing profiles

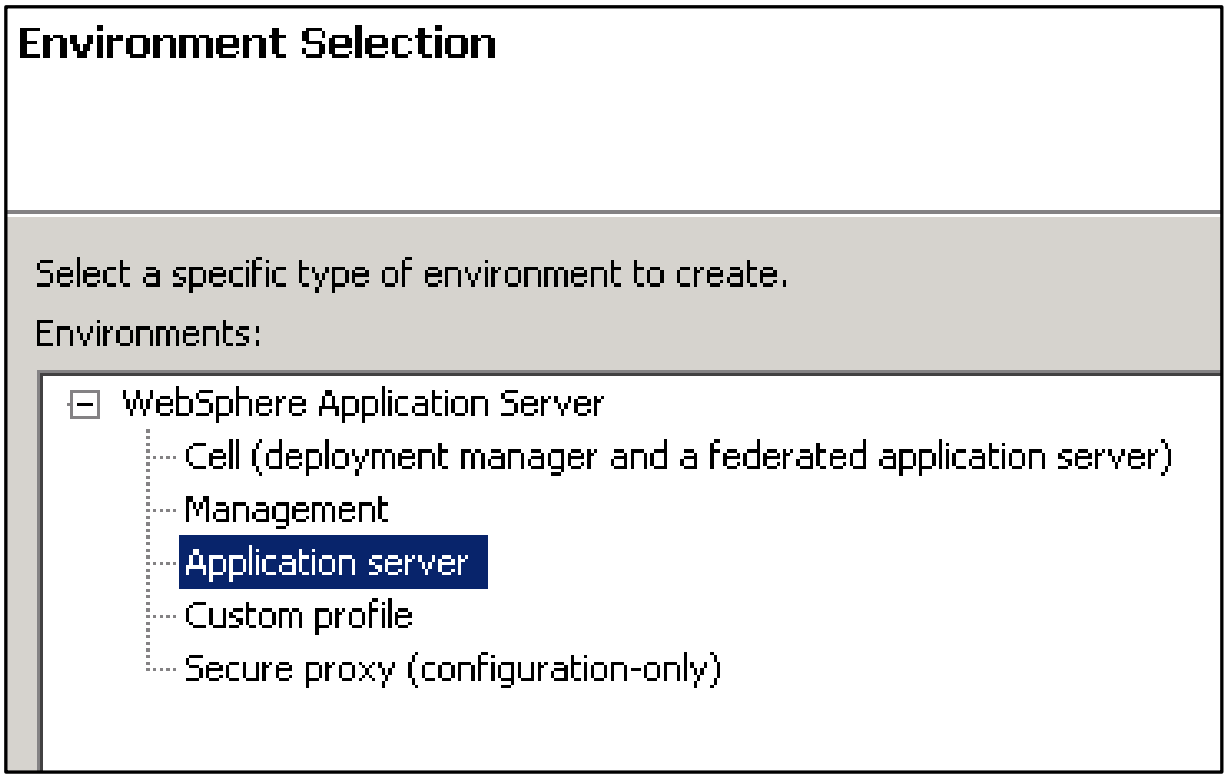


Profiles are managed through one of the tools provided:

1. Profile Management Tool
   - Accessed through the WebSphere Customization Toolbox
   - Gathers user input and starts the **`manageprofiles`** command-line tool to create the profiles
2. **`manageprofiles`** script
   - Command-line interface for profile management functions

Profile types

- Cell
  - Deployment manager with a federated application server
- Management
  - Administrative agent
  - Deployment manager
  - Job manager
- Application server
  - Stand-alone
- Custom profile
  - Federated node
    (no application server)
- Secure proxy



Unit summary

Having completed this unit, you should be able to:

- Describe a typical e-business application architecture
- Describe the architectural differences between WebSphere Application Server packages
- Describe what is running in a WebSphere Application Server node
- Describe the architectural implications of the web server plug-in
- Describe the use of Java Database Connectivity (JDBC) providers and data sources

Checkpoint questions

1. Which of the following provides an environment for running servlets?
   A. Client module
   B. Web container
   C. EJB module

2. Which type of JDBC driver is considered a “thick” driver?
   A. Type 2
   B. Type 3
   C. Type 4

3. Which of the following are components contained within the JVM of the application server?
   A. HTTP Server plug-in
   B. Embedded HTTP Server
   C. DB2 database

Checkpoint answers

1. Which of the following provides an environment for running servlets?
   B. Web container

2. Which type of JDBC driver is considered a “thick” driver?
   A. Type 2

3. Which of the following are components contained within the JVM of the application?
   B. Embedded HTTP Server