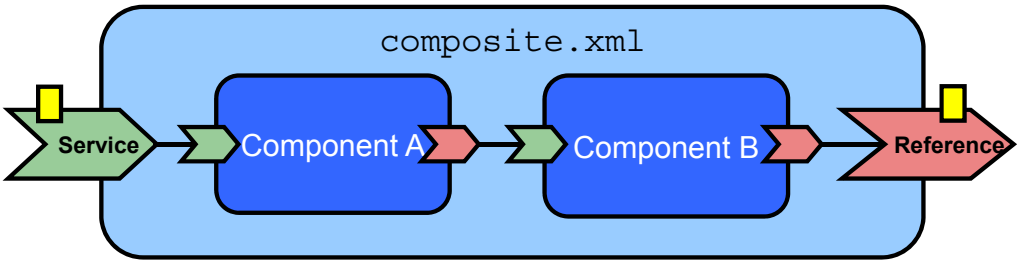
Understanding Binding Components

Binding components establish the connectivity between a SOA composite and the external world. There are two types:

- Service binding components provide an entry point to the SOA composite application.
- Reference binding components enable messages to be sent from the SOA composite application to external services.



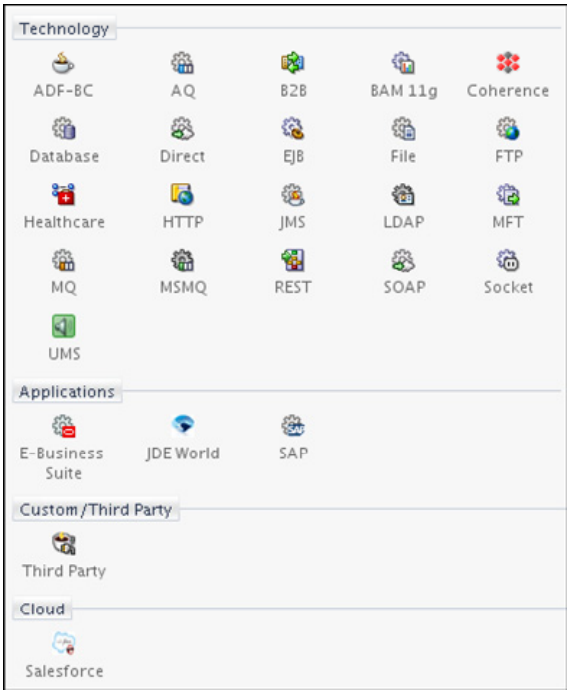
ORACLE

Binding components connect SOA composite applications to external services, applications, and technologies such as messaging systems or databases. Binding components are organized into two groups:

- **Services:** Provides the outside world with an entry point to the SOA composite application. The WSDL file of the service advertises its capabilities to external applications. The service bindings define how a SOA composite service can be invoked (for example, through SOAP).
- **References:** Sends messages from the SOA composite application to external services (for example, the same functionality that partner links provide for BPEL processes, but at the higher SOA composite application level)

Supported Technologies

- JCA adapters
- SOAP-based web services
- REST services
- HTTP binding
- EJB services
- Oracle BAM
- Oracle B2B
- Oracle Healthcare
- Oracle MFT
- ADF-BC services
- Direct binding services
- Cloud adapters



Binding components enable you to integrate the following types of technologies with SOA composite applications:

- JCA adapters: Enable you to connect services and references with different technologies and applications. JCA adapters include: Database Adapter, File Adapter, FTP Adapter, JMS Adapter, AQ Adapter, MQ Adapter, and Socket Adapter.
- SOAP-based web services: Expose the SOA composite as a web service available through SOAP. When used as a reference, it enables us to invoke external SOAP web services.
- REST services: Expose the SOA composite as a REST service. It is an alternative to using SOAP-based web services.
- HTTP binding: Enables you to expose the SOA composite or invoke an external service through HTTP POST and GET operations
- EJB services: Enable to integrate EJBs with SOA composite applications. Integration can be achieved through the use of SDO parameters or Java interfaces.
- Oracle BAM: Enables composite application to directly send data about business events to the BAM server

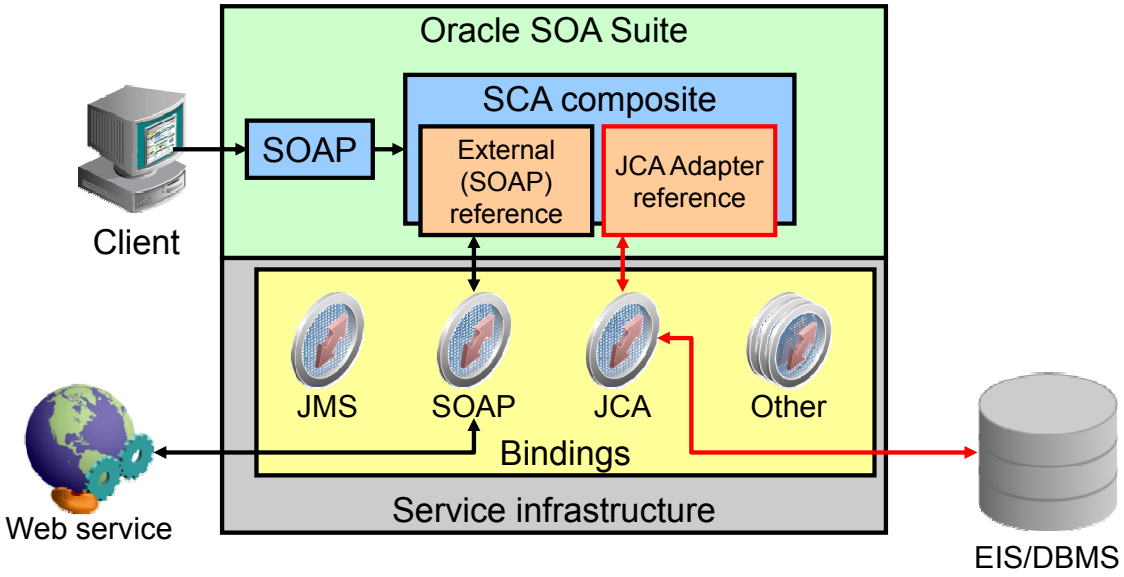
- Oracle B2B: Enables secure and reliable exchange of messages between SOA composite applications and organization trading partners by connecting to Oracle B2B.
- Oracle MFT: Enables you to transfer files to and from many endpoint types, such as FTP or sFTP servers, directories, and SOAP web service endpoints
- ADF-BC Services: Enables you to connect to Oracle Application Development Framework (ADF) Business Components services by using SDO for message exchange
- Direct binding services: Enables an SOA composite application to be invoked and exchange messages over RMI. When used as a reference, you have to select a reference target. Possible values are Oracle SOA Composite and Oracle Service Bus.
- Cloud Adapter: Enables you to connect to Cloud services

Roadmap

- Binding components
- JCA adapters
  - File Adapter
  - Database Adapter
  - JMS Adapter
  - LDAP Adapter
  - Coherence Adapter
- REST adapter

Overview of JCA Adapters

Adapters integrate with existing back-end applications through Java EE Connector Architecture standards.



The Java EE Connection Architecture (JCA) Binding component represents the core part of the adapter architecture. The JCA Binding component is a lightweight implementation that uses JCA standards for inbound and outbound communication. Adapters:

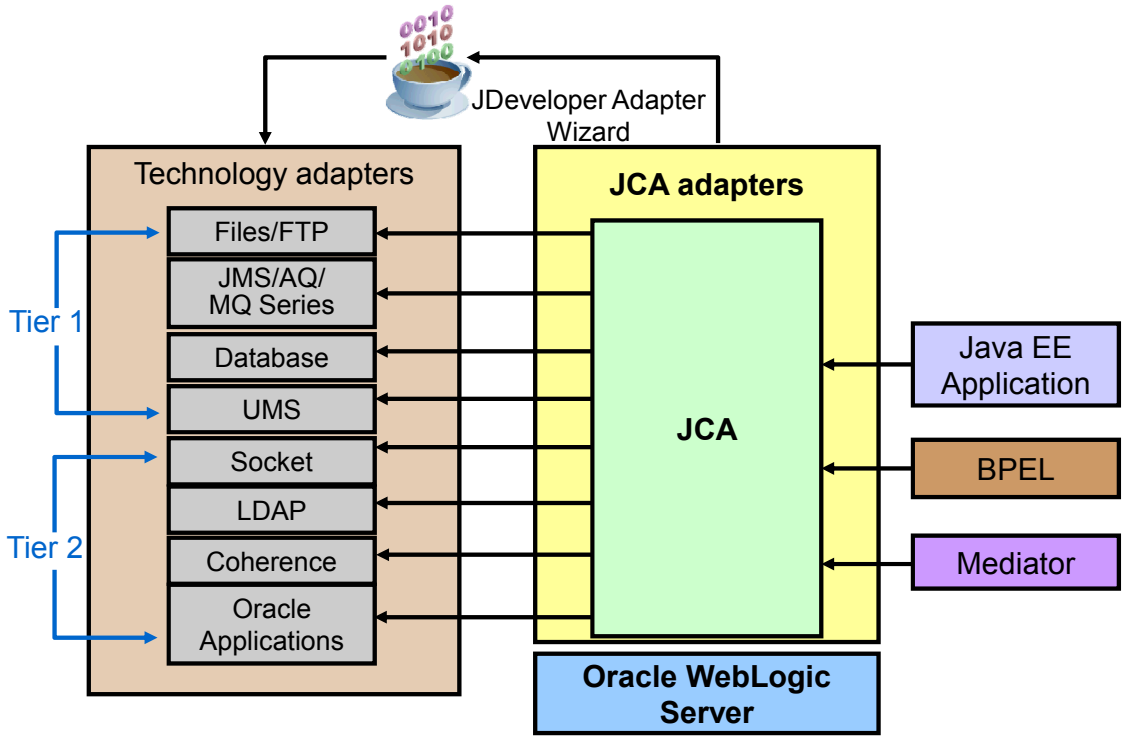
- Provide an interaction layer between the integration server and another application (either back-end systems or application functionality that needs to be exposed as service)
- Provide a mapping between two distinct interfaces and hide the complexities of those implementations from the end user and from the application integration developer
- Enable interoperability with heterogeneous applications, provided by different vendors, based on different technologies and platforms

An adapter, deployed as a JCA 1.5 resource adapter in a Java EE container, is described by a WSDL format and exposed through JCA mechanisms. The JCA Binding component integrates composite applications with services exposed through the adapter as if it were a web service.

Oracle JCA resource adapters support the following types of Enterprise Information System (EIS) integration services: JMS, TopLink or JDBC, PL/SQL, File, FTP, MQSeries, Sockets, Advanced Queuing, Oracle E-Business Suite, SAP, PeopleSoft, Siebel, JD Edwards, Tuxedo, CICS, VSAM, IMS-TM, IMS-DB, and many more through the OEM model.

Note: An adapter creates a service interface anywhere where one is absent and, therefore, provides another type of service in your “service portfolio.”

Oracle Technology Adapters



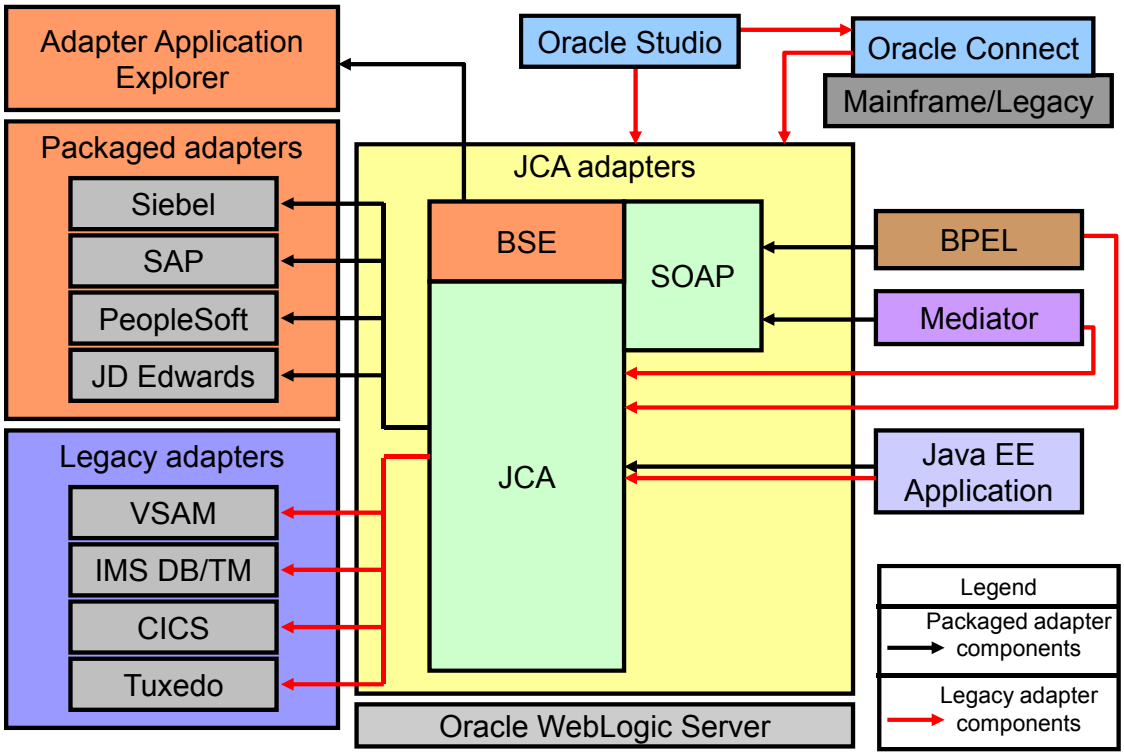
The following technology adapters are available for Oracle SOA Suite 12*c* Mediator and BPEL components:

- **File/FTP Adapter:** An inbound File or FTP Adapter service reads data from a local or remote file system, transforms the file data into an XML message, and sends it to an Oracle SOA Suite component when a new text file appears in a local file system. An outbound File Adapter service transforms the contents of an XML message to a text file and writes it to a local or remote file system.
- **JMS/AQ/MQ Series Adapter:** Either inbound or outbound, the JMS/AQ Adapter transmits an XML message to or from an Oracle SOA Suite component through a message-oriented service such as Oracle Advanced Queuing queue and other JMS providers.
- **Database Adapter:** An inbound Database Adapter service sends an XML message to an Oracle SOA Suite component when a SQL `INSERT`, `UPDATE`, or `DELETE` operation is performed against a database. An outbound Database Adapter transforms the contents of an XML message into a SQL `INSERT`, `UPDATE`, or `DELETE` operation on the target database.

- **Oracle UMS Adapter:** Enables two-way communication between users and deployed applications
- **Socket Adapter:** Communicates either as a client or server using TCP/IP-based protocols
- **Lightweight Directory Access Protocol (LDAP) Adapter:** Defines both asynchronous and synchronous interfaces to send requests to and receive responses from LDAP directory servers. The LDAP Adapter enables processes to search, compare, and modify LDAP directories using the LDAP protocol.
- **Coherence Adapter:** Allows you to put, remove, get, or query items from a coherence server cache
- **Oracle Applications (OA) Adapter:** Enables a tighter integration with Oracle Applications, such as Oracle E-Business Suite. An inbound OA Adapter sends XML messages to Oracle SOA Suite after receiving messages from an Oracle E-Business Suite interface. An outbound OA Adapter inserts data from Oracle SOA Suite to Oracle Applications by using interface tables, APIs, and concurrent programs.

With SOA Foundation profiles, these Adapters are logically grouped into two groups: Tier 1 and Tier 2. Tier 1 adapters are enabled by default when you install this release. The rest of the adapters are in an installed state; however, they are not targeted to any managed servers. You must manually target them in order to use them.

Packaged Application and Legacy Adapters



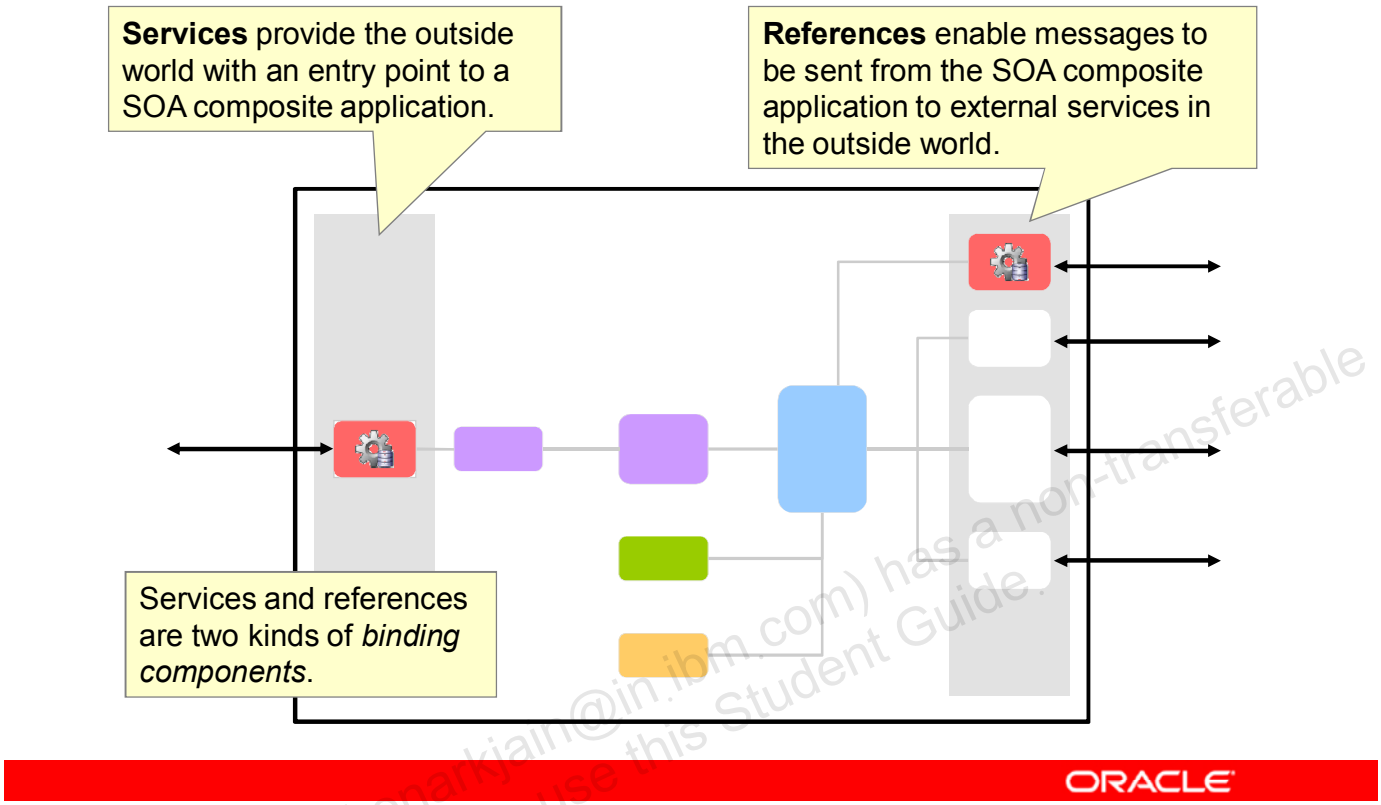
Packaged-application adapters integrate Oracle WebLogic Server with various packaged applications, such as SAP and Siebel, OracleAS Adapter for PeopleSoft, OracleAS Adapter for SAP R/3, OracleAS Adapter for Siebel, and OracleAS Adapter for JD Edwards.

Packaged-application adapters, available on the Oracle Adapters CD, support WSDL, SOAP, and JCA interfaces. The Application Explorer is a Java Swing–based design-time configuration tool. The Business Services Engine (BSE), deployed in the Oracle WebLogic Server container, uses SOAP for accepting requests from clients, interacting with the back-end application, and sending responses from the back-end application back to clients.

Legacy adapters integrate the WebLogic Server with legacy and mainframe applications, such as OracleAS Adapter for Tuxedo, OracleAS Adapter for CICS, OracleAS Adapter for VSAM, OracleAS Adapter for IMS/TM, and OracleAS Adapter for IMS/DB. Legacy adapters are available as part of the OracleAS Adapters CD. Oracle Connect executes on legacy and mainframe platforms and consists of server processes to handle client requests, native adapters, a daemon, an RPC-based listener, and a repository for storing configuration.

Note: Custom adapters can also be developed by customers or third-party companies.

Binding Components



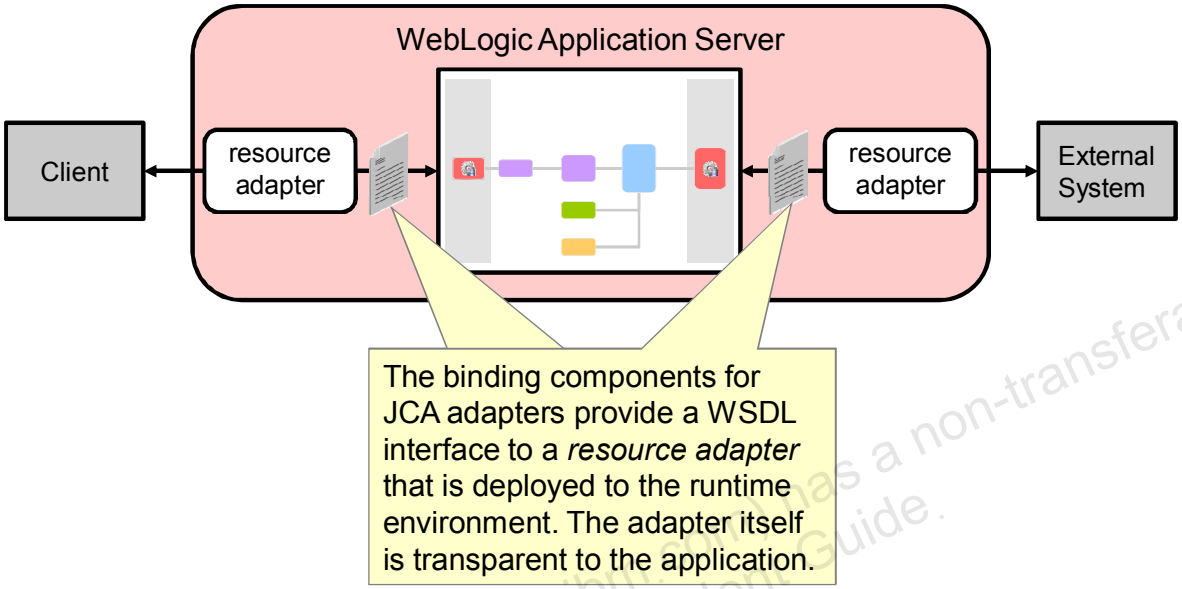
Binding components establish a connection between a SOA composite and the external world. There are two types of binding components:

- *Services* provide the outside world with an entry point to the SOA composite application. The WSDL file of the service advertises its capabilities to external applications. These capabilities are used for contacting the SOA composite application components. The binding connectivity of the service describes the protocols that can communicate with the service, for example, SOAP/HTTP or a JCA adapter.
- *References* enable messages to be sent from the SOA composite application to the external services in the outside world.

Note: Binding components are displayed in the JDeveloper Component Palette as service adapters.

Several types of binding components are provided by Oracle SOA Suite, including Web service (SOAP over HTTP), ADF-BC service, HTTP binding, and *JCA adapters*. The remainder of this lesson explores JCA adapters in more detail.

JCA Adapters



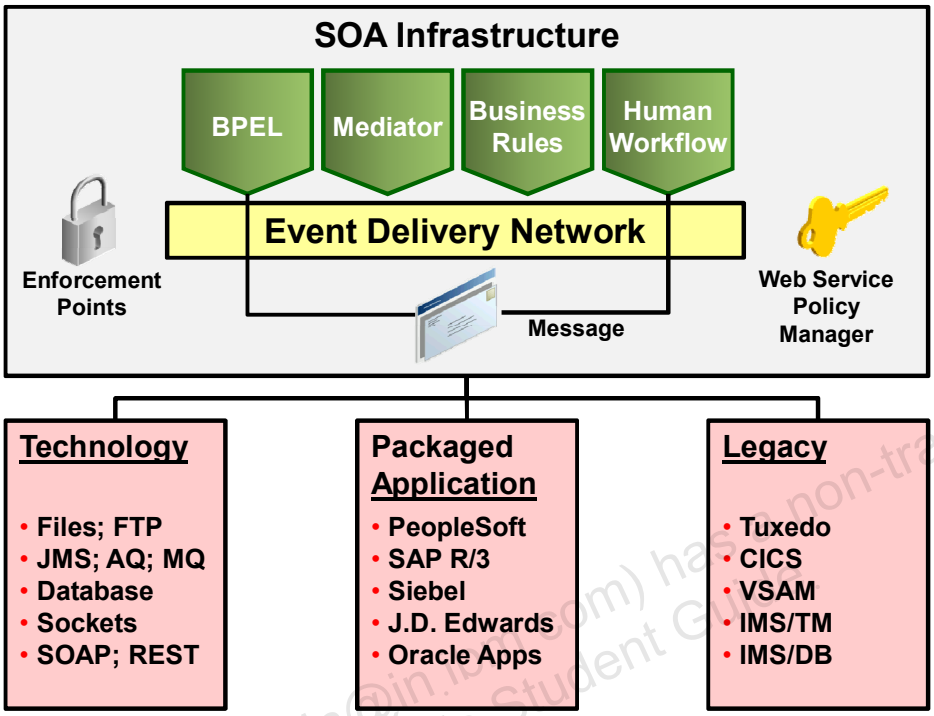
JCA stands for *JEE Connector Architecture*. It is part of the JEE specification. JCA describes the concept of resource adapters, or simply *adapters*. Adapters enable SOA Suite components to interact with systems outside the composite application, including those outside the application server. This simplifies the integration of diverse systems.

An adapter exposes an API through which a service component accesses an external system. The interface for this API is described by a WSDL document. This WSDL is the only view that the component has of the external system. The adapter itself is transparent to the service component.

Oracle JCA adapters enable communication with various back-end systems. This includes exchange of requests and (possibly) responses with back-end systems. Adapters also support the real-time event notification service. This service provides notification about the events associated with successful back-end transactions for creating, deleting, and updating back-end data. (More on the event notification service later.)

In many cases, adapters can offer advantages over web services. They are for tighter coupling and they bring value-adds such as connection pooling, for example. Adapters typically perform better than web services.

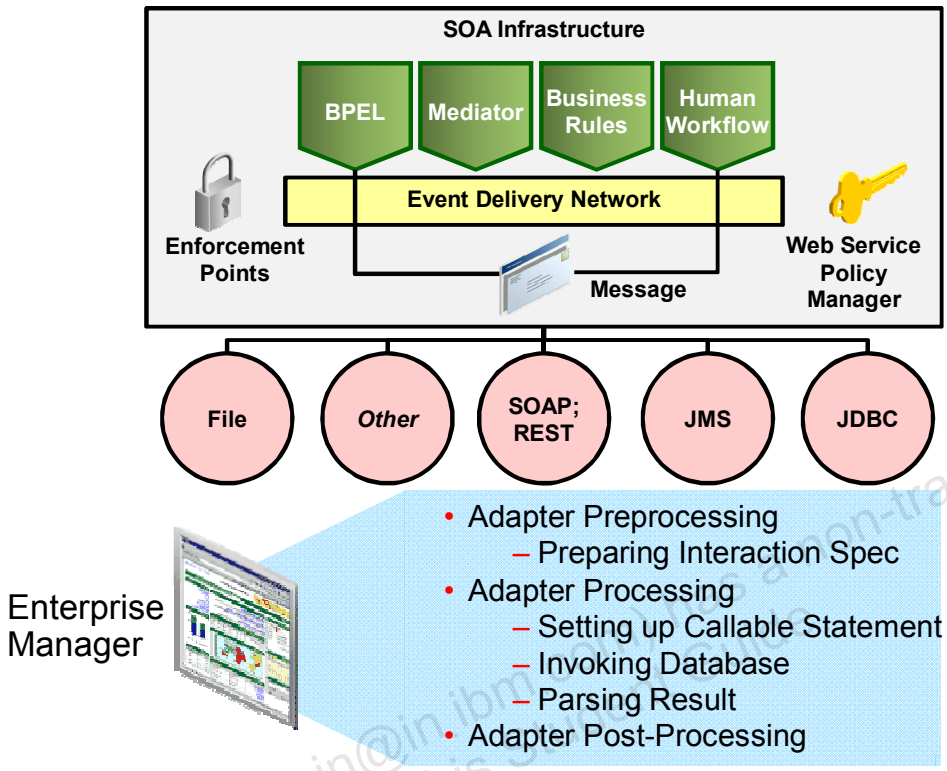
Oracle JCA Adapters



Oracle adapters can be categorized broadly into three groups:

- *Technology* adapters can be used to integrate SOA applications with transport protocols, data stores, and messaging middleware.
- *Application* adapters connect various packaged applications, such as SAP and Siebel, and databases.
- *Legacy* adapters integrate mainframe and legacy applications. There are CICS and Tuxedo adapters as well. (CICS and Tuxedo are not applications but command interfaces to legacy applications.)

Monitoring Adapters



Oracle JCA adapters such as File, JMS, and Database gather and publish statistics for every message they process, either inbound or outbound. The statistics are broken down into categories and individual tasks. The following is an example of how statistics are broken down in an outbound (reference) process:

- Adapter Preprocessing
  - Preparing Interaction Spec
- Adapter Processing
  - Setting up Callable Statement
  - Invoking Database
  - Parsing Result
- Adapter Post-processing

Adapter statistics can be viewed in the Oracle Enterprise Manager console.

Quiz

Statistics about message processing are gathered by adapters, and are viewable in the Oracle Enterprise Manager console.

a. True
b. False

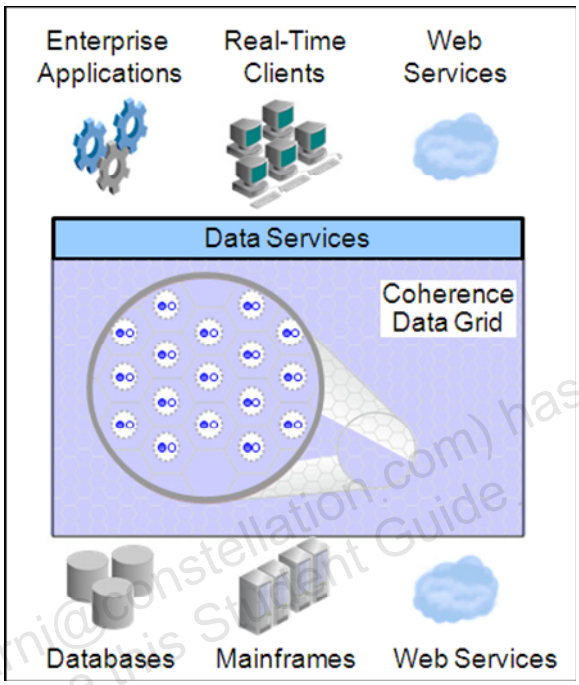
Answer: a

True. Adapters gather and publish statistics for every message they process, either inbound or outbound. Adapter statistics can be viewed in the Oracle Enterprise Manager console.

Coherence Data Grid

A Coherence data grid:

- Is a distributed in-memory data management grid
- Provides a reliable data tier with a single, consistent view of data
- Enables dynamic data capacity, including fault tolerance and load balancing
- Ensures that data capacity scales with processing capacity



Coherence is a JCache-compliant, in-memory, distributed data grid solution for clustered applications and application servers. The Java Temporary Caching API (JCache) provides the API and semantics for temporary, in-memory caching of Java objects, including object creation, shared access, spooling, and consistency across JVMs. Coherence is a way to cache objects in the middle tier to improve performance and scalability of high-transaction applications.

Some benefits of Coherence:

- Helps a specific class of applications that process a large number of transactions—high-throughput transactional systems that have demanding data-access and throughput requirements
- Is good for customers looking for Service-Oriented Architecture (SOA) deployments and those looking for middle-tier scalability

Coherence is written in Java and runs on the application tier (also referred to as the *data grid tier*). From the XTP point of view, storing and retrieving data from the database is an issue because it is much slower to access the disk than it is to access memory. Coherence solves this problem by caching all Java objects in memory on a data grid, so the application does not have to access the disk each time. Coherence works by embedding APIs into an existing application code that caches the Java objects in memory. Thus, applications can minimize the database round trips to fetch data and to write data as well.

Coherence Adapter: Introduction

- Coherence cache: A collection of data objects that serves as an intermediary between the database and the client applications.
- Coherence Adapter:
  - Allows seamless integration with the Coherence server
  - Supports operations:
    - Put
    - Remove
    - Get
    - Query
  - Cache types:
    - XML
    - POJO

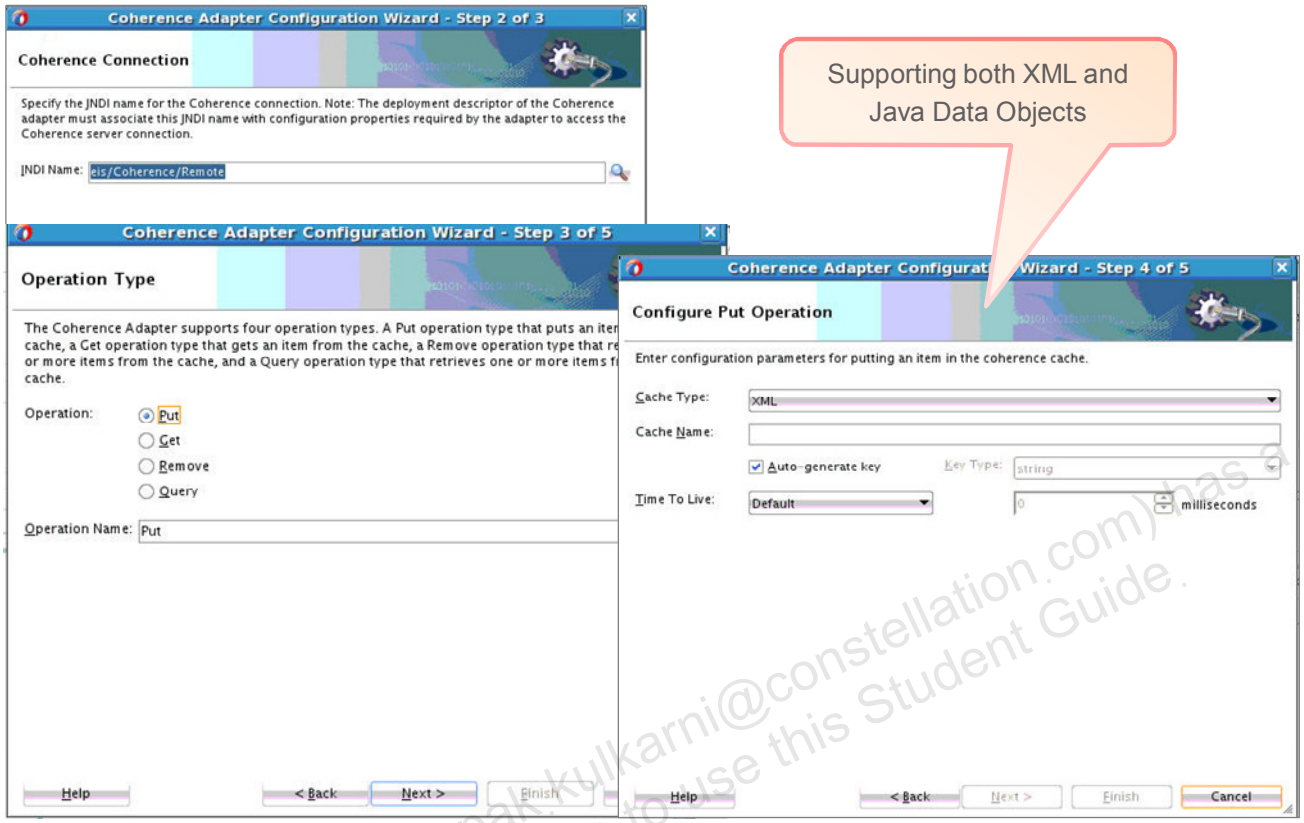
The Coherence Adapter is a JCA 1.5-compliant resource adapter for Oracle Coherence. When deployed in a SOA environment, the Coherence Adapter is used as an integration vehicle by SOA composite applications when they integrate with Oracle Coherence.

The Coherence Adapter enables you to perform useful Coherence operations such as adding an item to a Coherence cache, obtaining an item from a Coherence cache, removing an item, and querying from a Coherence cache.

You can use the Oracle Coherence Adapter to perform the following activities associated with Oracle Coherence:

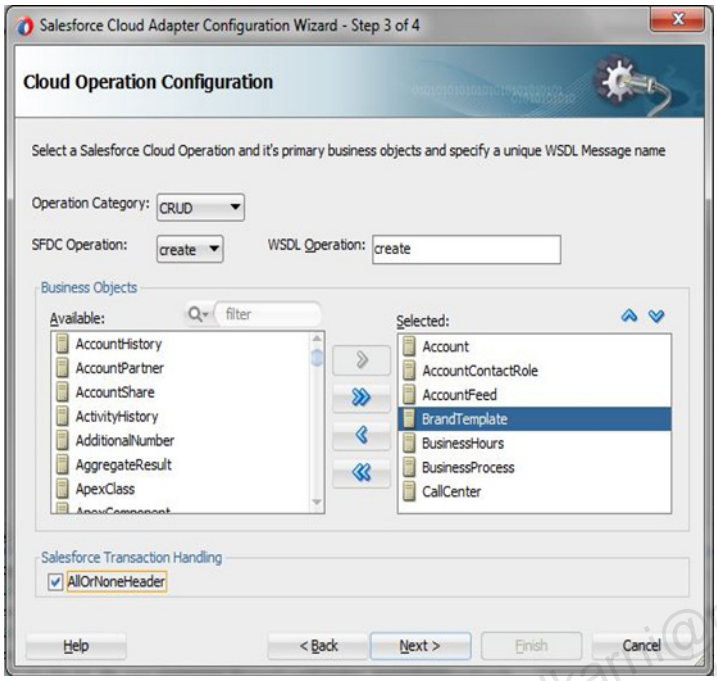
- **Add a cache entry:** Create a new entry in the Coherence cache.
- **Remove cache entries:** Identify an item to be removed from the cache, and the system removes the entry from the cache. You can also remove multiple entries from the cache by providing a filter or search criteria that match the multiple records in cache.
- **Get cache entry value:** After specifying an entry to obtain the associated value, the system returns the value of that entry to you.
- **Query cache:** After you identify the cache, and specify search criteria, the system returns the entries that match the search criteria.

Coherence Adapter Configuration Wizard



Note that when using the Coherence adapter in 12.1.3, you will not be able to interact with a remote Coherence cluster other than version 12.1.3. or a newer version.

Oracle SOA Suite Cloud Connectivity

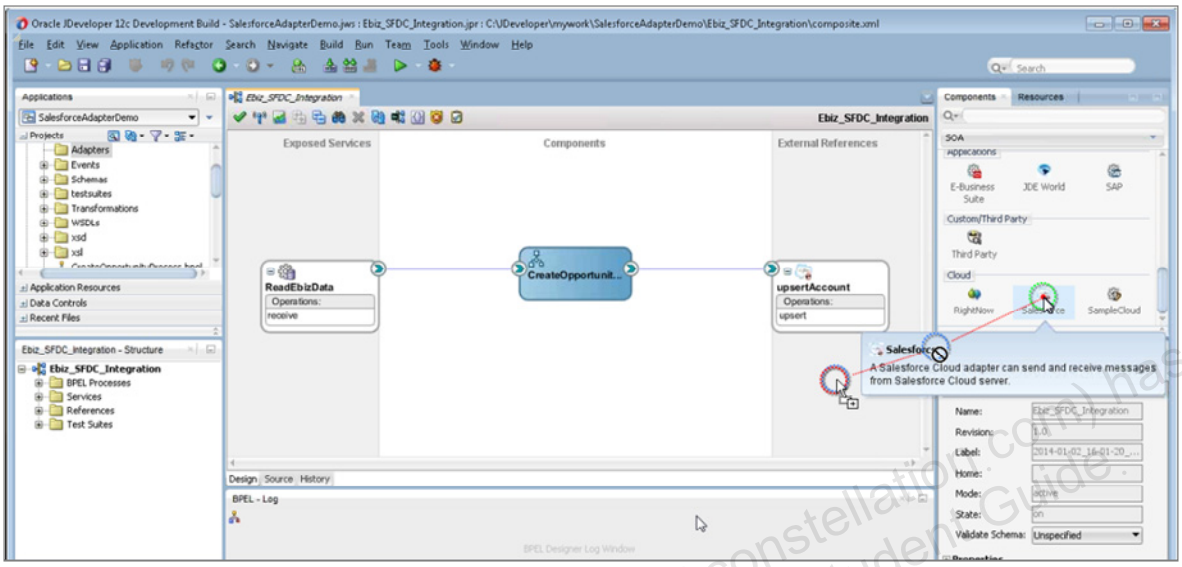


- Point-and-click modeling for connectivity to cloud applications
- Secure connectivity and session management
- Cloud Adapter SDK
- Reduce development time in half

Oracle SOA Suite provides a unified integration platform for both SaaS and on-premise applications. The features supported are:

- Simplified cloud connectivity
- Integrated with Oracle security
- Shielded from SaaS changes
- Unified monitoring and management

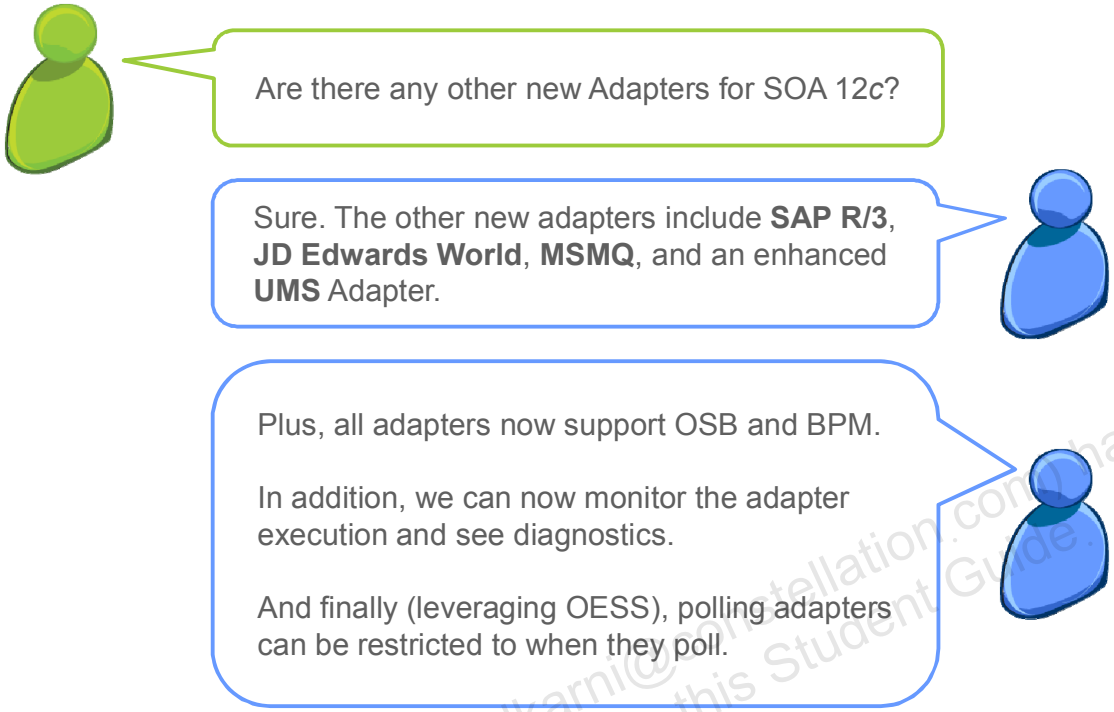
Salesforce Integration via Salesforce Adapter



Oracle JDeveloper provides a Salesforce adapter out-of-the-box for integrating with Salesforce services. The following features make the integration simpler and easier:

- Graphical Business Object Catalog
- Standard and custom object browsing
- Query Editing/Validation and Test
- Design-time capping of query results

Adapter Summary



- http://docs.oracle.com/middleware/1213/adapters/develop-soa-adapters/adptr_ldap.htm
- http://technology.amis.nl/2014/08/08/oracle-soa-suite-12c-ldapadapter-tutorial/?utm_source=rss&utm_medium=rss&utm_campaign=oracle-soa-suite-12c-ldapadapter-tutorial