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Oracle Fusion Middleware

Agenda

- Overview of Oracle Fusion Middleware
- About Key Oracle Fusion Middleware Concepts
- Overview of Oracle Fusion Middleware Components
- Using Oracle Fusion Middleware Tools

Overview of Oracle Fusion Middleware

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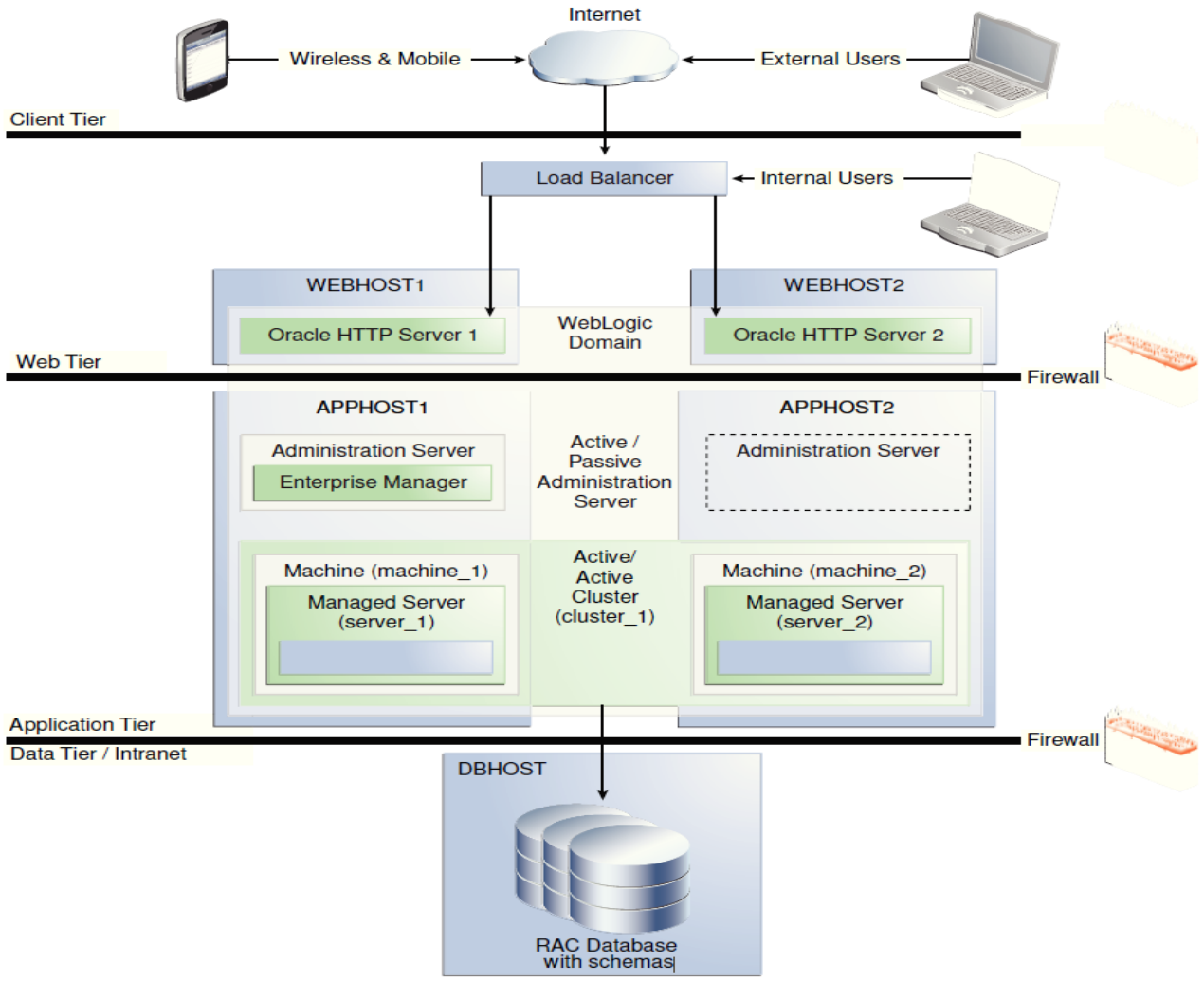

About Key Oracle Fusion Middleware Concepts

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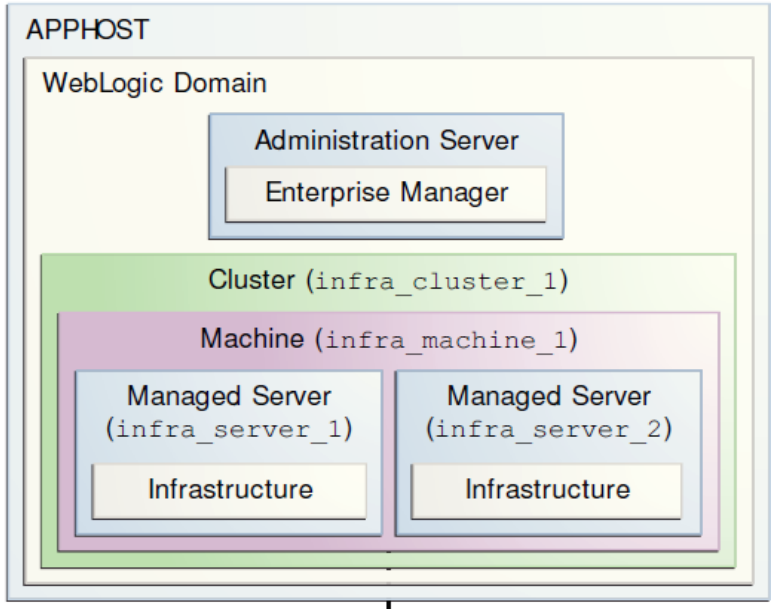
- What Is an Oracle WebLogic Server Domain?
- What Is the Administration Server?
- Overview of Managed Servers and Managed Server Clusters
- What Is a Java Component?
- What Is a System Component?
- What Is Node Manager?
- What Are the Key Oracle Fusion Middleware Directories?
- What Is the WebLogic Management Framework?
- What Is the Metadata Repository?

What Is an Oracle WebLogic Server Domain?

- An Oracle WebLogic Server **domain** is a logically related group of Java components.
- A domain includes a special WebLogic Server instance called the **Administration Server**, which is the central point from which you configure and manage all resources in the domain.



What Is the Administration Server?

- The **Administration Server** operates as the central control entity for the configuration of the entire domain.
- It maintains the domain's configuration documents and distributes changes in the configuration documents to Managed Servers.
- The Administration Server serves as a central location from which to manage and monitor all resources in a domain.
- Each domain must have one server instance that acts as the Administration Server.

Overview of Managed Servers and Managed Server Clusters

- **Managed Servers** host business applications, application components, Web services, and their associated resources.
- To optimize performance, Managed Servers maintain a read-only copy of the domain's configuration document.
- When a Managed Server starts, it connects to the domain's Administration Server to synchronize its configuration document with the document that the Administration Server maintains.
- For production environments that require increased application performance, throughput, or high availability, you can configure two or more Managed Servers to operate as a cluster.
- A **cluster** is a collection of multiple WebLogic Server instances running simultaneously and working together to provide increased scalability and reliability.

What Is a Java Component?

- A **Java component** is an Oracle Fusion Middleware component that is deployed as one or more Java EE applications and a set of resources.
- Java components are deployed to an Oracle WebLogic Server domain as part of a domain template.
- Oracle WebLogic Server and Oracle Coherence are examples of Java components.

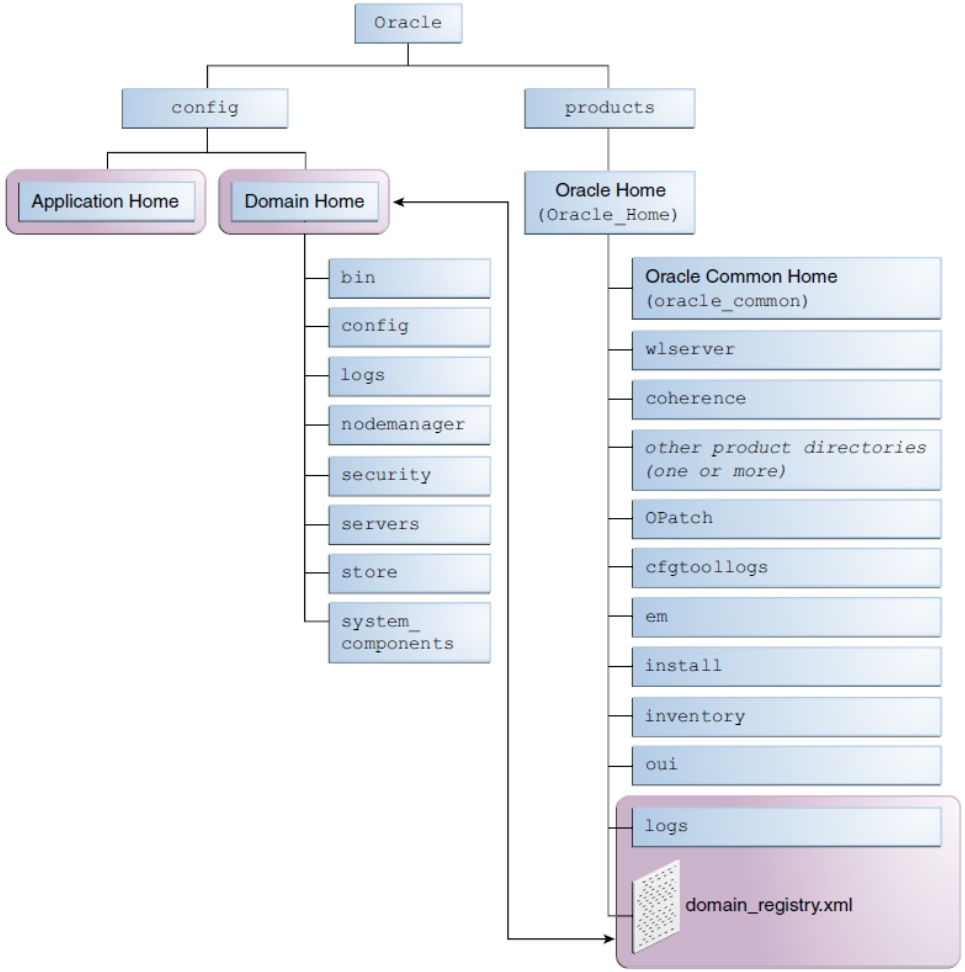
What Is a System Component?

- A **system component** is a manageable process that is not deployed in a Java application container. Oracle HTTP Server is an example of a system component.
- System components can be deployed in a WebLogic Server domain or in a standalone domain and managed by the Weblogic Management Framework.

What Is Node Manager?

- **Node Manager** is a Java utility that runs as a separate process from Oracle WebLogic Server and allows you to perform common operations for a Managed Server, regardless of its location with respect to its Administration Server, and for system components.
- If you run Node Manager on a computer that hosts Managed Servers, you can start and stop the Managed Servers remotely using the Administration Console, Fusion Middleware Control, or the command line.
- Node Manager can also automatically restart a Managed Server after an unexpected failure.

What Are the Key Oracle Fusion Middleware Directories?



What Is the WebLogic Management Framework?

- Oracle Fusion Middleware provides the **WebLogic Management Framework**, which provides heterogeneous management capabilities for Oracle Fusion Middleware products that require basic administrative capabilities.
- Its capabilities include start, stop, configuration settings, and other such basic product lifecycle operations through a common command line, API and user interface.

What Is the Metadata Repository?

- The metadata repository contains metadata for Oracle Fusion Middleware components, such as Oracle Application Development Framework and Oracle SOA Suite.
- It can also contain metadata about the configuration of Oracle Fusion Middleware and metadata for enterprise applications.
- A metadata repository can be database-based or file-based.
- If it is database-based, the repository can be installed into an existing database using the Repository Creation Utility (RCU).
- With RCU, you can create schemas for Oracle Fusion Middleware components.

Overview of Oracle Fusion Middleware Components

Overview of Oracle Fusion Middleware Components

- Oracle Fusion Middleware Infrastructure
- Oracle WebLogic Server
- Oracle Coherence
- Oracle HTTP Server
- Oracle Identity Management
- Oracle Data Integrator
- Oracle SOA Suite
- Oracle Business Process Management Suite
- Oracle Traffic Director
- Oracle WebCenter Content
- Oracle WebCenter Portal
- Oracle BI Enterprise Edition
- Oracle Forms Services

Oracle Fusion Middleware Infrastructure

- Oracle Fusion Middleware Infrastructure is an Oracle Fusion Middleware distribution that provides Oracle WebLogic Server, Oracle Coherence, and the Oracle JRF infrastructure services.
- The Oracle JRF infrastructure services include:
  - • Oracle Application Development Framework• Oracle Metadata Services
  - • Oracle Platform Security Services
  - • Oracle Web Services Manager
  - • Oracle Enterprise Manager Fusion Middleware Control
- These services are installed into the Oracle common directory inside the Oracle Fusion Middleware 12c Oracle home by the Infrastructure installer.

Oracle WebLogic Server

- The Oracle WebLogic Server is a scalable, enterprise-ready Java Platform, Enterprise Edition (Java EE) application server.
- The Oracle WebLogic Server infrastructure supports the deployment of many types of distributed applications and is an ideal foundation for building applications based on SOA.
- Java EE is a widely used platform for server programming in the Java programming language.
- The Java EE Platform differs from the standard edition of Java in that it adds libraries which provide functionality to deploy fault-tolerant, distributed, multi-tier Java software, based largely on modular components running on an application server.

Oracle Coherence

- Oracle Coherence provides clustered data management with a fully coherent, single system image (SSI), scalability for both read and write access, fast, transparent failover and failback, linear scalability for storage and processing, no Single-Points-of-Failure (SPOFs) and cluster-wide locking and transactions.
- Built on top of this foundation are the various services that Coherence provides, including database caching, HTTP session management, grid agent invocation and distributed queries.

Oracle HTTP Server

- Oracle HTTP Server is based on Apache HTTP Server infrastructure, and includes modules developed specifically by Oracle.
- The features of single sign-on, clustered deployment, and high availability enhance the operation of the Oracle HTTP Server.
- Oracle HTTP Server has the following components to handle client requests:
  - HTTP listener, to handle incoming requests and route them to the appropriate processing utility.
  - Modules (mods), to implement and extend the basic functionality of Oracle HTTP Server.

Oracle Identity Management

- Oracle Identity Management enables organizations to effectively manage the end-to-end lifecycle of user identities across all enterprise resources, both within and beyond the firewall and into the cloud.
- The Oracle Identity Management platform delivers scalable solutions for identity governance, access management and directory services.
- This modern platform helps organizations strengthen security, simplify compliance and capture business opportunities around mobile and social access.

Oracle Data Integrator

- Oracle Data Integrator provides a fully unified solution for building, deploying, and managing complex data warehouses or as part of data-centric architectures in a SOA or business intelligence environment.
- In addition, it combines all the elements of data integration — data movement, data synchronization, data quality, data management, and data services—to ensure that information is timely, accurate, and consistent across complex systems.
- Oracle Data Integrator features an active integration platform that includes all styles of data integration: data-based, event-based and service-based.
- ODI unifies silos of integration by transforming large volumes of data efficiently, processing events in real time through its advanced Changed Data Capture (CDC) capability, and providing data services to the Oracle SOA Suite.
- It also provides robust data integrity control features, assuring the consistency and correctness of data.
- With powerful core differentiators — heterogeneous E-LT, Declarative Design and Knowledge Modules — Oracle Data Integrator meets the performance, flexibility, productivity, modularity and hot-pluggability requirements of an integration platform.

Oracle SOA Suite

- Service Oriented Architecture (SOA) provides an enterprise architecture that supports building connected enterprise applications to provide solutions to business problems.
- SOA facilitates the development of enterprise applications as modular business web services that can be easily integrated and reused, creating a truly flexible, adaptable IT infrastructure.
- Oracle SOA Suite provides a complete set of service infrastructure components for designing, deploying, and managing composite applications.
- Oracle SOA Suite enables services to be created, managed, and orchestrated into composite applications and business processes.
- Composites enable you to easily assemble multiple technology components into one SOA composite application.
- Oracle SOA Suite plugs into heterogeneous IT infrastructures and enables enterprises to incrementally adopt SOA.

Oracle Business Process Management Suite

- Oracle BPM Suite provides an integrated environment for developing, administering, and using business applications centered around business processes.
- Oracle BPM Suite provides a seamless integration of all stages of the application development lifecycle from design-time and implementation to runtime and application management.
- Oracle BPM Suite is layered on Oracle SOA Suite and shares many of the same product components.

Oracle Traffic Director

- Oracle Traffic Director is a fast, reliable, and scalable layer-7 software load balancer.
- You can set up Oracle Traffic Director to serve as the reliable entry point for all HTTP, HTTPS and TCP traffic to application servers and web servers in the back end.
- Oracle Traffic Director distributes the requests that it receives from clients to servers in the back end based on the specified load-balancing method, routes the requests based on specified rules, caches frequently accessed data, prioritizes traffic, and controls the quality of service.
- The architecture of Oracle Traffic Director enables it to handle large volumes of application traffic with low latency.
- The product is optimized for use in Oracle Exalogic Elastic Cloud and Oracle SuperCluster.

Oracle WebCenter Content

- Oracle WebCenter Content can help a corporation unify, manage, and leverage all types of content across the entire enterprise.
- All corporate lines of business such as marketing, brand management, web presence, accounting, sales, human resources, and engineering can share the same tools and easily access the same information in a common repository.
- By centralizing information and allowing access to information by qualified users, Oracle WebCenter Content provides cost savings, eliminates redundancy and increases efficiency.
- At the same time, information is properly managed, tracked, and disposed of as needed.

Oracle WebCenter Portal

- Oracle WebCenter Portal is an integrated set of components with which you can create social applications, enterprise portals, collaborative communities, and composite applications, built on a standards-based, service-oriented architecture.
- Oracle WebCenter Portal combines dynamic user interface technologies with which to develop rich internet applications, the flexibility and power of an integrated, multichannel portal framework, and a set of tools and services that provide content, collaboration, presence and social networking capabilities.
- Based on these components, Oracle WebCenter Portal also provides an out-of-the-box enterprise-ready customizable application called WebCenter Portal, with a configurable work environment that enables individuals and groups to work and collaborate more effectively.

Oracle BI Enterprise Edition

- Oracle BI Enterprise Edition (sometimes simply referred to as Oracle Business Intelligence) provides a full range of business intelligence capabilities.
- These capabilities enable you to:
  - • Collect up-to-date data from your organization.
  - • Present the data in easy-to-understand formats (such as tables and graphs).
  - • Deliver data in a timely fashion to the employees in your organization.
- These capabilities enable your organization to make better decisions, take informed actions, and implement more-efficient business processes.

Oracle Forms Services

- Oracle Forms is used to develop and deploy Forms applications.
- The Forms applications provide a user interface to access Oracle Database in an efficient and tightly-coupled way.
- The applications can be integrated with Java and web services to take advantage of service-oriented architecture (SOA).

Using Oracle Fusion Middleware Tools

Using Oracle Fusion Middleware Tools

- About the Installation and Configuration Tools
  - Oracle Universal Installer
  - Repository Configuration Utility
  - OPatch
  - Configuration Wizard
  - Reconfiguration Wizard
  - Upgrade Assistant
- About the Administration Tools
  - Oracle Enterprise Manager Fusion Middleware Control
  - Oracle WebLogic Server Administration Console
  - Oracle WebLogic Scripting Tool (WLST)
  - Oracle Enterprise Manager Cloud Control
- About the Development Tools
  - Oracle JDeveloper
  - Oracle Application Development Framework
  - Oracle TopLink

Oracle Universal Installer

- Oracle Universal Installer (OUI) is a Java-based installer that enables you to install and deinstall Oracle components.
- It performs component-based installations as well as complex installations, such as integrated bundle and suite installations, and installations over the Web.
- One of the key features of OUI is that it provides a prerequisite checking tool to diagnose the readiness of an environment for installation.
- The prerequisite checks are run as part of the installation process, but can also be run as a separate application.

Repository Configuration Utility

- Many of the Oracle Fusion Middleware components require the existence of schemas in a database prior to installation.
- These schemas are created and loaded in your database using the Repository Creation Utility (RCU).

OPatch

- OPatch is a utility that assists you with the process of applying interim patches to Oracle's software.
- OPatch is a Java-based utility that can run on either OUI-based Oracle homes or standalone homes.
- It works on all operating systems for which Oracle releases software.

Configuration Wizard

- The Configuration Wizard creates the appropriate directory structure for a WebLogic Server domain or a standalone domain, a domain configuration file, and scripts you can use to start the servers in the domain.
- The Configuration Wizard guides you through the process of creating or updating a domain for your target environment by selecting the product components to include in your domain, or by selecting template JAR files.
- If necessary, you can also customize the domain to suit your environment by adding and configuring Managed Servers, clusters, and machine definitions, or customizing predefined JDBC data sources and JMS file store directories.

Reconfiguration Wizard

- The Reconfiguration Wizard reconfigures an existing WebLogic Server domain, which was created using a prior release.
- The following items are automatically updated, depending on the applications in the domain:
  - • WLS core infrastructure
  - • Domain version
- If your domain also includes Oracle Fusion Middleware products, other items may also be updated, depending on the particular product.
- This lets you take advantage of new features that are included with the newest version of Oracle Fusion Middleware.

Upgrade Assistant

- The Upgrade Assistant automates the upgrade of many aspects of the Oracle Fusion Middleware environment.
- The Oracle Fusion Middleware upgrade Assistant guides you through the process of upgrading from previous versions.

Oracle Enterprise Manager Fusion Middleware Control

- Oracle Enterprise Manager Fusion Middleware Control (Fusion Middleware Control) is a Web browser-based, graphical user interface that you can use to monitor and administer a domain.
- It can manage the Administration Server, Managed Servers, clusters, and the Oracle Fusion Middleware

Oracle WebLogic Server Administration Console

- Oracle WebLogic Server Administration Console is a Web browser-based, graphical user interface that you use to manage an Oracle WebLogic Server domain.
- It is accessible from any supported Web browser with network access to the Administration Server.
- Use the Administration Console to:
  - Configure, start, and stop Oracle WebLogic Server instances
  - Configure Oracle WebLogic Server clusters
  - Configure Oracle WebLogic Server services, such as database connectivity (JDBC) and JMS messaging
  - Configure security parameters, including creating and managing users, groups, and roles
  - Configure and deploy Java EE applications

Oracle WebLogic Scripting Tool (WLST)

- The Oracle WebLogic Scripting Tool (WLST) is a command-line scripting environment that you can use to create, manage, and monitor Oracle WebLogic Server domains and standalone domains.
- It is based on the Java scripting interpreter, Jython.
- In addition to supporting standard Jython features such as local variables, conditional variables, and flow control statements, WLST provides a set of scripting functions (commands) that are specific to Oracle WebLogic Server and Oracle Fusion Middleware components.
- You can extend the WebLogic scripting language to suit your needs by following the Jython language syntax.
- You can use any of the following techniques to invoke WLST commands:
  - • Interactively, on the command line
  - • In script mode, supplied in a file
  - • Embedded in Java code

Oracle Enterprise Manager Cloud Control

- Oracle Enterprise Manager Cloud Control provides a comprehensive management solution for Oracle WebLogic Server, Oracle Fusion Middleware, non-Oracle middleware technology, and lifecycle management including configuration management, compliance management, provisioning, and patching.
- Cloud Control encompasses out-of-the-box availability and performance monitoring, robust diagnostics, configuration management, and lifecycle management across middleware software such as Oracle WebLogic Server, Oracle Coherence, and Oracle HTTP Server.

Oracle JDeveloper

- Oracle JDeveloper is an integrated development environment (IDE) for building applications, such as SOA applications, using the latest standards for Java, XML, Web services, and SQL.
- It supports the complete development lifecycle with integrated features for modeling, coding, debugging, testing, profiling, tuning, and deploying applications.
- Oracle JDeveloper is the main development platform for the Oracle Fusion Middleware suite of products.
- It is a cross-platform IDE that runs on Windows, Linux, Mac OS X, and other UNIX-based systems.
- Oracle JDeveloper provides a visual and declarative development approach and works together with the Oracle ADF to simplify development.

Oracle Application Development Framework

- Oracle ADF is an end-to-end application framework that builds on Java EE standards and open-source technologies to simplify and accelerate implementing service-oriented-applications.
- Oracle ADF is suitable for enterprise developers who want to create applications that search, display, create, modify, and validate data using Web, wireless, desktop, or Web services interfaces.
- Used in tandem, Oracle JDeveloper and Oracle ADF provide an environment that covers the full development lifecycle from design to deployment, with drag-and-drop data binding, visual UI design, and team development features built in.

Oracle TopLink

- Oracle TopLink is an advanced, object-persistence and object-transformation framework that provides development tools and run time capabilities that reduce development and maintenance efforts, and increase enterprise application functionality.
- Oracle TopLink builds high-performance applications that store persistent object-oriented data in a relational database.
- It successfully transforms object-oriented data into either relational data, or Extensible Markup Language (XML) elements.

Q/A?

- https://docs.oracle.com/en/middleware/lifecycle/12.2.1.3/ascon/toc.htm
- https://docs.oracle.com/en/middleware/
- https://tinyurl.com/webvalto