White Paper

Provisioning Oracle Fusion Applications on the Cisco Unified Computing System

June 2012

Contents

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Introduction

This document provides an overview of the Oracle Fusion Applications provisioning process on the Cisco Unified Computing System™ (Cisco UCS™) platform. Provisioning is the act of installing, configuring, deploying, and removing Oracle Fusion Application components. Given the number of Oracle Fusion Middleware components, as well as the number of dependencies among Oracle Fusion Application products, the goal of the provisioning framework is to limit the need to install and configure these items manually.

The provisioning process mandates definition of the application topology, which includes selecting the Oracle Fusion Application you want to provision, the number of servers, the IP address and host name for each component, etc. At the end of the provisioning process, the system is operational, and an Oracle Fusion Application administrator will be able to log in to the application and begin the process of application functional configuration through the Oracle Fusion Functional Setup Manager application (beyond the scope of this document).

Disclaimer: Please note that the information provided here is based on a sample installation environment of Oracle Fusion Applications that was performed in a lab and is not a production-type environment. This document is for reference only and is not a replacement for the Oracle Fusion Applications Technology Documentation library (available for download at the Oracle Software Delivery Cloud), but must be used in conjunction with it.

Background

Cisco Unified Computing System Overview

Cisco Unified Computing System is the first truly unified data center platform that combines industry-standard, x86-architecture blade and rack servers with networking and storage access in a single system. The system uses a wire-once architecture with a self-aware, self-integrating, intelligent infrastructure that eliminates the time-consuming, manual, error-prone assembly of components into systems. Cisco UCS is built using the components illustrated in Figure 1.

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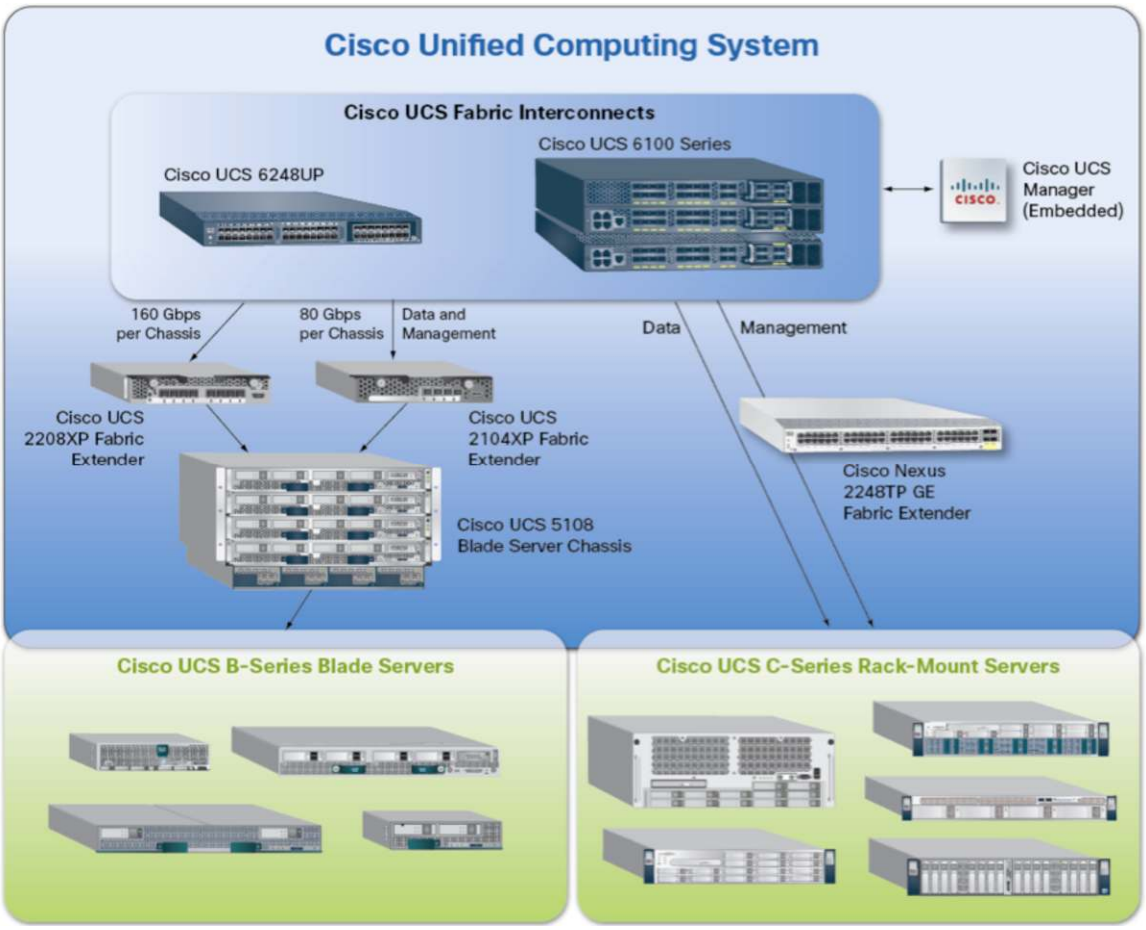
Figure 1. Cisco Unified Computing System Architecture



Cisco UCS Fabric Interconnects

Fabric interconnects provide a single point for connectivity and management for the entire system. Typically deployed as an active-active pair, the system's fabric interconnects integrate all components into a single, highly available management domain controlled by Cisco UCS Manager. The fabric interconnects manage all I/O efficiently and securely at a single point, resulting in deterministic I/O latency regardless of a server or virtual machine's topological location in the system.

Cisco UCS 6120XP 20-Port and 6140XP 40-Port Fabric Interconnects offer 20 or 40 fixed ports and one expansion module slot. These low-latency, line-rate interconnects provide all of the necessary downstream bandwidth to the solution's blade server chassis. They can connect upstream to standard Ethernet switches and storage systems. The fabric interconnects' cut-through architecture and jumbo frame capacity reduce latency and increase bandwidth to 10 Gigabit Ethernet-equipped storage systems such as EMC VNX storage systems. A fabric interconnect's capacity can be extended by populating its expansion module slot with one of four modules that increases 10 Gigabit Ethernet connectivity, connects to native Fibre Channel networks at up to 8 Gbps, or both.

Cisco UCS 6200 Series Fabric Interconnects support the system's 10-Gbps unified fabric with low-latency, lossless, cut-through switching that supports IP, storage, and management traffic using a single set of cables. The fabric interconnects offer virtual interfaces that terminate both physical and virtual connections equivalently,

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establishing a virtualization-aware environment in which blades, rack servers, and virtual machines are interconnected using the same mechanisms. The Cisco UCS 6248UP 48-Port Fabric Interconnect is a on rack-unit (1RU) fabric interconnect that offers up to 48 universal ports that can support 10 Gigabit Ethernet, Fibre Channel over Ethernet (FCoE), or native Fibre Channel connectivity. The Cisco UCS 6296UP packs 96 universal ports into only 2RUs.

Cisco Fabric Extenders

The fabric extenders are zero-management, low-cost, low-power-consumption devices that distribute the system's connectivity and management planes to rack and blade chassis to scale the system without complexity. Designed never to lose a packet, Cisco® fabric extenders eliminate the need for top-of-rack (ToR) switches and blade-server-resident Ethernet and Fibre Channel switches and management modules, dramatically reducing infrastructure cost per server.

Cisco UCS Fabric Extenders bring the unified fabric and management planes into Cisco UCS 5108 Blade Server Chassis. Typically deployed in pairs, each device brings up to 80 Gbps of bandwidth to the blade server chassis, for a total of up to 160 Gbps across up to eight servers. Each half-width blade has access to up to 80 Gbps of bandwidth.

Cisco UCS 2104XP Fabric Extenders each bring up to 40 Gbps of throughput to the blade server chassis, for a total of up to 80 Gbps per chassis. A pair of these fabric extenders supplies 40 Gbps of network connectivity per half-width blade.

Cisco Nexus® 2232PP 10GE Fabric Extenders extend the unified fabric and management planes to racks for connecting rack servers to the system. Cisco Nexus fabric extenders provide a simple, low-cost alternative to ToR switching, supporting rack-at-a-time server deployment without adding a single management point to the system. Today, separate data and management cables connect servers to the fabric extenders within each rack, with both data and management planes carried over a single set of cables to the fabric interconnects. Cisco server innovations prepare Cisco UCS C-Series Rack-Mount Servers for future one-wire management in which both data and management planes are carried over a single cable with racks.

Cisco UCS Blade Chassis and Racks

Cisco UCS blade chassis and racks act as containers for the system components.

The Cisco UCS 5100 Series Blade Server Chassis features flexible bay configurations that can support up to eight half-width blades or up to four full-width blades in a compact 6RU form factor. The blade chassis is a highly simplified device that contrasts with traditional blade chassis, which host multiple switches and management modules. The chassis adds no points of management to the system, because it is logically part of the fabric interconnects. The Cisco UCS 5100 Series chassis hosts up to two fabric extenders, low-power-consumption devices that provide the chassis with the power budget and airflow needed to support multiple future generations blade servers and network connectivity options. The blade chassis can be configured with up to four N+1 and N+N 2500-watt (W) grid-redundant power supplies that are designed for 92 percent efficiency and to deliver high efficiency at low power draws.

Cisco UCS racks are standard 19-inch racks that are optimized to house both Cisco UCS blade chassis and rack servers in the same physical chassis, providing the excellent flexibility needed to expand a system using the server form factor most appropriate for the task.

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Cisco UCS Servers

Delivering performance, versatility, and density in servers designed without compromise, Cisco UCS servers power every workload, including network infrastructure applications, virtualization, cloud computing, high-performance computing (HPC), high-frequency trading, big data, and mission-critical enterprise applications and database management systems. Powered by the latest Intel Xeon processors, Cisco UCS servers form the core of a flexible and efficient data center that meets diverse business needs with a balanced combination of performance, built-in capabilities, and cost effectiveness. Cisco UCS is platform neutral, with the capability to incorporate both rack and blade servers into a single unified system.

Cisco UCS C-Series Rack-Mount Servers provide a rack-server entry point to Cisco UCS. With world-record-setting performance for two- and four-socket servers, the Cisco C-Series incorporates the capability to integrate as part of Cisco UCS and innovations such as Cisco Extended Memory Technology. Cisco UCS rack servers provide a wide range of I/O, memory, internal disk, and SSD capacity for ease of matching servers to workloads.

Cisco UCS B-Series Blade Servers provide a comprehensive line of two- and four-socket servers to deliver world-record-setting performance to a wide range of workloads. Cisco offers the first server anywhere with built-in programmable I/O capacity in which the number and type of I/O devices can be configured on demand to satisfy the needs of almost any operating system or hypervisor. Cisco innovations embodied in Cisco UCS blade servers include patented Cisco Extended Memory Technology, one of the reasons that Cisco has a history of leading the market with some of the greatest memory capacity among blade servers. Among the many vendors offering servers based on Intel Xeon processors, only Cisco unleashes their full power with a balance of memory and I/O capacity that does not hold the system back.

Cisco UCS Virtual Interface Cards

Cisco UCS virtual interface cards (VICs) provide up to 256 I/O interfaces that are configured on demand to meet operating system, hypervisor, and application needs. Available in PCIe, mezzanine, and modular LAN on motherboard (mLOM) form factors, Cisco VICs can be configured with any combination of Ethernet network interface cards (NICs) and Fibre Channel host bus adapters (HBAs), carrying I/O traffic securely and with individual quality-of-service (QoS) controls directly to the system’s fabric interconnects. Cisco VICs support up to 80 Gbps of network connectivity, with hardware PortChannels maintaining traffic flow over a set of active-active links.

Acting as an adapter fabric extender, the cards connect fabric interconnect ports directly to operating systems and hypervisors. With Cisco Data Center Virtual Machine Fabric Extender (VM-FEX) technology, the cards connect fabric interconnect ports directly to individual virtual machines, offering exceptional visibility and control over virtual machine networking while eliminating up to two layers of switching that other solutions require.

Integrated and Embedded Management with Cisco Service Profiles

Traditional solution architectures involve the manual assembly of components, with management as an add-on afterthought. Management servers and networks must be assembled, configured, and maintained. Blade chassis contain multiple management systems that must be wired and configured and firmware that must be kept up-to-date. Individual element managers must be used to configure system components, including RAID controller settings and firmware, BIOS firmware and settings, firmware revisions, and settings for network components including NICs, HBAs, and blade-server-resident switches. Although some vendors claim that this scenario constitutes integrated management, if it requires a management server and manual configuration, the approach is not integrated.

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Cisco UCS uses true integrated, centralized, embedded management. Cisco UCS Manager resides on the Cisco UCS 6100 Series Fabric Interconnects and operates with high availability when two fabric interconnects are used, as they are in Oracle Fusion Middleware 11g. Logically, every system component is aggregated into the system and managed as if it were part of the fabric interconnects. Physically, components are distributed among data center racks and blade server chassis. Cisco UCS Manager acts as an element manager that allows every component to be configured from a single pane. For organizations that want to integrate Cisco UCS with higher-level management tools, Cisco UCS Manager can export configuration information for use by ITIL processes (including configuration-management databases). It also offers a robust XML API to facilitate deep integration with broader systems management tools.

Cisco UCS Manager offers flexible, role-based management that helps organizations make more efficient use of their limited administrator resources by allowing administrators to focus on defining policies to provision computing infrastructure and network connectivity, automating the actual provisioning. Cisco UCS Manager uses Cisco service profiles to provision servers and their I/O properties.

The system and its resources are stateless, and Cisco service profiles contain all the information needed to fully define and provision a server (Figure 2), including RAID levels, BIOS settings, firmware revisions and settings, adapter identities and settings, VLAN and VSAN network settings, network QoS, and data center connectivity. Oracle Fusion Middleware 11g uses predefined, downloadable service profiles that provision each of the solution's server components, allowing the solution to be deployed rapidly and accurately in minutes, rather than the days and weeks required when all the data center subject-matter experts must use individual element managers to configure each component in their domains.

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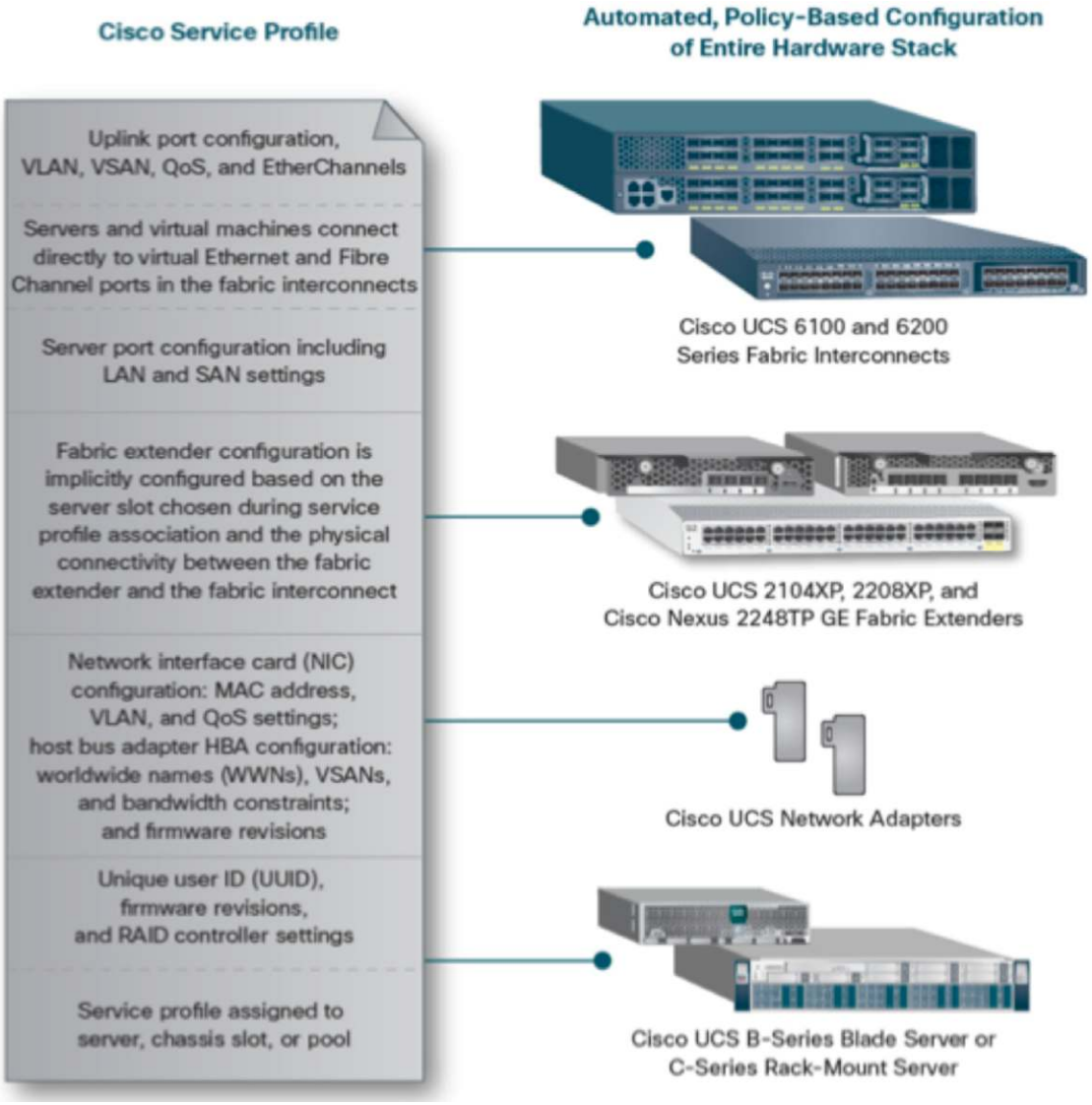
Figure 2. Cisco Service Profiles Provide Automatic, End-to-End Configuration of the Entire Hardware Stack



Cisco service profiles provide immense benefit to the solution. They reduce the time-consuming, error-prone, manual assembly of components to a policy-based click-of-the-mouse operation. They accelerate infrastructure scaling by allowing organizations to add incremental resources and put them to work more quickly and accurately. Servers can be pooled, and service profiles can be assigned to specific slots, so that any server inserted into the slot is provisioned and put to work automatically. Service profiles enable true workload portability so that if a server upgrade is required, an existing service profile can be applied to the upgraded server and put into service within minutes. Service profiles also reduce the number of spares that an organization needs to maintain, because a single spare can be put to any use rapidly simply by invoking the applicable service profile.

Virtualization-Optimized Computing Resources

Achieving the best price-to-performance ratio in a virtual desktop environment requires an efficient, scalable, virtualization-optimized infrastructure that is optimized for the unique workload requirements of virtualized environments. Oracle Fusion Middleware 11g is implemented using Cisco B-Series Blade Servers housed in Cisco

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UCS 5108 Blade Server Chassis. Some of the blade servers used in the solution use Cisco Extended Memory Technology, which provides up to 384 GB of memory in a two-socket server. The servers use Cisco VICs, which accelerate I/O in virtualized environments while increasing visibility and control over virtual machine network traffic.

The blade chassis are 6RU devices that have removable partitions to allow them to contain up to eight half-width blade servers or up to four full-width blade servers. Every component except the midplane is customer replaceable. Efficient power supplies are configurable as nonredundant, N+1 redundant, or grid redundant; the chassis' eight fans are hot swappable, all cables enter from the rear of the chassis, and all blade servers are accessible from the front panel.

Cisco UCS B250 M2 Extended Memory Blade Server

The Cisco UCS B250 M2 Extended Memory Blade Servers use the patented Cisco Extended Memory Technology. This Cisco technology provides more than twice as much industry-standard memory (384 GB) as traditional two-socket servers, increasing performance and capacity for demanding virtualization and large-data- set workloads. Alternatively, this technology offers a more cost-effective memory footprint for less-demanding workloads.

The Cisco UCS B250 M2 Extended Memory Blade Server increases performance and capacity for demanding virtualization and large-data-set workloads. The server is a full-width, two-socket blade server with substantial throughput and more than twice the memory capacity of other Intel Xeon 5600 series-based two-socket servers. It takes advantage of the most advanced Samsung 40 nm DDR3 ultra low power memory technology. A Cisco UCS 5108 Blade Server Chassis can house up to four Cisco UCS B250 M2 Extended Memory Blade Servers, with a maximum of 160 per Cisco Unified Computing System.

The Cisco UCS B250 M2 features Cisco's patented Extended Memory Technology. This Cisco technology provides more than twice as much energy-efficient, high performance memory (384 GB) as traditional two- socket servers, increasing performance and capacity for demanding virtualization and large-data-set workloads. Alternatively, this technology offers a more cost-effective memory footprint for less-demanding workloads through the use of industry-leading Samsung 40 nm DDR3 memory.

The Cisco UCS B250 M2 is designed to increase performance, energy efficiency, and flexibility for demanding virtualized and nonvirtualized applications. Based on Intel Xeon 5600 series processors, Cisco UCS B-Series Blade Servers adapt processor performance to application demands and intelligently scale energy use based on utilization.

Each Cisco UCS B250 M2 uses network adapters for consolidated access to the unified fabric. This design reduces the number of adapters, cables, and access-layer switches needed for LAN and SAN connectivity. This Cisco innovation can significantly reduce capital and operating expenses, including administrative overhead, power, and cooling costs. Network adapter choices include adapters optimized for virtualization, compatibility, and efficient, high-performance Ethernet.

Cisco UCS B200 M2 Blade Server

The Cisco UCS B200 M2 Blade Server balances simplicity, performance, and density for production-level virtualization and other mainstream data center workloads. The server is a half-width, two-socket blade server with substantial throughput and scalability.

The Cisco UCS B200 M2 is designed to increase performance, energy efficiency, and flexibility for demanding virtualized and nonvirtualized applications. Based on Intel Xeon 5600 series processors, Cisco UCS B-Series

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Blade Servers adapt processor performance to application demands and intelligently scale energy use based on utilization.

Each Cisco UCS B200 M2 uses network adapters for consolidated access to the unified fabric. This design reduces the number of adapters, cables, and access-layer switches needed for LAN and SAN connectivity. This Cisco innovation can significantly reduce capital and operating expenses, including administrative overhead, power, and cooling costs. Network adapter choices include adapters optimized for virtualization, compatibility, and efficient, high-performance Ethernet.

Cisco Network Adapters

Each Cisco UCS B-Series Blade Server uses Cisco network adapters for consolidated access to the unified fabric. The Cisco UCS B230 M1 can accommodate one mezzanine-format adapter. Oracle Fusion Middleware 11g uses the network adapters most appropriate for the customer's choice of hypervisor. Cisco UCS M81KR VICs are optimized for virtualization and provide up to 128 virtual devices, including any combination of NICs and HBAs.

Note: Cisco VICs were used for desktop virtualization with VMware vSphere and EMC storage.

Virtualized I/O and Cisco Unified Fabric

Virtualized environments are I/O intensive, and best practices for software such as the VMware vSphere hypervisor require the use of separate, redundant NICs and HBAs for functions including VMware vmconsole, vmkernel, and vMotion; virtual machine traffic; and storage access. In traditional server environments, this practice requires equipping each server with the appropriate number of interfaces and cabling each one to upstream Ethernet and Fibre Channel switches. At this point, the server is for all practical purposes dedicated to a single function for its entire lifecycle because of the time and complexity required to equip it to run different applications.

Cisco UCS is stateless down to the type and number of I/O devices installed in a server, allowing just-in-time provisioning of such fundamental characteristics as I/O interfaces. This capability accelerates virtual infrastructure deployment, supports true workload portability, and extends the lifecycle of servers because they can be repurposed simply by applying a different Cisco service profile. This virtualized I/O capability is enabled by the Cisco UCS M81KR VIC, which can be configured to provide up to 128 virtual devices per server. These are standard PCI devices that appear on the server's PCI bus. The actual number of available interfaces is determined by upstream switch resources. In the context of this solution, the card can support up to 58 virtual devices. A single Cisco VIC can thus support all of a hypervisor's I/O requirements with a single interface. It also can provide superior network throughput because it supports a separate I/O queue for each device.

Oracle Fusion Middleware 11g uses Cisco VN-Link technology to provide exceptional visibility and control over network links connected to hypervisors and virtual machines. Cisco VN-Link technology makes virtual links just as visible and manageable as physical links. Now network security, QoS, and network settings can be applied on a per-virtual-machine basis, and they remain constant regardless of virtual machine location. This capability overcomes the least-common-denominator security that is often applied in virtualized environments to facilitate virtual machine movement.

Unified fabric integrates the system's compute resources with a single network that supports all I/O in the system. This is one of the two keys to simplicity in the system: Cisco Unified Computing System integrates IP, storage, and management networks into a single I/O infrastructure.

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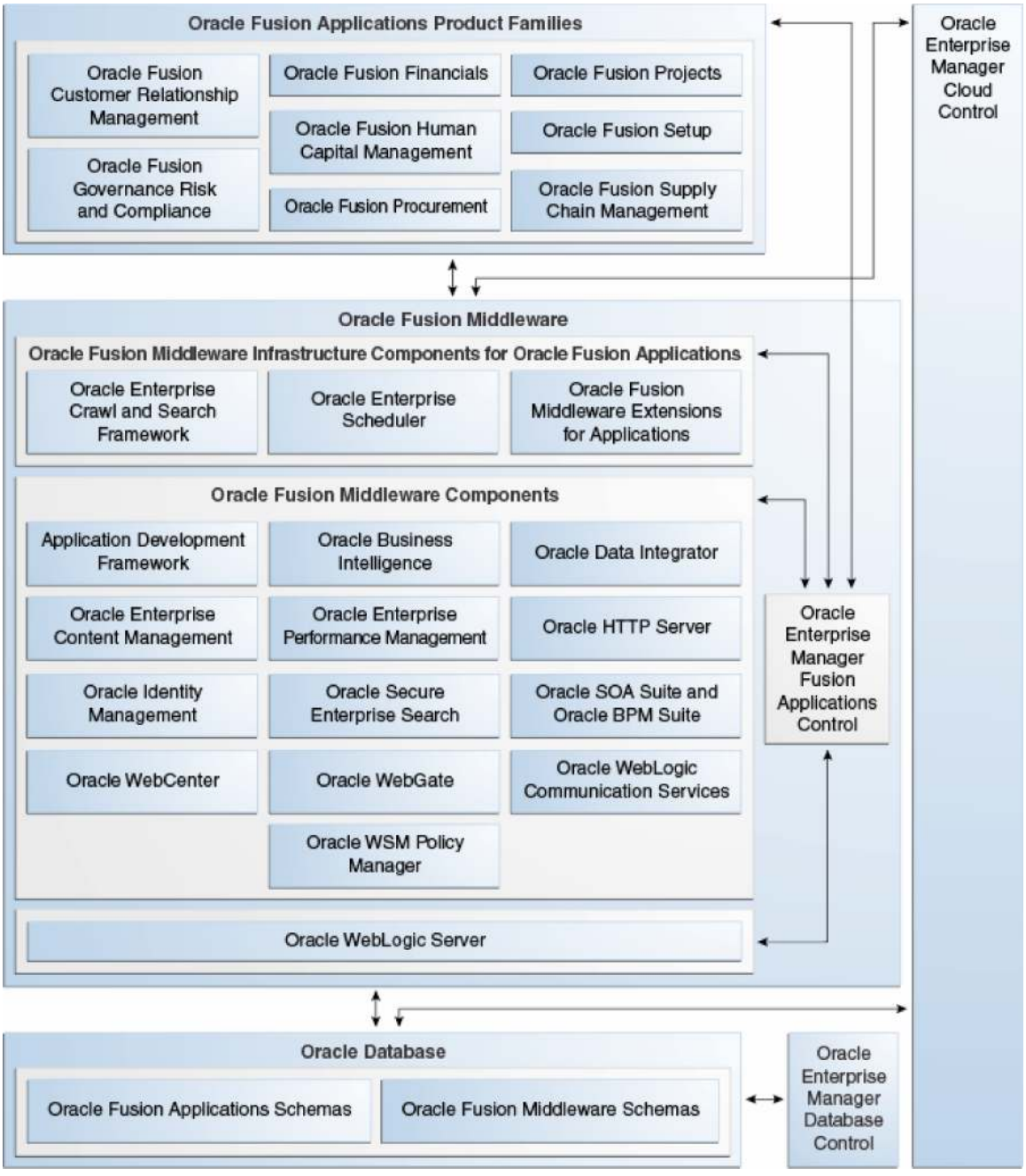
Oracle Fusion Applications Overview

Oracle Fusion Applications is Oracle's next-generation applications suite, built on a service-oriented platform. It brings together next-generation enterprise technologies, applications, and services, including Oracle Fusion Applications and Oracle Fusion Middleware. This section provides an introduction to the architecture, components, and concepts of Oracle Fusion Applications.

Oracle Fusion Applications products are built on the Oracle Fusion Middleware stack and use Oracle Database (Figure 3).

Figure 3. Oracle Fusion Applications Architecture



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Standards-Based Architecture

Oracle Fusion Applications is standards based, making it highly adaptable. This standards-based technology enables organizations to respond effectively to change with flexible, modular, user-focused business software that is powered by best-in-class business capabilities built on open standards. Its technology framework includes the following products:

- Oracle WebCenter provides design and runtime tools for building enterprise portals, transactional websites, and social networking sites.
- Oracle Business Intelligence provides a full range of business intelligence capabilities that enable customers to analyze, present, report, and implement contextual actions for organization data.
- Oracle Universal Content Management enables customers to use document management, web content management, digital asset management; and records retention functions to build and complement their business applications.
- Oracle Service Oriented Architecture (SOA) Suite provides a complete set of service infrastructure components for designing, deploying, and managing SOA composite applications. Oracle SOA Suite enables services to be created, managed, and orchestrated into SOA composite applications.
- Oracle WebLogic Server is a scalable, enterprise-ready application server based on Java Enterprise Edition (Java EE).
- Oracle JDeveloper is an integrated development environment with end-to-end support for the modeling, development, debugging, optimization, and deployment of Java applications and web services.
- Oracle Enterprise Manager offers business-based applications management, integrated application-to-disk management, integrated systems management, and support experience.
- Oracle Identity Management enables organizations to manage the end-to-end lifecycle of user identities and to secure access to enterprise resources and assets.

Use of a standards-based architecture reduces the cost of integration and enables customers to reuse systems and technologies. Standards-based architecture also increases the flexibility of the applications. Customers can fit the applications to their business by configuring not only the user interface, but also the business objects, the business processes, the business logic, and the business intelligence, all using the single integrated Oracle JDeveloper tooling platform.

The ease of managing Oracle Fusion Applications offers a low total cost of ownership (TCO), resulting in a faster return on investment (ROI) through the use of tools for rapid setup and flexible deployment models and providing investment protection for upgrades.

Best-Practices Business Processes

Oracle Fusion Applications incorporates best-practices business processes, including those from Oracle product lines, such as Oracle E-Business Suite, PeopleSoft, Oracle On Demand, JD Edwards, and Siebel, to optimize the user experience and productivity.

The Oracle Fusion Applications user interface facilitates the customer-based, intuitive design of the applications, which results in large productivity gains. The user interface design of Oracle Fusion Applications is:

- Role based, enabling pervasive delivery in multiple modes, on multiple devices, and through multiple channels

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- Configurable and extensible, through Oracle JDeveloper during design or the composer during runtime, enhancing productivity for individual users and groups of users
- Composite and contextual, providing integrated information in the context of processes
- Social and collaborative, offering built-in user communities and workspace, Web 2.0 information distribution, and embedded social computing to improve collaborative work

Specific features of the user interface include:

- Role-based dashboards, which can be configured to meet business needs
- Unified work lists, which list tasks across the applications
- Guided business processes, which are organized sets of tasks that help users get their work done more efficiently
- Embedded analysis methods, which provide the necessary information for completing a task
- Contextual help, which provides conceptual and procedural reference information
- Oracle Fusion Applications Search, which provides a transparent search experience for easily locating and taking action on relevant data
- Tagging, which enables the association of keywords with objects so they can be easily located
- Instant collaboration, which provides the contact information for the people related to users' tasks

Choice of Deployment Options

Oracle Fusion Applications are delivered as a suite, but they can also be adopted gradually because of their modular architecture. In other words, you can adopt Oracle Fusion Applications as a single suite, as product offerings (the highest-level collection of functions that you can license and implement), or as solution sets that work with other Oracle Applications Unlimited product lines depending on the customer's readiness and adoption roadmap, thereby giving customers a choice.

Oracle Fusion Applications is offered with the following deployment options:

- On premises, hosted by the enterprise
- Oracle cloud (available to the general public), hosted over the Internet by Oracle, software as a service (SaaS), or Oracle business partners offering business process outsourcing (BPO) solutions
- On Premise cloud (available internally behind a firewall), hosted as a SaaS or BPO offering
- Hybrid, as a cohesive integrated implementation both on premises and in the cloud

Deployment Topology

Oracle Fusion Applications are deployed as a suite but can also be deployed gradually using a modular approach. Oracle has put together enterprise deployment reference architectures, and as an example Figure 4 shows the overall Oracle Fusion Customer Relationship Management (CRM) reference enterprise deployment topology, to which variations can be applied.

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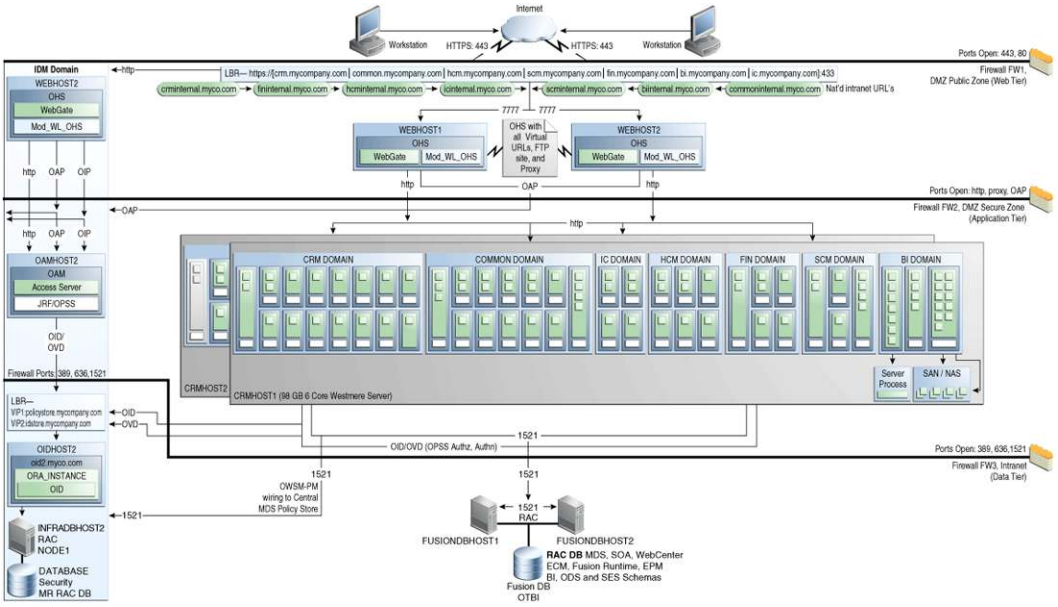
Figure 4. Oracle Fusion CRM Reference Enterprise Deployment Topology



In the topology in Figure 4, the primary node (also known as a host and shown as CRMHOST1 in the figure) is actively running the Oracle Fusion Applications instance. The secondary node (CRMHOST2) is the redundant (high-availability) node for the Oracle Fusion Applications instance. The primary node consists of an administration server and applications that have been deployed to managed servers. Managed servers can be grouped into clusters to provide scalability and high availability for applications. Together, the primary and secondary nodes form a domain.

As shown in Figure 4, the overall Oracle Fusion CRM reference enterprise deployment topology consists of several domains:

- Oracle Fusion CRM domain
- Oracle Fusion Common domain
- Oracle Fusion Financials domain
- Oracle Fusion Human Capital Management (HCM) domain
- Oracle Fusion Supply Chain Management (SCM) domain
- Oracle Fusion Incentive Compensation domain
- Oracle Fusion Business Intelligence domain

Figure 5 shows each domain in detail.

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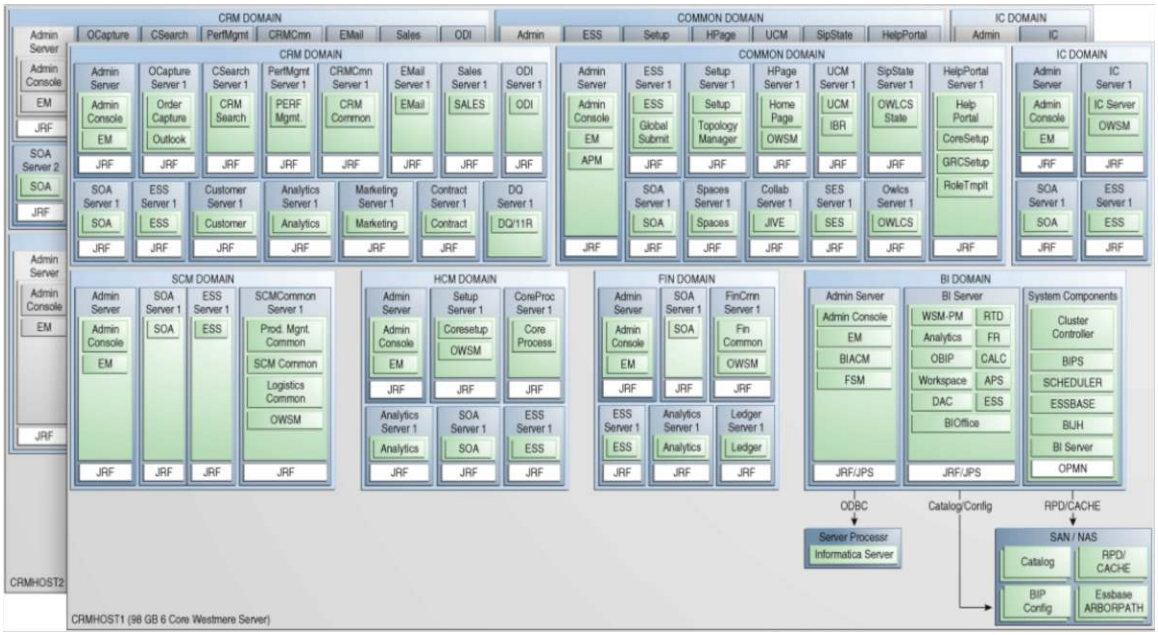
Figure 5. Oracle Fusion CRM Applications Domain Details



Solution Overview

The solution presented here demonstrates the steps required for provisioning the Oracle Fusion HCM application module on to the Cisco UCS platform in a lab environment to illustrate the readiness of the Cisco UCS platform for provisioning Oracle Fusion Applications (all Oracle Fusion Applications products are based on a common standards-based architecture and are deployed in the same way). Please see the disclaimer about the scope and use of this document and refer to the comprehensive Oracle Fusion Applications product documentation at Oracle Software Delivery Cloud.

As already noted, provisioning is the act of installing, configuring, deploying, and removing Oracle Fusion Applications components. Because Oracle Fusion Applications includes a number of Oracle Fusion Middleware components, and because there are multiple dependencies among Oracle Fusion Applications products, the provisioning framework's goal is to limit the need to install and configure these items manually.

Following are the main provisioning goals:

- Install the applications, database, and middleware components required to run Oracle Fusion Applications.
- Use a guided process to gather details about the new environment using an online interview flow. The details collected form the basis for a provisioning plan that you can apply when you are ready to perform the physical installation, configuration, and deployment of the application product offerings that will run in the environment.
- Configure the applications, database, and middleware components and deploy them in the environment.

Cisco Unified Computing System Setup and Configuration

The following are the main hardware and software components used for this setup.

- Hardware
  - 1 full-blade Cisco UCS B250 M2 Extended Memory Blade Server with 192 GB of RAM (UCS6)

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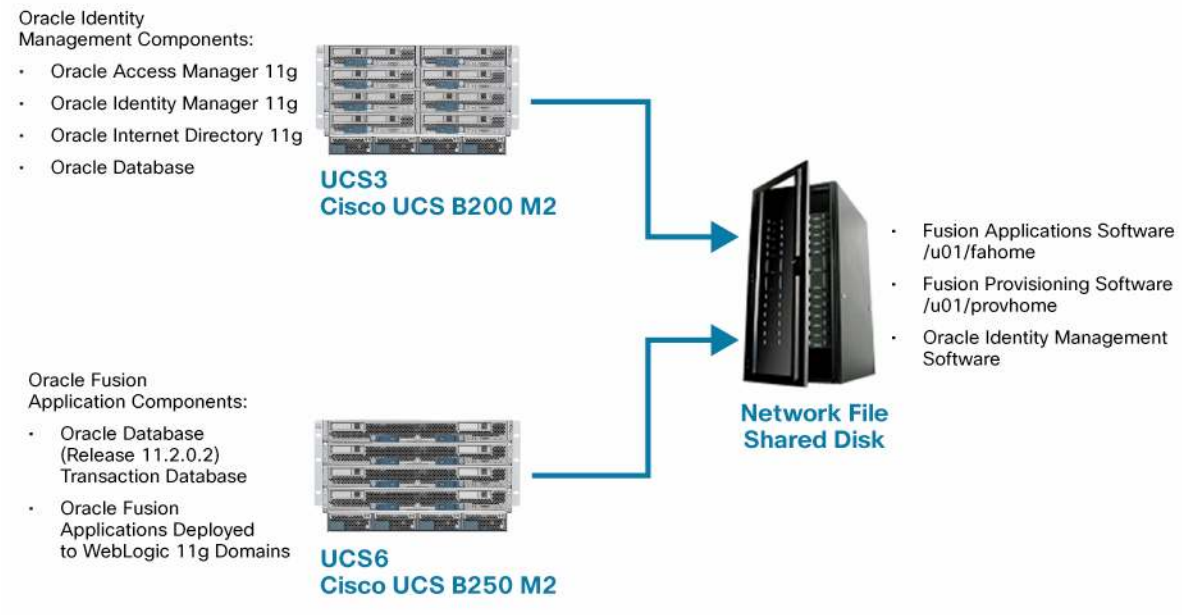
- 1 half-blade Cisco UCS B200 M2 Blade Server with 48 GB of RAM (UCS3)
- Shared storage

- Software
  - Oracle Database 11g (Release 11.2.0.2)
  - Oracle Identity Management 11g (Release 11.1.1.5)
  - Oracle Fusion Applications 11g (deployed to WebLogic domains)
  - Oracle Linux 5.6 (64-bit) (Red hat compatible kernel)

Figure 6 illustrates the setup used for this document.

Figure 6. Solution Installation Setup



Oracle Fusion Applications Provisioning

The Oracle Fusion Applications Media Pack is available for download from the Oracle Software Delivery site. The media pack is a set of zip files that includes the installation software for the Oracle Fusion Applications, Oracle Identity Management, etc. as well as the Oracle Fusion Applications Technology Documentation Library.

Oracle Fusion Applications installation consists of the following four steps:

1. Install and configure the Oracle Identity Management components for the Oracle Fusion Applications environment.
2. Install and configure the Oracle Fusion Applications database.
3. Create the provisioning plan using the interview process graphical tool called Provisioning Wizard.
4. Provision the Applications environment using the Provisioning Wizard tool or the provisioning command-line interface (CLI).

The rest of this section contains detailed information regarding these steps.

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Oracle Identity Management

Oracle Identity Management is a core component and prerequisite for provisioning an Oracle Fusion Applications environment. It enables enterprises to manage the end-to-end lifecycle of user identities across all enterprise resources, both within and outside the firewall. An installation of Oracle Fusion Applications relies on Oracle Identity Management components to provide web single-sign-on (SSO) capability and to act as the policy, credential, and identity store.

The Oracle Identity Management components that must be present in an Oracle Fusion Applications environment are:

- **Oracle Access Manager (OAM):** Provides identity administration and security functions, including web SSO, user self-service and self-registration, policy management, and delegated administration
- **Oracle Identity Manager (OIM):** Coordinates the management activities and business processes for creating, modifying, and deleting user access rights
- **Oracle Virtual Directory (OVD):** A Lightweight Directory Access Protocol (LDAP)-enabled service that provides a virtualized abstraction of one or more enterprise data sources in a single directory view
- **Oracle Internet Directory (OID):** A general-purpose directory service that enables fast retrieval and centralized management of information about dispersed users and network resources

Refer to the Oracle Fusion Middleware Enterprise Deployment Guide for Oracle Identity Management (Oracle Fusion Applications Edition) document, which is part of the Oracle Fusion Applications Technology Documentation Library, and the latest Oracle Fusion Applications release notes, which can be downloaded from the Oracle Support site, to install and configure the following components specifically for use with Oracle Fusion Applications:

- Oracle Database (Release 11.2.0.2) for the policy store and identity store
- Oracle Internet Directory 11g (OID)
- Oracle Virtual Directory 11g (OVD)
- Oracle Identity Manager 11g (OIM)
- Oracle Access Manager 11g (OAM)

Oracle Fusion Applications Database

An installation of Oracle Database 11gR2 Enterprise Edition is required for storing the Oracle Fusion Applications transaction data. This database can be created using the database template that is shipped with the Oracle Fusion Applications software. The template contains the database structure and features, but is not seeded. It is generic for use across platforms.

For a small-scale, single-node database, use the Oracle Fusion Applications Provisioning Wizard and select the Install an Applications Transaction Database option to install a single-node instance of Oracle Database Enterprise Edition. Alternatively, you can install the database manually (interactively) if you are creating a production-scale, multiple-node database. Oracle Fusion Applications also supports Oracle Real Application Clusters (RAC). The Oracle Fusion Applications software provides a repository of installers, each called silently when needed to perform application-specific tasks during the provisioning of a new environment. The Oracle Fusion Applications provisioning installer (**faprov**) is part of this repository of installers, and its purpose is to create the Oracle Fusion Applications provisioning framework, which includes the following components:

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- **Provisioning wizard:** A question-and-answer interview that guides you through the process of installing a database, creating or updating a provisioning plan, and provisioning or deinstalling an Oracle Fusion Applications environment
- **Provisioning CLI:** Interface used to start the wizard and run installation phases on the primary, secondary, and DMZ hosts (when present)
- **Provisioning-related files and utilities:** The Ant utilities, binary files, library files, templates, locations of saved provisioning plans and provisioning build scripts, and other provisioning utilities required for performing provisioning tasks

The high-level database provisioning requirements are:

- Oracle Database 11gR2 Enterprise Edition
- Provisioning framework and Provisioning wizard (described in the preceding paragraphs)
- Preseeded database shipped with Oracle Fusion Applications, containing the applications and middleware schemas, applications seed data, and PL/SQL packages

When you install the database software, you are asked a set of questions about the configuration of the application database. After you answer the questions, the installation wizard performs prerequisite validation checks and returns a list of the checks and status information and a summary of the actions to be performed. At the end of the interview process, the wizard generates and runs the database installer.

The Oracle Fusion Applications Repository Creation Utility (RCU) is a GUI- and CLI-based tool used to create and manage database schemas, seed data, and PL/SQL packages required by Oracle Fusion Applications. You need to run RCU after the relational database system (RDBMS) is installed and configured, and an empty database has been created. The main features of the RCU are:

- **Custom schemas and tablespaces:** The RCU provides the flexibility to create custom schemas and table spaces. Users can change the tablespace allocation so that components can share a single or multiple table spaces.
- **Global and component-level prerequisites:** At runtime, the RCU performs checks against both global and component-level prerequisites. If a prerequisite is not met, the RCU may post a warning and allow the procedure to continue (soft stop), or it will notify the user that a prerequisite must be met before the operation can continue (hard stop).

For this specific installation environment, the Oracle Fusion Applications Provisioning Wizard was used to install the database. Figures 7 though 10 provide sample screen images captured during the database installation using the provisioning wizard.

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Figure 7. Starting the Provisioning Wizard

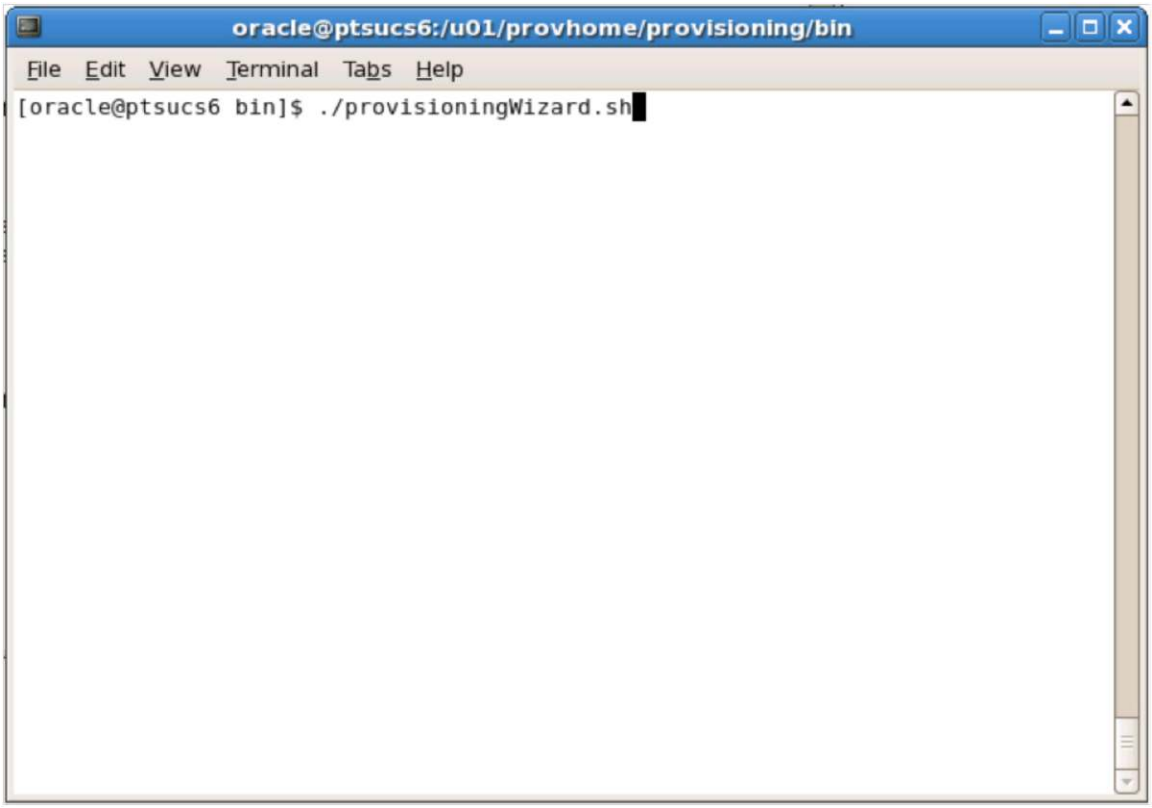

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Figure 8. Welcome Screen

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Figure 9. Installing an Application Transaction Database

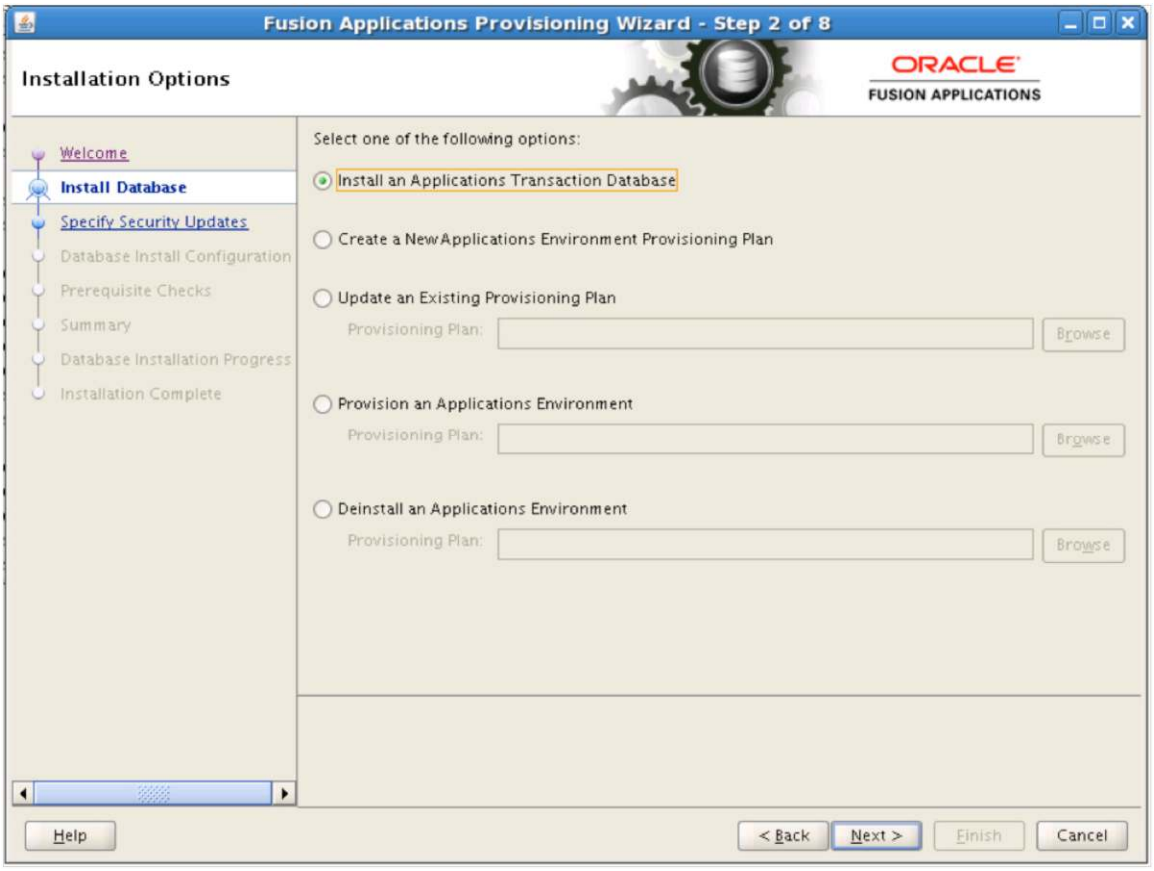

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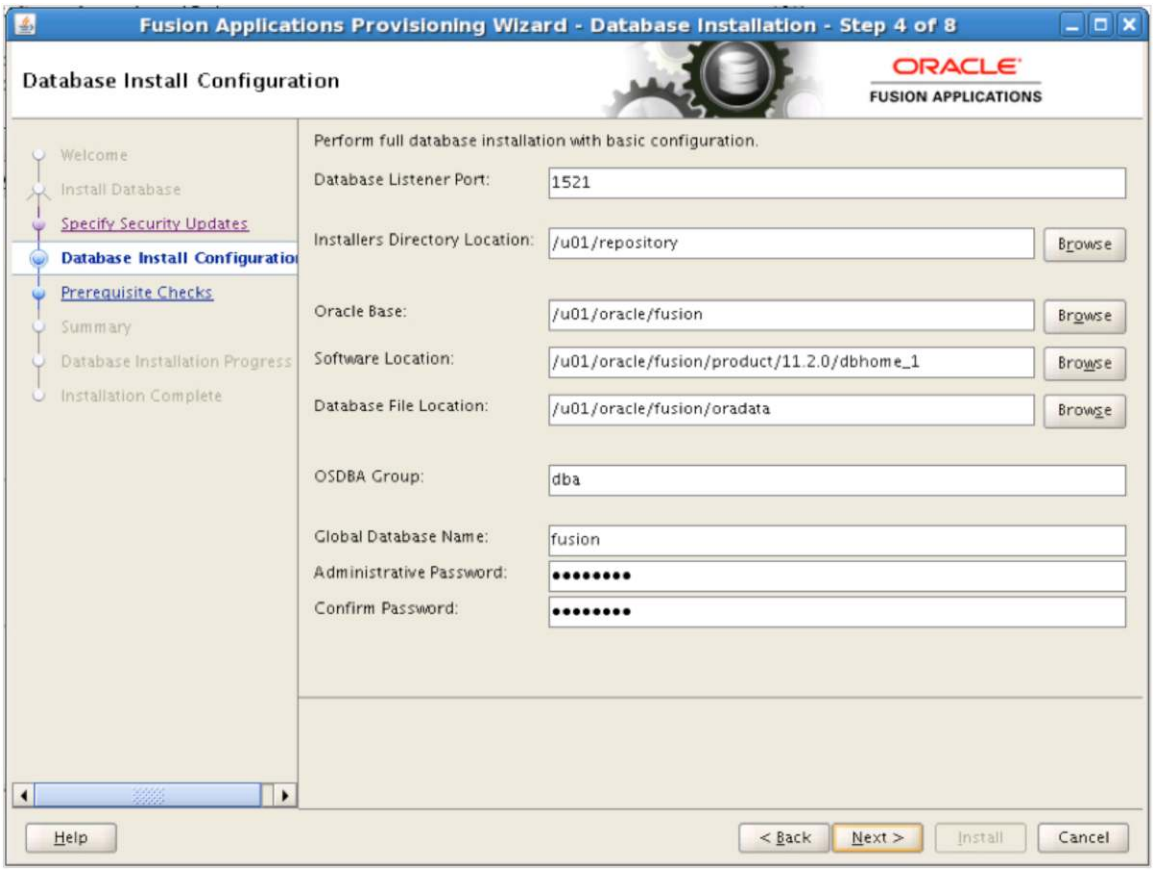
Figure 10. Database Installation Configuration



To complete the database installation, you must use the Oracle Fusion Applications Repository Creation Utility (Applications RCU) to perform the following actions:

- Create Oracle Fusion Middleware schema and tablespace users and define the tables, views, and other artifacts that the schema user owns.
- Create empty tablespaces for Oracle Fusion Applications components and the schema owners. The owners do not own any tables or data initially.

Import default seed data values for the schema users using Oracle Data Pump files.

Creating the Provisioning Plan/Provisioning Response

Create the provisioning plan/provisioning response using the interview process graphical tool called Provisioning Wizard.

Oracle Fusion Applications are logically divided into groups of features known as product offerings. An offering is the highest-level collection of functions that you can choose to license and implement. The features are implemented by one or more products in at least one product line. For example, there are three product offerings associated with the Human Capital Management product family: Workforce Development, Workforce Deployment, and Compensation Management.

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To provision your new environment, you must supply the provisioning engine with the details it needs to perform the physical installation, configuration, and deployment of the product offerings you want to install. This process is managed by the provisioning wizard, which presents an interview screen flow designed to gather the information necessary to perform the installation.

During the interview process, you choose product offerings and then supply details about credentials, application and middleware hosts, ports, and other details as required. This information is stored as a provisioning plan, which you save and apply when you are ready to perform the physical installation and deployment of your product offerings.

The provisioning plan can be created using the script provisioningwizard.sh available in $PORVISIONING_HOME/provisioning/bin.

For this specific installation environment, the Oracle Fusion Applications Provisioning Wizard was used to create a provisioning plan for the Oracle Fusion HCM product offering. Figures 11 through 25 show some sample screen images captured during the creation of the provisioning plan using the provisioning wizard.

Figure 11. Creation of a New Applications Environment Provisioning Plan

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Figure 12. Product Offering Selection

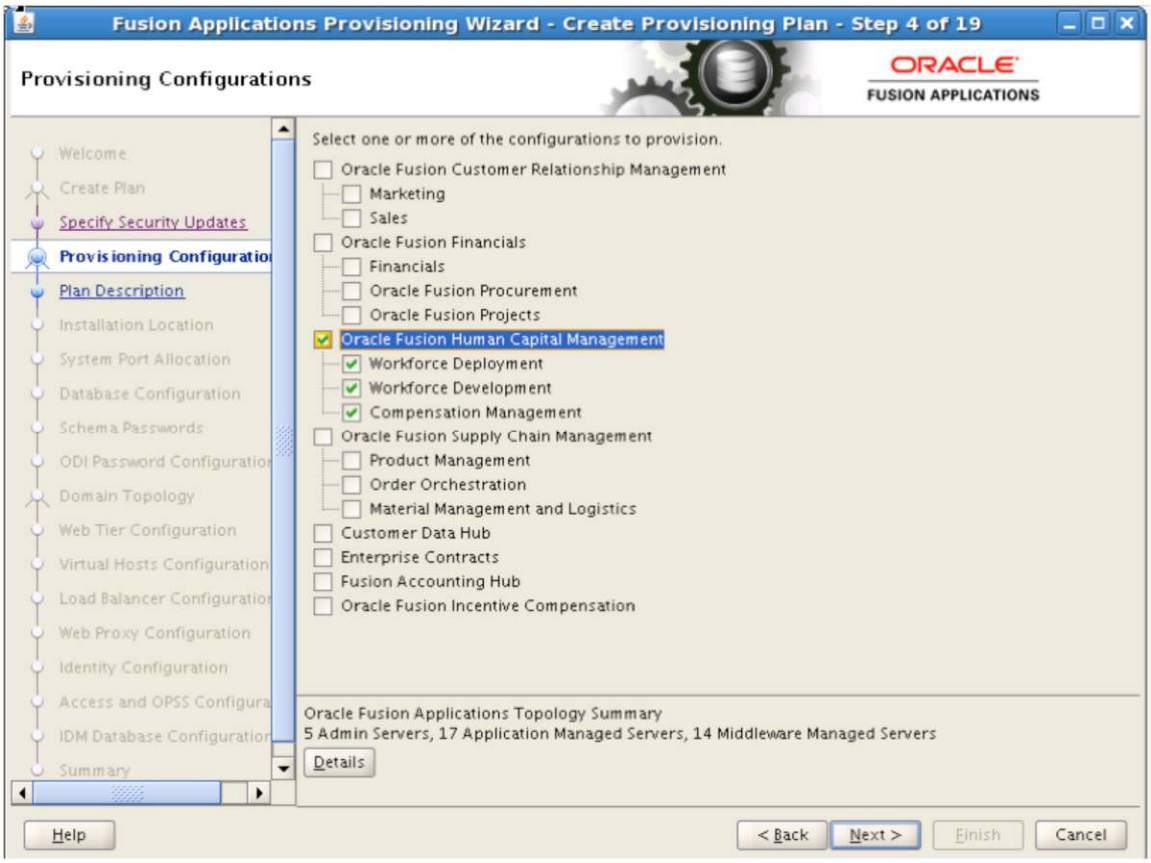

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Figure 13. Installation Location (1)

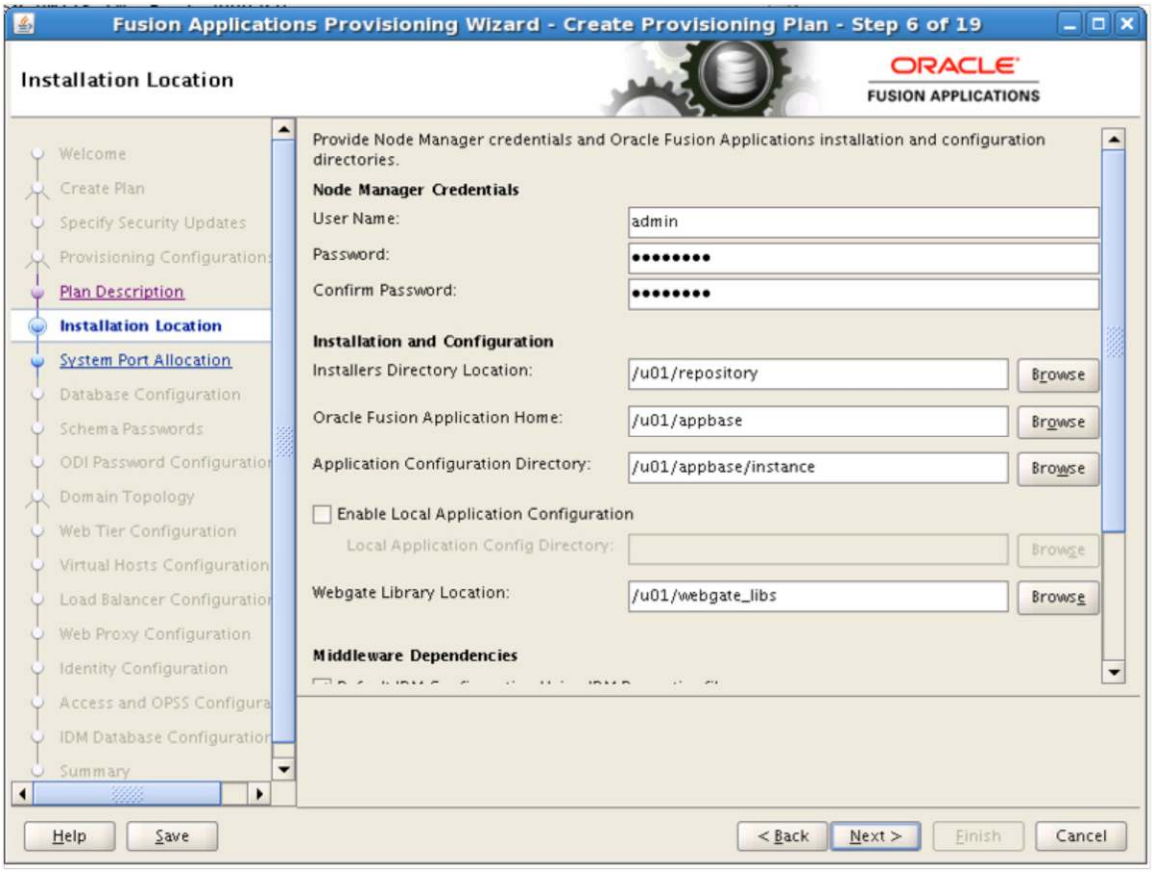

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Figure 14. Installation Location (2)

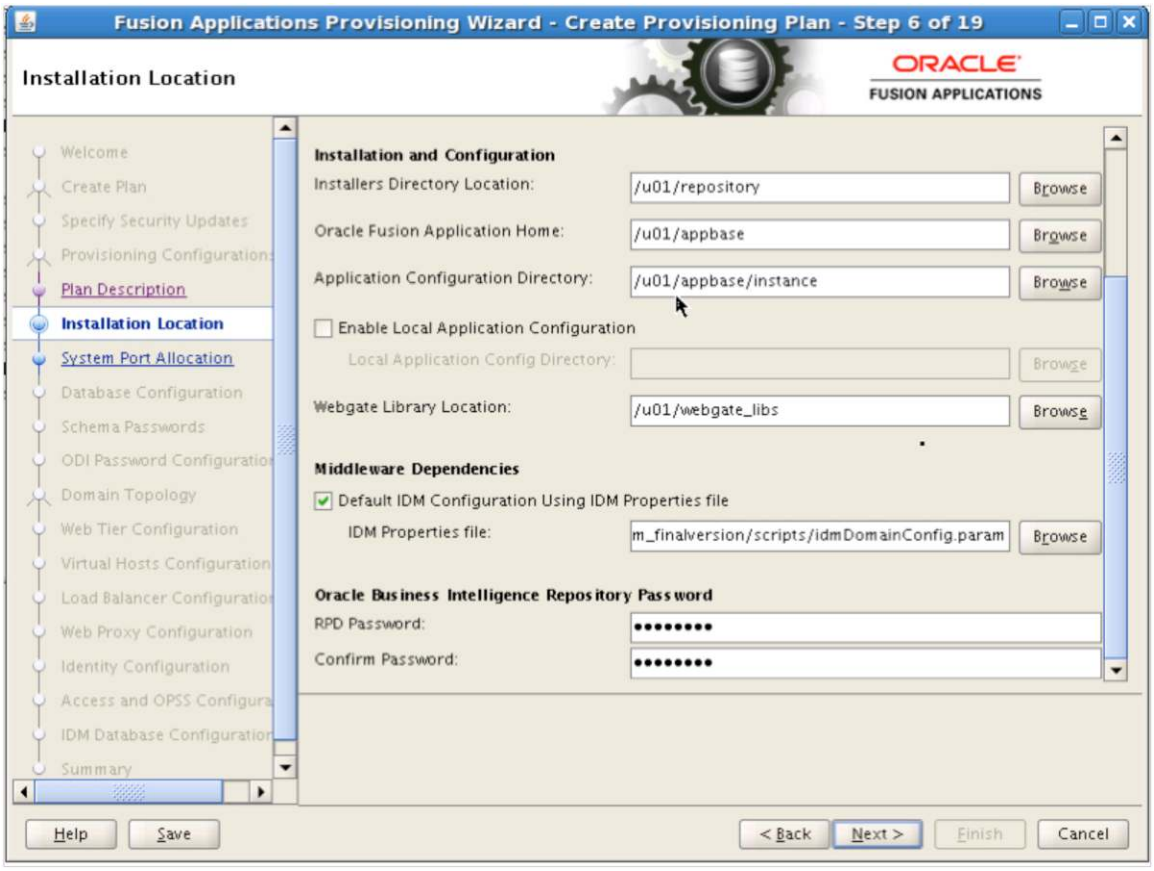

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Figure 15. Directory Structure (figure taken from Oracle Fusion Applications Administration Guide)

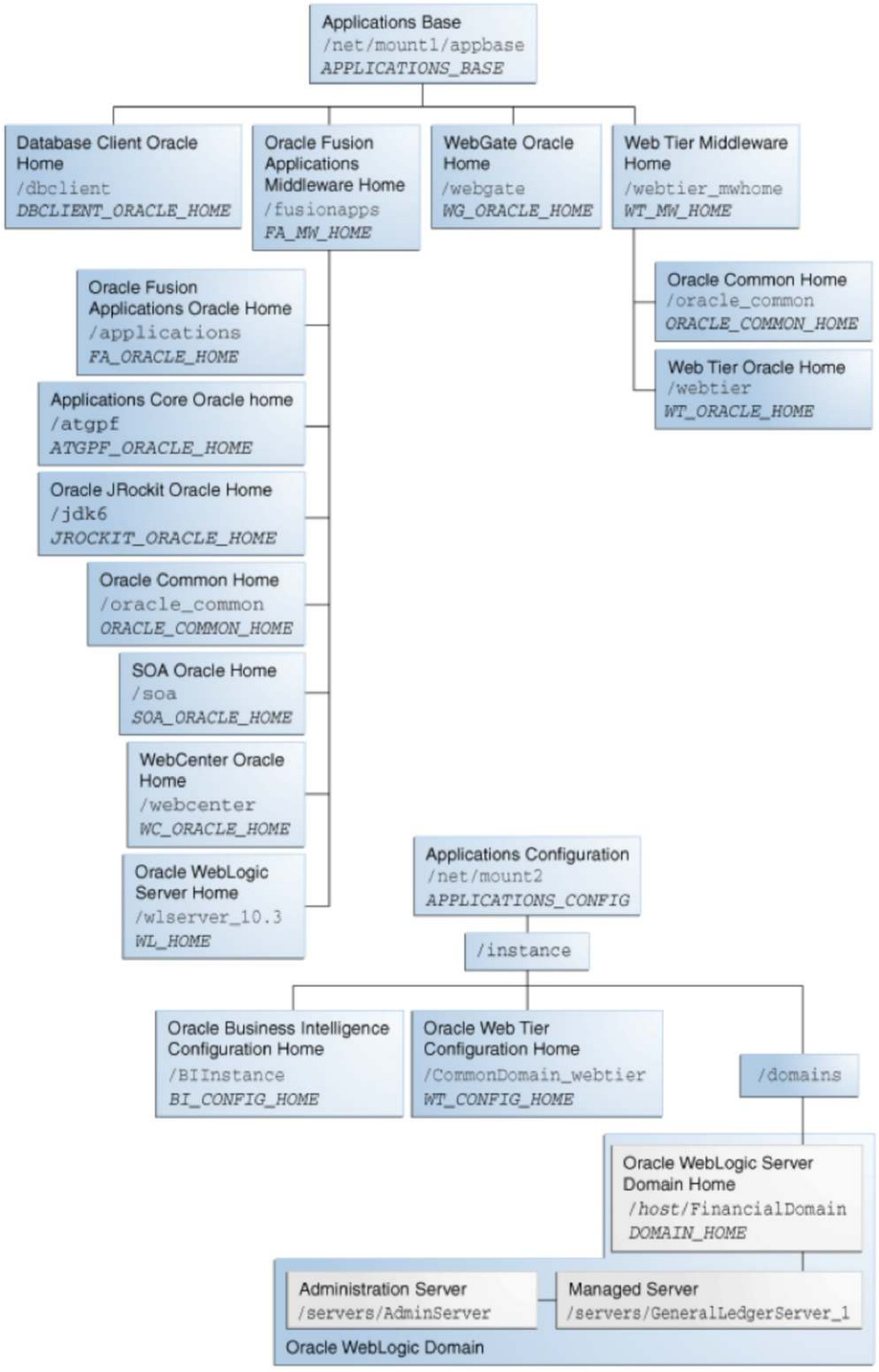

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Figure 16. Database Configuration

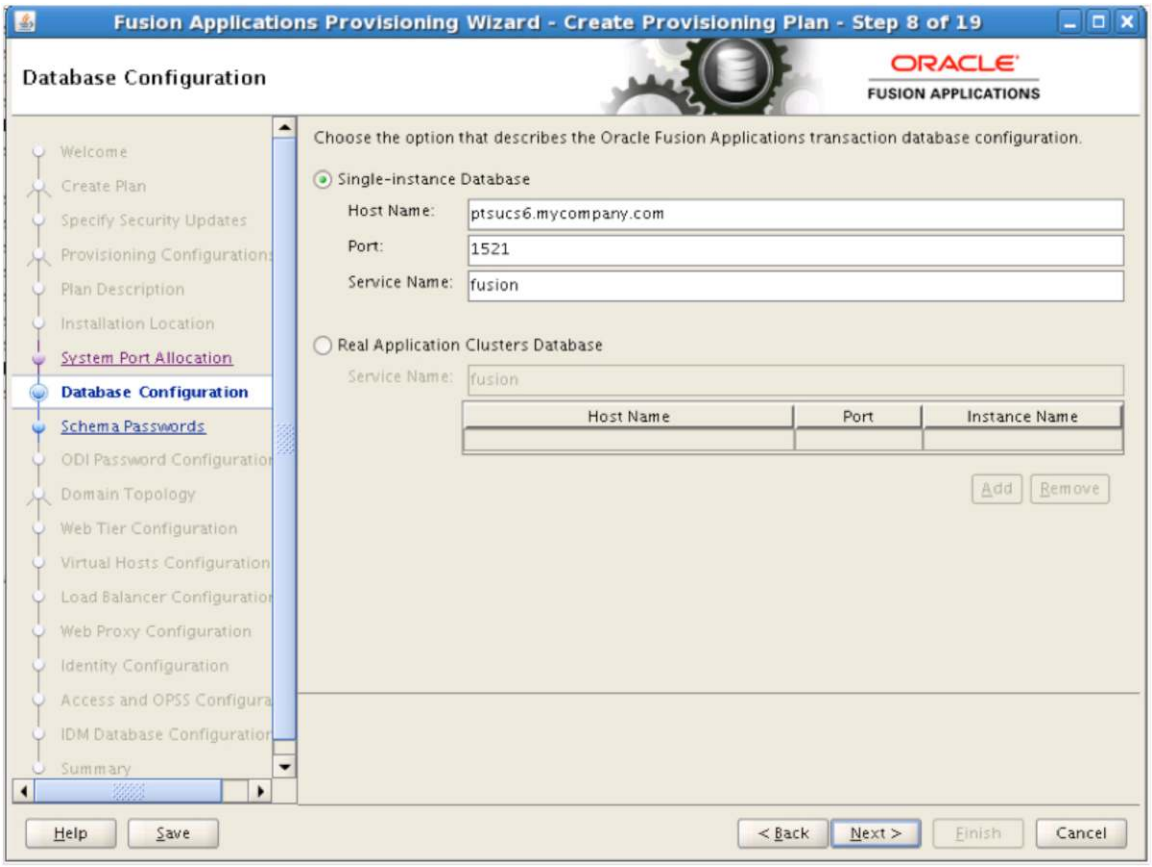

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Figure 17. Domain Topology Configuration

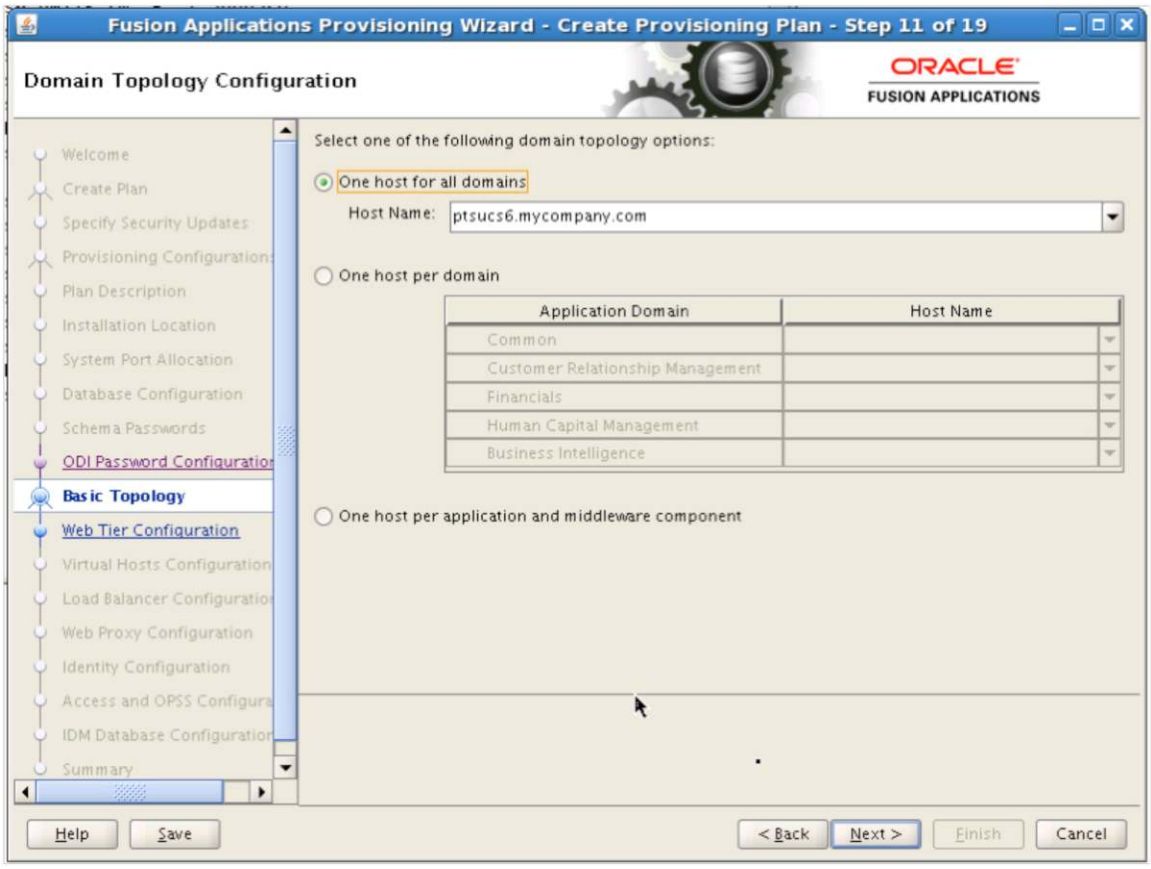

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Figure 18. Web Tier Configuration

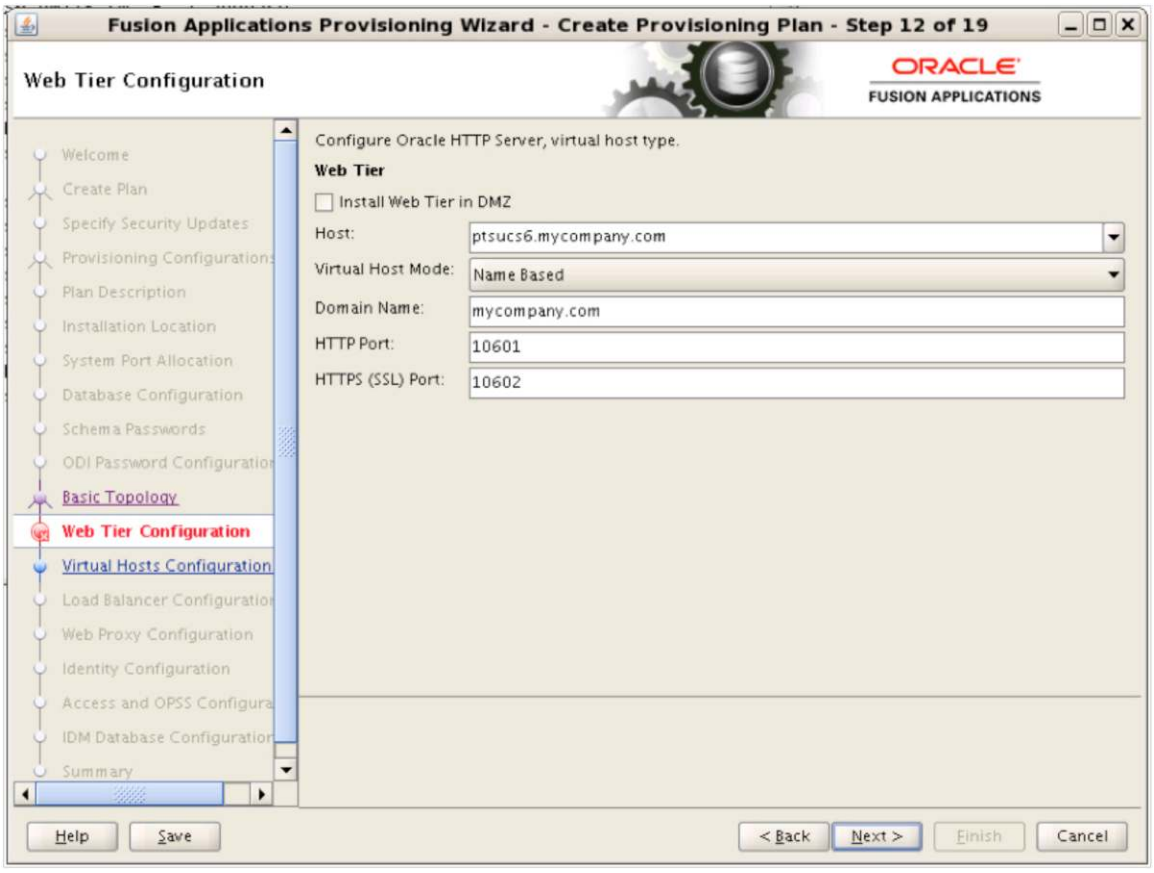

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Figure 19. Virtual Hosts Configuration

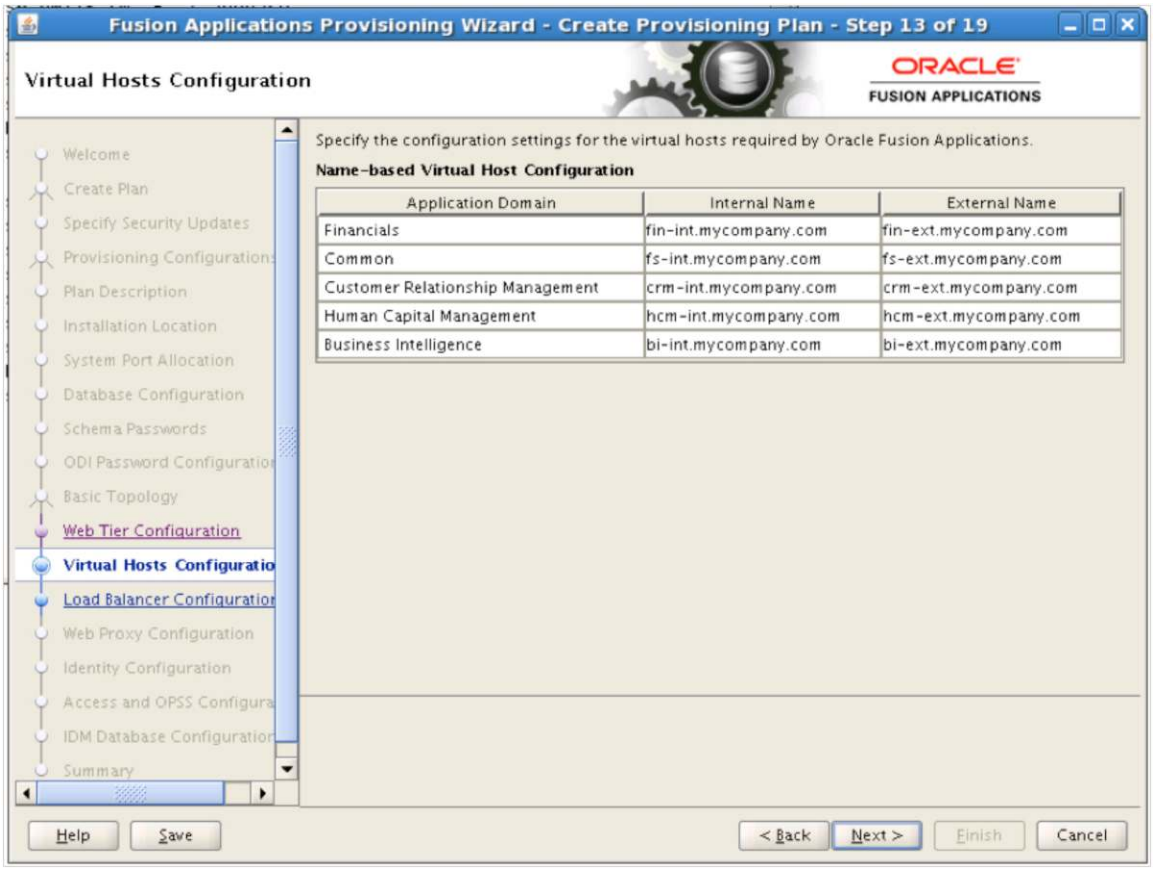

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Figure 20. Oracle Identity Management Configuration (1)

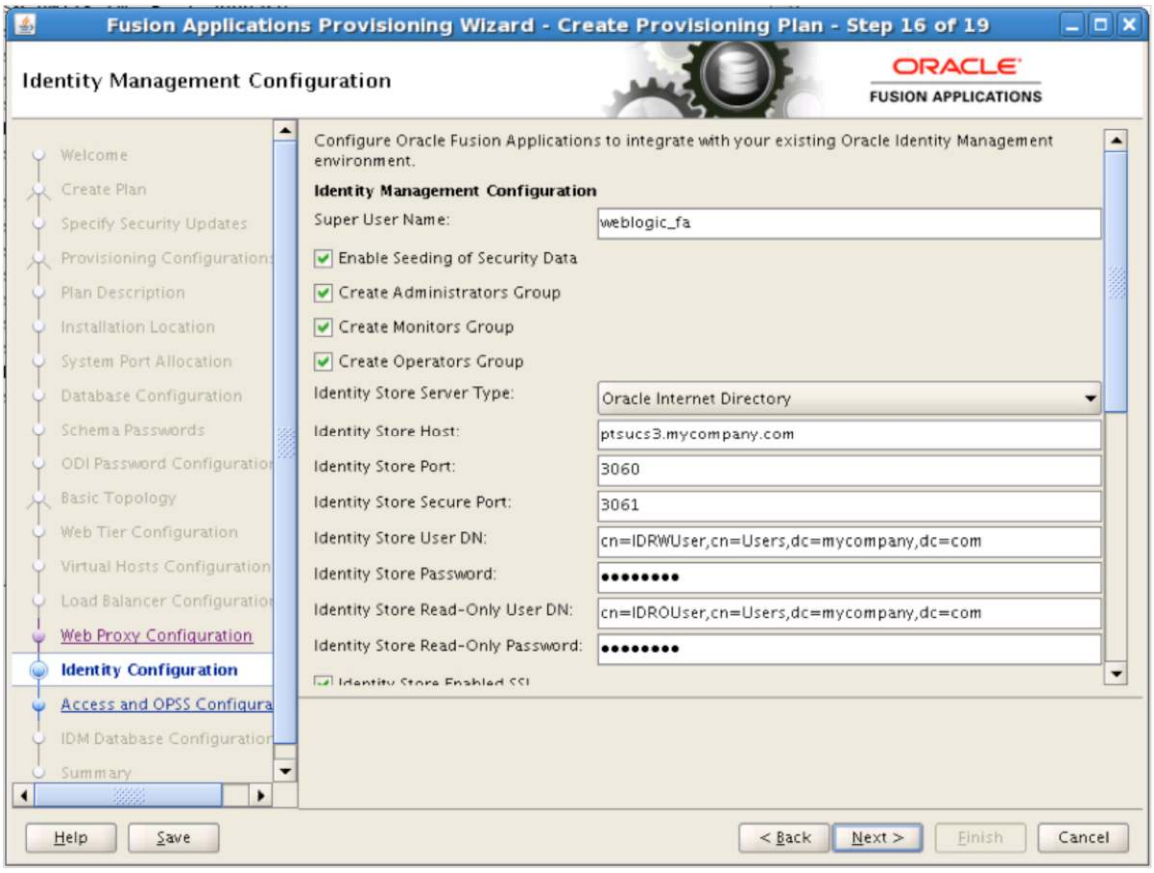

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Figure 21. Oracle Identity Management Configuration (2)

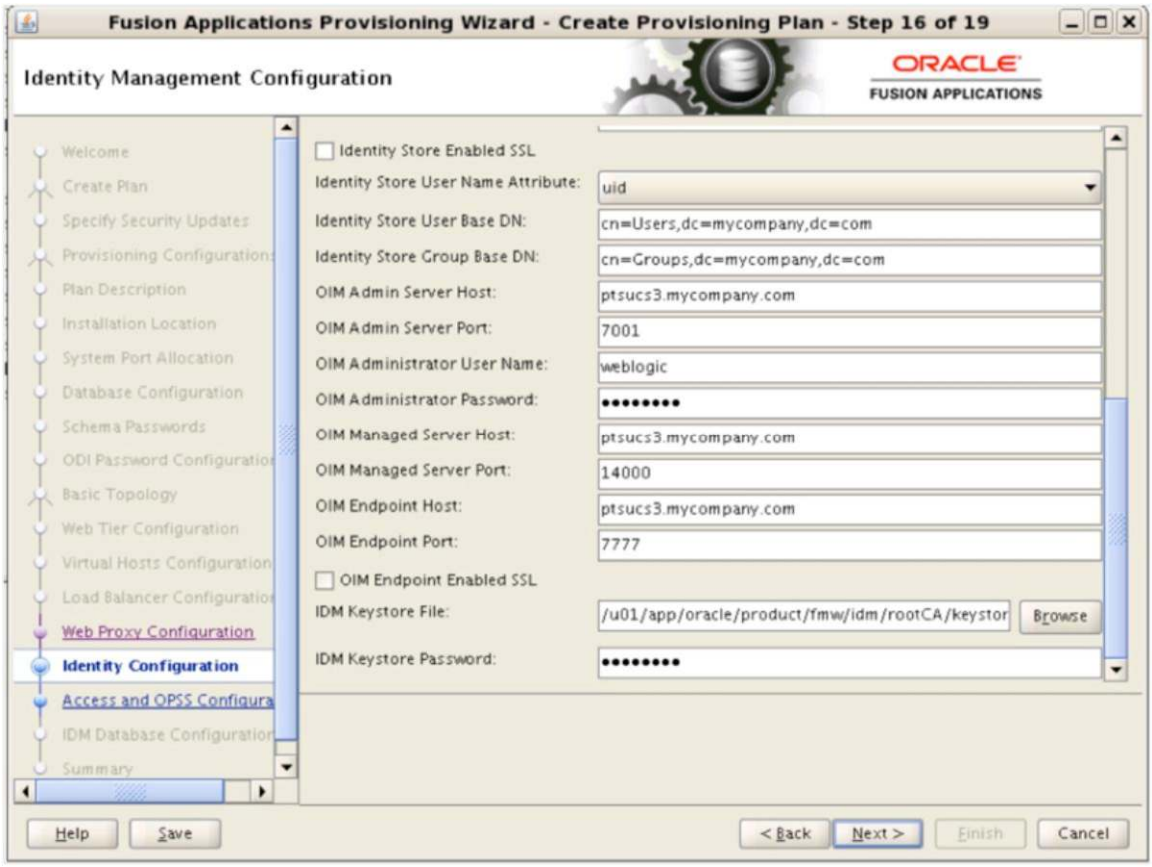

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Figure 22. Access and Policy Management Configuration (1)

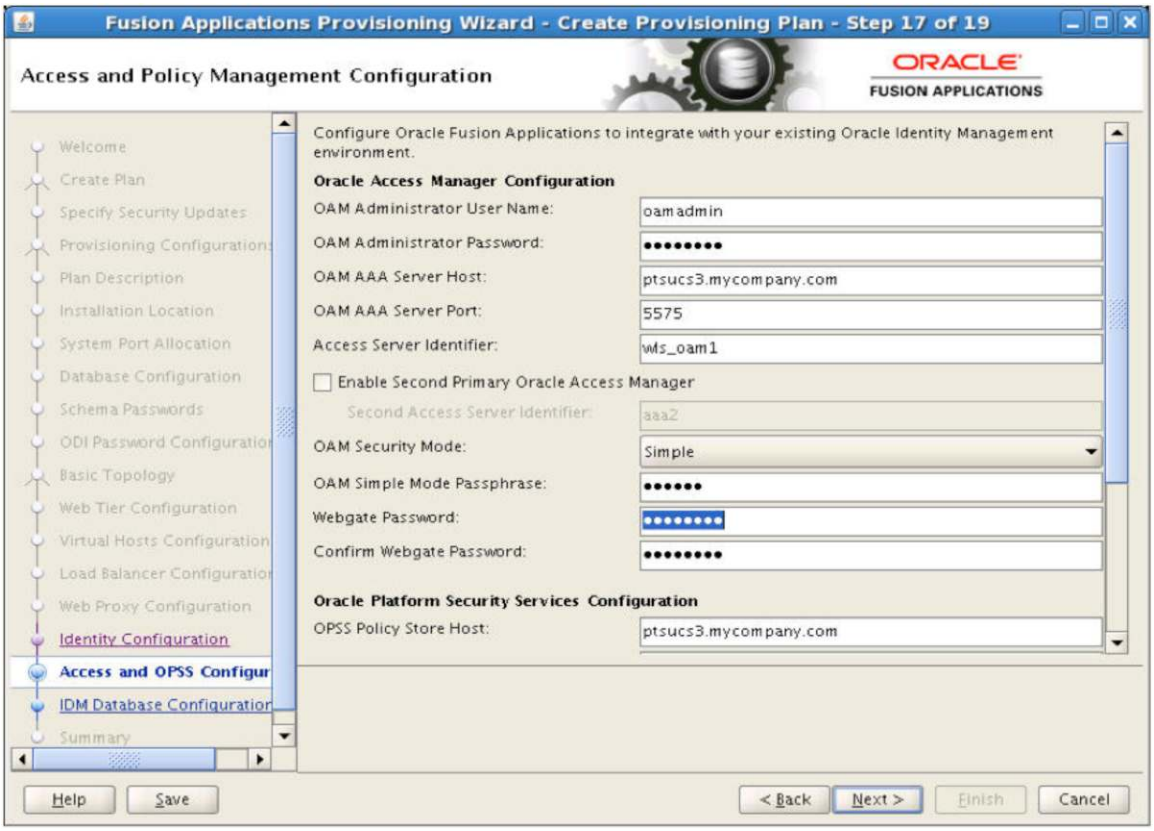

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Figure 23. Access and Policy Management Configuration (2)

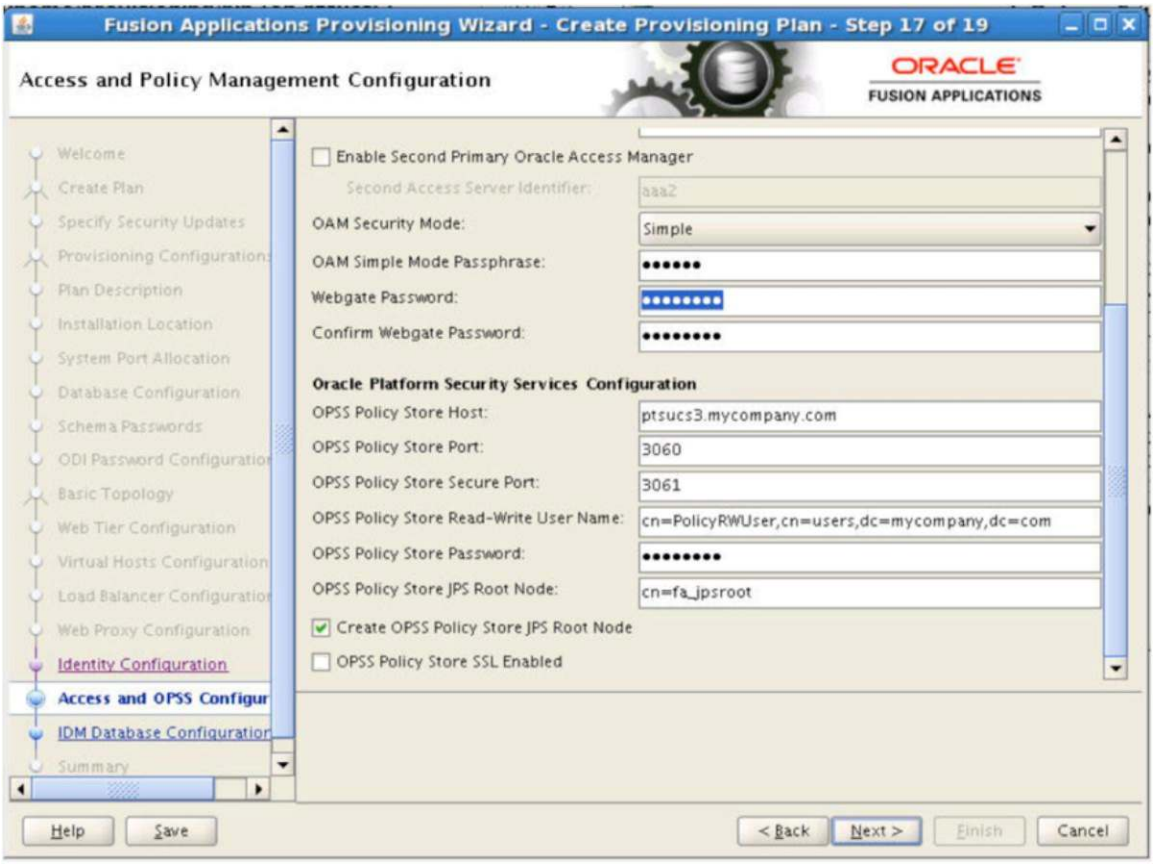

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Figure 24. Oracle Identity Management (IDM) Database Configuration

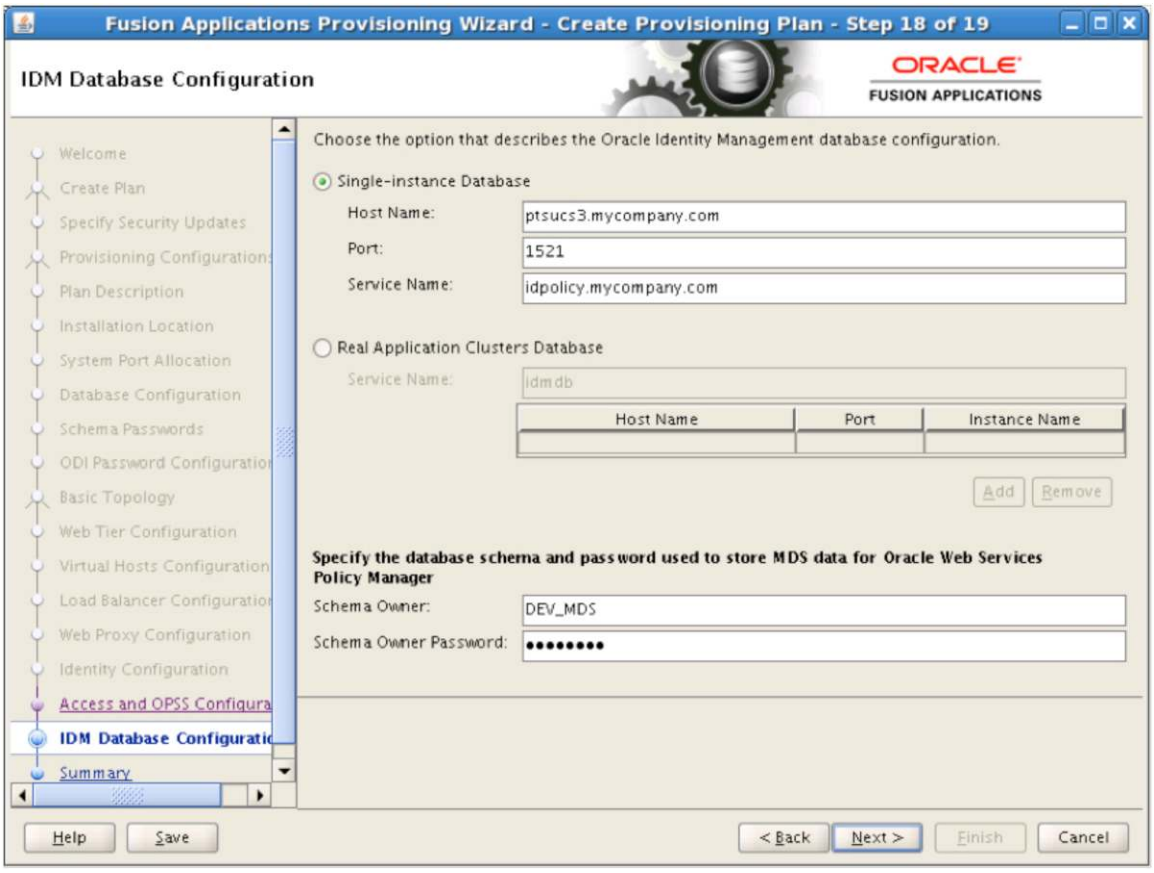

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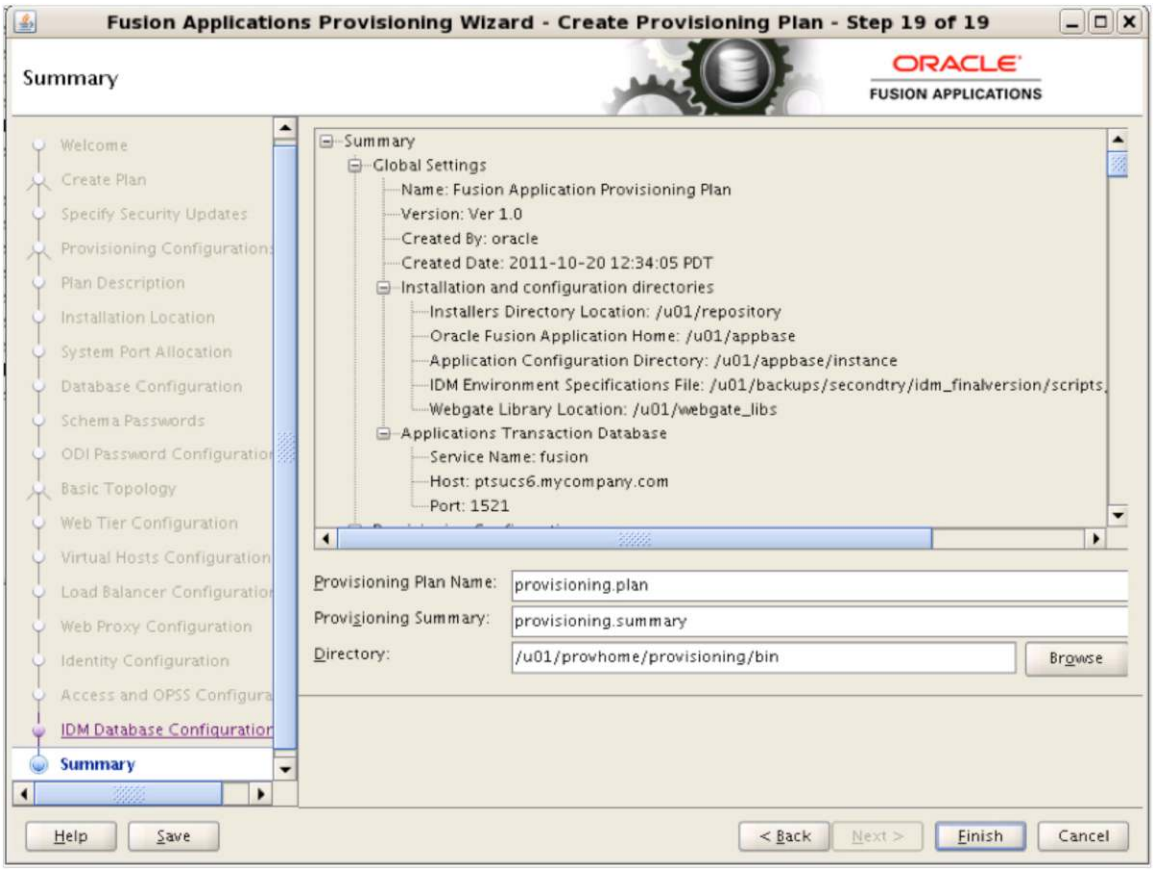
Figure 25. Summary



Provision the Applications environment

Provision the Applications environment using the graphical Provisioning Wizard tool or the CLI. The choice of product offerings and the values specified during the interview process determine the installation, configuration, and deployment actions.

After the provisioning plan is generated, the next step is to provision the Applications environment on each host specified in the provisioning plan. Two tools are available to provision the Applications environment:

- You can use the provisioning CLI, which provides granular control over where and what is implemented on each particular host.
- You can use the same wizard that generated the provisioning plan to also provision the Applications environment. This option in the wizard asks additional questions (application root, and installation library location) and allows you to make last minute updates to the offering configuration prior to implementing the plan.

Provisioning provides scripts that read from the provisioning plan and take action for each provisioning phase (also known as targets). As each phase is run, its progress is tracked on a related screen in the provisioning wizard's user interface.

The major steps during provisioning the Applications environment are:

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- **Preverify:** Checks to make sure that all prerequisites for an installation have been met
- **Install:** Installs middleware components (Oracle Secure Enterprise Search, WebLogic Server, ATG product family, and SOA) and installs applications and creates the applications Oracle home directory
- **Preconfigure:** Modifies the Oracle Application Development Framework (ADF) configuration file to use the database, based on Oracle Metadata Service (MDS) in the application's enterprise archive (EAR) files; also updates the connection's XML file in all application EAR files with endpoint information
- **Configure:** Creates and configures domains, managed servers, and clusters; applies templates; creates and configures data sources, queues, and topics; configures middleware (wiring); and deploys application product offerings to the appropriate domains
- **Configure Secondary:** Performs the configuration actions on the primary or secondary hosts, or both; if there are no primary or secondary hosts, or if there are only primary hosts, this phase runs but takes action only if it finds other hosts
- **Postconfigure:** Configures the node manager, deploys the SOA composite, establishes Oracle HTTP Server wiring, and sets up the postdeployment security configuration
- **Startup:** Starts the administration server and managed servers for each domain on the host on which you are running this phase
- **Validate:** Validates the deployment configuration

Figures 26 through 28 show sample screen images captured during the provisioning process.

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Figure 26. Provisioning an Applications Environment

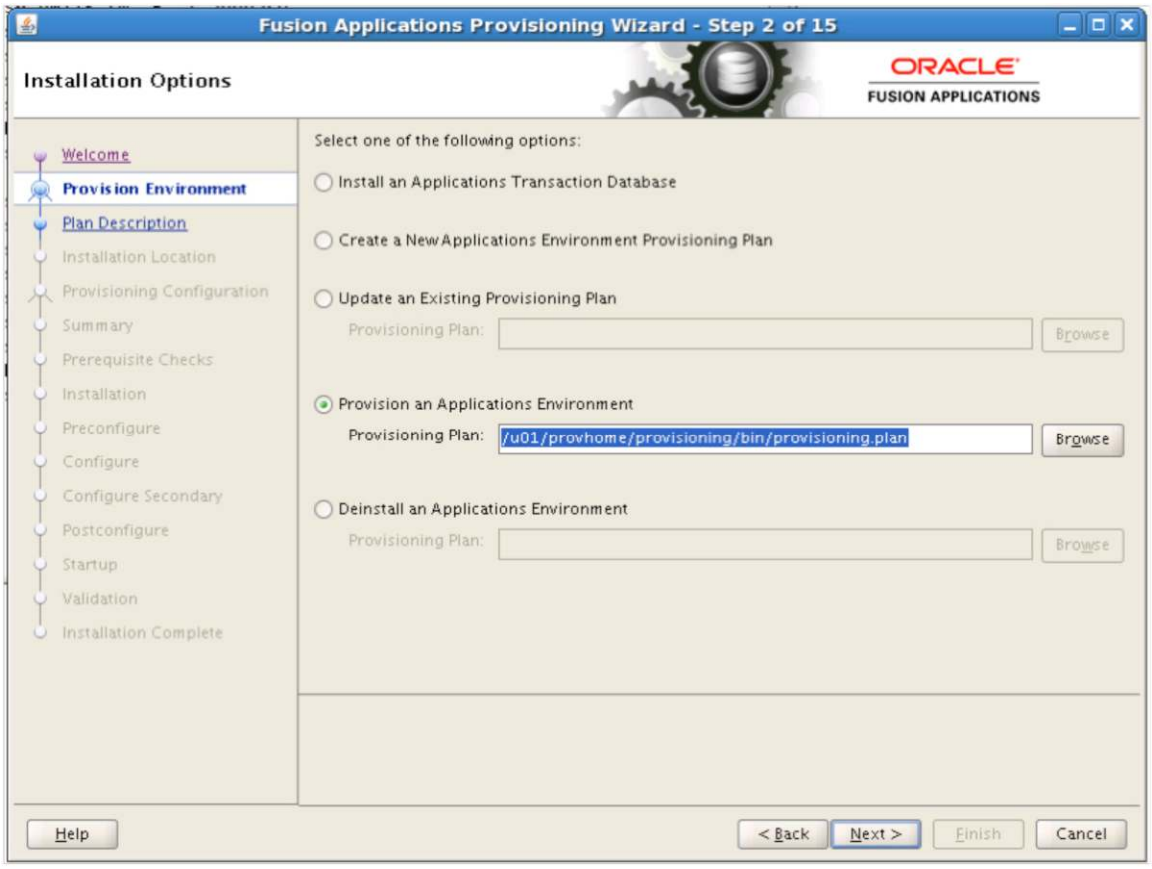

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Figure 27. Prerequisite Checks (1)

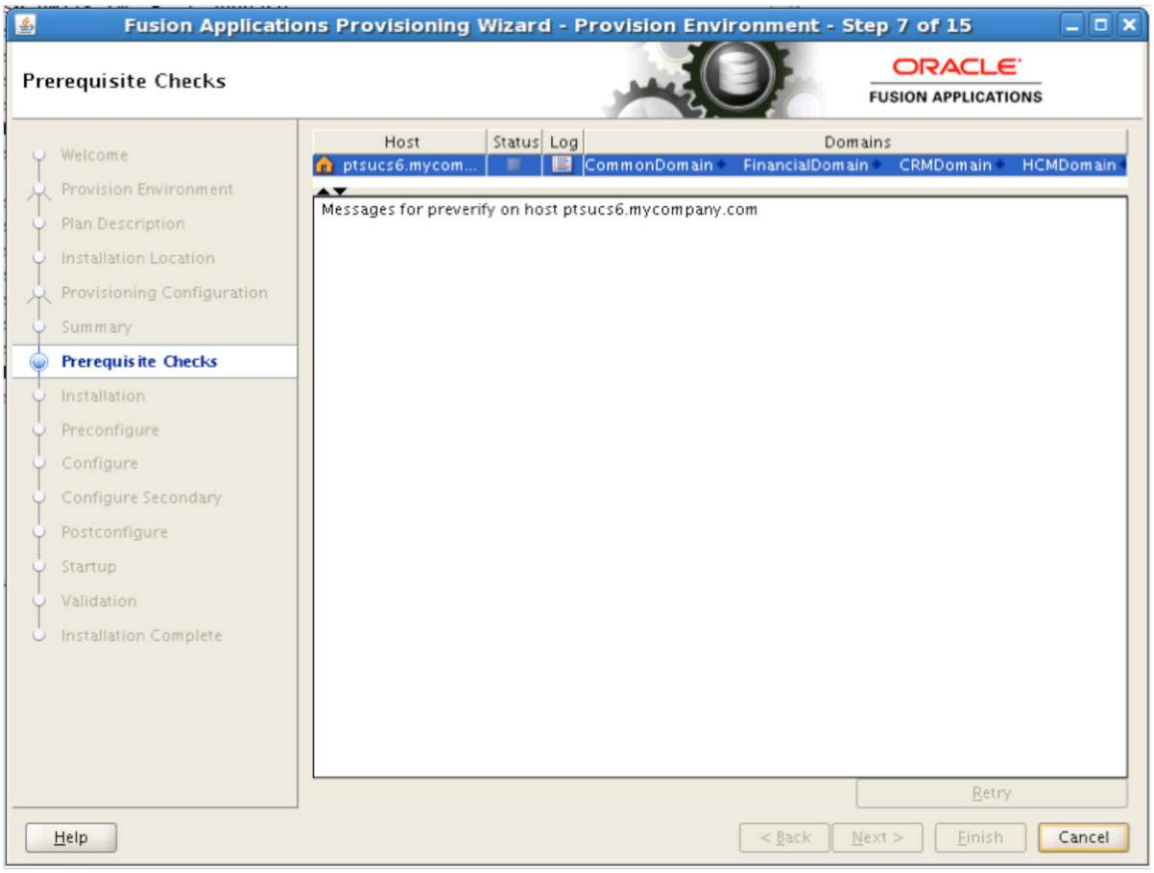

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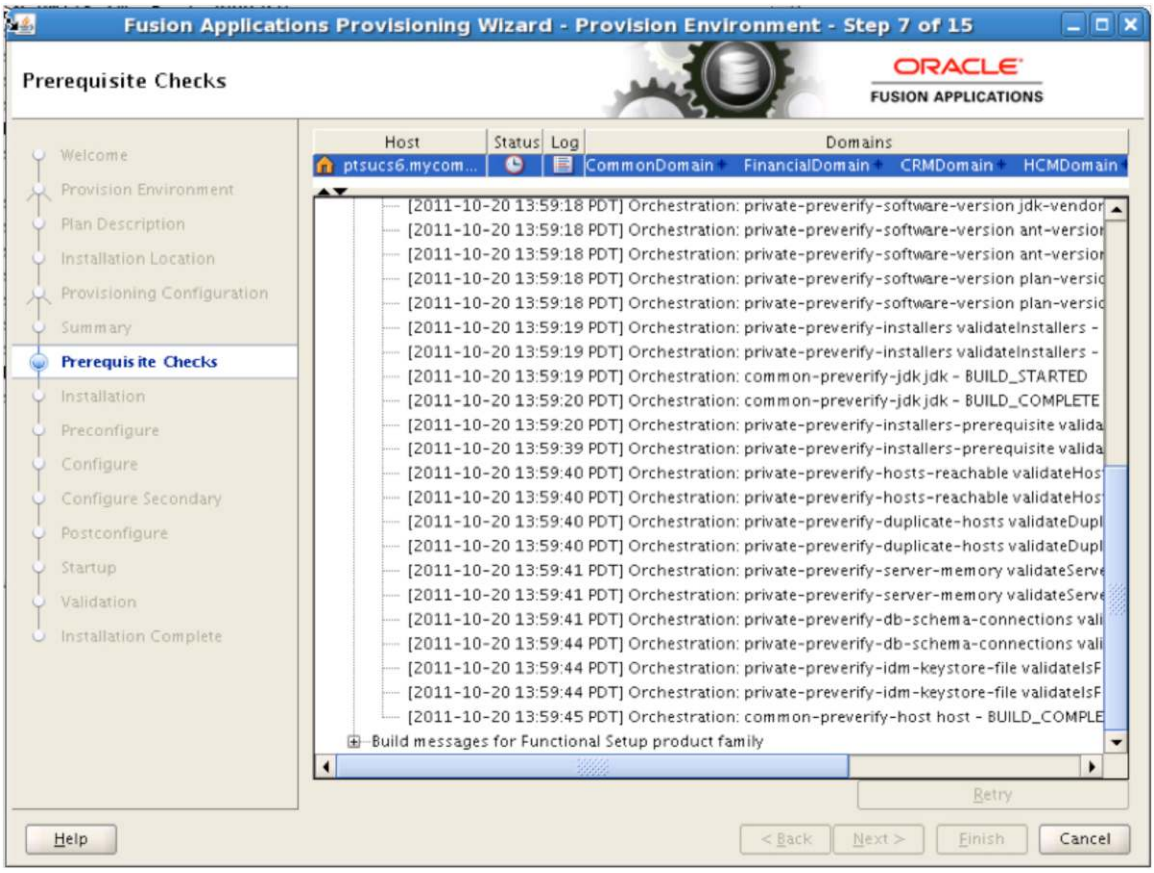
Figure 28. Prerequisite Checks (2)



At this point, you are ready to test the Oracle Fusion Applications login process and access the applications.

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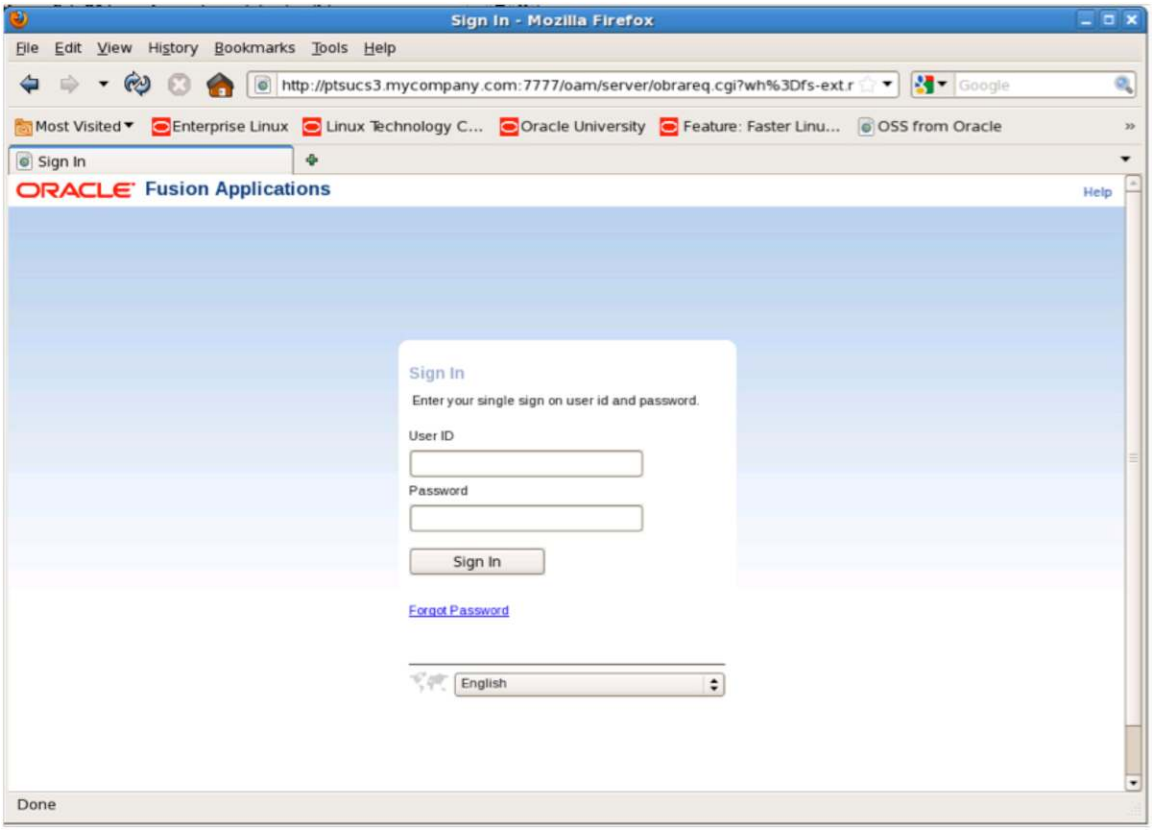
Accessing the Oracle Fusion Applications Environment

Access the Oracle Fusion Applications environment and test the installation by logging in to the URL http://<host-name>:<port-num>/homePage (Figure 29).

Figure 29. Login Page



After successful login, the Oracle Fusion Applications homepage appears (Figure 30).

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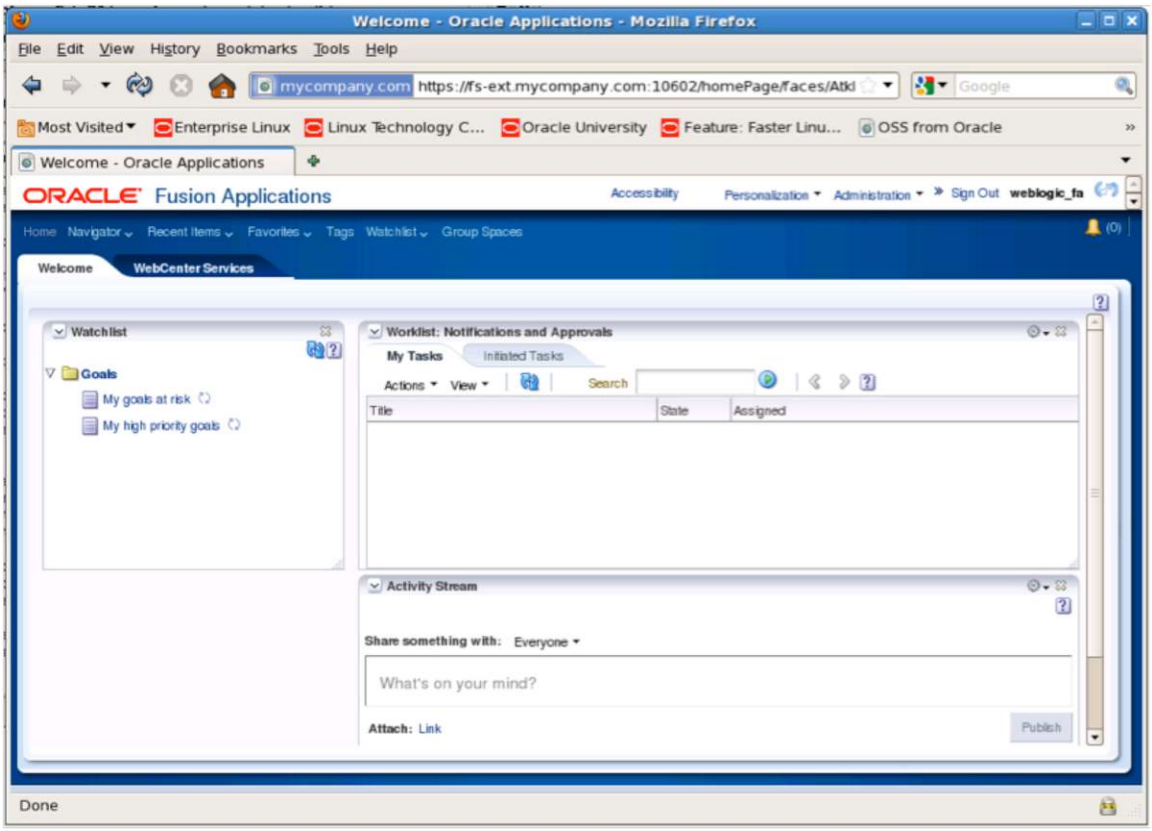
Figure 30. Homepage



Conclusion

Cisco and Oracle have joined forces to dramatically increase IT infrastructure reliability and agility while drastically reducing complexity. The results of this unique approach are innovative, cost-effective, and flexible infrastructure solutions that meet dynamic and evolving challenges.

Unlike others in the server industry, who chose to base their server technology on Intel processors, Cisco took the revolutionary approach of designing its system based on the network. By extending network technology to the server, Cisco UCS can offer customers higher levels of performance and the capability to host and deploy enterprise applications in the cloud. One example of these enterprise applications is the Oracle Fusion Applications suite.

Designed from the start using the latest technology advances and incorporating best practices gathered from thousands of customers, the Oracle Fusion Applications suite offers completely open, service-enabled enterprise applications. Built on a foundation of 100 percent standards-based middleware and using a SOA approach and a common data model, Oracle Fusion Applications products set a new standard for the way customers innovate, work, and adopt technology. Delivered as a complete suite of modular applications, Oracle Fusion Applications products work together with your existing application investments, helping you improve performance, lower IT costs, and get better results.

Using Cisco UCS, a platform with proven capability to enable the highest levels of performance for Oracle enterprise applications, in combination with the latest in Oracle technology and the capability to meet exacting

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customer needs, the Cisco and Oracle solution enhances not only your use of Oracle Fusion Applications but also the competiveness of your business.

For More Information

For more information about the Cisco and Oracle technologies discussed in this document, please refer to the following:

- Cisco Unified Computing System: http://www.cisco.com/go/ucs
- Oracle Fusion Applications: http://www.oracle.com/us/products/applications/fusion/index.html
- Oracle Fusion Middleware 11g: http://www.oracle.com/us/products/middleware/index.html
- Oracle Database 11g: http://www.oracle.com/us/products/database/index.html
- Oracle Linux: http://www.oracle.com/us/technologies/linux/index.html
- Oracle solutions on Cisco UCS: http://www.cisco.com/go/oracle

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