



# SmartStack for Oracle's JD Edwards EnterpriseOne 9.1 with Cisco

Guide

January 2015



---

# Contents

<b>Executive Summary .....</b>	<b>3</b>
Introduction.....	3
Purpose of This Document.....	3
Audience .....	3
<b>Solution Overview .....</b>	<b>4</b>
Cisco UCS Mini .....	5
Nimble Storage CS300.....	7
Oracle VM .....	8
Oracle's JD Edwards EnterpriseOne.....	10
<b>Deployment Architecture.....</b>	<b>12</b>
Storage Layout.....	13
Network Configuration.....	14
<b>Validation of Oracle's JD Edwards EnterpriseOne Setup .....</b>	<b>14</b>
<b>Best Practices and Tuning Recommendations .....</b>	<b>18</b>
System Configuration .....	18
Jumbo Frames .....	20
TCP Parameter Configuration .....	21
Oracle Database Configuration .....	22
Oracle WebLogic Server Configuration.....	22
JD Edwards Enterprise Server Configuration.....	22
<b>Conclusion.....</b>	<b>24</b>
<b>For More Information .....</b>	<b>24</b>

---

# Executive Summary

## Introduction

Oracle's JD Edwards EnterpriseOne release 9.1 continues Oracle's commitment to Applications Unlimited with important advancements for user productivity, industry-specific functionality, and support for global business operations. JD Edwards EnterpriseOne 9.1 addresses the most critical user needs, while delivering important enhancements in several areas, including reporting, user experience, and global business processes.

This document presents the validation of Oracle's JD Edwards EnterpriseOne 9.1 on Nimble Storage SmartStack. SmartStack for Oracle's JD Edwards EnterpriseOne with Cisco, hereafter referred to as SmartStack, is based on a Nimble Storage CS300 Adaptive Flash array and Cisco UCS<sup>®</sup> Mini: a compact solution designed for midsized deployments. With this solution, organizations can rapidly upgrade to or deploy the latest version of JD Edwards EnterpriseOne while meeting high-performance demands and scaling capacity and performance without disruption.

## Purpose of This Document

This document discusses the design validation for deployment of Oracle's JD Edwards EnterpriseOne 9.1 on SmartStack using Oracle VM Templates and Cisco UCS. It demonstrates the main infrastructure requirements and best practices for providing a highly reliable Oracle JD Edwards environment with fast deployment time and low total cost of ownership (TCO).

## Audience

The audience for this guide includes sales engineers, field consultants, professional services staff, IT managers, partner engineering staff, and customers who want to deploy SmartStack for Oracle's JD Edwards EnterpriseOne.

This document is intended to help solution architects, JD Edwards project managers, infrastructure managers, sales engineers, field engineers, and consultants plan, design, and deploy Oracle JD Edwards EnterpriseOne 9.1 hosted on SmartStack. This document assumes that the reader has an architectural understanding of Cisco Unified Computing System<sup>™</sup> (Cisco UCS) servers and Nimble Storage, Oracle's JD Edwards, Oracle VM, and related software.

# Solution Overview

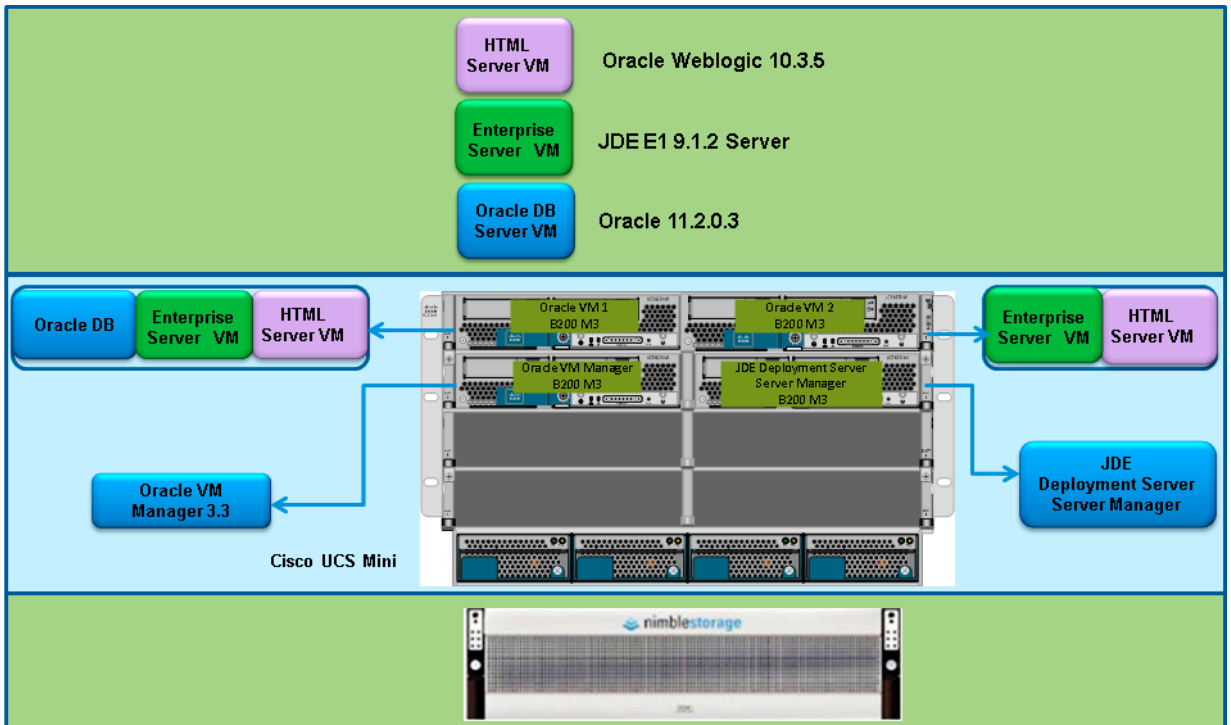
Oracle's JD Edwards EnterpriseOne 9.1 solution architecture is designed to run on multiple platforms and on multiple databases. In this deployment, the Oracle's JD Edwards EnterpriseOne (JDE E1) Release 9.1.2 was validated on SmartStack with Oracle VM 3.3.0 using Oracle VM Templates.

SmartStack for Oracle's JD Edwards EnterpriseOne with Cisco includes:

- Cisco UCS Mini
- Nimble Storage CS300
- Oracle's JD Edwards EnterpriseOne 9.1
- Oracle Database 11gR2
- Oracle Linux with the Unbreakable Enterprise Kernel
- Oracle VM (with Oracle VM template for JD Edwards)

Figure 1 shows the components of JD Edwards using SmartStack.

**Figure 1.** Deployment Overview of JD Edwards EnterpriseOne on SmartStack with Cisco



---

## Cisco UCS Mini

With Cisco UCS Mini, the Cisco Unified Computing System, originally designed for the data center, is now optimized for branch and remote offices, point-of-sale locations, and smaller IT environments. Cisco UCS Mini is for customers who need fewer servers but still want the robust management capabilities provided by Cisco UCS Manager. This solution delivers servers, storage, and 10 Gigabit networking in an easy-to-deploy, compact form factor. The main solution components of Cisco UCS Mini are described in this section.

### Cisco UCS Manager 3.0

Cisco UCS Manager provides unified, embedded management of all Cisco UCS software and hardware components through a choice of an intuitive GUI, a command-line interface (CLI), or an XML API. Cisco UCS Manager provides a unified management domain with centralized management capabilities and controls multiple chassis and thousands of virtual machines.

The Cisco UCS 6324 Fabric Interconnect hosts and runs Cisco UCS Manager in a highly available configuration, enabling the fabric interconnects to fully manage all Cisco UCS elements. The Cisco UCS 6324 supports out-of-band management through dedicated 10/100/1000-Mbps Ethernet management ports. Cisco UCS Manager typically is deployed in a clustered active-passive configuration with two Cisco UCS 6324 Fabric Interconnects connected through the cluster interconnect built into the chassis.

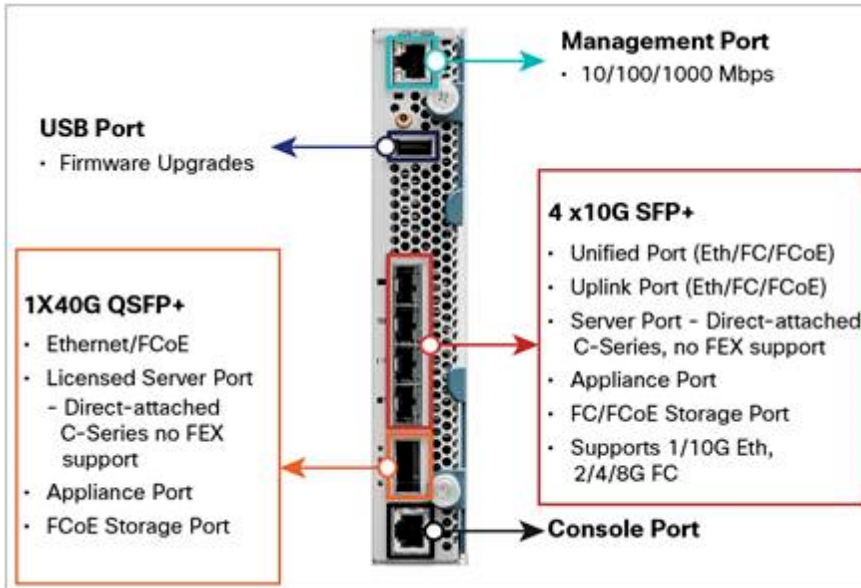
Cisco UCS Manager 3.0 supports the Cisco UCS 6324 that integrates the fabric interconnect into the Cisco UCS chassis and provides an integrated solution for a smaller deployment environment. Cisco UCS Mini simplifies system management and saves costs for smaller-scale deployments. The hardware and software components support Cisco<sup>®</sup> Unified Fabric, which runs multiple types of data center traffic over a single converged network adapter.

### Cisco UCS 6324UP Fabric Interconnect

The Cisco UCS 6324 Fabric Interconnect provides management, LAN, and storage connectivity for the Cisco UCS 5108 Blade Server Chassis and direct-connect rack-mount servers. It provides the same full-featured Cisco UCS management capabilities and XML API as the full-scale Cisco UCS solution and integrates with Cisco UCS Central Software and Cisco UCS Director (Figure 2).

From a networking perspective, the Cisco UCS 6324 uses a cut-through architecture, supporting deterministic, low-latency, line-rate 10 Gigabit Ethernet on all ports and switching capacity of up to 500 Gbps, independent of packet size and enabled services. Sixteen 10-Gbps links connect to the servers, providing a 20-Gbps link from each Cisco UCS 6324 to each server. The product family supports Cisco low-latency, lossless 10 Gigabit Ethernet unified network fabric capabilities, which increase the reliability, efficiency, and scalability of Ethernet networks. The fabric interconnect supports multiple traffic classes over a lossless Ethernet fabric from the blade through the fabric interconnect. Significant TCO savings come from a server design optimized for Fibre Channel over Ethernet (FCoE) in which network interface cards (NICs), host bus adapters (HBAs), cables, and switches can be consolidated.

**Figure 2.** Cisco UCS 6234 Fabric Interconnect



### Cisco UCS B200 M3 Blade Server

Building on the success of the Cisco UCS B200 M2 Blade Server, the enterprise-class Cisco UCS B200 M3 Blade Server (Figure 3) extends the capabilities of the Cisco UCS portfolio in a half-blade form factor. The Cisco UCS B200 M3 harnesses the power of the Intel® Xeon® processor E5-2600 v2 product family, up to 786 GB of RAM, two hard drives, and up to eight ports of 10 Gigabit Ethernet to deliver exceptional levels of performance, memory expandability, and I/O throughput for nearly all applications.

**Figure 3.** Cisco UCS B200 M3 Blade Server



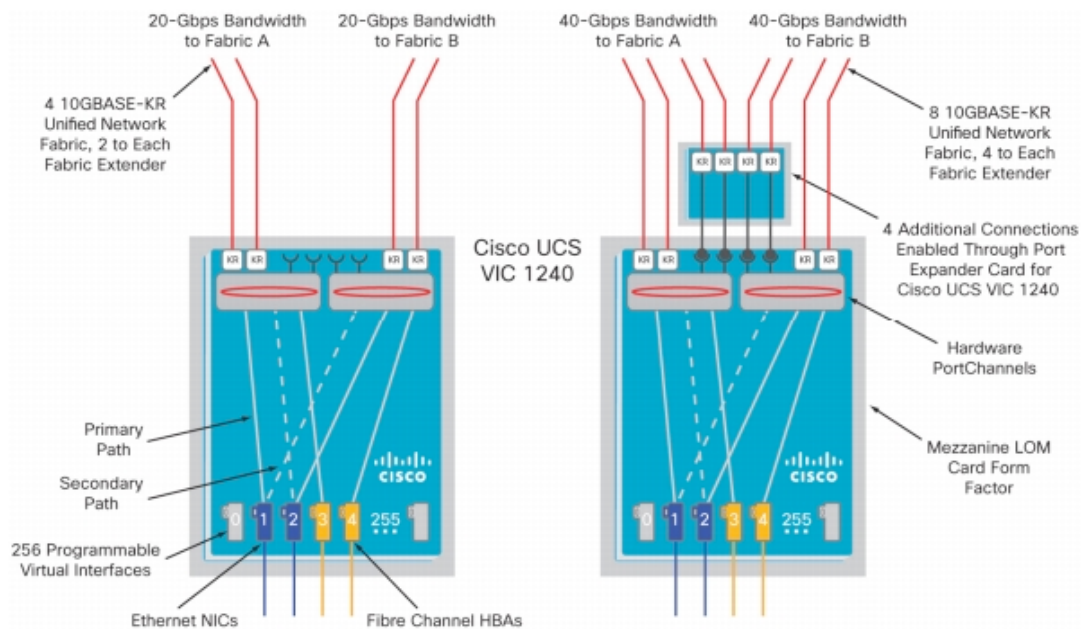
### Cisco I/O Adapters

The Cisco UCS blade server has several converged network adapters (CNA) options. The Cisco UCS Virtual Interface Card (VIC) 1240 option is used in this Cisco Validated Design.

Cisco UCS VIC 1240 is a 4-port 10 Gigabit Ethernet, FCoE-capable modular LAN on motherboard (mLOM) designed exclusively for the M3 generation of Cisco UCS B-Series Blade Servers. When used in combination with an optional port expander, the Cisco UCS VIC 1240 capabilities can be expanded to eight ports of 10 Gigabit Ethernet.

The Cisco UCS VIC 1240 enables a policy-based, stateless, agile server infrastructure that can present up to 256 PCI Express (PCIe) standards-compliant interfaces to the host that can be dynamically configured as either NICs or HBAs. In addition, the Cisco UCS VIC 1240 supports Cisco Data Center Virtual Machine Fabric Extender (VM-FEX) technology, which extends the Cisco UCS fabric interconnect ports to virtual machines, simplifying server virtualization deployment (Figure 4).

**Figure 4.** Cisco UCS VIC 1240



## Nimble Storage CS300

The Nimble Storage Adaptive Flash platform is the first storage solution to eliminate the flash memory performance and capacity trade-off. The Adaptive Flash platform is based on Nimble Storage Cache Accelerated Sequential Layout (CASL) architecture and on InfoSight, Nimble Storage’s data sciences–based approach to the storage lifecycle. Nimble Storage arrays deliver performance and capacity efficiency, transparent scalability, and clustering and provide integrated data protection, data sciences–based management, and support.

The Nimble Storage CS300 is well suited for midsize IT departments and distributed sites of larger organizations. It combines the speed of flash memory with the cost-effective capacity of hard-disk workloads such as Oracle’s JD Edwards EnterpriseOne 9.1, Microsoft applications, virtual desktop infrastructure (VDI), and virtual server consolidation.

The Nimble Storage CS300 offers these main benefits:

- Performance and capacity
  - Flexible scaling of storage resources to meet the changing demands of business-critical applications
  - Five times greater performance and capacity density than traditional storage systems
  - Up to a 75% smaller data footprint, and a tenfold reduction in data center rack space
- Transparent scalability
  - Nondisruptive and independent scaling of performance and capacity within a single array or a cluster
- Integrated data protection
  - Up to 90 days of hourly snapshots on a single array
  - WAN-efficient replication of snapshot data for disaster recovery

- Proactive wellness
  - Peak storage health guided by powerful data science
  - Greater than five nines system uptime

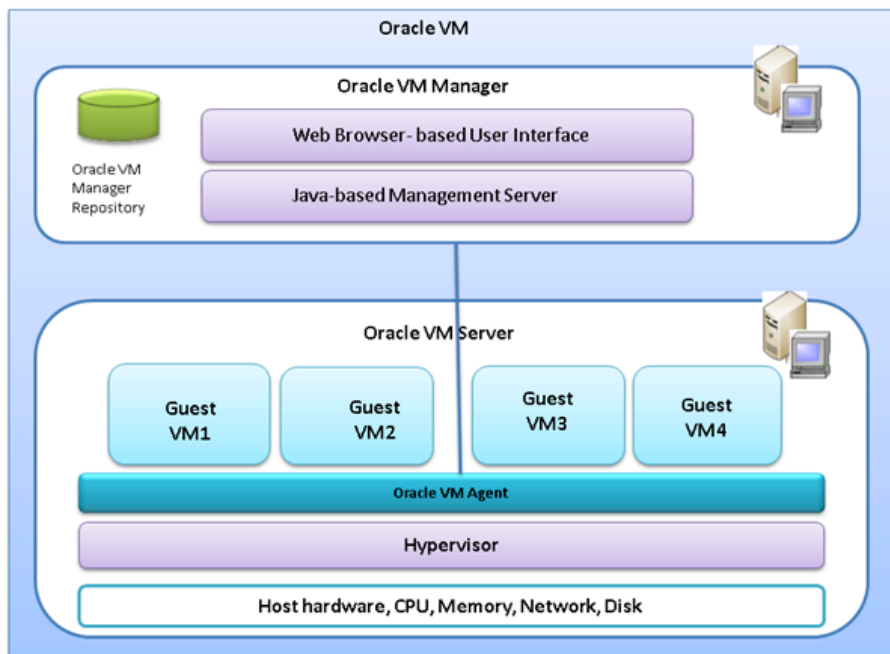
## Oracle VM

Oracle VM is a platform that provides a fully equipped environment with all the latest benefits of virtualization technology. Oracle VM enables you to deploy operating systems and application software within a supported virtualization environment. Oracle VM is a Citrix Xen-based hypervisor that runs at nearly bare-metal speeds.

### Oracle VM Architecture

Figure 5 shows the Oracle VM architecture. The Oracle VM architecture has three important components:

**Figure 5.** Oracle VM Architecture



- **Oracle VM Manager:** This component provides the user interface, which is a standard application development framework (ADF) web application, for managing Oracle VM Servers. It manages the virtual machine lifecycle, including the creation of virtual machines from installation media or from a virtual machine template and the deletion, powering off, uploading, deployment, and live migration of virtual machines. It manages resources, including ISO files, virtual machine templates, and sharable hard disks.
- **Oracle VM Server:** This self-contained virtualization environment is designed to provide a lightweight, secure, server-based platform for running virtual machines. Oracle VM Server is based on an updated version of the underlying Citrix Xen hypervisor technology and includes Oracle VM Agent.
- **Oracle VM Agent:** This component is installed with Oracle VM Server. It communicates with Oracle VM Manager to manage virtual machines.



---

## Advantages of Oracle VM for Oracle JD Edwards EnterpriseOne with Oracle Database

Oracle's virtualization technologies are excellent delivery vehicles for independent software vendors (ISVs) seeking a simple, easy-to-install, and easy-to-support application-delivery solution.

Oracle now offers a highly available, grid-ready virtualization solution for your data center, combining all the benefits of a fully virtualized environment.

The combination of Oracle VM and Oracle's JD Edwards EnterpriseOne enables better server consolidation (bare-metal deployments with underutilized CPU resources can often benefit from consolidation with other workloads using server virtualization) subcapacity licensing, and rapid provisioning.

Oracle VM also supports the creation of nonproduction virtual clusters on a single physical server for production demonstrations and test and development environments. This deployment combination permits dynamic changes to preconfigured database resources for an agile response to changing service-level requirements, common in consolidated environments.

Oracle VM is the only software-based virtualization solution that is fully supported and certified for both Oracle's JD Edwards EnterpriseOne and Oracle Real Application Clusters (RAC).

Customers may want to run Oracle's JD Edwards EnterpriseOne in an Oracle VM environment for several reasons. Some of the more common reasons are summarized here:

- **Server consolidation:** Oracle's JD Edwards EnterpriseOne underutilized CPU resources or variable CPU utilization can often benefit from consolidation with other workloads using server virtualization. A typical use case for this scenario is the consolidation of several JD Edwards EnterpriseOne components, such as consolidation of multiple batch and interactive servers running on individual hardware into a virtualized environment through multiple virtual machines hosted on a smaller number of servers.
- **Subcapacity licensing:** The current Oracle licensing model requires the Oracle database to be licensed for all CPUs on each server in the cluster. However, customers may want to use only a subset of the CPUs on the server for a particular Oracle database. Oracle VM can be configured in such way that it is recognized as a hard partition. Hard partitions allow customers to license only those CPUs used by the partition instead of having to license all the CPUs on the physical server. For more information about subcapacity licensing using hard partitioning, see the Oracle partitioning document. For more information about the use of hard partitioning with Oracle VM, refer to the document [Hard Partitioning with Oracle VM](#).
- **Create a virtual cluster:** Oracle VM enables the creation of a virtual cluster on a single physical server. This use case is particularly applicable to product demonstrations, educational settings, and test environments. This configuration should never be used to run a production JD Edwards environment. The following are valid deployments for this use case:
  - Test and development cluster
  - Demonstration cluster
  - Education cluster
- **Rapid provisioning:** The provisioning time for a new application consists of the server (physical or virtual) deployment time and the software installation and configuration time. Oracle VM can help reduce the deployment time for both of these components. Oracle VM supports the capability to create deployment templates. These templates can then be used to rapidly provision new systems.

Oracle VM templates for JD Edwards EnterpriseOne enable rapid implementation of your JD Edwards EnterpriseOne system. With these preconfigured, pretested templates of the JD Edwards EnterpriseOne Enterprise, Database, and HTML Servers, you can have your system up and running in just a few days. Oracle VM templates contain the complete technology stack necessary to run the server: operating system, database, web server, and JD Edwards EnterpriseOne tools and applications.

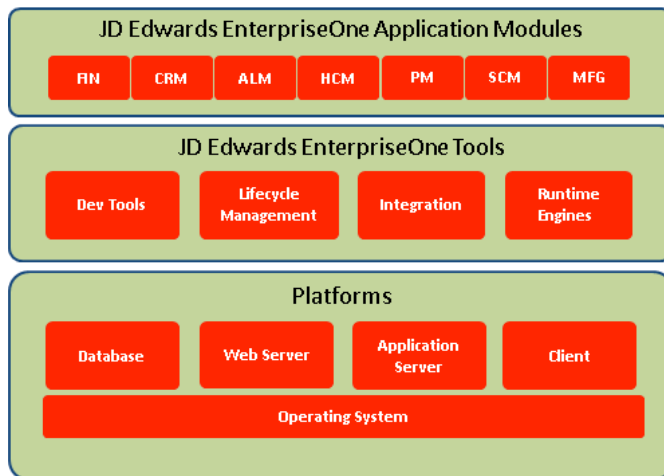
### Paravirtualized Virtual Machine

Guest virtual machines running on Oracle VM Server can be configured in paravirtualized mode. In this mode, the kernel of the guest operating system is modified to so that it runs on a hypervisor instead of on the bare-metal hardware. As a result, I/O actions and system clock timers in particular are handled more efficiently than in nonparavirtualized systems, in which I/O hardware and timers must be emulated in the operating system. Oracle VM supports paravirtualized kernels for Oracle Linux and Red Hat Enterprise Linux, offering better performance and scalability.

### Oracle's JD Edwards EnterpriseOne

Oracle's JD Edwards EnterpriseOne is the enterprise resource planning (ERP) solution of choice for many small and medium-sized businesses (SMBs). JD Edwards EnterpriseOne offers an attractive combination of a large number of easy-to-deploy and easy-to-use ERP applications across multiple industries. These applications include Supply Chain Management (SCM), Human Capital Management (HCM), Supplier Relationship Management (SRM), Financials, and Customer Relationship Management (CRM). Figure 6 shows the components of JD Edwards EnterpriseOne.

**Figure 6.** JD Edwards EnterpriseOne Components



---

## What's New in Oracle's JD Edwards EnterpriseOne 9.1

Oracle's JD Edwards EnterpriseOne 9.1 addresses the most critical user needs while delivering important enhancements in several areas, including:

- **Reporting:** New innovations enable users to easily build their own interactive reports and then use the power of Oracle Business Intelligence (BI) Publisher to generate the report output in multiple formats. JD Edwards EnterpriseOne 9.1 empowers end users and reduces the need for IT assistance with 40 new user inquiry and reporting applications that support 178 prebuilt reports.
- **User experience:** JD Edwards EnterpriseOne 9.1 offers significant enhancements in the user experience, including Web 2.0 features that reduce task time and enable access to meaningful information when and where it is needed.
- **Industry-specific functions:** JD Edwards EnterpriseOne adds industry-specific functions with each new release. JD Edwards EnterpriseOne 9.1 delivers enhancements for the consumer goods, real estate management, and manufacturing and distribution industries.
- **Global business processes:** JD Edwards EnterpriseOne 9.1 supports global operations with several new features, including enhancements to the entire ERP business process associated with the management of country-of-origin requirements.
- **Productivity:** JD Edwards EnterpriseOne 9.1 offers new, more tightly integrated business processes and other productivity advancements, including improved data access and enhanced financial controls. In addition, significant productivity enhancements have been built into the following products:
  - Financial Management
  - Capital Asset Management
  - Project Costing
  - Project Manufacturing
  - Requisition Self-Service
  - Sales Order Management
  - Human Capital Management

# Deployment Architecture

Figure 7 shows the deployment architecture of Oracle's JD Edwards EnterpriseOne.

**Figure 7.** Deployment Architecture

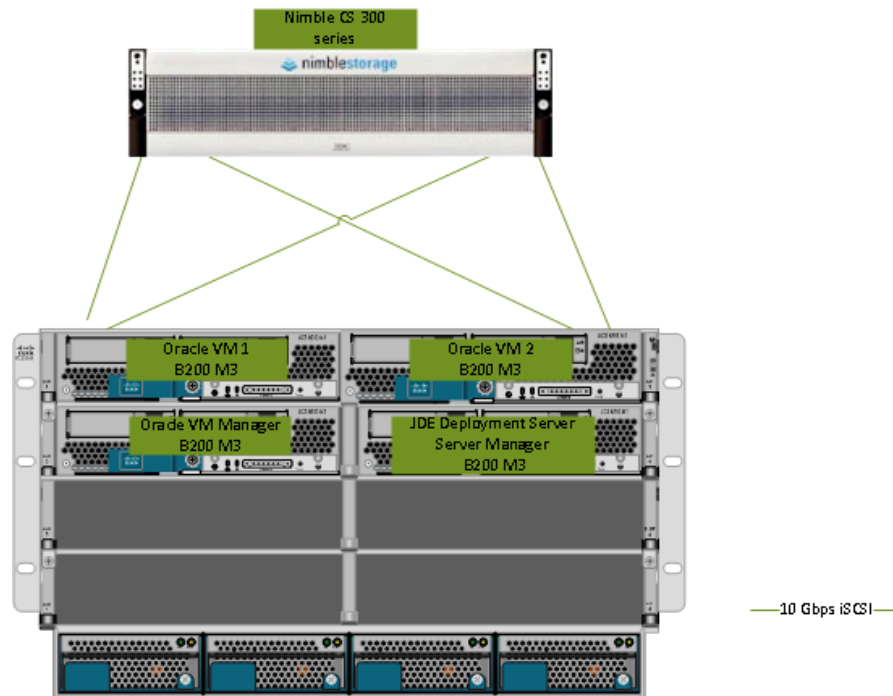


Table 1 lists the main components used in the configuration presented in this document.

**Table 1.** Configuration Components

Component	Configuration
<b>Oracle VM Servers</b>	<ul style="list-style-type: none"> <li>• 2 Cisco UCS B200 M3 Blade Servers equipped with 2 Intel Xeon processor E5-2697 v2 2.7-GHz CPUs and 256 GB of physical memory and local disk space</li> <li>• Oracle VM 3.3.1</li> </ul>
<b>JDE E1 templates</b>	<ul style="list-style-type: none"> <li>• Oracle VM templates for JD Edwards EnterpriseOne 9.1.2 and Tools 9.1.3.3 for x86 64-bit</li> </ul>
<b>JDE E1 HTML Servers 1 and 2</b>	<ul style="list-style-type: none"> <li>• Each virtual machine configured with 8 virtual CPUs (vCPUs) and 64 GB of physical memory</li> <li>• Oracle WebLogic 10.3.5 on Oracle Linux 5.8 (uek kernel)</li> </ul>
<b>JDE E1 Enterprise Server (interactive applications)</b>	<ul style="list-style-type: none"> <li>• Guest OS configured with 10 vCPUs and 64 GB of physical memory</li> <li>• JDE E1 Release 9.1, Update 2, with Tools Release 9.1.3.3, deployed on Oracle Linux 5.8 (uek kernel)</li> </ul>
<b>JDE E1 Enterprise Server (batch and Universal Batch Engine [UBE] applications)</b>	<ul style="list-style-type: none"> <li>• Guest OS configured with 10 vCPUs and 64 GB of physical memory</li> <li>• JDE E1 Release 9.1, Update 2, with Tools Release 9.1.3.3, deployed on Oracle Linux 5.8 (uek kernel)</li> </ul>
<b>JDE E1 Database Server</b>	<ul style="list-style-type: none"> <li>• Each virtual machine configured with 10 vCPUs and 120 GB of physical memory</li> <li>• Oracle Database 11.2.0.3</li> </ul>
<b>Deployment server and server manager</b>	<ul style="list-style-type: none"> <li>• Cisco UCS B200 M3 Blade Server equipped with 2 Intel Xeon processor E5-2620 v2 2.1-GHz CPUs and configured with 64 GB of physical memory</li> <li>• Microsoft Windows 2008 R2 Enterprise Edition</li> </ul>

Component	Configuration
Oracle VM Manager	<ul style="list-style-type: none"> <li>Oracle VM Manager 3.3.1</li> <li>Cisco UCS B200 M3 Blade Server equipped with 2 Intel Xeon processor E5-2620 v2 2.1-GHz CPUs and configured with 64 GB of physical memory</li> <li>Oracle Linux 6.4</li> </ul>
Storage	<ul style="list-style-type: none"> <li>Nimble Storage CS300 (8 TB of usable capacity, 1.2-TB flash cache, and dual 10-Gbps Small Computer System Interface over IP [iSCSI])</li> </ul>
Operating system (64-bit)	<ul style="list-style-type: none"> <li>Oracle VM 3.3.1 for Oracle VM Host</li> <li>Guest OS configured with Oracle Linux 5.8 (uek kernel)</li> </ul>

## Storage Layout

Table 2 summarizes the storage layout created for the configuration presented in Table 1. Figure 8 shows the performance policy parameters.

**Table 2.** Storage Configuration

Nimble Storage CS300 Storage Layout			
Name	Performance Policy	User Capacity (GB)	Host
Cluster-lun	Oracle Online Transaction Processing (OLTP)	40	jde-ovm1/jde-ovm2
JDE-templates	Oracle OLTP	1000	jde-ovm1/jde-ovm2
ovm1-data	Oracle OLTP	800	jde-ovm1/jde-ovm2
ovm2-data	Oracle OLTP	800	jde-ovm1/jde-ovm2
orcl-data	Oracle OLTP	1000	jde-ovm1/jde-ovm2

**Figure 8.** Nimble Storage Performance Policy

[Performance Policies](#) > Oracle OLTP

---

**PERFORMANCE PARAMETERS**

**Block size** 8192 bytes

---

**Compress** Yes

---

**Cache** Yes

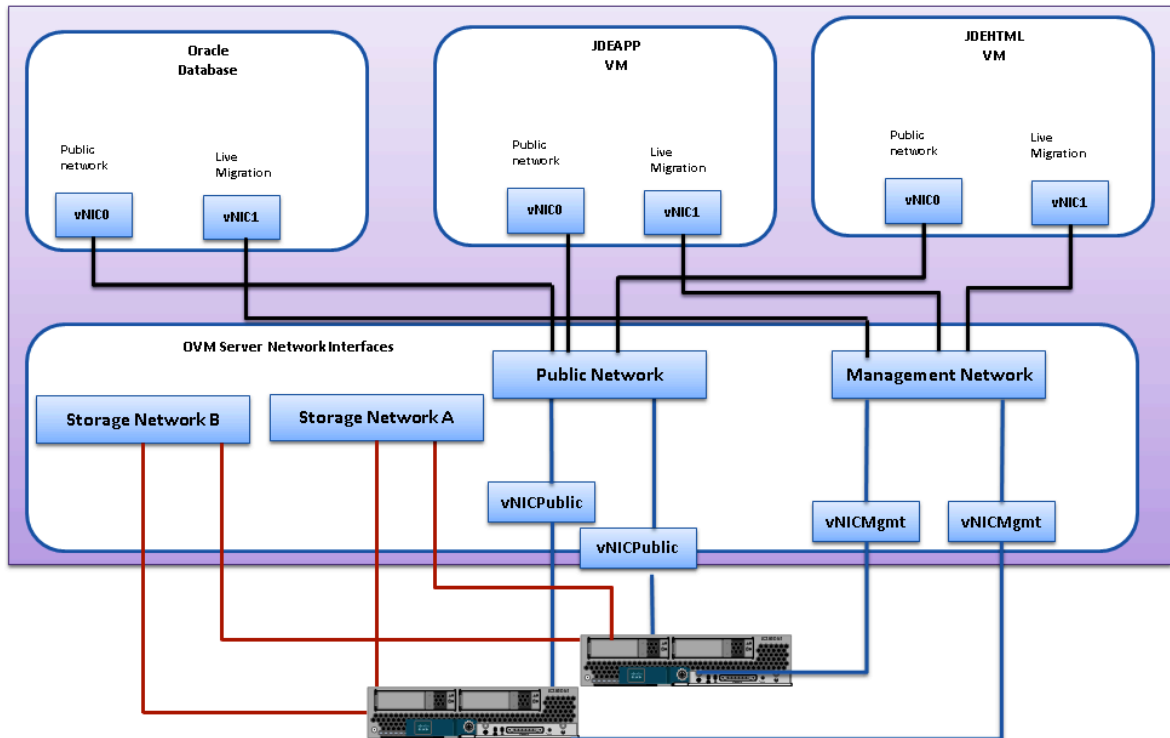
---

**Note:** Nimble Storage uses triple-parity RAID protection for all volumes provisioned from the array.

## Network Configuration

Figure 9 shows the network configuration for each of the Oracle VM Servers deployed on the Cisco UCS B200 M3.

**Figure 9.** Network Configuration

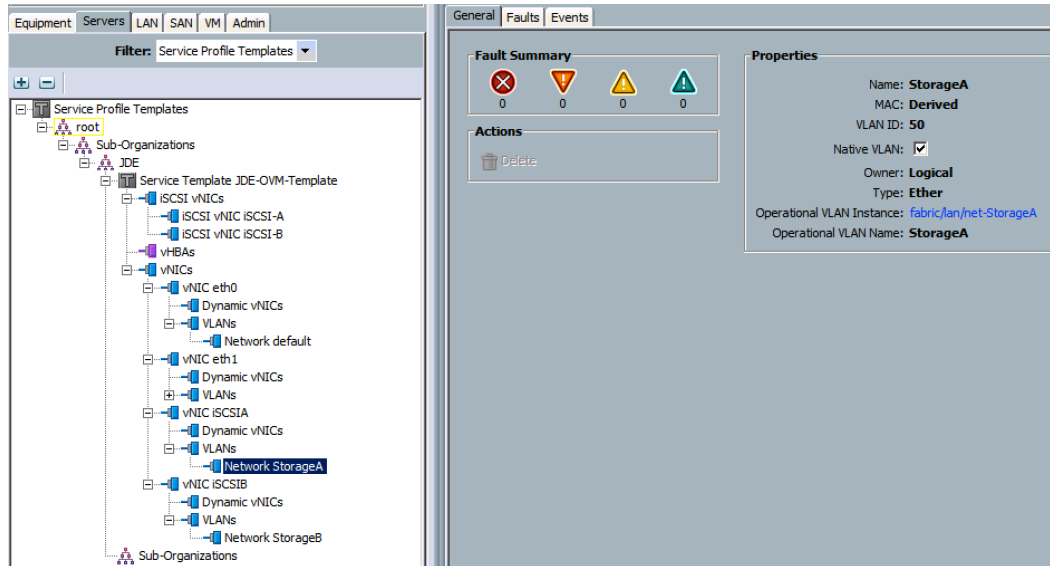


## Validation of Oracle's JD Edwards EnterpriseOne Setup

Following are some of the steps for validating SmartStack with Oracle VM templates.

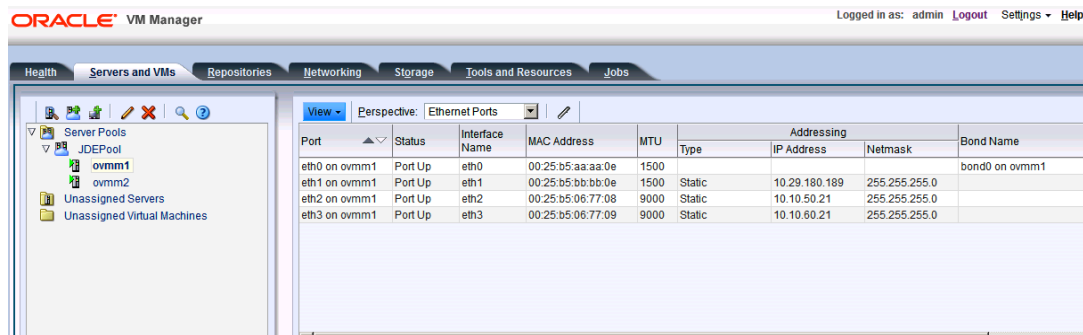
1. Verify that the network interfaces for Cisco UCS service profiles for each Oracle VM Server is configured as listed in Network Configuration section and shown in Figure 10.

**Figure 10.** Virtual NIC (vNIC) interfaces for Oracle VM Service Profile



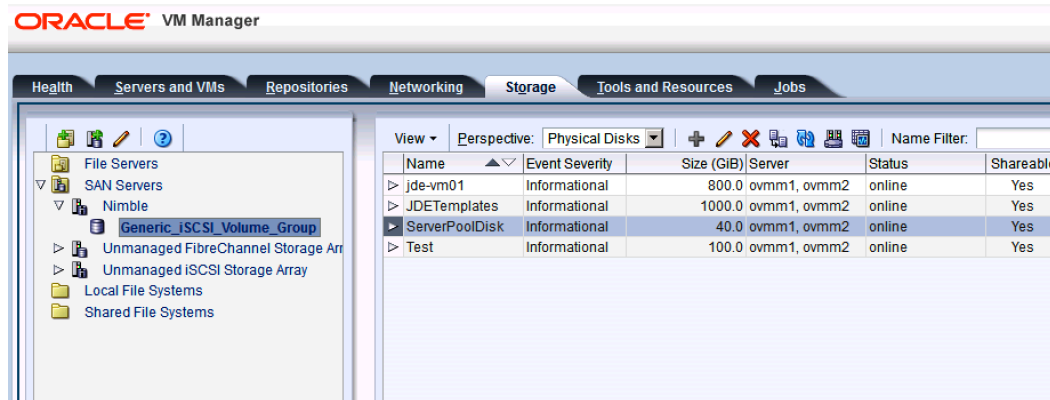
2. Verify that Oracle VM Server 3.3.1 is installed on each Cisco UCS B200 M3 server. (Because iSCSI boot from SAN is not supported, you should install Oracle VM Server on the local disk.)
3. Verify that Nimble Storage is discovered by each Oracle VM Server.
4. Verify the network interfaces on Oracle VM Server (Figure 11).

**Figure 11.** Oracle VM Network



5. Verify that logical unit numbers (LUNs) discovered by Oracle VM Manager are marked as shareable (Figure 12).

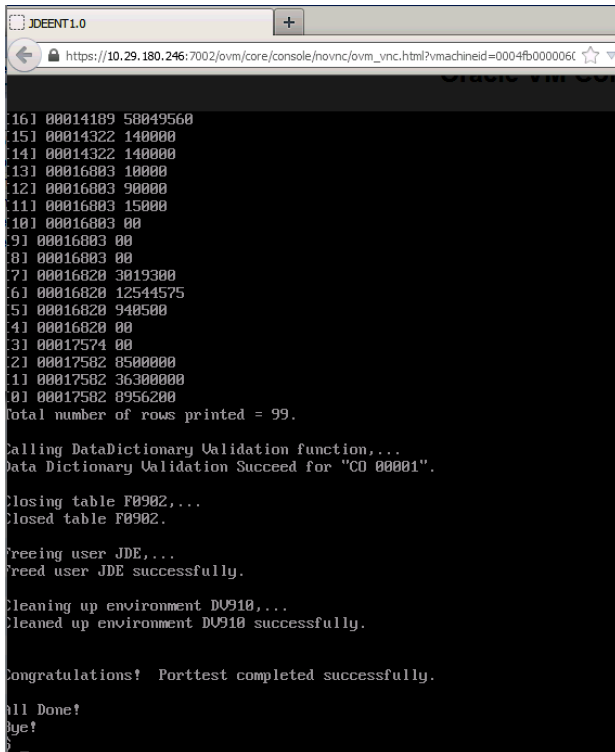
**Figure 12.** Shareable LUNs in Oracle VM Manager



6. Verify that the Oracle VM cluster pool is configured. Refer to <http://www.oracle.com/technetwork/documentation/vm-096300.html> for the Oracle VM Manager configuration.
7. Oracle VM templates for Oracle JD Edwards 9.1.2 and Tools 9.1.3.3 can be downloaded from <https://edelivery.oracle.com/oraclevm>.
8. All Oracle's JD Edwards templates are uploaded to the Oracle VM Manager repository. Refer to [https://docs.oracle.com/cd/E24902\\_01/doc.91/e37833/toc.htm](https://docs.oracle.com/cd/E24902_01/doc.91/e37833/toc.htm).
9. After importing Oracle's JD Edwards templates for Oracle Database Server, JD Edwards EnterpriseOne Enterprise Server, and HTML Server, run a port test on the JD Edwards EnterpriseOne Enterprise Server to verify the connectivity of the enterprise server with the database server. The port test should pass as shown in Figure 13.



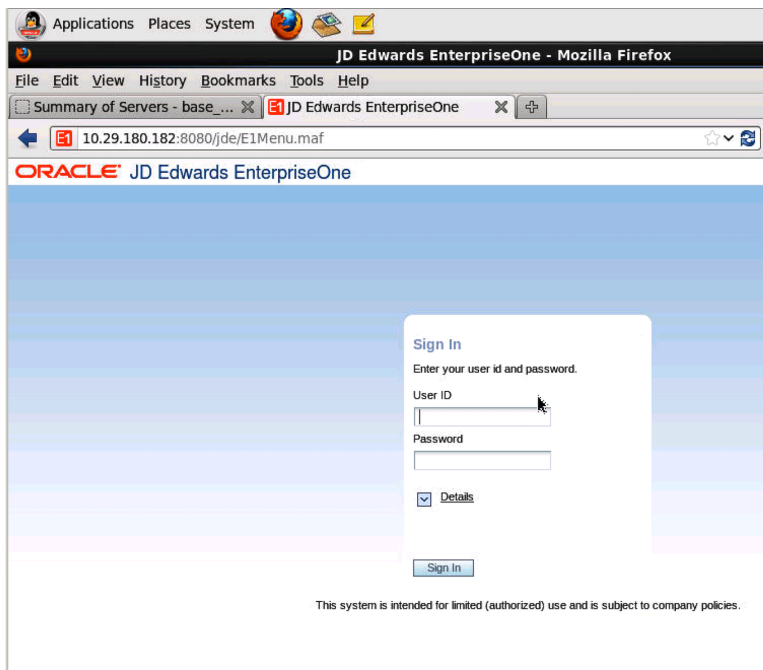
Figure 13. Port Test on JD Edwards EnterpriseOne Enterprise Server



```
JDEENT1.0
https://10.29.180.246:7002/ovm/core/console/novnc/ovm_vnc.html?vmachineid=0004fb000006c
161 00014189 58049560
151 00014322 140000
141 00014322 140000
131 00016803 10000
121 00016803 90000
111 00016803 15000
101 00016803 00
91 00016803 00
81 00016803 00
71 00016820 3019300
61 00016820 12544575
51 00016820 940500
41 00016820 00
31 00017574 00
21 00017582 0500000
11 00017582 36300000
01 00017582 0956200
Total number of rows printed = 99.
Calling DataDictionary Validation function,...
Data Dictionary Validation Succeed for "CO 00001".
Closing table F0902,...
Closed table F0902.
Freeing user JDE,...
 Freed user JDE successfully.
Cleaning up environment DU910,...
Cleaned up environment DU910 successfully.
Congratulations! Porttest completed successfully.
All Done!
bye!
? =
```

10. After the port test succeeds, import the HTML server template. Log in to the JD Edwards EnterpriseOne servers with username jde and password jde (Figure 14)

Figure 14. JD Edwards EnterpriseOne Login Screen



- 
11. You can now browse through various modules of Oracle's JD Edwards EnterpriseOne to verify that none of the JD Edwards EnterpriseOne screens report exceptions.

After these steps are complete, Oracle's JD Edwards EnterpriseOne deployment on Nimble Storage SmartStack with Cisco is validated.

## Best Practices and Tuning Recommendations

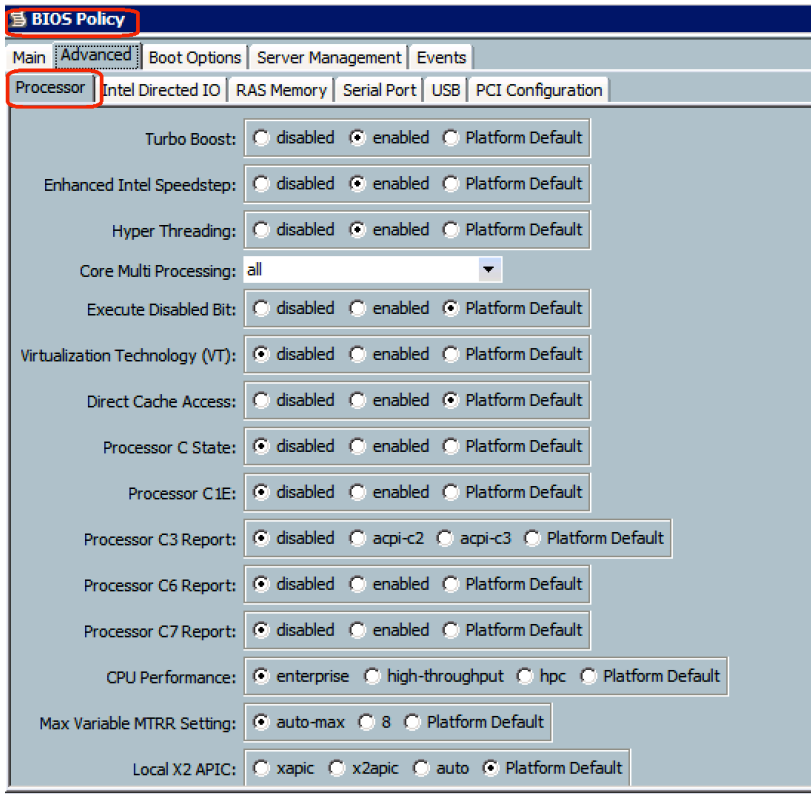
Oracle's JD Edwards EnterpriseOne deployed on Nimble Storage SmartStack with Oracle VM was configured for a small to medium-size ERP deployment. Oracle VM templates provide fast deployment time for JD Edwards EnterpriseOne. This section discusses the tuning parameters and best practices that should be incorporated across the solution's hardware and software stack.

### System Configuration

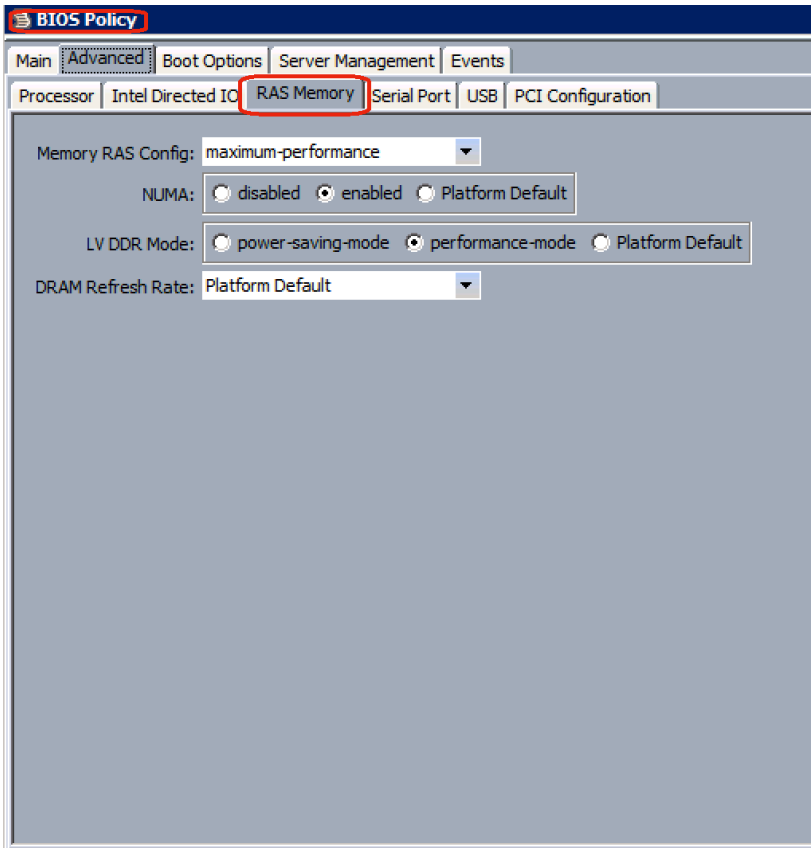
All the validation testing was performed using two Cisco UCS B200 M3 servers. Each server was equipped with two Intel Xeon processor E5-2697 v2 CPUs and 256 GB of physical memory. Five guest virtual machines were installed on the two Cisco UCS B200 M3 servers, with two instances each of the Oracle HTML Server and JD Edwards EnterpriseOne Server and a single instance of Oracle Database VM.

Both Cisco UCS blade servers were attached to a BIOS policy. BIOS policy is one of the features of Cisco UCS service profiles that enables users to incorporate similar BIOS settings across all deployed servers. This feature helps ensure consistent configuration, and administrators do not need to interrupt the boot process on each server to alter the BIOS settings. Figures 15 and 16 show the BIOS policy configured for the JD Edwards EnterpriseOne deployment.

Figure 15. BIOS Settings for CPU Performance



**Figure 16.** BIOS Settings for Physical Memory



Disable I/O memory-management unit (MMU) virtualization settings (VT-d). Refer to [http://docs.oracle.com/cd/E27300\\_01/E27307/html/vmrns-bugs.html](http://docs.oracle.com/cd/E27300_01/E27307/html/vmrns-bugs.html), Section 7.2.1.

### Jumbo Frames

Oracle VM 3.3.1 supports jumbo frames, enabling use of 10-Gbps ports in the storage network. Verify that jumbo frames are enabled on both the storage NICs in the Cisco UCS Manager service profile and the Ethernet interfaces for each Oracle VM Server under Oracle VM Manager. Nimble Storage jumbo frames should be enabled on the array as well as on the vNICs in Cisco UCS Manager (Figures 17 and 18).

**Figure 17.** Nimble Storage Subnet Jumbo Frames Setting

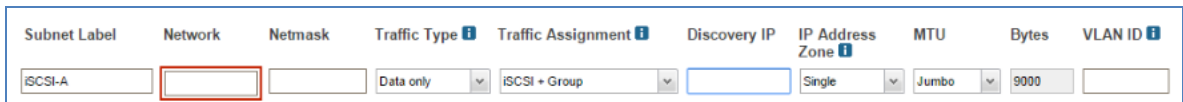
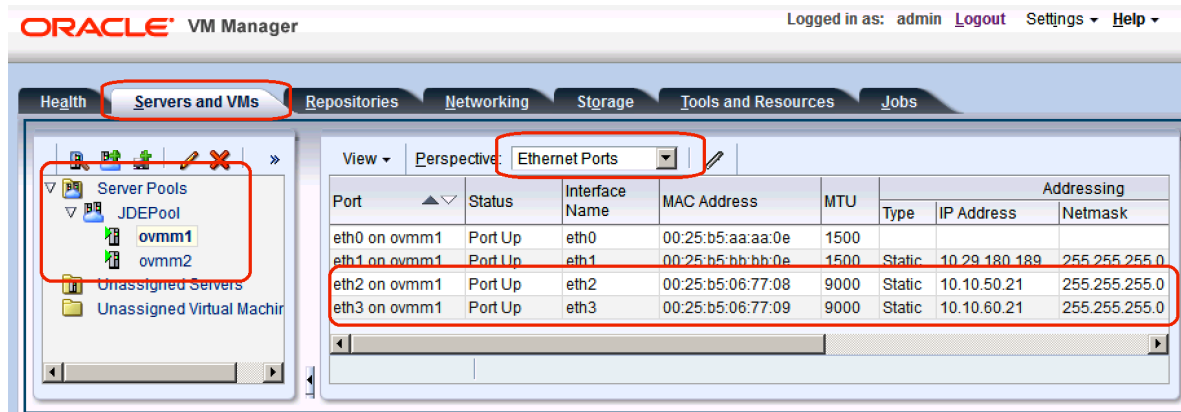


Figure 18. Jumbo Frames Under Oracle VM Manager



### TCP Parameter Configuration

The default TCP parameters in most Linux virtual machine distributions are conservative. They commonly are tuned to handle 100-Mbps or 1-Gbps port speeds, resulting in buffer sizes that are too small for 10-Gbps networks. Modifying these values can lead to significant performance gains in a 10-Gbps virtual machine network.

Buffer sizes should be adjusted to permit the maximum number of bytes in transit and prevent traffic throttling. The values shown here can be set on the virtual machines as well as in dom0. Edit `/etc/sysctl.conf` to make these changes. These settings can be changed both on virtual machines and on dom0. (Refer to [Oracle VM 3: 10GbE Network Performance Tuning](#) for more information.)

```
net.core.rmem_max = 134217728
net.core.wmem_max = 134217728
net.ipv4.tcp_rmem = 4096 87380 134217728
net.ipv4.tcp_wmem = 4096 65536 134217728
net.core.netdev_max_backlog = 300000
net.ipv4.tcp_moderate_rcvbuf =1
```

Additionally, for Oracle VM Server for x86 prior to Release 3.2, turn off the net filter on bridge devices, as shown here. This configuration is performed automatically in Oracle VM Release 3.2 and later.

```
net.bridge.bridge-nf-call-iptables=0
net.bridge.bridge-nf-call-arptables=0
net.bridge.bridge-nf-call-ip6tables=0
```

---

## Oracle Database Configuration

Several settings were changed on Oracle Database VM to support the high load that the relational database management system (RDBMS) handles. Some of the important tuning parameters are listed here:

- The data files and log files were configured on RAID 6. This configuration provides low read and write latency, thus helping lower response times for JD Edwards EnterpriseOne interactive applications.
- Virtual machines can run in either of two main modes: paravirtualized mode (PVM) or hardware-virtualized mode (HVM). In paravirtualized mode, the kernel of the guest operating system is recompiled so that it is aware of the virtual environment. This configuration allows the paravirtualized guest to run at near-native speed because most memory, disk, and network accesses are optimized for maximum performance. Oracle recommends creating paravirtualized virtual machines if possible, because the performance of a paravirtualized virtual machine is superior to that of a hardware virtualized guest.
- Configure the data and log LUNs as physical disks for Oracle Database VM. This configuration provides better I/O performance for both data and log disks.
- To understand the memory required for highly interactive and batch workloads, analyze the Automatic Workload Repository (AWR) report and set the system global area (SGA) and program global area (PGA) targets accordingly.
- In general, a JD Edwards EnterpriseOne online user consumes around 150 to 200 process per 100 concurrent interactive users.

## Oracle WebLogic Server Configuration

The JRockit Java Virtual Machine (JVM) was used along with Oracle WebLogic 10.3.5. A vertical cluster of up to several JVMs should be created, and Oracle HTTP Server should be used to balance the load among the various nodes of the vertical cluster.

Some of the important configuration details for Oracle WebLogic Server are listed here:

- For optimal performance, about 150 to 200 JD Edwards EnterpriseOne interactive users were hosted per cluster node and JVM.
- The minimum and maximum heap size for each node was set to 2 GB.
- The garbage collection policy was set to gencon because the pattern of object creation and destruction on the JD Edwards EnterpriseOne HTML Server indicated that a large number of short-lived objects were created and destroyed frequently.
- The nursery size was set to 512 MB.

## JD Edwards Enterprise Server Configuration

JD Edwards Tools Release 9.1.3.3 was used with JD Edwards 9.1.2 application release. The number of interactive users per call object should be about nine per call-object kernel.

Some of the important configuration settings for JD Edwards EnterpriseOne initialization files are listed here:

- JDE.ini
  - Kernel configuration:
    - Security kernels=70

- 
- Call-object kernels=400
  - Workflow kernels=30
  - Metadata kernels=1
  - [JDENET]
    - maxNetProcesses=60
    - maxNetConnections=8000
    - maxKernelProcesses=1000
    - maxNumSocketMsgQueue=1000
    - maxIPCQueueMsgs=600
    - maxLenInlineData=4096
    - maxLenFixedData=16384
    - maxFixedDataPackets=2000
    - internalQueueTimeOut=90
  - [JDEIPC]
    - maxNumberOfResources=4000
    - maxNumberOfSemaphores=2000
    - startIPCKeyValue=6001
    - avgResourceNameLength=40
    - avgHandles=200
    - hashBucketSize=53
    - maxMsgqMsgBytes=5096
    - maxMsgqEntries=1024
    - maxMsgqBytes=65536
    - msgQueueDelayTimeMillis=40
  - jdbj.ini
    - JDBj-CONNECTION POOL
      - minConnection=5
      - maxConnection=800
      - poolGrowth=5
      - initialConnection=25
      - maxSize=500
  - jas.ini
    - OWWEB
      - MAXUser=500
      - OWVirtualThreadPoolSize=800
    - JDENET
      - maxPoolSize=500

---

## Conclusion

This document demonstrates how Nimble Storage SmartStack for Oracle's JD Edwards EnterpriseOne with Cisco, using deployment best practices, provides a highly reliable, robust solution for a JD Edwards EnterpriseOne 9.1 implementation.

SmartStack for Oracle's JD Edwards EnterpriseOne with Cisco is a prevalidated reference architecture based on best-in-class solutions from Nimble Storage, Cisco, and Oracle that deliver enterprise-class availability, performance, and capacity for JD Edwards EnterpriseOne.

ERP, which is a business-critical application, takes a long time to implement and test, and organizations are always seeking to move to newer technologies or experiment with the advanced features that are available today. Because ERP is a business-critical application, predictability is one of the most important concerns for any solution: Will it work for you? How will it work? What will it cost? Nimble Storage SmartStack, a combination of Cisco UCS Mini, Nimble Storage CS300, and Oracle VM, demonstrates faster deployment time, which is crucial to JD Edwards EnterpriseOne ERP implementations.

Cisco and Nimble Storage have invested considerable time and effort in testing and validating Oracle's JD Edwards EnterpriseOne on the Cisco UCS platform and providing comprehensive scalable architecture and best practices. By using the best practices and lessons learned in this extensive JD Edwards validation, customers can confidently deploy and consolidate JD Edwards EnterpriseOne on the Cisco UCS platform with Oracle VM virtualization.

## For More Information

- Cisco UCS Manager 3.0 Configuration Guide for UCS Mini: <http://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-manager/products-installation-and-configuration-guides-list.html>
- Oracle VM 3.3 Configuration Guide: [https://docs.oracle.com/cd/E50245\\_01/index.html](https://docs.oracle.com/cd/E50245_01/index.html)
- JD Edwards EnterpriseOne Oracle VM Templates Express Installation Guide: [https://docs.oracle.com/cd/E24902\\_01/doc.91/e37833/toc.htm](https://docs.oracle.com/cd/E24902_01/doc.91/e37833/toc.htm)
- Oracle JD Edwards VM Templates for JDE 9.1.2 and Tools 9.1.3.3: <https://edelivery.oracle.com/oraclevm>
- Nimble Storage SmartStack Resources: <http://www.nimblestorage.com/resources/SmartStack.php>





---

**Americas Headquarters**  
Cisco Systems, Inc.  
San Jose, CA

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
Singapore

**Europe Headquarters**  
Cisco Systems International BV Amsterdam,  
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: [www.cisco.com/go/trademarks](http://www.cisco.com/go/trademarks). Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

Printed in USA

C11-733613-00 01/15