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Deployment Guide

Oracle WebLogic Using Cisco Unified Computing System

Oracle WebLogic Server, Oracle Database and Apache on OEL

Depolyment Guide

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Contents

1.1 Audience	3
2. Infrastructure Components	. 3
2.1 Cisco Unified Computing System	. 3
2.2 Cisco Unified Computing System Components	. 4
2.2.1 Cisco UCS Manager	. 4
2.2.2 Fabric Interconnect	5
2.2.3 Cisco Fabric Extenders Module	7
2.2.4 Cisco UCS Chassis	8
2.2.5 Intel Xeon 5600 Series Processor	8
2.2.6 Intel Xeon 7500 Series Processor	
2.2.7 Cisco UCS B200M2 Blade Server	
2.2.8 Cisco UCS B230M1 Blade Server1 2.2.9 Cisco UCS B250M2Extended Memory Blade Server1	10
2.2.9 Cisco OCS B250M2Extended Memory Blade Server	
2.2.10 Extended Memory Architecture	11 12
2.3 EMC CLARiiON	12
2.4 Cisco Networking Infrastructure	
2.4.1 Cisco Nexus 5010 28-Port Switch	13
2.4.2 Cisco Nexus 5000 Series Feature Highlights	13
3. Platform Components	
•	
3.1 Oracle WebLogic Server 11gR1	14
3.2 Oracle Database 11gR2	
3.3 Oracle Enterprise Linux	
4. Solution Validation 1	
4.1 Deployment Architecture 1	15
4.2 Cisco Unified Computing System Configuration1	17
4.2.1 Service Profile Configuration	
4.3 Boot from SAN	
4.3.1 Storage Array Configuration	31
4.3.2 Cisco UCS Manager Configuration	30 40
4.3.3 Zone Configuration	+2 17
4.4 OEL installation on SAN	17
4.5 WebLogic11gR1 installation	56
4.5.1 Configuration of WebLogic Install LUN on CX4	56
4.5.2 JRockit 64-bit Installation	58
4.5.3 Oracle WebLogic Server Installation	59
4.5.4 Oracle WebLogic Cluster Configuration6	65
4.5.5 Apache HTTP Server Plug-in7	78
4.6 Cisco UCS Statelessness	78
4.6.1 Service Profile Migration	79
5. Future Considerations	33
5.1 Server Failure Detection and Automated Service Profile Migration	33
5.2 Performance and Scalability Analysis for WebLogic on a Cisco UCS Blade Server	33
6. For More Information	33

1. Goals

This document details how to deploy the Oracle WebLogic Middleware solution on Cisco® UCS B-Series Blade Servers that are connected to the EMC CLARiiON CX4 Storage array. It also details the best practice recommendations for configuring Cisco UCS Service Profiles, the SAN Boot configuration, and describes the Cisco UCS advantages for Java Enterprise Edition platforms.

1.1 Audience

This document is intended to assist solution architects, sales engineers, field engineers and consultants in deploying Oracle WebLogic Cluster solutions on the Cisco Unified Computing System. This document assumes that the reader has an architectural understanding of the Cisco Unified Computing System, Java EE, Oracle WebLogic middleware platform, and related software.

2. Infrastructure Components

The following sections detail the infrastructure components used in this particular configuration.

2.1 Cisco Unified Computing System

The Cisco Unified Computing System is a next-generation data center platform that unites compute, network, storage access, and virtualization into a cohesive system designed to reduce total cost of ownership (TCO) and increase business agility. The Cisco Unified Computing System server portfolio consists of the blade server platform, B-Series and the C-Series Rack-Mount platform. We chose the Cisco UCS B-Series Blade Server platform for this study. The system integrates a low-latency, lossless 10 Gigabit Ethernet unified network fabric with enterprise-class x86-architecture servers. The system is an integrated, scalable, multi-chassis platform in which all resources participate in a unified management domain.

The main system components include:

Compute—the system is based on an entirely new class of computing system that incorporates blade servers based on Intel Xeon 5500 Series Processors. The Cisco UCS blade servers offer patented Cisco Extended Memory Technology to support applications with large datasets and allow more virtual machines per server.

Network—the system is integrated onto a low-latency, lossless, 10-Gbps unified network fabric. This network foundation consolidates what today are three separate networks: LANs, SANs, and high-performance computing networks. The unified fabric lowers costs by reducing the number of network adapters, switches, and cables, and by decreasing power and cooling requirements.

Virtualization—the system unleashes the full potential of virtualization by enhancing the scalability, performance, and operational control of virtual environments. Cisco security, policy enforcement, and diagnostic features are now extended into virtualized environments to better support changing business and IT requirements.

Storage access—the system provides consolidated access to both SAN storage and Network Attached Storage (NAS) over the unified fabric. Unifying storage access means that the Cisco Unified Computing System can access storage over Ethernet, Fibre Channel, Fibre Channel over Ethernet (FCoE), and iSCSI, providing customers with choice and investment protection. In addition, administrators can pre-assign storage-access policies for system connectivity to storage resources, simplifying storage connectivity and management while helping increase productivity.

Management—the system uniquely integrates all the system components, enabling the entire solution to be managed as a single entity through the Cisco UCS Manager software. The Cisco UCS Manager provides an

intuitive graphical user interface (GUI), a command-line interface (CLI), and a robust application programming interface (API) to manage all system configuration and operations. The Cisco UCS Manager helps increase IT staff productivity, enabling storage, network, and server administrators to collaborate on defining service profiles for applications. Service profiles are logical representations of desired physical configurations and infrastructure policies. They help automate provisioning and increase business agility, allowing data center managers to provision resources in minutes instead of days.

Working as a single, cohesive system, these components unify technology in the data center. They represent a radical simplification in comparison to traditional systems, helping simplify data center operations while reducing power and cooling requirements. The system amplifies IT agility for improved business outcomes. The Cisco Unified Computing System components illustrated in Figure 1 include, from left to right, fabric interconnects, blade server chassis, blade servers, and in the foreground, fabric extenders and network adapters.

Figure 1. Cisco Unified Computing System



2.2 Cisco Unified Computing System Components

2.2.1 Cisco UCS Manager

Cisco UCS Manager serves as an embedded device manager for all Cisco Unified Computing System components. The Cisco UCS Manager creates a unified management domain that serves as the central nervous system of the Cisco UCS Manager creates a unified management domain that serves as the central nervous management tools associated with a traditional computing architecture by integrating computing, networking, and virtualization resources into one cohesive system. Cisco UCS Manager implements policy-based management using *service profiles* to help automate provisioning and increase agility.

In managing the services within Cisco UCS, configuration details are applied to service profiles, instead of many tedious touches of a physical server and the associated LAN, SAN, and management networks. The service profile includes all the firmware, firmware settings, and BIOS settings. For example, definition of server connectivity, configuration, and identity. This model allows for rapid service instantiation, cloning, growth, shrink, retirement, and re-use in a highly automated fashion. One capability is for a project-by-project instantiation of compute resources with integrated governance, and a life-cycle that returns the physical compute hardware to a pool for other business unit usage. If the project requires a re-build of a previous infrastructure, the stateless nature of Cisco UCS provides for a rapid standup of the prior environment (assuming a SAN boot, or physical disk storage scenario). With other vendors, there is a loosely coupled system of packages having many meshed and customized interconnections. When any of these items is versioned, the effects of updating are not isolated to a given component—they impact other components within a solution. Cisco UCS, with its single source of information and

configuration, and open schema, handles upgrades, as well as daily operations, in a simple, straightforward manner.

In the present setup consists of two B200M2 Servers for Apache and an application server for each. A configured service profile was used for one of the B200M2 servers and then simply cloned the profile for the second server. This allows fast provisioning of new servers in the Cisco UCS configuration.

Figure 2 illustrates the Cisco UCS Manager with a service profile associated with a B200M2 server.



Figure 2. Cisco UCS Manager View

2.2.2 Fabric Interconnect

The Cisco UCS 6100 Series Fabric Interconnects are a core part of the Cisco Unified Computing System, providing both network connectivity and management capabilities for the system (Figure 2). The Cisco UCS 6100 Series offers line-rate, low-latency, lossless 10 Gigabit Ethernet and FCoE functions.

The Cisco UCS 6100 Series provides the management and communication backbone for the Cisco UCS B-Series Blade Servers and Cisco UCS 5100 Series Blade Server Chassis. All chassis and therefore all blades, attached to the Cisco UCS 6100 Series Fabric Interconnects become part of a single, highly available management domain. In addition, by supporting unified fabric, the Cisco UCS 6100 Series provides both the LAN and SAN connectivity for all blades within its domain.

From a networking perspective, the Cisco UCS 6100 Series uses a cut-through architecture, supporting deterministic, low-latency, line-rate 10 Gigabit Ethernet on all ports, independent of packet size and enabled services. 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 interconnect. Significant TCO savings come from an FCoE-optimized server design in which network interface cards (NICs), host bus adapters (HBAs), cables, and switches can be consolidated.

The Cisco UCS 6100 Series is also built to consolidate LAN and SAN traffic onto a single unified fabric, saving the capital and operating expenses associated with multiple parallel networks, different types of adapter cards, switching infrastructure, and cabling within racks. Fibre Channel expansion modules in the interconnect support direct connections from the Cisco Unified Computing System to existing native Fibre Channel SANs. The capability to connect FCoE to native Fibre Channel protects existing storage system investments while dramatically simplifying in-rack cabling.

Figure 3. Cisco UCS 6120XP 20-Port Fabric Interconnect (Top) and Cisco UCS 6140XP 40-Port Fabric Interconnect



The Cisco UCS 6100 Series is equipped to support the following module options:

- Ethernet module that provides 6 ports of 10 Gigabit Ethernet using the SFP+ interface
- Fibre Channel plus Ethernet module that provides 4 ports of 10 Gigabit Ethernet using the SFP+ interface; and 4 ports of 1/2/4-Gbps native Fibre Channel connectivity using the SFP interface
- Fibre Channel module that provides 8 ports of 1/2/4-Gbps native Fibre Channel using the SFP interface for transparent connectivity with existing Fibre Channel networks
- Fibre Channel module that provides 6 ports of 1/2/4/8-Gbps native Fibre Channel using the SFP or SFP+ interface for transparent connectivity with existing Fibre Channel networks

Figure 4. From left to right: 8-Port 1/2/4-Gbps Native Fibre Channel Expansion Module; 4-Port Fibre Channel plus 4-Port 10



2.2.3 Cisco Fabric Extenders Module

The Cisco UCS 2100 Series Fabric Extenders bring the unified fabric into the blade server enclosure, providing 10 Gigabit Ethernet connections between blade servers and the fabric interconnect, simplifying diagnostics, cabling, and management.

The Cisco UCS 2100 Series extends the I/O fabric between the Cisco UCS 6100 Series Fabric Interconnects and the Cisco UCS 5100 Series Blade Server Chassis, enabling a lossless and deterministic FCoE fabric to connect all blades and chassis together. Since the fabric extender is similar to a distributed line card, it does not do any switching and is managed as an extension of the fabric interconnects. This approach removes switching from the chassis, reducing overall infrastructure complexity and enabling the Cisco Unified Computing System to scale to many chassis without multiplying the number of switches needed, reducing TCO and allowing all chassis to be managed as a single, highly available management domain.

The Cisco 2100 Series also manages the chassis environment (the power supply and fans as well as the blades) in conjunction with the fabric interconnect. Therefore, separate chassis management modules are not required.

The Cisco UCS 2100 Series Fabric Extenders fit into the back of the Cisco UCS 5100 Series chassis. Each Cisco UCS 5100 Series chassis can support up to two fabric extenders, enabling increased capacity as well as redundancy.



Figure 5. Rear view of Cisco UCS 5108 Blade Server Chassis with two Cisco UCS 2104XP Fabric Extenders

The Cisco UCS 2104XP Fabric Extender has four 10 Gigabit Ethernet, FCoE-capable, Small Form-Factor Pluggable Plus (SFP+) ports that connect the blade chassis to the fabric interconnect. Each Cisco UCS 2104XP has eight 10 Gigabit Ethernet ports connected through the midplane to each half-width slot in the chassis. Typically configured in pairs for redundancy, two fabric extenders provide up to 80 Gbps of I/O to the chassis.

Figure 6. Cisco UCS 2104XP Fabric Extender



2.2.4 Cisco UCS Chassis

The Cisco UCS 5100 Series Blade Server Chassis is a crucial building block of the Cisco Unified Computing System, delivering a scalable and flexible blade server chassis for today's and tomorrow's data center while helping reduce TCO.

Cisco's first blade server chassis offering, the Cisco UCS 5108 Blade Server Chassis, is six rack units (6RU) high and can mount in an industry-standard 19-inch rack. A chassis can house up to eight half-width Cisco UCS B-Series Blade Servers and can accommodate both half- and full-width blade form factors.

Four single-phase, hot-swappable power supplies are accessible from the front of the chassis. These power supplies are 92 percent efficient and can be configured to support non-redundant, N+ 1 redundant and grid-redundant configuration. The rear of the chassis contains eight hot-swappable fans, four power connectors (one per power supply), and two I/O bays for Cisco UCS 2104XP Fabric Extenders.

A passive mid-plane provides up to 20 Gbps of I/O bandwidth per server slot and up to 40 Gbps of I/O bandwidth for two slots. The chassis is capable of supporting future 40 Gigabit Ethernet standards.

Figure 7. Cisco Blade Server Chassis (front and back view)



2.2.5 Intel Xeon 5600 Series Processor

As data centers reach the upper limits of their power and cooling capacity, efficiency has become the focus of extending the life of existing data centers and designing new ones. As part of these efforts, IT needs to refresh existing infrastructure with standard enterprise servers that deliver more performance and scalability, more efficiently. The Intel Xeon 5600 Series Processor automatically regulates power consumption and intelligently adjusts server performance according to your application needs, both energy efficiency and performance. The secret to this compelling combination is Intel's new 32nmXeon microarchitecture. Featuring Intel Intelligent Power Technology that automatically shifts the CPU and memory into the lowest available power state, while delivering the performance as previous-generation servers but uses up to 30 percent less power. You can achieve up to a 93 percent reduction in energy costs when consolidating your single-core infrastructure with a new infrastructure built on Intel Xeon 5600 Series Processor.

This groundbreaking intelligent server technology features:

- Intel's new 32nm Microarchitecture Xeon built with second-generation high-k and metal gate transistor technology.
- Intelligent Performance that automatically optimizes performance to fit business and application requirements and delivers up to 60 percent more performance per watt than Intel Xeon 5500 Series Processor.
- Automated Energy Efficiency that scales energy usage to the workload to achieve optimal performance/watt and with new 40 Watt options and lower power DDR3 memory, you can lower your energy costs even further.

 Flexible virtualization that offers best-in-class performance and manageability in virtualized environments to improve IT infrastructure and enable up to 15:1 consolidation over two socket, single-core servers. New standard enterprise servers and workstations built with this new generation of Intel process technology offer an unprecedented opportunity to dramatically advance the efficiency of IT infrastructure and provide unmatched business capabilities.

Figure 8. Intel Xeon 5600 Series Processor



2.2.6 Intel Xeon 7500 Series Processor

The Intel Xeon processor 7500 series supports up to eight integrated cores and 16 threads, and is available with frequencies up to 2.66 GHz, and 24 MB of cache memory, four Intel QPI links and Intel Turbo boost technology. Thermal design point (TDP) power levels range from 95 watt to 130 watts.

This new Intel processor is packed with more than 20 new features that deliver a leap forward in reliability, availability and serviceability (RAS). These reliability capabilities are designed to improve the protection of data integrity, increase availability and minimize planned downtime.

For example, this is the first Xeon processor to possess Machine Check Architecture (MCA) Recovery, a feature that allows the silicon to work with the operating system and virtual machine manager to recover from otherwise fatal system errors, a mechanism until now found only in Intel® Itanium® processor family and RISC processors.

2.2.7 Cisco UCS B200M2 Blade Server

The Cisco UCS B200M2 Blade Server is a half-width, two-socket blade server. Cisco UCS B200M2 blade server uses two Intel Xeon 5600 Series Processors, with up to 96GB of DDR3 memory, two optional hot-swappable small form factor (SFF) serial attached SCSI (SAS) disk drives, and a single mezzanine connector for up to 20 Gbps of I/O throughput. The server balances simplicity, performance, and density for production-level virtualization and other mainstream data center workloads.

Figure 9. Cisco UCS B200 M2 Blade Server



2.2.8 Cisco UCS B230M1 Blade Server

Cisco has expanded the architectural advantages of its Intel Xeon Processor 6500 and 7500 Series-based server platforms with an exceptionally high density blade server. The two-socket Cisco UCS B230M1 Blade Server platform delivers high performance and density in a compact, half-width form factor.

In addition, it provides one dual-port mezzanine card for up to 20 Gbps I/O per blade. Options include a Cisco UCS M81KR Virtual Interface Card or converged network adapter (Emulex or QLogic compatible).

Other features include:

- 32 dual in-line memory module (DIMM) slots and up to 256 GB at 1066 MHz based on Samsung 40nanometer class (DDR3) technology
- Two optional front-accessible, hot-swappable solid-state drives (SSDs) and an LSI SAS2108 RAID Controller
- Greatly simplified deployment and systems management with embedded integration into Cisco UCS Manager
- Each Cisco UCS 5108 Blade Server Chassis can house up to eight B230M1 servers (a maximum of 320 per Cisco Unified Computing System).

Figure 10. Cisco UCS B230 M1 Blade Server



2.2.9 Cisco UCS B250M2Extended Memory Blade Server

The Cisco UCS B250M2 Extended Memory Blade Server is a full-width, two-socket blade server featuring Cisco Extended Memory Technology. The system supports two Intel Xeon 5600 Series Processors, up to 384 GB of DDR3 memory, two optional SFF SAS disk drives, and two mezzanine connections for up to 40 Gbps of I/O throughput. The server increases performance and capacity for demanding virtualization and large-data-set workloads with greater memory capacity and throughput.

Figure 11. Cisco UCS B250 M2 Extended Memory Blade Server



2.2.10 Extended Memory Architecture

Modern CPUs with built-in memory controllers support a limited number of memory channels and slots per CPU. The need for virtualization software to run multiple OS instances demands large amounts of memory, and that, combined with the fact that CPU performance is outstripping memory performance, can lead to memory bottlenecks. Even some traditional non-virtualized applications demand large amounts of main memory: database management system performance can be improved dramatically by caching database tables in memory, and modeling and simulation software can benefit from caching more of the problem state in memory.

To obtain a larger memory footprint, most IT organizations are forced to upgrade to larger, more expensive, foursocket servers. CPUs that can support four-socket configurations are typically more expensive, require more power, and entail higher licensing costs. Cisco Extended Memory Technology expands the capabilities of CPUbased memory controllers by logically changing the geometry of main memory while still using standard DDR3 memory. This technology makes every four DIMM slots in the expanded memory blade server appear to the CPU's memory controller as a single DIMM that is four times the size (Figure 16). For example, using standard DDR3DIMMs, the technology makes four 8-GB DIMMS appear as a single 32-GB DIMM. Cisco UCS B250M2 servers implements Cisco Extended Memory technology.

This patented technology allows the CPU to access more industry-standard memory than ever before in a twosocket server:

For memory-intensive environments, data centers can better balance the ratio of CPU power to memory and install larger amounts of memory without having the expense and energy waste of moving to four-socket servers simply to have a larger memory capacity. With a larger main-memory footprint, CPU utilization can improve because of fewer disk waits on page-in and other I/O operations, making more effective use of capital investments and more conservative use of energy.

For environments that need significant amounts of main memory but which do not need a full 384 GB, smallersized DIMMs can be used in place of 8-GB DIMMs, with resulting cost savings: two 4-GB DIMMS are typically less expensive than one 8-GB DIMM.



Figure 12. Cisco Extended Memory Architecture

2.2.11 Cisco UCS Virtual Interface Card (VIC)

Cisco Virtual Interface Cards were developed ground up to provide acceleration for the various new operational modes introduced by server virtualization. The Virtual Interface Cards are highly configurable and self-virtualized adapters that can create up 128 PCIe endpoints per adapter. These PCIe endpoints are created in the adapter firmware and present fully compliant standard PCIe topology to the host OS or hypervisor.

Each of these PCIe endpoints the Virtual Interface Card creates can be configured individually for the following attributes:

- Interface type: FCoE, Ethernet or Dynamic Ethernet interface device
- Resource maps that are presented to the host: PCIeBARs, interrupt arrays
- · The Network presence and attributes: MTU, VLAN membership
- QoS parameters: 802.1p class, ETS attributes, rate limiting and shaping

Figure 13. Cisco UCS Virtual Interface Card



2.3 EMC CLARIION

EMC CLARiiON CX4 model 240 is a powerful networked storage system that scales seamlessly up to 231 TB of capacity. CLARiiON CX4 model 240 combines CLARiiON five 9s availability with automated storage tiering (FAST), FAST Cache, Flash drives, compression, 64-bit operating system, and multicore processors.

In the present setup, we have used CX4-240 to deploy Oracle WebLogic Cluster.

Figure 14. EMC Clariion – CX4-240



2.4 Cisco Networking Infrastructure

2.4.1 Cisco Nexus 5010 28-Port Switch

The Cisco Nexus 5010 Switch is a 1RU, 10 Gigabit Ethernet/FCoE access layer switch built to provide more than 500 Gigabits per second (Gbps) throughput with very low latency. It has 20 fixed 10 Gigabit Ethernet/FCoE ports that accept modules and cables meeting the Small Form-Factor Pluggable Plus (SFP+) form factor. One expansion module slot can be configured to support up to six additional 10 Gigabit Ethernet/FCoE ports, up to eight Fibre Channel ports, or a combination of both. The switch has a single serial console port and a single out-of-band 10/100/1000-Mbps Ethernet management port. Two N+1 redundant, hot-pluggable power supplies and five N+1 redundant, hot-pluggable fan modules provide highly reliable front-to-back cooling.

2.4.2 Cisco Nexus 5000 Series Feature Highlights

Features and Benefits

The switch family's rich feature set makes the series ideal for rack-level, access-layer applications. It protects investments in data center racks with standards-based Ethernet and FCoE features that allow IT departments to consolidate networks based on their own requirements and timing.

The combination of high port density, wire-speed performance, and extremely low latency makes the switch an ideal product to meet the growing demand for 10 Gigabit Ethernet at the rack level. The switch family has sufficient port density to support single or multiple racks fully populated with blade and rack-mount servers.

Built for today's data centers, the switches are designed just like the servers they support. Ports and power connections are at the rear, closer to server ports, helping keep cable lengths as short and efficient as possible. Hot-swappable power and cooling modules can be accessed from the front panel, where status lights offer an at-a-glance view of switch operation. Front-to-back cooling is consistent with server designs, supporting efficient data center hot- and cold-aisle designs. Serviceability is enhanced with all customer-replaceable units accessible from the front panel. The use of SFP+ ports offers increased flexibility to use a range of interconnect solutions, including copper for short runs and fiber for long runs.

Fibre Channel over Ethernet and IEEE Data Center Bridging features supports I/O consolidation, eases management of multiple traffic flows, and optimizes performance. Although implementing SAN consolidation requires only the lossless fabric provided by the Ethernet pause mechanism, the Cisco Nexus 5000 Series provides additional features that create an even more easily managed, high-performance, unified network fabric.

10 Gigabit Ethernet and Unified Fabric Features

The Cisco Nexus 5000 Series is first and foremost a family of outstanding access switches for 10 Gigabit Ethernet connectivity. Most of the features on the switches are designed for high performance with 10 Gigabit Ethernet. The Cisco Nexus 5000 Series also supports FCoE on each 10 Gigabit Ethernet port that can be used to implement a unified data center fabric, consolidating LAN, SAN, and server clustering traffic.

Low Latency

The cut-through switching technology used in the Cisco Nexus 5000 Series ASICs enables the product to offer a low latency of 3.2 microseconds, which remains constant regardless of the size of the packet being switched. This latency was measured on fully configured interfaces, with access control lists (ACLs), quality of service (QoS), and all other data path features turned on. The low latency on the Cisco Nexus 5000 Series enables application-to-application latency on the order of 10 microseconds (depending on the network interface card [NIC]). These numbers, together with the congestion management features described next, make the Cisco Nexus 5000 Series a great choice for latency-sensitive environments.

Other features include: Nonblocking Line-Rate Performance, Single-Stage Fabric, Congestion Management, Virtual Output Queues, Lossless Ethernet (Priority Flow Control), Delayed Drop Fibre Channel over Ethernet, Hardware-Level I/O Consolidation, and End-Port Virtualization. For more information, see: http://www.cisco.com/en/US/products/ps9670/prod_white_papers_list.html.

3. Platform Components

3.1 Oracle WebLogic Server 11gR1

Oracle WebLogic Server is a scalable, enterprise-ready Java Platform, Enterprise Edition (Java EE) application server. The WebLogic Server infrastructure supports the deployment of many types of distributed applications and is an ideal foundation for building applications based on Service Oriented Architectures (SOA).

The WebLogic Server complete implementation of The Sun Microsystems Java EE 5.0 specification provides a standard set of APIs for creating distributed Java applications that can access a wide variety of services, such as databases, messaging services, and connections to external enterprise systems. End-user clients access these applications using Web browser clients or Java clients. It also supports the Spring Framework, a programming model for Java applications which provides an alternative to aspects of the Java EE model.

In addition to the Java EE implementation, WebLogic Server enables enterprises to deploy mission-critical applications in a robust, secure, highly available, and scalable environment. These features allow enterprises to configure clusters of WebLogic Server instances to distribute load, and provide extra capacity in case of hardware or other failures.

In the present setup, we clustered Oracle WebLogic 11g (10.3.5) on Cisco UCS B230M1 blade server.

3.2 Oracle Database 11gR2

Oracle Database is an ORDBMS (Object Relational DatabaseManagement System), with its own Volume Manager and managed Database. Oracle Database 11g Release 2 provides the foundation for IT to successfully deliver more information with higher quality of service, reduce the risk of change within IT, and make more efficient use of their IT budgets. Oracle implements, Oracle Real Application Clusters (RAC), an option to Oracle Database 11g Release 2, enables acluster of low-cost commodity servers to work together as a single shared database grid. Applications can be deployed on a grid without modification or re-architecture and enjoy thebenefit of consolidation, higher availability, faster performance and scalability on-demand.

3.3 Oracle Enterprise Linux

Oracle Linux is an open source operating system available under the GNU General Public License (GPL) and is available for free download through Oracle E-Delivery. Oracle Linux offers two Linux kernels to choose from:

- The Red Hat Compatible Kernel, for those who prefer strict Red Hat compatibility
- The new Unbreakable Enterprise Kernel, for those who want to leverage the latest features in Linux and boost performance and scalability

In the present setup, we used 64-bit Oracle Enterprise Linux 5.5.

4. Solution Validation

4.1 Deployment Architecture

The three-tier web deployment used in the present setup is detailed in Figure 15.





The configuration presented in this document is based on the following main components (Error! Reference source not found.).

WebServer	Apache 2.2 is deployed on UCS B200M2 blade server equipped with two six-core Intel Xeon 5680 processors at 3.33 GHz with a physcial memory of 24G
Application Server	Oracle WebLogic Server 11g (10.3.5) Cluster is deployed on 2X1 UCS B230M1 Server, both equipped with two eight-core Intel Xeon 7560 processors at 2.26GHz with a physcial memory of 128G
Database	Oracle Database 11g Release is deployed on Cisco Full width blade sever – B250M2 which is equipped with with two six-core Intel Xeon 5680 processors at 3.33 GHz and configured with 96G of physical memory through the use of a Cisco Extended Memory Technology
Storage	EMC Clariion CX4-240
Operating System (64 bit)	Oracle Enterprise Linux 5.5

Table 1. Configuration Components

Figure 16. Deployment Architecture



The high-level workflow to configure the system is elaborated in Figure 17.



Figure 17. Workflow – 3-tier cluster deployment on WebLogic Server

4.2 Cisco Unified Computing System Configuration

This section details the Cisco Unified Computing System configuration that was done as part of the infrastructure build out for deployment of WebLogic platform. The racking, power and installation of the chassis are described in the install guide (<u>http://www.cisco.com/en/US/docs/unified_computing/ucs/hw/chassis/install/ucs5108_install.html</u>) and it is beyond the scope of this document. More details on each step can be found in the following documents:

- Cisco Unified Computing System CLI Configuration guide
 <u>http://www.cisco.com/en/US/docs/unified_computing/ucs/sw/cli/config/guide/1.4/b_UCSM_CLI_Configuration_n_Guide_1_4.html</u>
- Cisco UCSManager GUI configuration
 guide<u>http://www.cisco.com/en/US/docs/unified_computing/ucs/sw/gui/config/guide/1.4/b_UCSM_GUI_Config
 guration_Guide_1_4.html
 </u>

An important aspect of configuring a physical server in a Cisco UCS 5108 chassis is to develop a service profile through Cisco UCS Manager. Service profile is an extension of the virtual machine abstraction applied to physical servers. The definition has been expanded to include elements of the environment that span the entire data center, encapsulating the server identity (LAN and SAN addressing, I/O configurations, firmware versions, boot order, network VLAN, physical port, and quality-of-service [QoS] policies) in logical "service profiles" that can be dynamically created and associated with any physical server in the system within minutes rather than hours or days. The association of service profiles with physical servers is performed as a simple, single operation. It enables migration of identities between servers in the environment without requiring any physical configuration changes and facilitates rapid bare metal provisioning of replacements for failed servers.

Service profiles can be created in several ways:

- Manually: Create a new service profile using the Cisco UCS Manager GUI.
- From a Template: Create a service policy from a template.
- By Cloning: Cloning a service profile creates a replica of a service profile. Cloning is equivalent to creating a template from the service policy and then creating a service policy from that template to associate with a server.

Before starting the service profile creation make sure to do the following:

- Firmware on the UCS system is current, the latest firmware as of now is 1.4.1(2b).
- Connectivity between Fabric Interconnect and Chassis is enabled
- Upstream Ethernet links and Fiber Channel links are enabled
- MAC pool, WWPN pool, WWNN pool, UUID pool are created











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4.2.1 Service Profile Configuration

In the present scenario we created a Service profile initial template and thereafter instantiate service profile through the template.

A service profile template parameterizes theUIDs that differentiate one instance of an otherwise identical server from another. Templates can be categorized into two types: initial and updating.

Initial Template: The initial template is used to create a new server from a service profile with UIDs, but after the server is deployed, there is no linkage between the server and the template, so changes to the template will not propagate to the server, and all changes to items defined by the template must be made individually to each server deployed with the initial template.

Updating Template: An updating template maintains a link between the template and the deployed servers, and changes to the template (most likely to be firmware revisions) cascade to the servers deployed with that template on a schedule determined by the administrator.

Service profiles, templates, and other management data is stored in high-speed persistent storage on the CiscoUnified Computing System fabric interconnects, with mirroring between fault-tolerant pairs of fabric interconnects.



The following are the steps to configure a service profile template.













As demonstrated in the above steps, the Cisco Unified Computing System enables data center servers to become stateless and fungible, where the server's identity (using MAC or WWN addressing or UIDs) as well as build and operational policy information such as firmware and BIOS revisions and network and storage connectivity profiles can be dynamically provisioned or migrated to any physical server in the system.

4.3 Boot from SAN

Booting from SAN is another critical feature which helps in moving towards stateless computing in which there is no static binding between a physical server and the OS / applications it is supposed to run. The OS is installed on a SAN lun and boot from SAN policy is applied to the service profile template or the service profile. If the service profile were to be moved to another server, the pwwn of the HBAs and the server policy also moves along with it. The new server now takes the same exact view of the old server, the true stateless nature of the blade server.

The main benefits of booting from the SAN:

- Reduce Server Footprints: Boot from SAN alleviates the necessity for each server to have its own directattached disk, eliminating internal disks as a potential point of failure. Thin diskless servers also take up less facility space, require less power, and are generally less expensive because they have fewer hardware components.
- Disaster and Server Failure Recovery: All the boot information and production data stored on a local SAN can be replicated to a SAN at a remote disaster recovery site. If a disaster destroys functionality of the servers at the primary site, the remote site can take over with minimal downtime.
- Recovery from server failures is simplified in a SAN environment. With the help of snapshots, mirrors of a failed server can be recovered quickly by booting from the original copy of its image. As a result, boot from SAN can greatly reduce the time required for server recovery.

- High Availability: A typical data center is highly redundant in nature redundant paths, redundant disks and redundant storage controllers. When operating system images are stored on disks in the SAN, it supports high availability and eliminates the potential for mechanical failure of a local disk.
- Rapid Redeployment: Businesses that experience temporary high production workloads can take
 advantage of SAN technologies to clone the boot image and distribute the image to multiple servers for
 rapid deployment. Such servers may only need to be in production for hours or days and can be readily
 removed when the production need has been met. Highly efficient deployment of boot images makes
 temporary server usage a cost effective endeavor.
- Centralized Image Management: When operating system images are stored on networked disks, all
 upgrades and fixes can be managed at a centralized location. Changes made to disks in a storage array are
 readily accessible by each server.

With boot from SAN, the image resides on the SAN and the server communicates with the SAN through a host bus adapter (HBA). The HBAs BIOS contain the instructions that enable the server to find the boot disk. After power on self test (POST), the server hardware component fetches the boot device that is designated as the boot device in the hardware BOIS settings. When the hardware detects the boot device, it follows the regular boot process.

There are four distinct portions of the SAN procedure:

- Storage array configuration
- Cisco UCS configuration of service profile
- SAN zone configuration
- Host Registration on Storage

4.3.1 Storage Array Configuration

In the present setup, EMC CLARiiON CX4-240 is used as a Storage device. Subsequent figure gives an overview of SAN connectivity for the WebLogic deployment over Cisco UCS Blade servers.





The process to configure storage is as follows:

Tasks #	Task Description
1.	Create RAID Group in CX4-240
	You have created a RAID Type of RAID1 for OS installation. In the this setup you have allocated 2 disk for SAN Boot, allocating a total of around 400G. You would carve out LUNs from this RAID group for all OS installations.
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2.	Create 50GLUN from the RAID Group created through Storage Provisioning Wizard. You have created a 50GLUN for OEL installation used for WebLogic Server.

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4.3.2 Cisco UCS Manager Configuration

To enable boot from SAN from a Cisco UCS Manager perspective, do the following:




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	fc2/6 8			2b50:06:01:60:bc:e0:1b:2b 2010:00:58:8d:09:0f:2b:20		
	rk3-N5K-2# s	hflogi database				
	INTERFACE	VSANFCID	PORT NAME	NODE NAME		
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	Total number of flogi = 5. The final mapping looks like as follows					
	vhba0	Storage Pc	ort SP-B0 - Primary rt SP-A3 - Seconda	Target – 50:06:01:68:3c:e0:1b:2b ry Target- 50:06:01:63:3c:e0:1b:2b		
				Target - 50:06:01:6b:3c:e0:1b:2b :0:06:01:60:3c:e0:1b:2b		









INTERFACE VSAN FCID PORT NAME NODE NAME fc2/1 4 0x5302ef 50:06:01:69:3c:e0:1b:f8 50:06:01:60:bc:ef fc2/2 4 0x530001 20:41:00:05:73:a3:17:40 20:05:00:05:73:a3 fc2/3 4 0x5301ef 50:06:01:60:3c:e0:1b:f8 50:06:01:60:bc:ef fc2/4 8 0x9b0003 20:43:00:05:73:a2:97:40 20:00:00:25:b5:aa fc2/4 8 0x9b0005 20:00:00:25:b5:aa:01:0e 20:00:00:25:b5:aa fc2/5 8 0x9b0000 20:00:00:25:b5:aa:01:0e 50:06:01:60:bc:ef fc2/6 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f vfc18 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f rk3-N5k-1# WWPN of vhba0 rk3-N5K-2# sh flogi database	rk3-N5k-1# sh	. flogi da	tabase		
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fc2/3 4 0x5301ef 50:06:01:60:3c:e0:1b:f8 50:06:01:60:bc:e1 fc2/4 8 0x9b0003 20:43:00:05:73:a2:97:40 20:08:00:05:73:a3 fc2/4 8 0x9b0005 20:00:00:25:b5:aa:01:0e 20:00:00:25:b5:aa fc2/5 8 0x9b02ef 50:06:01:63:3c:e0:1b:2b 50:06:01:60:bc:e0 fc2/6 8 0x9b01ef 50:06:01:68:3c:e0:1b:2b 50:06:01:60:bc:e0 fc2/6 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f vfc18 8 0x9b0000 20:00:58:8d:09:0f 10:00:58:8d:09:0f rk3-N5k-1# • • • • • rk3-N5K-2# sh flogi database • • • • • rk3-N5K-2# sh flogi database • • • • • ic2/1 4 0x8602ef 50:06:01:68:3c:e0:1b:f8 50:06:01:60:bc:e fc2/1 4 0x8601ef 50:06:01:61:3c:e0:1b:f8 50:06:01:60:bc:e fc2/3 4 0x8601ef 50:06:01:61:3c:e0:1b:f8 50:06:01:60:bc:e fc2/4 8 0x440002 20:43:	 fc2/1	4	0x5302ef	50:06:01:69:3c:e0:1b:f8	50:06:01:60:bc:e
fc2/4 8 0x9b0003 20:43:00:05:73:a2:97:40 20:08:00:05:73:a3: fc2/4 8 0x9b0005 20:00:00:25:b5:aa:01:00 20:00:00:25:b5:aa: fc2/5 8 0x9b01ef 50:06:01:63:3c:e0:1b:2b 50:06:01:60:bc:e1 fc2/6 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f vfc18 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f Total number of flogi = 8. WWPN of vhba0 rk3-N5k-1# WWPN of vhba0 rk3-N5K-2# sh flogi database	fc2/2	4	0x530001	20:41:00:05:73:a3:17:40	20:05:00:05:73:a
cc2/4 8 0x9b0005 20:00:00:25:b5:aa:01:0e 20:00:00:25:b5:aa: fc2/5 8 0x9b02ef 50:06:01:63:3c:e0:1b:2b 50:06:01:60:bc:e1 fc2/6 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f vfc18 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f Total number of flogi = 8. WWPN of vhba0 rk3-N5k-1# WWPN of vhba0 rk3-N5K-2# sh flogi database	fc2/3	4	0x5301ef	50:06:01:60:3c:e0:1b:f8	50:06:01:60:bc:e
fc2/5 8 UX9602ef S0:06:01:63:3c:e0:1b:2b S0:06:01:60:bc:e1 fc2/6 8 0X9b01ef S0:06:01:68:3c:e0:1b:2b S0:06:01:60:bc:e1 vfc18 8 0X9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f Total number of flogi = 8. WWPN of vhba0 rk3-N5k-1# WWPN of vhba0 rk3-N5K-2# sh flogi database	fc2/4	8	0x9b0003	20:43:00:05:73:a2:97:40	20:08:00:05:73:a
fc2/6 8 0x9b01ef 50:06:01:68:3c:e0:1b:2b 50:06:01:60:bc:ei vfc18 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f Total number of flogi = 8. WWPN of vhba0 rk3-N5k-1# WWPN of vhba0 rk3-N5K-2# sh flogi database	<u>tc2/4</u>	8	0x9b0005	20:00:00:25:b5:aa:01:0e	20:00:00:25:b5:a
vfc18 8 0x9b0000 20:00:58:8d:09:0f:2b:20 10:00:58:8d:09:0f Total number of flogi = 8. WWPN of vhba0 rk3-N5k-1# WWPN of vhba0 rk3-N5K-2# sh flogi database	fc2/5	8			
Total number of flogi = 8. rk3-N5k-1# WWPN of vhba0 rk3-N5K-2# sh flogi database WWPN of vhba0 INTERFACE VSAN FCID PORT NAME NODE NAME fc2/1 4 0x8602ef 50:06:01:68:3c:e0:1b:f8 50:06:01:60:bc:e fc2/2 4 0x860001 20:41:00:05:73:a2:b2:80 20:05:00:05:73:a fc2/3 4 0x8601ef 50:06:01:61:3c:e0:1b:f8 50:06:01:60:bc:e fc2/4 8 0x440002 20:43:00:05:73:a2:c2:c0 20:08:00:05:73:a3 fc2/4 8 0x440003 20:00:00:25:b5:aa:02:0e 20:00:00:25:b5:aa fc2/5 0 0x4401ef 50:06:01:60:3c:e0:1b:2b 50:06:01:60:bc:e	fc2/6	8	0x9b01ef	50:06:01:68:3c:e0:1b:2b	50:06:01:60:bc:e
rk3-N5k-1# WWPN of vhba0 rk3-N5K-2# sh flogi database	vfc18	8	0x9b0000	20:00:58:8d:09:0f:2b:20	10:00:58:8d:09:0
fc2/1 4 0x8602ef 50:06:01:68:3c:e0:1b:f8 50:06:01:60:bc:e fc2/2 4 0x860001 20:41:00:05:73:a2:b2:80 20:05:00:05:73:a fc2/3 4 0x8601ef 50:06:01:61:3c:e0:1b:f8 50:06:01:60:bc:e fc2/4 8 0x440002 20:43:00:05:73:a2:c2:c0 20:08:00:05:73:a fc2/4 8 0x440003 20:00:00:25:b5:aa:02:0e 20:00:00:25:b5:a fc2/3 0 0x4402e1 50:06:01:00.50:00:00:00:00:00:00:00:00:00:00:00:00:0				WWP	N of vhba0
fc2/2 4 0x860001 20:41:00:05:73:a2:b2:80 20:05:00:05:73:a fc2/3 4 0x8601ef 50:06:01:61:3c:e0:1b:f8 50:06:01:60:bc:e fc2/4 8 0x440002 20:43:00:05:73:a2:c2:c0 20:08:00:05:73:a fc2/4 8 0x440002 20:00:00:25:b5:aa:02:0e 20:00:00:25:b5:a fc2/3 0 0x4402e1 50:06:01:05.3c:e0:1b:2b 50:06:01:00.bc:e fc2/4 8 0x4402e1 50:06:01:05.3c:e0:1b:2b 50:06:01:00.bc:e fc2/6 8 0x4401ef 50:06:01:60:3c:e0:1b:2b 50:06:01:60:bc:e		flogi da	tabase	WWP	N of vhba0
fc2/2 4 0x860001 20:41:00:05:73:a2:b2:80 20:05:00:05:73:a fc2/3 4 0x8601ef 50:06:01:61:3c:e0:1b:f8 50:06:01:60:bc:e fc2/4 8 0x440002 20:43:00:05:73:a2:c2:c0 20:08:00:05:73:a fc2/4 8 0x440003 20:00:00:25:b5:aa:02:0e 20:00:00:25:b5:a fc2/5 0 0x4402ef 50:06:01:00.05:00:05:70:ac:e0:1b:2b 50:06:01:00.05:c0:ac:e0:1b:2b fc2/6 8 0x4401ef 50:06:01:60:3c:e0:1b:2b 50:06:01:60:bc:e	rk3-N5K-2# sh 				N of vhba0
fc2/3 4 0x8601ef 50:06:01:61:3c:e0:1b:f8 50:06:01:60:bc:e fc2/4 8 0x440002 20:43:00:05:73:a2:c2:c0 20:08:00:05:73:a fc2/4 8 0x440003 20:00:00:25:b5:aa:02:0e 20:00:00:25:b5:a fc2/3 0 0x4402e1 50:00:01:0b.st.e0:1b:2b 50:00:01:00.st.e0 fc2/6 8 0x4401ef 50:06:01:60:3c:e0:1b:2b 50:06:01:60:bc:e	rk3-N5K-2# sh INTERFACE 	 VSAN 	FCID	PORT NAME	NODE NAME
fc2/4 8 0x440002 20:43:00:05:73:a2:c2:c0 20:08:00:05:73:a fc2/4 8 0x440003 20:00:00:25:b5:aa:02:0e 20:00:00:25:b5:a fc2/5 0 0x4402er 30:00:01:00:35:ce0:rb2:b5:00:01:00:00:02:ce 20:00:01:00:00:02:ce fc2/6 8 0x4401ef 50:06:01:60:3c:e0:1b:2b 50:06:01:60:bc:e	rk3-N5K-2# sh INTERFACE fc2/1	 VSAN 4	FCID 0x8602ef	PORT NAME 50:06:01:68:3c:e0:1b:f8	NODE NAME 50:06:01:60:bc:e
tc2/4 8 0x440003 20:00:00:25:b5:aa:02:0e 20:00:00:25:b5:a 1c2/5 0 0x4402er 30:00:01:00:30:e0:10:20 30:00:01:00:00:00:00:00:00:00:00:00:00:00	rk3-N5K-2# sh INTERFACE fc2/1 fc2/2	 VSAN 4 4	FCID 0x8602ef 0x860001	PORT NAME 50:06:01:68:3c:e0:1b:f8 20:41:00:05:73:a2:b2:80	NODE NAME 50:06:01:60:bc:e 20:05:00:05:73:a
fc2/5 0 0x4402er 50.00.01.00.30.e0.10.20 50.00.01.00.00.e fc2/6 8 0x4401ef 50:06:01:60:3c:e0:1b:2b 50:06:01:60:bc:e	rk3-N5K-2# sh INTERFACE fc2/1 fc2/2 fc2/3	 VSAN 4 4 4	FCID 0x8602ef 0x860001 0x8601ef	PORT NAME 50:06:01:68:3c:e0:1b:f8 20:41:00:05:73:a2:b2:80 50:06:01:61:3c:e0:1b:f8	NODE NAME 50:06:01:60:bc:e 20:05:00:05:73:a 50:06:01:60:bc:e
fc2/6 8 0x4401ef 50:06:01:60:3c:e0:1b:2b 50:06:01:60:bc:e	rk3-N5K-2# sh INTERFACE fc2/1 fc2/2 fc2/3 fc2/4	VSAN 4 4 4 8	FCID 0x8602ef 0x860001 0x8601ef 0x440002	PORT NAME 50:06:01:68:3c:e0:1b:f8 20:41:00:05:73:a2:b2:80 50:06:01:61:3c:e0:1b:f8 20:43:00:05:73:a2:c2:c0	NODE NAME 50:06:01:60:bc:e 20:05:00:05:73:a 50:06:01:60:bc:e 20:08:00:05:73:a
	rk3-N5K-2# sh INTERFACE fc2/1 fc2/2 fc2/3 fc2/4 fc2/4	 VSAN 4 4 4 8 8	FCID 0x8602ef 0x860001 0x8601ef 0x440002 0x440003	PORT NAME 50:06:01:68:3c:e0:1b:f8 20:41:00:05:73:a2:b2:80 50:06:01:61:3c:e0:1b:f8 20:43:00:05:73:a2:c2:c0 20:00:00:25:b5:aa:02:0e	NODE NAME 50:06:01:60:bc:e 20:05:00:05:73:a 50:06:01:60:bc:e 20:08:00:05:73:a 20:00:00:25:b5:a
VIC2U 8 UX440000 20:00:58:8d:09:01:2b:11 10:00:58:8d:09:0	rk3-N5K-2# sh INTERFACE fc2/1 fc2/2 fc2/3 fc2/4 fc2/4 fc2/3	4 4 4 8 8	FCID 0x8602ef 0x860001 0x8601ef 0x440002 0x440003	PORT NAME 50:06:01:68:3c:e0:1b:f8 20:41:00:05:73:a2:b2:80 50:06:01:61:3c:e0:1b:f8 20:43:00:05:73:a2:c2:c0 20:00:00:25:b5:aa:02:0e	NODE NAME 50:06:01:60:bc:e 20:05:00:05:73:a 50:06:01:60:bc:e 20:08:00:05:73:a 20:00:00:25:b5:a
	rk3-N5K-2# sh INTERFACE fc2/1 fc2/2 fc2/3 fc2/4 fc2/4 fc2/5 fc2/6	4 4 4 8 8 8 8 8	FCID 0x8602ef 0x860001 0x8601ef 0x440002 0x440003 0x440003 0x4401ef	PORT NAME 50:06:01:68:3c:e0:1b:f8 20:41:00:05:73:a2:b2:80 50:06:01:61:3c:e0:1b:f8 20:43:00:05:73:a2:c2:c0 20:00:00:25:b5:aa:02:0e 50:06:01:60:3c:e0:1b:2b	NODE NAME 50:06:01:60:bc:e 20:05:00:05:73:a 50:06:01:60:bc:e 20:08:00:05:73:a 20:00:00:25:b5:a 50:06:01:60:bc:e
$\mathbf{T}_{\mathbf{r}}$	rk3-N5K-2# sh INTERFACE fc2/1 fc2/2 fc2/3 fc2/4 fc2/4 fc2/4 fc2/6 vfc20	VSAN 4 4 8 8 8 8 8 8	FCID 0x8602ef 0x860001 0x8601ef 0x440002 0x440003 0x440003 0x4401ef 0x4401ef	PORT NAME 50:06:01:68:3c:e0:1b:f8 20:41:00:05:73:a2:b2:80 50:06:01:61:3c:e0:1b:f8 20:43:00:05:73:a2:c2:c0 20:00:00:25:b5:aa:02:0e 50:06:01:60:3c:e0:1b:2b	NODE NAME 50:06:01:60:bc:e 20:05:00:05:73:e 50:06:01:60:bc:e 20:08:00:05:73;e 20:00:00:25:b5:e 50:06:01:60:bc:e
Total number of flogi = 8.	rk3-N5K-2# sh INTERFACE fc2/1 fc2/2 fc2/3 fc2/4 fc2/4 fc2/4 fc2/6 vfc20	VSAN 4 4 8 8 8 8 8 8	FCID 0x8602ef 0x860001 0x8601ef 0x440002 0x440003 0x440003 0x4401ef 0x4401ef	PORT NAME 50:06:01:68:3c:e0:1b:f8 20:41:00:05:73:a2:b2:80 50:06:01:61:3c:e0:1b:f8 20:43:00:05:73:a2:c2:c0 20:00:00:25:b5:aa:02:0e 50:06:01:60:3c:e0:1b:2b	NODE NAME 50:06:01:60:bc:e 20:05:00:05:73:e 50:06:01:60:bc:e 20:08:00:05:73;e 20:00:00:25:b5:e 50:06:01:60:bc:e

4.3.3 Zone Configuration

The following are the steps to configure VSAN and add zones in Nexus 5010 for VHBA configured in service profile of B230 server.

```
1) Create VSAN for Storage target ports and Server initiator ports
rk3-N5k-1# conf t
Enter configuration commands, one per line. End with CNTL/Z.
rk3-N5k-1(config)# v
vlan vrf vsan
rk3-N5k-1(config)# vsan database
rk3-N5k-1(config-vsan-db)# vsan 8 → This is the same VSAN which we have in UCS Manager VSAN
rk3-N5k-1(config-vsan-db)# Vsan 8 interface fc2/5
rk3-N5k-1(config-vsan-db)# Vsan 8 interface fc2/6
rk3-N5k-1(config-vsan-db)# Vsan 8 interface fc2/4
```

2) Modify server port fc2/4 as F port of N5K

rk3-N5k-1(config)# interface fc2/4
rk3-N5k-1(config)# switchport mode F
rk3-N5k-1(config)# exit

3) Above defined steps need to be done on N5K2 as well

```
4) Add zone & zoneset
```

rk3-N5k-1# conf t Enter configuration commands, one per line. End with CNTL/Z. rk3-N5k-1(config)# exit rk3-N5k-1# sh flogi database

INTERFACE	VSAN	FCID	PORT NAME	NODE NAME
fc2/1	4	0x5302ef	50:06:01:69:3c:e0:1b:f8	50:06:01:60:bc:e0:1b:f8
fc2/2	4	0x530001	20:41:00:05:73:a3:17:40	20:04:00:05:73:a3:17:41
fc2/3	4	0x5301ef	50:06:01:60:3c:e0:1b:f8	50:06:01:60:bc:e0:1b:f8
fc2/4	8	0x9b0003	20:43:00:05:73:a2:97:40	20:08:00:05:73:a2:97:41
fc2/4	8	0x9b0005	20:00:00:25:b5:aa:01:0e	20:00:00:25:b5:aa:00:0f→ WWPN of vhba0
fc2/5	8	0x9b02ef	50:06:01:63:3c:e0:1b:2b	50:06:01:60:bc:e0:1b:2b->Storage port
fc2/6	8	0x9b01ef	50:06:01:68:3c:e0:1b:2b	50:06:01:60:bc:e0:1b:2b > Storage port
vfc18	8	0x9b0000	20:00:58:8d:09:0f:2b:20	10:00:58:8d:09:0f:2b:20

Total number of flogi = 8.

rk3-N5k-1# conf t

```
Enter configuration commands, one per line. End with {\tt CNTL}/{\tt Z}.
```

```
rk3-N5k-1(config)# zone name b230-WebLogic1-vhba0 vsan 8-> Add zone name
rk3-N5k-1(config-zone)# member pwwn 20:00:00:25:b5:aa:01:0e
rk3-N5k-1(config-zone)# member pwwn 50:06:01:63:3c:e0:1b:2b→ WWPN of SP-A3
rk3-N5k-1(config-zone)# member pwwn 50:06:01:68:3c:e0:1b:2b→ WWPN of SP-B0
rk3-N5k-1(config-zone)# exit
rk3-N5k-1(config)# zone
                      zone-attribute-group zoneset
zone
rk3-N5k-1(config)# zoneset name WebLogic1 vsan 8→ Add zoneset name
rk3-N5k-1(config-zoneset)# member b230-WebLogic1-vhba0-> Add zone in zoneset
rk3-N5k-1(config-zoneset)# zoneset activate name WebLogic1 vsan 8-> activate zoneset
rk3-N5k-1(config)# copy r s
rk3-N5k-1(config)# show zoneset active vsan 8
zoneset name WebLogic1 vsan 8
 zone name sql vsan 8
  * fcid 0x9b01ef [pwwn 50:06:01:68:3c:e0:1b:2b]
```

* fcid 0x9b0000 [pwwn 20:00:58:8d:09:0f:2b:20] * fcid 0x9b02ef [pwwn 50:06:01:63:3c:e0:1b:2b] zone name b230-WebLogic1-vhba0 vsan 8> Active zoneset

- * fcid 0x9b02ef [pwwn 50:06:01:63:3c:e0:1b:2b]
- * fcid 0x9b01ef [pwwn 50:06:01:68:3c:e0:1b:2b]
- * fcid 0x9b0005 [pwwn 20:00:00:25:b5:aa:01:0e]

The addition of WWPN of vhba1 and Storage ports SP-A0 and SP-B0 has to be done for N5K2.

```
N5K2 configuration

rk3-N5K-2# show zoneset active vsan 8

zoneset name WebLogicl vsan 8

zone name sql vsan 8

* fcid 0x440000 [pwwn 20:00:58:8d:09:0f:2b:1f]

* fcid 0x4401ef [pwwn 50:06:01:60:3c:e0:1b:2b]

* fcid 0x4402ef [pwwn 50:06:01:6b:3c:e0:1b:2b]

zone name b230-WebLogicl-vhbal vsan 8

* fcid 0x4401ef [pwwn 50:06:01:60:3c:e0:1b:2b]→ WWPN of SP-A0

* fcid 0x4402ef [pwwn 50:06:01:6b:3c:e0:1b:2b]→ WWPN of SP-B3

* fcid 0x44003 [pwwn 20:00:00:25:b5:aa:02:0e]→ WWPN of vhbal
```

When the zone is configured, you can view the both VHBA's (vhba0&vhba1) of B230 WebLogic server logged in Storage Array.



4.3.4 Host Registration on Storage

When the login status of the Cisco UCS B230 server is verified on Storage array, register the host to the server vhba initiators.







4.4 OEL installation on SAN

When the SAN and Service Profile configuration for Boot from SAN is completed, start the OEL installation process.

Tasks # Task Description







8.	In the next screen, Select "Remove all partitions on selected drives and create default
	<i>layout</i> " Select " <i>Review and modify partitioning layout</i> " If at all /dev/sda (mapped to HDD) is selected , just uncheck that and go to Next Screen.
	NB: RAID 50G drive visible, is the same 50GLUN which you configured in Storage Array.
	× ·
	Installation requires partitioning of your hard drive. By default, a partitioning layout is chosen which is
	reasonable for most users. You can either choose
	to use this or create your own.
	Remove all partitions on selected drives and create default layout.
	Encrypt system
	Select the drive(s) to use for this installation.
	☑ mapper/mpath0 51199 MB DGC,RAID 1,3600601
	Acian configuration
	Review and modify partitioning layout
	<u>■ R</u> elease Notes

9.	Delete all the def	ault partitions and click New to create new partition	ons.
	🐥 SP-8230-Weblogic1 (Chassis 1- Serv		
	File View Macros Tools Help 		
	KVM Console Properties		
			-1
		Drive /dev/mapper/mpath0 (51199 MB) (Model: DGC,RAID 1,360060160b3b02200beee3280f6a3e0	11)
		mapper/mpath0p2 51097 MB	
		Confirm Delete	
		New You are about to delete the /dev/mapper/mpath0p1 partition.	
		Device	
		▼ Hard Drives	
		/dev/mapper/m /dev/mapper/mpath0p1 /boot ext3 101 1 13	
		/dev/mapper/mpath0p2 LVM PV 🗸 51097 14 6527	
		Hide RAID device/LVM Volume Group members	
		Belease Notes	rh Nout
		☐ gerease notes ♥ Back	₩ <u>N</u> ext
	Connected to IP: 10.104.108.127		System Time: 2011-07-04T09:43
	- Connection to 14: 10:104-104		39366mi time: 2011-07-04103545
10.	New partitions ca	an be created per the deployment requirements, in	n the present
	scenario,you hav	e created partitions as seen inbelow.	
	SP-B230-Weblogic1 (Chassis 1- Ser File Yew Macros Tools Help	ver 3)	
	🚙 Boot Server 🔮 Shutdown Server 🧟 Rese	e de la companya de l	
	KVM Console Properties		
			E.
		¥.	
		Drive /dev/mapper/mpath0 (\$1199 MB) (Model: DGC, RAID 1, 360060160b3b02200beee3280f6a mapper/mpath0p1 mapper/mpath0p1 (3595 MB) 10236 MB 4996 Mt	3e011)
		35957 MB 10236 MB 4996 MB	
		New Edit Delete Reset RAID	LVM
		Device Mount Point/ RAID/Volume Type Format Size Start End	
		∀ Hard Drives	
		/dev/mapper/mpath0p2 swap 🗸 10236 4585 5889	
		/dev/mapper/mpath0p3 /tmp ext3 👌 🗸 4996 5890 6526	
			v
		/dev/mapper/mpath0p3 /tmp ext3 v 4996 5890 6526 Free Free space 7 6527 6527 □ Hide RAID device/LVM Volume <u>G</u> roup members	
		/dev/mapper/mpath0p3 /tmp ext3	▼ ▼ Next
	ካ _በ Connected to IP: 10.104.108.127	/dev/mapper/mpath0p3 /tmp ext3 v 4996 5890 6526 Free Free space 7 6527 6527 □ Hide RAID device/LVM Volume <u>G</u> roup members	

11.	Select "Configure Advanced Boot loader option"	
		ACLE
	The GRUB boot loader will be installed on /dev/sda.	
	\bigcirc No boot loader will be installed.	
	You can configure the boot loader to boot other operating systems. It will allow you to select a	
	to boot from the list. To add additional operating systems, which are not automatically detect change the operating system booted by default, select 'Default' by the desired operating syst	
	Default Label Device	Add
	Enterprise Linux /dev/mapper/mpath0p1	Edit
		Delete
	A boot loader password prevents users from changing options passed to the kernel. For great	
	is recommended that you set a password.	er system security, it
	Use a boot loader password Change password	
	Configure advanced boot loader options	
	h	
2	On the next screen. Select the mpath which you configured during di	sk partitioning
2.	On the next screen , Select the mpath which you configured during dis configuration and go to "Change Drive Order"	sk partitioning
2.	configuration and go to "Change Drive Order"	
2.		
2.	configuration and go to "Change Drive Order"	
2.	Configuration and go to "Change Drive Order"	
2.	configuration and go to "Change Drive Order"	
2.	Configuration and go to "Change Drive Order"	
2.	Install Boot Loader record on: /dev/sda Master Boot Record (MBR)	
<u>)</u> .	Configuration and go to "Change Drive Order"	
<u>)</u> .	Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
2.	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition Change Drive Order Eorce LBA32 (not normally required)	LE
	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
2.	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
2.	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
2.	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
<u>)</u>	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
2.	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
2.	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
2.	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE
2.	configuration and go to "Change Drive Order" Install Boot Loader record on: /dev/sda Master Boot Record (MBR) /dev/mapper/mpath0p1 First sector of boot partition	LE

Change the Drive Order such that /dev/mapper/mpath0is the first option	
Install Boot Loader record on: O /dev/sda Master Boot Record (MBR)	
/dev/mapper/mpath0p Edit Drive Order Change Arrange the drives to be in the same order as used by the BIOS. Changing the drive order may be useful if you have Discont provide the drive order of the same order as used by the BIOS. Changing the drive order may be useful if you have multiple SCSI adapters or both SCSI and IDE adapters and	
If you wish to add default General kernel parameter Changing the drive order will change where the installation program locates the Master Boot Record (MBR). /dev/mapper/mpath0 51199 MB Linux device-mapper /dev/sda	' field.
Belease Notes	▶ <u>N</u> ext



16.	WhenOEL installation completes, you can restart which would boot the OEL5.5from
	SAN.

4.5 WebLogic11gR1 installation

When the OEL5.5 boot from SAN is completed, start the installation of Oracle WebLogic Server. The WebLogic Server installation is as follows:

- Configuration of WebLogic install LUN on CX4
- JRockit 64 bit installation
- Oracle WebLogic Server base install
- Cluster Configuration

4.5.1 Configuration of WebLogic Install LUN on CX4

In the this setup, you have configured vhba0&vhba1 with Storage Group of CX4 having SAN Boot LUN and vhba2 and vhba3 with Storage Group of CX4 having WebLogic install LUN.

The procedure to configure the same, is detailed in the subsequent table:

```
Tasks # | Task Description
        WWPN of vhba2 and vhba3 are zoned in clustered Nexus 5010
1.
        For N5K1
        rk3-N5k-1# sh zoneset active vsan 8
        zoneset name WebLogic1 vsan 8
        zone name b230-WebLogic1-vhba0 vsan 8 > OS install
          * fcid 0x9b02ef [pwwn 50:06:01:63:3c:e0:1b:2b]
          * fcid 0x9b01ef [pwwn 50:06:01:68:3c:e0:1b:2b]
          * fcid 0x9b0005 [pwwn 20:00:00:25:b5:aa:01:0e]
        zone name b230-WebLogic1-data-vhba2 vsan 8-)WebLogic Install
          * fcid 0x9b0006 [pwwn 20:00:00:25:b5:aa:01:0f]
          * fcid 0x9b02ef [pwwn 50:06:01:63:3c:e0:1b:2b]
          * fcid 0x9b01ef [pwwn 50:06:01:68:3c:e0:1b:2b]
        For N5K2
        rk3-N5K-2# sh zoneset active vsan 8
        zoneset name WebLogic1 vsan 8
        zone name b230-WebLogic1-vhba1 vsan 8 > OS install
          * fcid 0x4401ef [pwwn 50:06:01:60:3c:e0:1b:2b]
          * fcid 0x4402ef [pwwn 50:06:01:6b:3c:e0:1b:2b]
        * fcid 0x440003 [pwwn 20:00:00:25:b5:aa:02:0e]
        zone name b230-WebLogic1-data-vhba3 vsan 8->WebLogic Install
          * fcid 0x440004 [pwwn 20:00:00:25:b5:aa:02:0f]
          * fcid 0x4402ef [pwwn 50:06:01:6b:3c:e0:1b:2b]
          * fcid 0x4401ef [pwwn 50:06:01:60:3c:e0:1b:2b]
```

2.	Add WebLogic install LUN to Storage Group.
	EMC Unisphere - Windows Internet Explorer EMC Unisphere Pool LUN Seerch Advanced Q Q
	EMC Unisphere Pool LUN 🔍 Search 🖓 Advanced 👰 🍹 Q.
	APM00090300110 Storage Husts Womening Seconds Seconds
	Storage Pools 🔹 Storage Groups 😵 🗘 🏹 🔧 🕞 🕐
	Create Storage Pool Ø ENC Unisphere - Windows Internet Explorer
	EMC Unisphere Pool LUN V Search D Advanced & Q .
	<
	APM00090300110 > Storage Groups
	Storage Pools Storage Groups Create Storage Pool
	Storage Group Name Weblogic Install LUN WWN
	LUNS Image: Display and Di
	LUN Migration Summary Storage Expansion Wigard
	Storace Provisioning Wizard 🔮 SQL-Consolidation DE:CF:19:8F:05:91:E0:11:AF:E8:00:60:16:28:80:DF
	Storage Groups •
	Create Storage Group
	Storage Assignment Wizard 1 Selected Create Delete Properties Connect LUNs Connect Hosts 5 items
	Folders
	Create LUN Folder Details Veblogic Install LUN,
	Connectivity August LUNs SAN Copy Connections Size=200G RAID1/0
	Connect Host to Storage S., Storage System Connectivity Name ID State RAID Type Storage Pool User Capacity Current Owner Host Informati Additional Info
	Builde Deale RAID Type State RAID Type State Copiet of Set Copiet and Copiet
3.	Register Vhba2 and vhba3 published on CX4.
З.	
	😫 APM00090300110 - Connectivity Status
	V Storage Group is enabled
	Host Initiators MirrorView Initiators SAN Copy Initiators
	Initiator Name 🛆
	E- 0 b230-weblogic1 [10.104.109.81; Fibre; Host Agent not reachable or connection registered manually or with Unisphere Server Utility]
	- 10 b250-oracle1-data [10.10.10.11; Fibre; Manually registered; Host Agent not reachable or connection registered manually or with Unis
	- 😡 weblogic-install-vhba2 [10.10.10.10; Fibre; Manually registered; Host Agent not reachable or connection registered manually or with L
	- 20:00:00:25:B5:AA:00:07:25:B5:AA:01:07
	20:00:00:25:B5:AA:00:0F:20:00:00:25:B5:AA:02:0F
	<pre></pre>
	Refresh ALL Refresh Detail Create Edit Register Deregister
	<u>O</u> K <u>Cancel</u> <u>H</u> elp
·.	Install EMC NaviAgent as mentioned in the following steps
	i. Edit the linux hosts file (/etc/hosts) with weblogic server hostname and IP
	ii. Install EMC NaviAgent
	rpm -ivh NaviHostAgent-Linux-64-x86-en_US-6.29.6.0.35-1.x86_64.rpm
	iii. verify HostIDFile.txt is created under /var/log with the server IP populated in the
	mentioned file

	current=SP B	391ED4A7E011 [b230-weblogic1-install-lum prity=0; queued-IOs=0; Array failover mode: 1				
Host - ### HW Path	I/O Paths	- Stor - Interf.	I/O Mode	Path State	Stat Q-IOs H	cs Errors
 0 fnic		SP A3				
0 fnic	sdf	SP BO	unlic	alive	0	0
1 fnic	sdl	SP B3	active	alive	0	0
1 fnic	sdn	SP B3 SP A0	active	alive	0	0
CLARIION ID=APM000903(Logical device ID=600(state=alive; policy=Ba Owner: default=SP A, o ====================================	60160B3B02200BEEE asicFailover; pri current=SP A	3280F6A3E0 ority=0; q Array fa	ueued-IOs ilover mc ======	s=0; ode: 1		
Logical device ID=6000 state=alive; policy=Ba Owner: default=SP A, o ====================================	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A I/O Paths	3280F6A3E0 ority=0; q Array fa - Stor - Interf.	ueued-IOs ilover ma ======= I/O Mode	=0; ode: 1 ======= Path State	Stat Q-IOs E	ts Errors
Logical device ID=6006 state=alive; policy=Ba Owner: default=SP A, o ====================================	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A 	3280F6A3E0 .ority=0; q Array fa - Stor - Interf. SP A3	ueued-IOs ilover mo I/O Mode ====================================	=0; ode: 1 Path State alive	Stat Q-IOs F	Errors
Logical device ID=6000 state=alive; policy=Ba Owner: default=SP A, o Host - ### HW Path	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A 	3280F6A3E0 .ority=0; q Array fa - Stor - Interf. SP A3	ueued-IOs ilover mo I/O Mode ====================================	=0; ode: 1 Path State alive	Stat Q-IOs F	Errors
Logical device ID=6000 state=alive; policy=Ba Owner: default=SP A, o Host - ### HW Path 0 fnic	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A 	3280F6A3E0 .ority=0; q Array fa - Stor - Interf. SP A3 SP B0 SP B3	ueued-IOs ilover mc I/O Mode unlic unlic active	s=0; ode: 1 Path State alive alive alive	Stat Q-IOS F 0 0 0	Errors ===== 0 0 0
Logical device ID=6000 state=alive; policy=Ba Owner: default=SP A, o Host - ### HW Path 0 fnic 0 fnic 0 fnic	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A 	3280F6A3E0 .ority=0; q Array fa - Stor - Interf. SP A3	ueued-IOs ilover mc I/O Mode unlic unlic active	s=0; ode: 1 Path State alive alive alive	Stat Q-IOS E 0 0 0	Errors ===== 0 0 0
Logical device ID=6000 state=alive; policy=Ba Owner: default=SP A, o Host - ### HW Path 0 fnic 0 fnic 1 fnic	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A 	3280F6A3E0 .ority=0; q Array fa - Stor - Interf. SP A3 SP B0 SP B3	ueued-IOs ilover mc I/O Mode unlic unlic active	s=0; ode: 1 Path State alive alive alive	Stat Q-IOS F 0 0 0	Errors ===== 0 0 0
Logical device ID=6000 state=alive; policy=Ba Owner: default=SP A, o Host - ### HW Path Host - 0 fnic 0 fnic 1 fnic 1 fnic 1 fnic	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A 	3280F6A3E0 .ority=0; q Array fa - Stor - Interf. SP A3 SP B0 SP B3 SP A0	ueued-IOs ilover mo I/O Mode unlic unlic active active	s=0; ode: 1 Path State alive alive alive	Stat Q-IOS F 0 0 0	Errors ===== 0 0 0
Logical device ID=6000 state=alive; policy=Ba Owner: default=SP A, o ====================================	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A I/O Paths sdc sde sdk sdk sdm ~]# df -h Size Used Avail 0-LogVol00	3280F6A3E0 .ority=0; q Array fa - Stor - Interf. SP A3 SP B0 SP B3 SP A0	ueued-IOs ilover mo I/O Mode unlic unlic active active	s=0; ode: 1 Path State alive alive alive	Stat Q-IOS F 0 0 0	Errors ===== 0 0 0
Logical device ID=6000 state=alive; policy=Ba Owner: default=SP A, o Host - ### HW Path Host - ### HW Path Host - 0 fnic 0 fnic 1 fnic 1 fnic 1 fnic [root@b230-WebLogic1 - Filesystem	00110 [weblogic1- 60160B3B02200BEEE asicFailover; pri current=SP A 	3280F6A3E0 .ority=0; q Array fa - Stor - Interf. SP A3 SP B0 SP B3 SP A0 . Use% Mount : 25% /	ueued-IOs ilover mc I/O Mode unlic unlic active active ted on	s=0; ode: 1 Path State alive alive alive	Stat Q-IOS F 0 0 0	Errors ===== 0 0 0

4.5.2 JRockit 64-bit Installation

Install 64 bit JVM. (WebLogic Installation recommends JRockit for production deployment of Oracle WebLogic Server).

```
[root@b230-WebLogic1 ~]# java -version
java version "1.6.0_24"
Java(TM) SE Runtime Environment (build 1.6.0_24-b07)
Oracle JRockit(R) (build R28.1.3-11-141760-1.6.0_24-20110301-1432-linux-x86_64, compiled mode)
```

4.5.3 Oracle WebLogic Server Installation

When the WebLogic Install LUN and 64-bit JRockitJVMis configured, install the Oracle WebLogic Server 10.3.5. In the this setup, a generic WebLogic installer (wls1035_generic.jar) was used, which is compatible with 64 bit platforms.

Tasks #	Task Description
1.	Create user: oracle under group : dba
	groupadddba -g 500
	useradd oracle –u 501 –g 500
	Use this user for WebLogic Server installation
	Change the installation directory user ownership chown -R oracle: /u01
2.	Start vncserver with user oracle
	[oracle@b230-WebLogic1 ~]\$ vncserver
	You will require a password to access your desktops.
	Password:
	Verify: xauth: creating new authority file /home/oracle/.Xauthority
	New 'b230-WebLogic1:1 (oracle)' desktop is b230-WebLogic1:1
	Creating default startup script /home/oracle/.vnc/xstartup
	Starting applications specified in /home/oracle/.vnc/xstartup
	Log file is /home/oracle/.vnc/b230-WebLogic1:1.log
	VNC enables to execute the Oracle WebLogic GUI installer



4.	Define the WebLogic install directory. For example, configure a RA vhba2&vhba3 mounted as /u01.	ID1/0 LUN with
	Oracle Installer - WebLogic 10.3.5.0	巴
	Choose Middleware Home Directory Specify the Middleware Home where you wish to install WebLogic 10.3.5.0.	ORACLE
	Middleware Home Type Use an existing Middleware Home Create a new Middleware Home Point to weblogic install drive	
	/u01/Oracle/Middleware Browse Reset	
	Exit	Previous Next

5.	Bypass the Security updates option.	
	Oracle Installer - WebLogic 10.3.5.0	2
	Register for Security Updates Provide your email address for security updates and to initiate configuration manager.	ORACLE
	Email: Use My Oracle Support email address/usern	ame
	✓ I wish to receive security updates via My Oracle Support Support Password:]
	E <u>x</u> it	Previous <u>N</u> ext
6.	As you are not installing Coherence, choose custom installation and un	check Coherence
	server installation.	
	Oracle Installer - WebLogic 10.3.5.0 Choose Install Type Select the type of installation you wish to perform.	€.
	 Typical Install the following product(s) and component(s): WebLogic Server Oracle Coherence Oracle Coherence and components to install and perform optional coefficient of the products and components to install and perform 	
	Exit Previous Ne	xt

	un-check coherence deployment. Coherence Oracle Installer - WebLogic 10.3.5.0	
	Choose Products and Components Grayed selections are already installed. Double-click headings to reveal or collapse selections	ORACLE
	 WebLogic Server Core Application Server Administration Console Configuration Wizard and Upgrade Frame Web 2.0 HTTP Pub-Sub Server WebLogic JDBC Drivers WebLogic JDBC Drivers Third Party JDBC Drivers WebLogic Server Clients WebLogic Web Server Plugins UDDI and Xquery Support Server Examples Evaluation Database Oracle Coherence 	Description Coherence provides reliable distributed in-memory data management and caching services on top of a highly scalable peer-to-peer clustering protocol. Approximate Installed Size* Highlighted item: 12.6 MB Common artifacts: 49.8 MB Total of all selected items: 660.3 MB *Installer requires free disk space approximately 2x this total
8.	Exit Coherence installa	ettion <u>P</u> revious <u>N</u> ext
	Oracle Installer - WebLogic 10.3.5.0 JDK Selection JDK(s) chosen will be installed. Defaults will be used in script string-substitution if installed.	ORACLE
	Bundled JDK:	 Discard Changes Approximate installed size* Highlighted item: All selected bundled JDK's: 0.0 KB Total of all selected items: 660.3 MB *Installer requires free disk space
	Cocar JDK: ✓ Oracle 1.6.0_24 (/u01/jrockit-jdk1.6.0_24-R28.1.3-4.0	approximately 2x this total
	Browse	Previous Next



4.5.4 Oracle WebLogic Cluster Configuration

In the previous section, we discussed the base installation of Oracle WebLogic Server 10.3.5. When the basic configuration is completed, you can start the quick start UI, which would enable you to configure WebLogic Admin Server, Node Manager and WebLogic domain which would include WebLogic Managed Servers.





Oracle WebLogic Cluster can be deployed either on a single physical server or on multiple physical servers. In the event of hardware failure of either of the physical servers, deployment of cluster on multiple physical servers help ensures Failover and thus high availability of the deployed system. In the present setup, you have configured a vertical scaling scenario, where several instances of WebLogic managed servers are deployed on a cluster, within a single physical server.

In the this setup, you use two physical servers for Oracle WebLogic Cluster configuration. Each of the physical servers will have multiple managed servers and a NodeManager. The Node Manager on a machine that hosts Managed Serversenables the start and stop of Managed Servers remotely using the Administration Console or from the command line.WebLogic AdminConsole resides on one of the physical servers. Figure 19 shows the WebLogic Cluster deployment.

Some of the important steps to cluster Oracle WebLogic Server are as follows:

- Create domain , Admin Server and Node Manager on UCS B230Server1
- Create domain and Node Manager in UCS B230Server2
- Register Node Managers to Admin Server on UCS B230Server1
- Configure Managed Server on UCS B230Server1 and Server2
- Register Managed Servers to respective Node Managers
- Create a Cluster through AdminConsole and Assign Managed Server

Tasks	Task Description
	ster configuration, install the WebLogic Base server on the second B230
WebLogic Platform - 10.3.5.0	delines detailed under Oracle WebLogic Server Installation.
	ORACLE
QUICKSTART	
These QuickStart links	
are provided to help get you started with your	Getting started with WebLogic Server® 10.3.5
installed Oracle products.	Starter dismatrazing the Configuration Villaria' decine starter dismain to explore WebLogic Server. Select the wis_starter
Windows users will also find useful shortcuts in the Start Menu, to create	domain template to include a deployed application containing a welcome page, R <mark>Launches the Configuration Wizard</mark>
domains, start servers, relaunch QuickStart,	Upgrade domains to version 10.3.5
and more.	Launch the domain Upgrade Wizard, which streamlines upgrade of WebLogic Server 8.1, 9.1, 9.2 and 10.0 domains.
	Access documentation online Review our online documentation to learn about Oracle products
	and what's available in this release.
	is Demois which is used is creating a Wahl agis Conver Cluster
2 Create a new WebLog Select create new Web	ic Domain, which is used in creating a WebLogic Server Cluster.
Fusion Middleware Configuration Wizard	
Welcome	ORACLE
● Create a new WebLogic c	Iomain
Create a WebLogic domain in yo	ir projects directory.
O Extend an existing WebL	ogic domain bonents to an existing domain and modify configuration settings.
Use this option to add new comp	onems to an existing domain and modify comiguration settings.
E <u>x</u> it <u>H</u> elp	Previous Next Go to the next screen
3 Select Generate WebL	ogic Basic Domain.

Select Domain Source		
Select Domain Source		ORACLE'
	domain configured automatically to support th pgic Server Domain - 10.3.4.0 [wiserver_10.3] *	he following products:
	ogic SIP Server Domain - 10.3.4.0 [wlserver_10.3]	
_	dvanced Web Services for JAX-RPC Extension - 10.3.4.0 [w	
	dvanced Web Services for JAX-WS Extension - 10.3.4.0 [wls	server_10.3]
	main on an existing template	
Template locatio	on: /u01/Oracle/Middleware	Browse
E <u>x</u> it <u>H</u> elp		Previous Next
	erver domain , JAX-RPC and JAX-W	S extensions , but for illustration w
have opted for Basic W	Veblogic Server Domain	
have opted for Basic W	Veblogic Server Domain nd accept the default installation dire	
have opted for Basic W Rename the domain a	Veblogic Server Domain nd accept the default installation dire m Wizard	ectory.
have opted for Basic W Rename the domain an Fusion Middleware Configuration	Veblogic Server Domain nd accept the default installation dire m Wizard	ectory.
have opted for Basic W Rename the domain an Fusion Middleware Configuration	Veblogic Server Domain nd accept the default installation dire on Wizard .ocation Enter the name and location for the domain	ectory.

5	Mode. Select Production Mode (Ora	rd for WebLogic domain and continue with domain Startup acle Recommends JRockit for Production Mode).
	Fusion Middleware Configuration Wizard Configure Server Start Mode and JDK	ORACLE'
	Before putting your domain into production, make sure the 'Securing a Production Environment' in the WebLogic Sen	hat the production environment is secure. For more information, see the topic ver documentation. JDK Selection
	 ○ Development Mode Utilize boot, properties for username and password and poll for applications to deploy. Sun JDK recommended for better startup performance during iterative development. ○ Production Mode Require the entry of a username and password and do not poll for applications to deploy. WebLogic JRockit JDK recommended for better runtime performance and management. 	Available JDKs Fockit SDK 1.6.0_24 @ /u01/jrockit-jdk1.6.0_24-R28 O Other JDK Location: Previous Next
6	cluster Setting, and RDBMS Securit	ough the Administration Server setting, Managed Server, y Store Settings. Presently we would just configure a Machine configure Managed Server and Clusters through Admin

	Fusion Middleware Configuration Wizard	<u></u> ۲	
	Select Optional Configuration	ORACLE	
	Administration Server Modify Settings Managed Servers, Clusters and Machines Add or Delete Modify Settings RDBMS Security Store Modify Settings		
	Exit Help	Previous Next	
7	For Administration Server, select SSL Enabled.		
	Fusion Middleware Configuration Wizard		
	Configure the Administration Server		CLE.
	O Dis <u>c</u> ard Changes		
	*Name: AdminServer *Listen address: All Local Addresses Listen port: 7001 SSL listen port: 7002 SSL enabled: Image: Comparison of the second seco		
	k		
	Exit Help	Previous	Next
8	Do not add any Managed Servers. These are added afterthe Admin Console.	e Clusters are conf	igured, through the

I Fusion Middleware	Configuration Wizard			巴
Configure Manage	d Servers			ORACLE
📮 <u>A</u> dd 🗱 <u>D</u> elete	🕐 Dis <u>c</u> ard Changes			Switch Display
Nam e*	Listen address* <mark>Leave Blank</mark>	Listen port	SSL listen port	SSL enabled
		¥		
E <u>x</u> it <u>H</u> elp]			Previous Next
registering theN		Imin Console.		
📴 Add 🗱 Delete (Dis <u>c</u> ard Changes			Switch Display
Name*	Cluster messaging mode	Multicast address	Multicast port	Cluster address
	<mark>No Cluster Cor</mark>	figuration		
E <u>x</u> it <u>H</u> elp				Previous Next
Add Node Mana	ger details.			

Configure Machines	A	민
Configure Machines	Υ.	ORACLE
Machine Unix Machine ☐ Add ¥ Delete O Discard Name* b230-weblogic1	Changes Node manager listen address All Local Addresses	Node manager listen port V 5556
Exit Help 1 No ManagedServers were	created so accept the default c	Previous Next
Machine screen.	-	
Assign Servers to Machines		ORACLE
Select a machine in the right pane. Then s button.	select the server(s) in the left pane and assign them to	the machine by clicking the right arrow
	select the server(s) in the left pane and assign them to Machine Machine Machine D30 b230-weblo	
button.	Machine Machine b230-weblo	
button. Server	Machine Machine Machine b230-weblo	
button.	Take as Default →	

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	Fusion Middleware Configuratio Creating Domain	Progress: Preparing Extracting Domain Contents Creating Domain Security Information Saving the Domain Information Storing Domain Information String Substituting Domain Files Performing OS Specific Tasks Domain Creation Tasks Domain Created Successfully! Domain Location: /u01/Oracle/Middlewain	re/user_projects/domains/ucs_domain

15	Start AdminConsole in b230-weblogic1
	[oracle@b230-weblogic1 ucs_domain]\$ pwd /u01/Oracle/Middleware/user_projects/domains/ucs_domain [oracle@b230-weblogic1 ucs_domain]\$./startWebLogic.sh
16	Register Node Manager in b230-weblogic1 with AdminConsole through WebLogic Scripting Tool.
	Node Manager is a Java utility that runs as separate process from WebLogic Server and allows performing, common operations tasks for a Managed Server, regardless of its location with respect to its Administration Server. Node Manager on a machine enables hosts Managed Servers, to start and stop the Managed Servers remotely using the Administration Console or from the command line.
	<pre>[oracle@b230-weblogic1 bin]\$./wlst.sh→WLST tool CLASSPATH=/u01/Oracle/Middleware/patch_wls1035/profiles/default/sys_manifest_classpath/weblogic _patch.jar:/usr/jrockit-jdk1.6.0_24-R28.1.3- 4.0.1/lib/tools.jar:/u01/Oracle/Middleware/wlserver_10.3/server/lib/weblogic_sp.jar:/u01/Oracle /Middleware/wlserver_10.3/server/lib/weblogic.jar:/u01/Oracle/Middleware/modules/features/weblo gic.server.modules_10.3.5.0.jar:/u01/Oracle/Middleware/wlserver_10.3/server/lib/webservices.jar</pre>
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	Your environment has been set.
	CLASSPATH=/u01/Oracle/Middleware/patch_wls1035/profiles/default/sys_manifest_classpath/weblogic _patch.jar:/usr/jrockit-jdk1.6.0_24-R28.1.3- 4.0.1/lib/tools.jar:/u01/Oracle/Middleware/wlserver_10.3/server/lib/weblogic_sp.jar:/u01/Oracle /Middleware/wlserver_10.3/server/lib/weblogic.jar:/u01/Oracle/Middleware/modules/features/weblo gic.server.modules_10.3.5.0.jar:/u01/Oracle/Middleware/wlserver_10.3/server/lib/webservices.jar :/u01/Oracle/Middleware/modules/org.apache.ant_1.7.1/lib/ant- all.jar:/u01/Oracle/Middleware/modules/net.sf.antcontrib_1.1.0.0_1-0b2/lib/ant- contrib.jar::/u01/Oracle/Middleware/wlserver_10.3/comfig- launch.jar::/u01/Oracle/Middleware/wlserver_10.3/common/derby/lib/derbynet.jar:/u01/Oracle/Midd leware/wlserver_10.3/common/derby/lib/derbyclient.jar:/u01/Oracle/Middleware/wlserver_10.3/comm on/derby/lib/derbytools.jar::
	Initializing WebLogic Scripting Tool (WLST)
	Jython scans all the jar files it can find at first startup. Depending on the system, this process may take a few minutes to complete, and WLST may not return a prompt right away.
	Welcome to WebLogic Server Administration Scripting Shell
	Type help() for help on available command
	wls:/offline> connect ('weblogic','weblogic1','t3://10.104.109.84:7001')→AdminConsole Connection Connecting to t3://10.104.109.84:7001 with userid weblogic Successfully connected to Admin Server 'AdminServer' that belongs to domain 'base_domain'.



	🖉 Summary of Servers - base_domain - WL	LS Console - 🌈 Cr	eate a New Server - base_domain -	WLS Console - Windows Internet Explorer		
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	Coherence Clusters Machines	Comments (Machines		INISEIARI ²	
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	Deployments Services		eployments ervices	Server Listen Address:	10.104.109.84	ort
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	base_domain				11 II	
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	Servers Clusters Virtual Hosts		Use this page to configure	general features of this server such as d	efault network communications.	
	Migratable Targets Coherence Servers Coherence Clusters		Name:	MServer_3		
	Machines Work Managers Startup and Shutdown Class	es	街 Machine:	b230-weblogic2		
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21	Panast stone 19 on	d 10 to 7	add athar three a	orvere with opproprie	to ID and	
21				ervers, with appropria	ALE IF AILU	
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View changes and restarts	Home >S	Summary of Servers >MServer_3 :	>Summary of Servers >MServer_3 >\$	ummary of Servers	
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	This pa	ge summarizes each server that	has been configured in the current	WebLogic Server domai	n.
Clusters	25				
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Create Managed Servers Clone Servers		MService 02	Lago multipatio	2004	
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	http://download.oracle.com/docs/cd/E11035_01/wls100/cluster/features.html)											
	Note:	messaging v	ng a new clust vithin a cluster ebLogic Serve sters.	. For backw	ard com	patibility w	ith previous	6				
	In Unicast messaging mode, cluster members are split into groups and every group has a group leader. Cluster members communicate to the group leader when they need to send a broadcast message which is usually the heartbeat message. When the cluster members detect the failure of a group leader, the next oldest member becomes the group leader. All group leaders are connected to each other											
23	when a bluster is created you can start the servers and view the server status and verify machine a											
	cluster assignment. You can also start the	convors from com	mand prompt	for oxample:								
			inanu prompi ,	ioi example.								
	/u01/Oracle/Middleware/user_projects/domains/ucs_domain/bin/startManagedWebLogic.sh MServer_1 <admin-server>:7001</admin-server>											
	/u01/Oracle/Middleware/user_projects/domains/ucs_domain/bin/startManagedWebLogic.sh MServer_2http:// <admin-server>:7001</admin-server>											
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	Domain Structure Asset bas_domain Asset/service Environment Asset/service Custors This page summarizes each server that has been configured in the current WebLogic Server domain. Custors Custors Model be Targets Custors Coherence Servers Customize this table Model Magners Servers (Filtered - More Columns Exist)											
	Startup and Shutdown Classes	New Clone Delete				Sho	wing 1 to 6 of 6 Previous Ne:	×t				
	Services Services Services Services	🔲 Name 🗠	Machine	Listen Port	Health	Cluster	State					
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	Create Managed Servers Clone Servers	MServer_01	6230-weblogic3	7001	🖋 ОК	Cluster-UCS	RUNNING					
	Delete Managed Servers Delete the Administration Server	M5erver_02	b230-weblogic3	7004	🖋 ОК	Cluster-UC5	RUNNING	_				
	Start and stop servers	MServer_1	b230-weblogic2	7003	🖋 ок	Cluster-UCS	RUNNING	_				
24	Some of the important steps to deploy an application on WebLogic cluster are detailed below. In the this setup, you have used MedRec application which is part of samples of WebLogic Server installation. #Deployment on Clustered Weblogic Server (Deployment of application is executed from WebLogic Admin Console) 1) Confgure DataSource with JNDI Name = jdbc/MedRecGlobalDataSourceXA, driver = Oracle Driver (Thin XA) and target as WebLogic Cluster 2) Goto Services → Messaging a) Add JMS Server b) Configure JMSModule with Target as WebLogic Cluster c) Add Queues to JMS Module 3) Goto Domain → Deployment											
			libraries (den	lov as libra	ries)							
	a) Install jsf and jstl libraries (deploy as libraries) b) Install browser-starter.war , physician.ear and medrec.ear											

```
c) In broweser-starter.war edit the context root to /browser-starter
d) On Medrec Overview tab , edit the Deployment Order to "1"
e) Ensure all targets point to previously created cluster
4) Start the application . Presently we can access the application to each of the configrd
Weblogic Cluster. In next section we would use Apache HTTP Server with Weblogic HTTP plugin and define the cluster configuration
```

When the Oracle WebLogic Cluster is configured, interface it with Apache 2.2 HTTP Server by using Apache HTTP Server Plug-in for WebLogic 10.3.5.

4.5.5 Apache HTTP Server Plug-in

Apache HTTP Server Plug-In allows requests to be routed from an Apache HTTP Server to WebLogic Cluster. The plug-in is intended for use in an environment where an Apache Server serves static pages, and dynamic part of web-page (HTTP Servlets or JSP's) is delegated to WebLogic Server, which may be operating in a different process, possibly on a different host.

Tasks #	Task Description						
1.	Copy the Apache2.2-WebLogic (mod_wl_22.so) plug-in from						
	\$WL_HOME/server/plugin/linux/x86_64 to \$Apache_Home/modules						
2.	Edit \$Apache_Home/conf/httpd.conf with following parameters:						
	#Load WebLogic plug-in module						
	LoadModule WebLogic_module modules/mod_wl_22.so						
	# SetHandler specifies the handler for the Apache HTTP Server Plug-In module						
	.Presently we have are proxing all request to WebLogic.						
	<pre><location medrec=""> We have clustered WebLogic MedRec application and defined the loationSetHandler WebLogic-handler</location></pre>						
	# Add an IfModule block that defines WebLogic Cluster						
	<ifmodule mod="" weblogic.c=""></ifmodule>						
	WebLogicCluster MServer_1:7003,MServer_2:7004,MServer_01:7001,MServer_02:7004						
3.	Restart apache, and we have a Apache 2.2 proxying requests to Oracle WebLogic Cluster. Access <u>http://<apache-server>/medrec/</apache-server></u> to ensure that you can access the clustered application.						

4.6 Cisco UCS Statelessness

As elaborated in the previous sections, Cisco Unified Computing System enables data center servers to be stateless, for example a server's identity (using MAC or WWN addressing or UIDs) as well as build and operational policy information such as firmware and BIOS revisions and network and storage connectivity profiles can be dynamically provisioned or migrated to any physical server in the system.

Cisco UCS Service profiles, in combination with the stateless nature of Cisco Unified Computing System servers, provide the underlying mechanism that allows the use of a common pool of spare servers that can be quickly repurposed for nearly any requirement. For most organization and applications, this feature can result in an immediate reduction in capital expenditures (CapEx) because required spare and overflow capacity can be shared

among multiple departments and applications. Users can tailor the cost and acceptable risk by varying the size of these shared resource pools.

The subsequent sections detail the migration of Service Profile created for Oracle WebLogic Server hardware, thus utilizing the statelessness benefits of the Cisco Unified Computing System.

4.6.1 Service Profile Migration

In the present setup, there is a single Oracle WebLogic server hardware, with multiple WebLogic Managed Servers instantiated in a WebLogic Cluster. In the event of hardware failure, migrate the Service profile of WebLogic Server hardware to another server, which would help ensure minimal downtime for application server environment and faster deployment of new hardware deployed with WebLogic Server Cluster.

In the event of multiple physical servers for WebLogic Cluster deployment, youwill achieve lossless end-user services, as Service Profile of failed physical server would be migrated to the redundant physical server.

The pre-requisites to successfully migrate the failed WebLogic Cluster physical server to a available stand-by areSANBoot of OEL5.5.







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As stated above, the service profile migration successfully migrates the failed physical server to a stand-by server pool, without changing any configuration on the new Cisco UCS B230 blade sever. This demonstrates the power of the statelessness characteristic of the Cisco Unified Computing System.

5. Future Considerations

5.1 Server Failure Detection and Automated Service Profile Migration

This deployment guide detailed the stateless behavior of Cisco UCS Service profile and its benefits in the data center. Defined is a methodology to migrate a service profile from a failed physical server to a stand-by server. Cisco UCSManager, with its API's can be configured for an automated service profile migration, during physical server hardware failure.

The next step is automated scripts which would enable this behavior. A deployed Cisco UCS service profile would move over to a available server in a stand-by server pool without manual intervention.

5.2 Performance and Scalability Analysis for WebLogic on a Cisco UCS Blade Server

To explore the performance and scalability benefits of a Cisco UCS B230blade server deployed with Oracle WebLogic Cluster, you would deploy a Java EE benchmark application and evaluate over Cisco UCS and evaluate Cisco Unified Computing System on three important criteria:

- Throughput–Maximum transaction/sec achieved from the deployed application with the condition of acceptable application response time or saturation of available system resources
- Response Time-Time taken to execute deployed application transaction.
- Multi-Instance Application Server Cluster–Performance improvement either on basis of maximum throughput or lower response time achieved by deploying multiple instances or nodes in Oracle WebLogic application server cluster.

6. For More Information

http://www.cisco.com/en/US/products/ps10280/index.html



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