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# CON8924 - Extreme SOA: Secure, Fast, Scalable, and Reliable—Delivered on Oracle ExaLogic

September 28–  
October 2, 2014  
San Francisco

**ORACLE**  
**OPEN**  
**WORLD**

Panduka Weeraratne, SriLankan Airlines  
Biplab Ray, Sherwin-Williams  
Sundar Padmanabhan, Bahwan CyberTek  
Suresh Sharma, Oracle

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# About the Presenters



**Panduka  
Weeraratne,**  
Senior Manager,  
SriLankan Airlines



**Biplab Ray**  
Sr. Lead Architect,  
Sherwin-Williams



**Sundar  
Padmanabhan,**  
VP consulting,  
Bahwan CyberTek



**Suresh Sharma**  
Product Strategy Director,  
Oracle



# Program Agenda

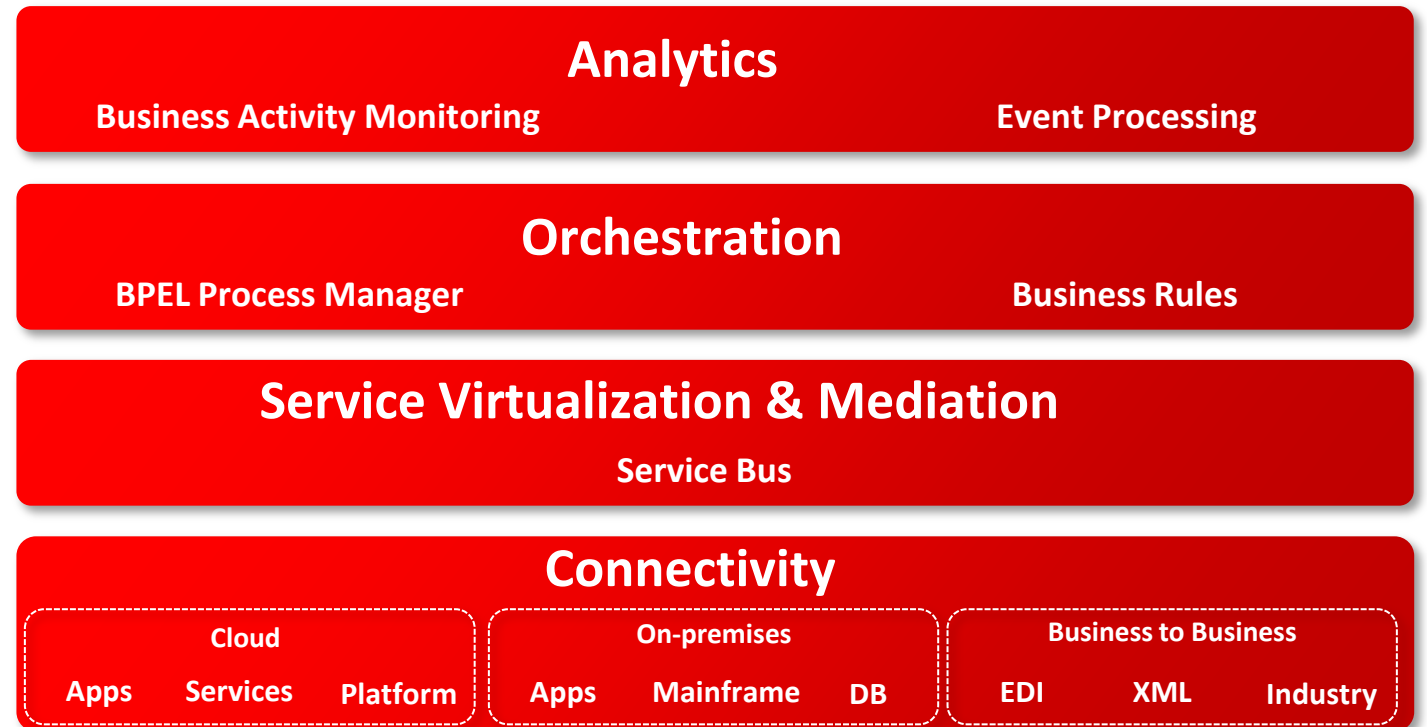
- 1 Oracle SOA Suite
- 2 SOA on ExaLogic Deployment Case Studies
- 3 SriLankan Airlines
- 4 Sherwin-Williams
- 5 Behwan CyberTeck



# Oracle SOA Suite

## Unified Integration Across Cloud, Mobile, and On-premise

- Simplifies development and management
- Standards-based, open infrastructure interoperates with your existing IT
- Consistent tooling - Single development, deployment and management platform





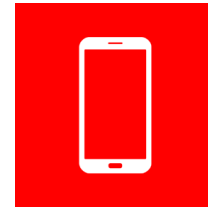
# SOA Suite 12c

## Key Features



Web Scale

- 30 % memory footprint reduction
- Startup acceleration
- Pre-tuned database profiles
- Active-active support



Mobile

- First class support for mobile-friendly standards (REST, JSON, ...)
- Automated conversions REST/SOAP



Developer  
Productivity

- One-click install
- Everything in JDeveloper
- Debugger & tester
- Templates



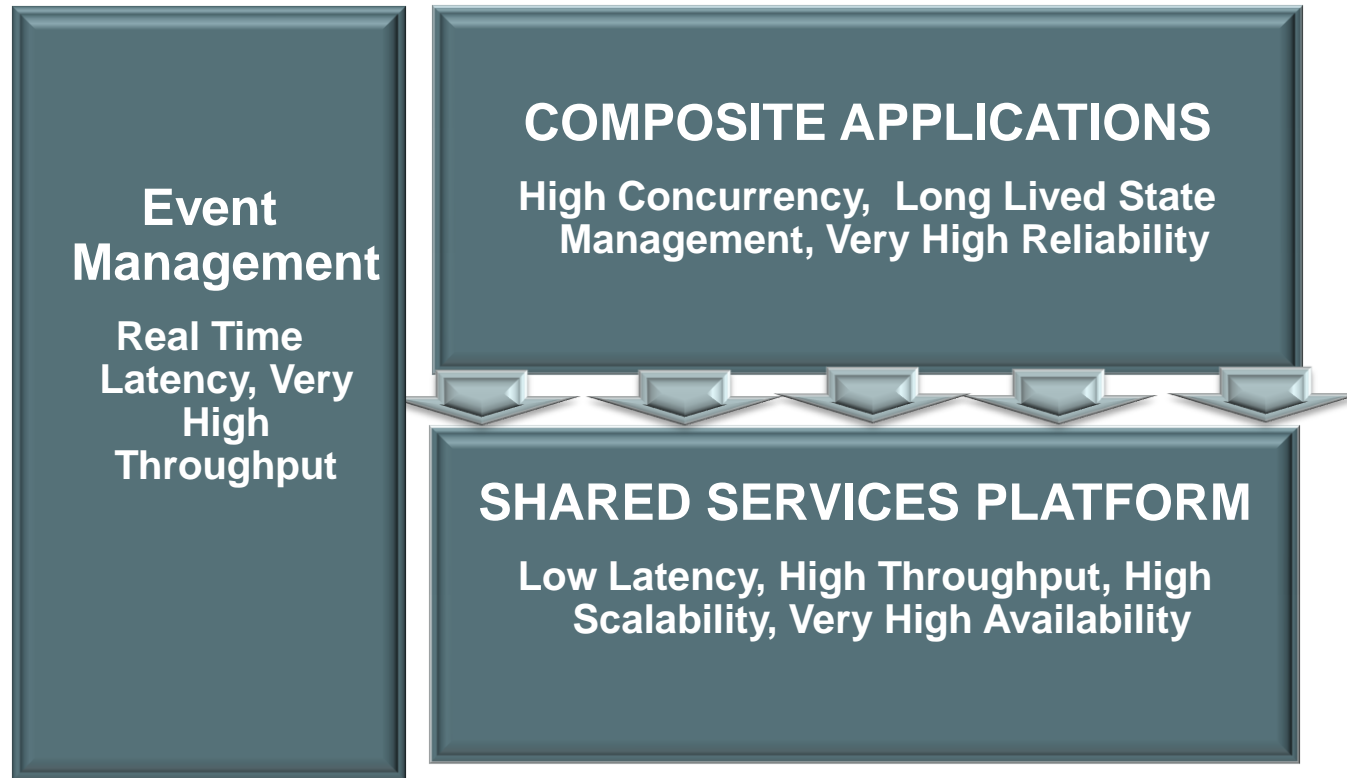
Cloud

- Cloud adapters to simplify on-prem to cloud integration
- Managed File Transfer (MFT) for file-based integration (new SKU)
- Certifications on Oracle Public Cloud



# Platform: Performance Under Load

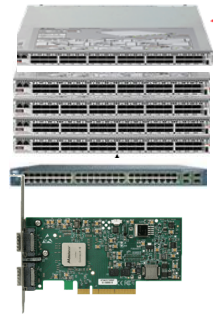
Performance challenges as more load goes through SOA infrastructure



- Korean International Air Carrier
  - Passenger Integration Platform
  - 10,000 TPS (messages)
- Brazilian Mobile Operator
  - Value Added Services Platform
  - 5000 TPS (messages)
- US Credit Card Issuer
  - Online, Mobile services platform
  - 2500 TPS (messages)
- B2B Service Provider
  - B2B Hub
  - 150 TPS (processes)



# Exalogic: Hardware and Software Working Together



## Hardware

- x86 Compute Nodes
- Storage
- InfiniBand Switches
- InfiniBand HCAs

## Exalogic

## Exalogic Elastic Cloud Software

### Cloud Management

### System Software

### App & FMW Enhancements



- Infrastructure-as-a-Service
- Platform-as-a-Service

- Exabus, Oracle Traffic Director
- Firmware
- Lifecycle tooling

- Enhancements to WebLogic, Coherence, JVM, EBS, PeopleSoft, ATG, etc



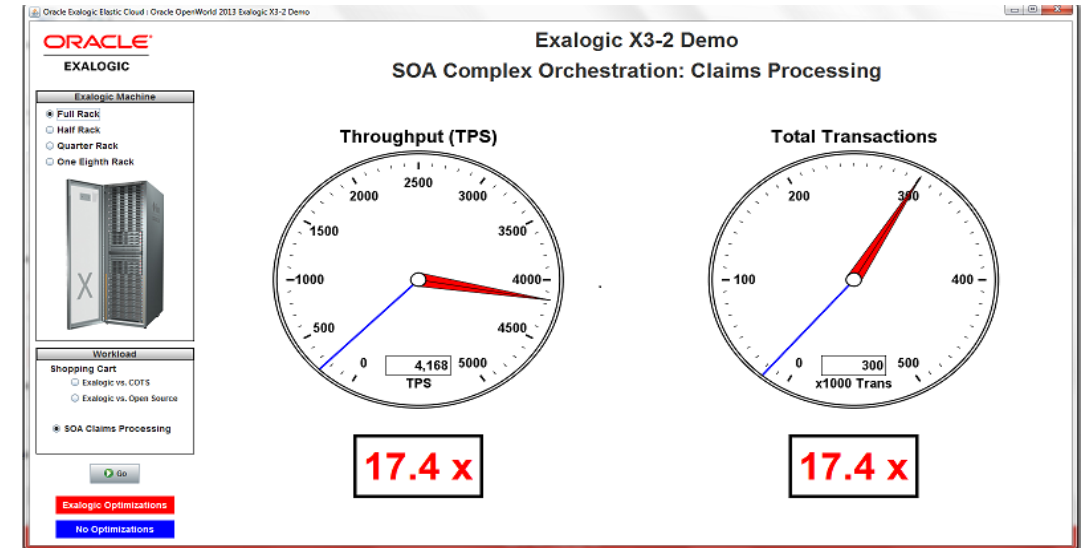
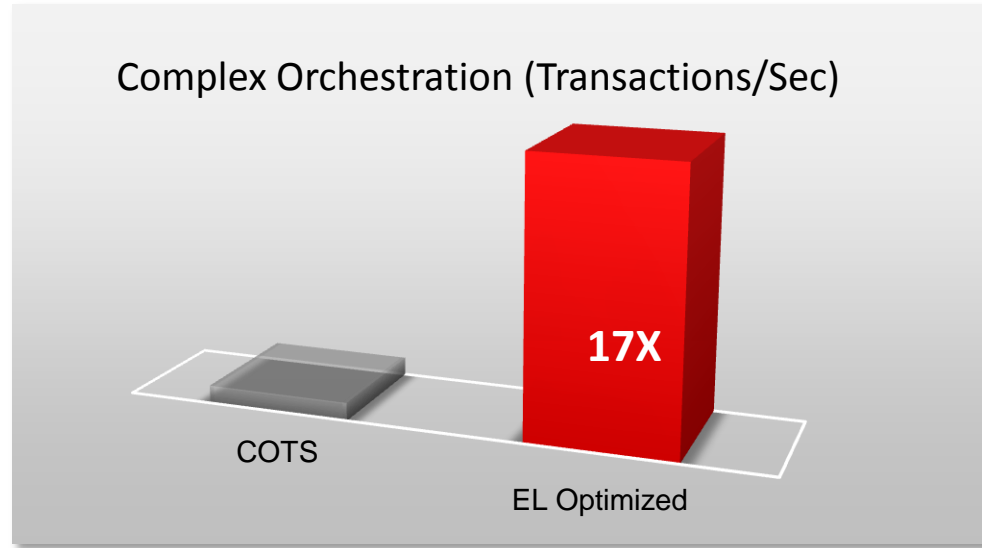
# How Exalogic Solves Common Business Problems

Exalogic is a *Solution*, Comprised of Hardware, Software and Services

Time to Market	Cost	Performance	Flexibility
<ul style="list-style-type: none"><li>• Vertically integrated hardware and software reduces deployment time</li><li>• Provision quickly with IaaS and PaaS approach</li></ul>	<ul style="list-style-type: none"><li>• Reduced TCO through software and services lifecycle</li><li>• Reduced hardware needed due to greater performance and throughput</li></ul>	<ul style="list-style-type: none"><li>• Improved performance by eliminating I/O bottlenecks can increase customer satisfaction</li><li>• Apps and FMW enhancements have positive user impact</li></ul>	<ul style="list-style-type: none"><li>• Provision quickly with IaaS and PaaS results in increased agility and staff productivity</li><li>• Provides the ability to mix public with private cloud approaches to best suit business requirements</li></ul>



# SOA BPEL On Exalogic 17X Faster



## SOA Complex Orchestration scenario implements claims processing:

Uses SOA File Adapter and async BPEL components

Heavy DB interaction for async BPEL process

SOA 12.1.3 brings low memory footprint, pre-tuned database profiles, WLS self tuned threading model

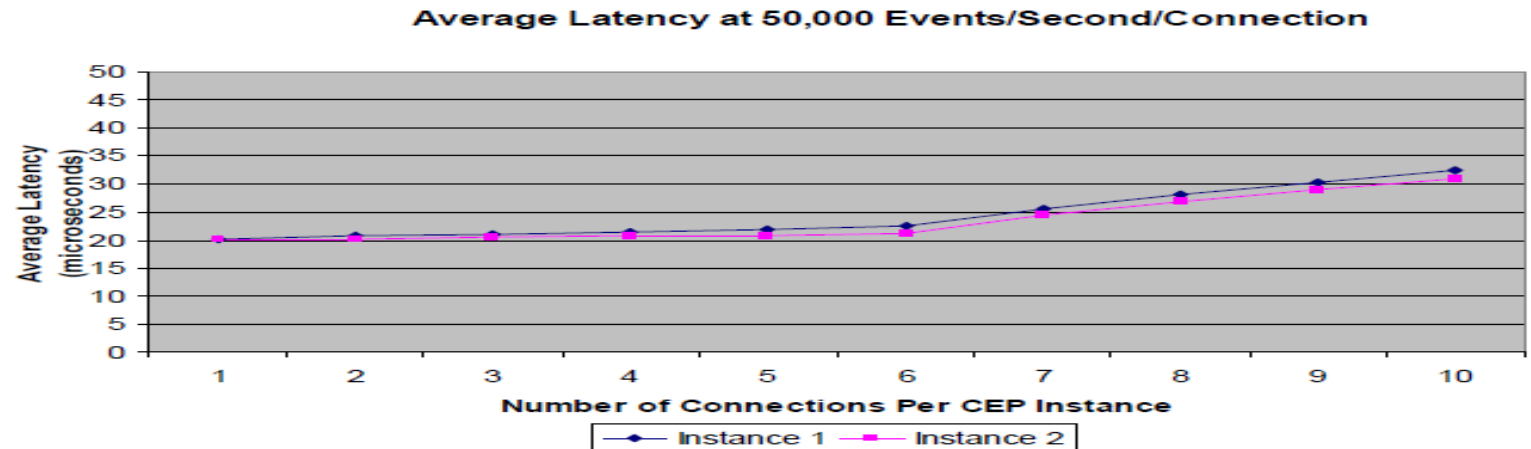
Uses 12.1.3 enhanced JCA Connection management and BPEL Optimizations



# Sample Benchmarks – OEP



- **Extreme Throughput** - 1 million events per second
- **Low Average latency** - 32 micro seconds per event
- **Low Peak Latency** - 99.99% events processed under 2 ms



\*On One Exalogic compute node



# Oracle SOA on Exalogic

## Customer Case Studies



- Exalogic to run WLS, OTD, SOA Suite, BPM and Enterprise Manager
- **11x** Response time improvement , Estimated **1** day environment setup reduced to **9 minutes**



- ExaLogic to consolidate all custom applications using OSB, SOA Suite, BAM, BPM
- High availability: **99.9%**, min. unplanned downtime, **75%** reduction in time to market
- **2x** Improved throughput, **90%** cost reduction in man-hours for maintenance



- Exalogic to consolidate and run Oracle SW: Oracle Apps (SOA, CC&B, BI, Webcenter, Primavera, UCM)
- **6x** reduced upgrade/setup time and **3x** faster response time



- Exalogic to consolidate and run all Cetelem applications and entire FMW portfolio including SOA
- **50%** improvement in test/integration, **25%** reduction in IT budget, **50%** improvement in time to market



- A leader in asset recovery management industry ~\$150M revenue/year, ~1300 emp.
- Custom application built in SOA (600+ instances) and ADF used by 100 collection agents
- **9x** response time improvement, **5x** concurrent users vs prior IBM and Dell systems



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## Sri Lankan Airlines PSS Integration Platform (PIP)



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## SriLankan Airlines Today

- National carrier of Sri Lanka, founded in 1979
- Over 80 online and code-share destinations worldwide
- Member of the **oneworld** alliance
- Award-winning carrier with a long-held reputation for excellence in service, comfort, safety, reliability and punctuality
- Next-generation fleet including Airbus A350s on order





# SriLankan Airlines - Background

SriLankan Airlines, the National Airline of Sri Lanka, is an award winning carrier with a firm reputation as a global leader in service, comfort, safety, reliability, and punctuality

Sri Lankan Airlines Limited intends to replace its current passenger services system (PSS), Presently they use the Mercator PSS system together with PROS revenue management system, RAPID (Mercator) revenue accounting system, CRIS (Mercator) frequent flyer program

- The management reports are available through few 3rd party products from the same PSS provider and others
- Presently Sri Lankan does not have an operational data store, instead depends on limited available system data for management reports
- Sri Lankan intends to join One World Alliance

The solution provided for multi delivery channel platform for corporate integration system project is also known as PSS Integration Platform (PIP)

The PIP platform will enable Lankan to enjoy these potential benefits:

- Minimize integration risk
- Minimize costs and maximize benefits
- Create unique customer experiences
- Provide valuable customer data
- Enable dynamic business processes and services



# Business & IT Challenges

## Business Challenges

- SLA joining the OneWorld Alliance necessitated changes to the core systems to address the alliance related requirements and improve efficiency in service to the customers
- SLA initiated migration to the Amadeus Altea suite of products as part of revamp of their Passenger Service Systems (PSS). The data related to all PSS systems are provided by Amadeus post migration
- Together the above initiatives resulted in the need for SLA to have an integrated Datawarehouse / MIS reporting system
- The initial integration between various peripheral systems and PSS systems were custom built point-to-point integrations, which were not flexible or scalable.

## IT Challenges

- The IT reporting/MIS systems prior to migration to Altea Suite of Applications, were based on Mercator systems
- These reporting systems were in obsolete platforms and had limited functional and technical capabilities to meet the user requirements
- There were different applications for different subject areas and hence getting an integrated reporting was a challenge
- The proposed Datawarehouse / MIS system is based on contemporary Oracle platform and delivers ability for users to generate their own reports and analysis apart from the standard pre-defined reports
- The proposed enterprise integrations were based on Oracle SOA-OSB middleware platform and delivers robust and flexible communication between various systems.





# Requirements

Setting up **MIS** for SriLankan Airlines to make strategic, tactical and operational decisions.

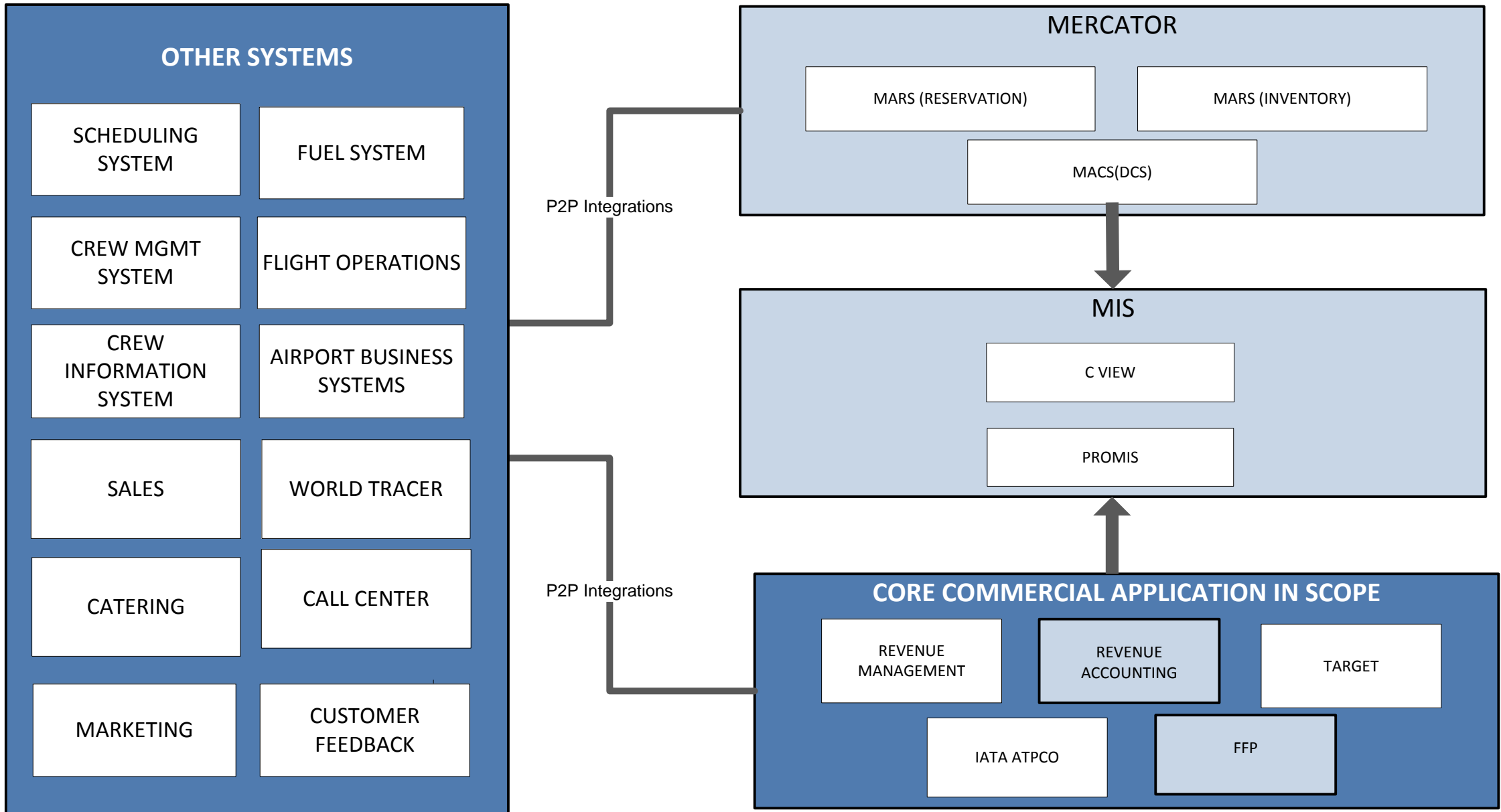
Setting up an **Operation Data store (ODS)** to replicate airline data from the PSS system and to enhance the ODS by integrating other key and relevant in-house and third party applications to build a **data warehouse** solution.

Build a SOA based integration platform (**middleware**) using Oracle Service Bus (OSB) & Oracle SOA Suite, and integrate Passenger Service System (PSS-Amadeus - Altéa platform) with existing internal & external applications and enabling cost effective & convenient future enhancement.

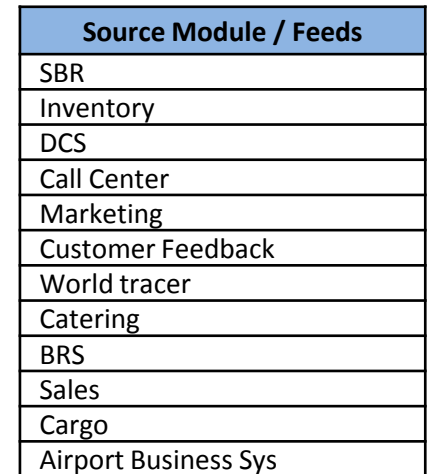
Provision of a comprehensive **CRM** system for the airline



# Old Architecture

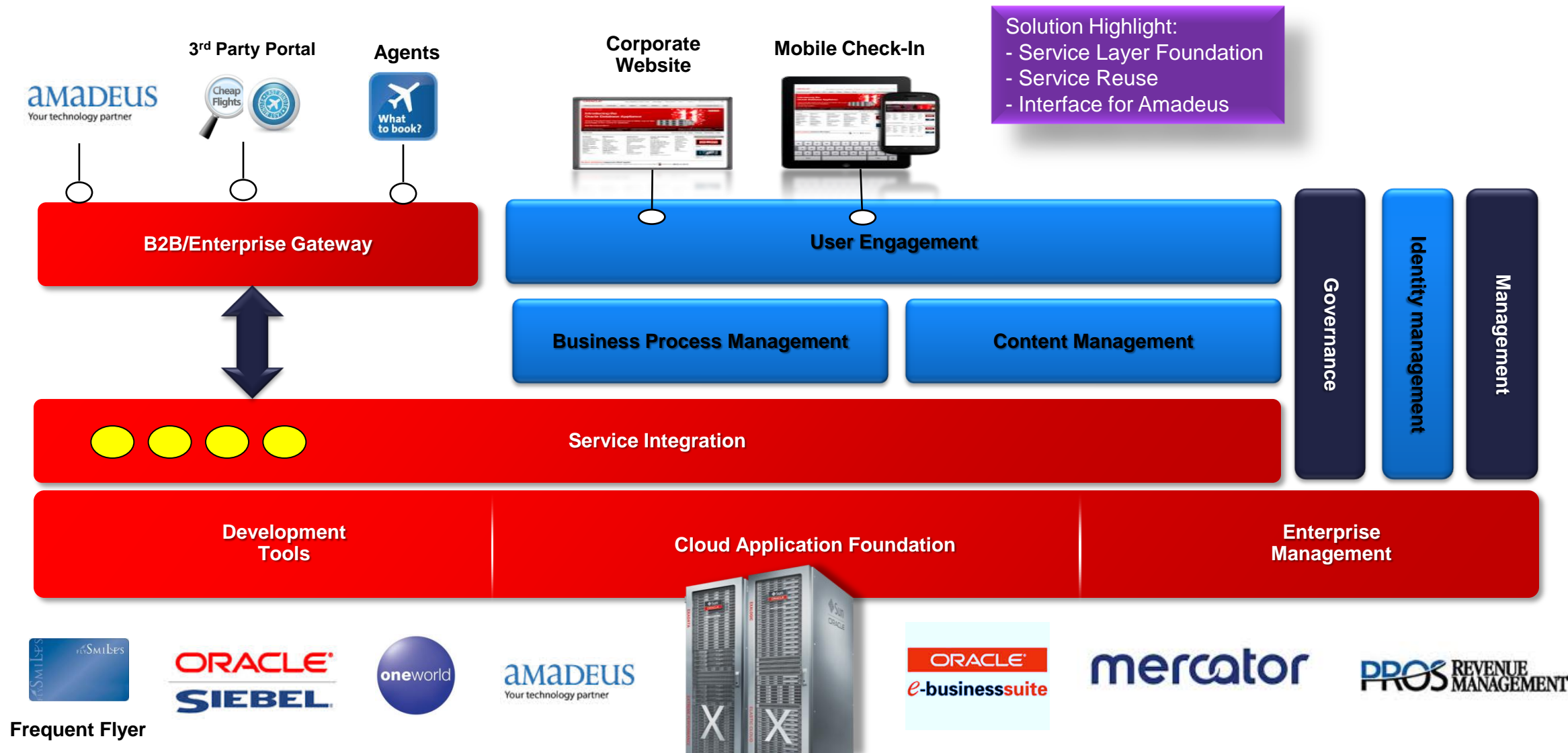






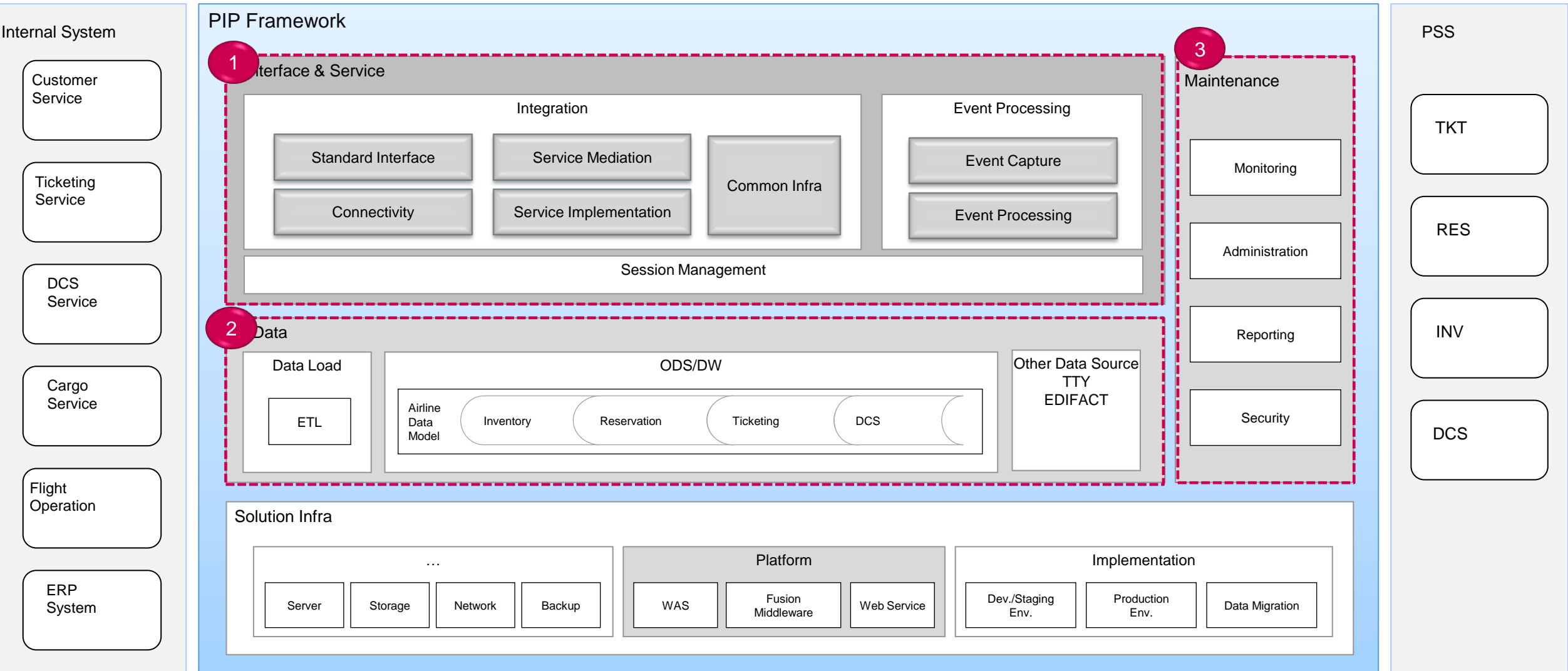


# PSS Integration Platform





# PSS Integration Platform Architecture

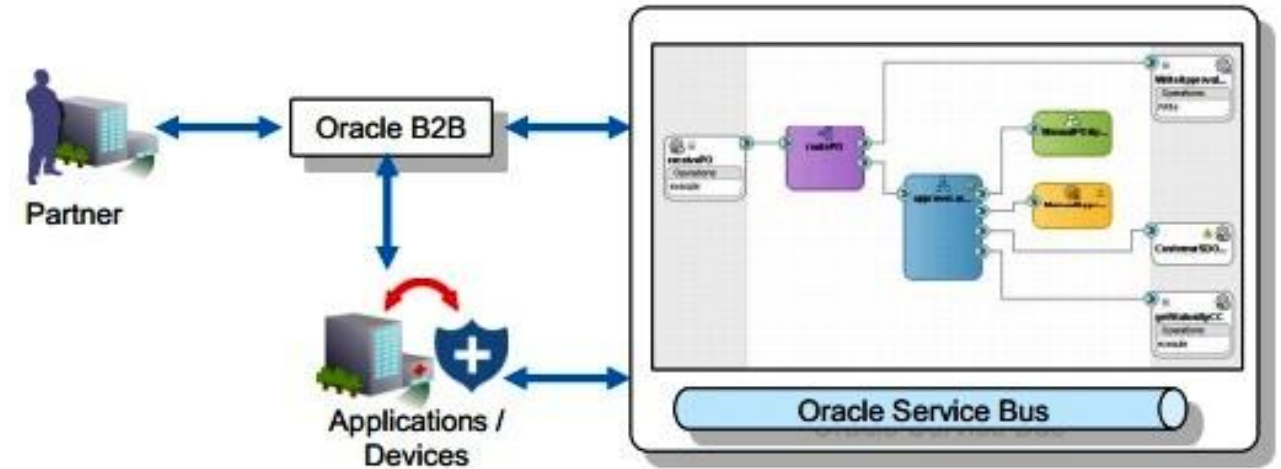




# Custom EDIFACT Business Integration | A First In Market

Oracle B2B enables the secure and reliable exchange of messages between an enterprise and its trading partners, enabling:

- Document Management
- Transport and Exchange Management
- Trading Partner Management
- Reports and Monitoring
- System Management

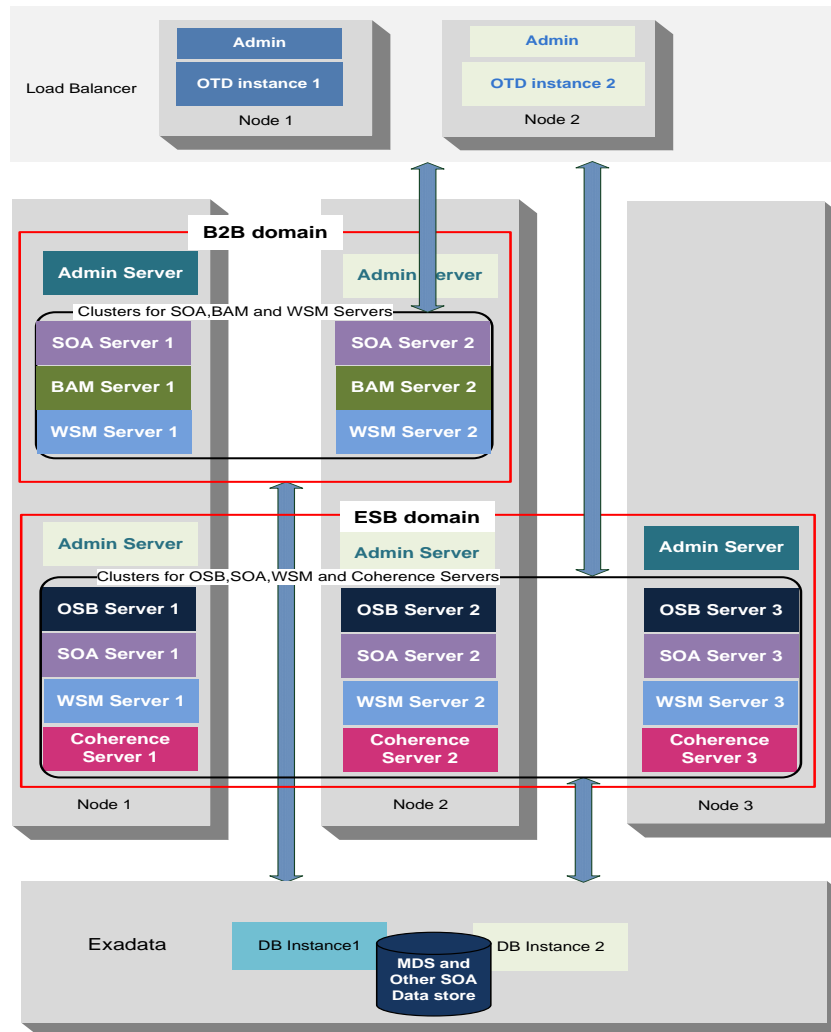


Srilankan PIP program processes Custom AMADEDUS Inventory, SBR and DCS EDIFACT files as a daily activity



Inventory Process Performance – B2B		
	UL	MJ
Feed arrival time	7:40 PM	7:40 PM
Feed size (Min, Avg & Max	140 - 160 MB	58 - 66 MB
Feed Processing Time in B2B	20 Min	15 Min
Total Transactions per day	62000 - 66000	22000 - 24000
Min, Avg & Max data that gets loaded to B2B tables	16 - 17 GB	5 - 6 GB
Data purging method currently used.	B2B Console	B2B Console
Feed Processing Flow and strategy	<ol style="list-style-type: none"> <li>1. Amadeus places the file in the FTP location by 7:40 PM</li> <li>2. Unix script splits the Feed and places to the B2B folder</li> <li>3. B2B consumes the splitted files and converts to xml.</li> </ol>	<ol style="list-style-type: none"> <li>1. Amadeus places the file in the FTP location by 7:40 PM</li> <li>2. Unix script splits the Feed and places to the B2B folder</li> <li>3. B2B consumes the splitted files and converts to xml.</li> </ol>





The environment has two Oracle SOA domains, namely, B2B domain and ESB domain.

The B2B domain serves for batch processing and real time monitoring.

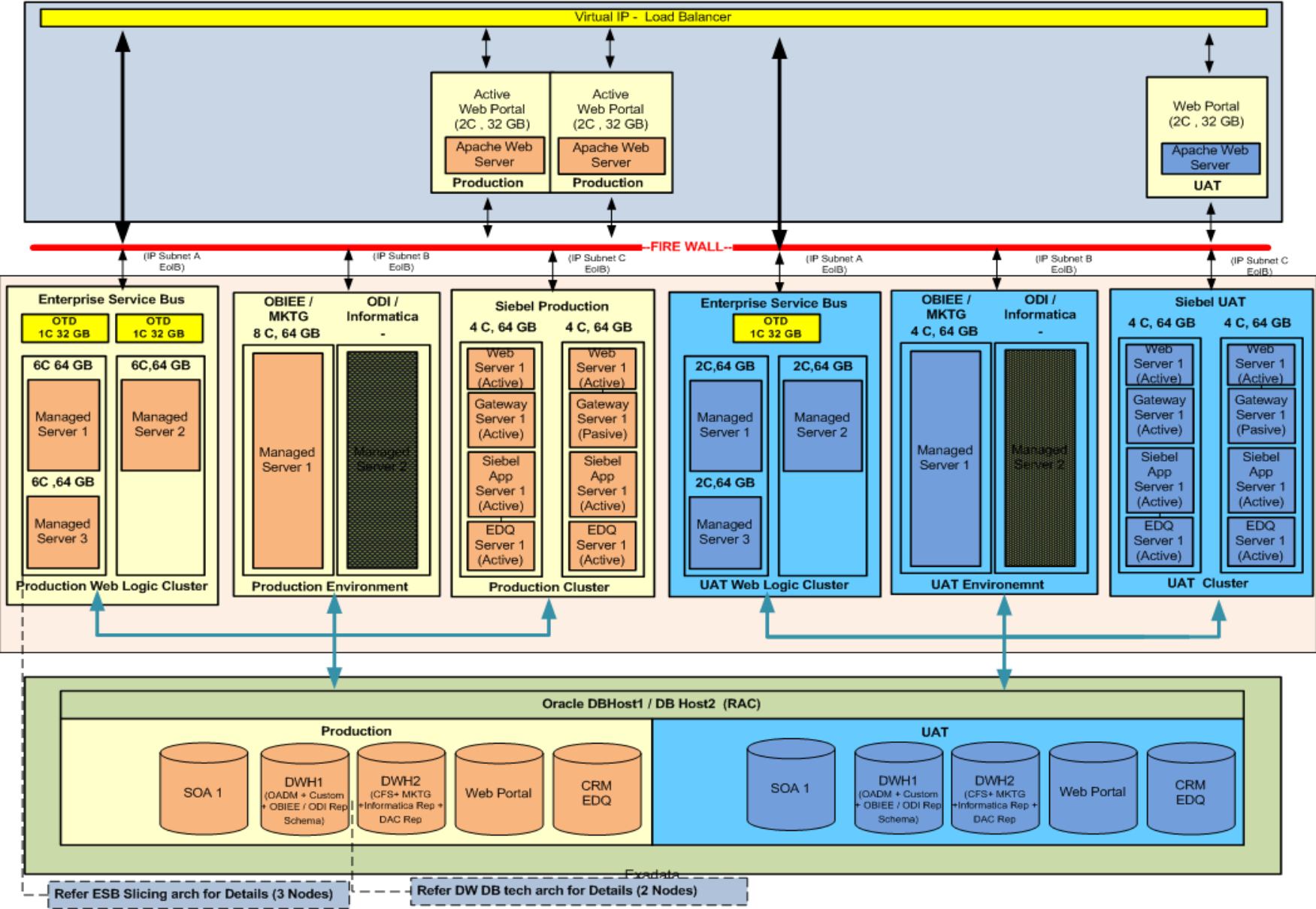
ESB domain serves for all other types of message processing. All HTTP/S and TCP requests to the servers are passed through Oracle Traffic Director .

Traffic director and Admin servers of all domains are Active-Passive configuration

All SOA servers, OSB servers, WSM servers and BAM servers are configured as Active-Active.



# SriLankan Program Deployment Architecture



Exalogic

Exadata



## IT Benefits of SOA-OSB Architecture on ExaLogic

- Highly available and scalable SOA platform
- Platform and services are extendable for future use
- High level of Service reusability and Standardized reusable connectivity services for Amadeus and other EIS
- Common framework for error handling, security
- Easier maintenance and management of services and infrastructure
- Enterprise level real time monitoring
- No downtime for minor configuration changes
- Effective usage of Amadeus services leads to reduces cost
- Centralized caching
- Backward compatibility



# Business Benefits

Sri Lankan Airlines Limited at a very highly level have reaped the following benefits after going live with Oracle ExaLogic solution.

- **150% ROI** as earlier we were paying for every query being made to the PSS system but now because of the PIP Architecture relevant data is being hosted and cached internally.
- **50% reduction in Time to Market**, with a shared service infrastructure in place service reusability is at its peak which has not only resulted in a better Time to Market for new initiatives but also brought the TCO down.
- Approximately **75% reduction in Time** for rolling out patches to production because of system being deployment on engineered systems (a combination of both Exalogic and Exadata).

- Engineered system has brought down the IT **troubleshooting cost by 15%**, single window operations is the key.
- The PIP architecture along with engineered system foundation have **enhanced the business transaction performance by 80%**, Business Process Orchestration has automated most system processes resulting in enhanced performance.
- Shared service infrastructure has promoted service abstraction and reusability as a result same services are being used for multiple channels hence the **risk for future projects and new initiatives is down by 30%**



## We were

- One of the **First** Five Oracle Application Customers in Sri Lanka along with Lankabell, DFCC, JKCS, Aitken Spence 1999 
- The **First** Airline in the world to migrate to Oracle EBS Release 12 2008 
- The **First** company in Sri Lanka to implement Oracle iProcurement 2014 
- One of the **First** Three customers for Oracle ExaLogic & ExaData platforms in Sri Lanka along with Dialog and SLT 2014 
- One of the **First** Three companies to implement Oracle CRM in Sri Lanka next to Dialog 2014 



A **Reference Partner** for many companies in Sri Lanka for Oracle EBS products often contacted by other Oracle Partners like DMS, Aitken Spence, Synapsis (DFCC), Lanka Orix IT in reference to new products, features and user reviews





SHERWIN-WILLIAMS.

# Extreme SOA: Secure, Fast, Scalable, and Reliable—Delivered on Oracle Exalogic

*Biplab Ray*





# *The Sherwin - Williams Company*



- Largest Producer of Paint & Coatings in US, among Top 3 worldwide
- Founded in 1866, Cleveland, OH
- 2016 is 150<sup>th</sup> Anniversary
- 2013 - \$10.19 billion in sales
- Business in 120+ Countries
- 34,000+ employees
- 4,000+ Company Owned Stores
- 90+ Manufacturing Facilities Globally





# Why Exalogic?

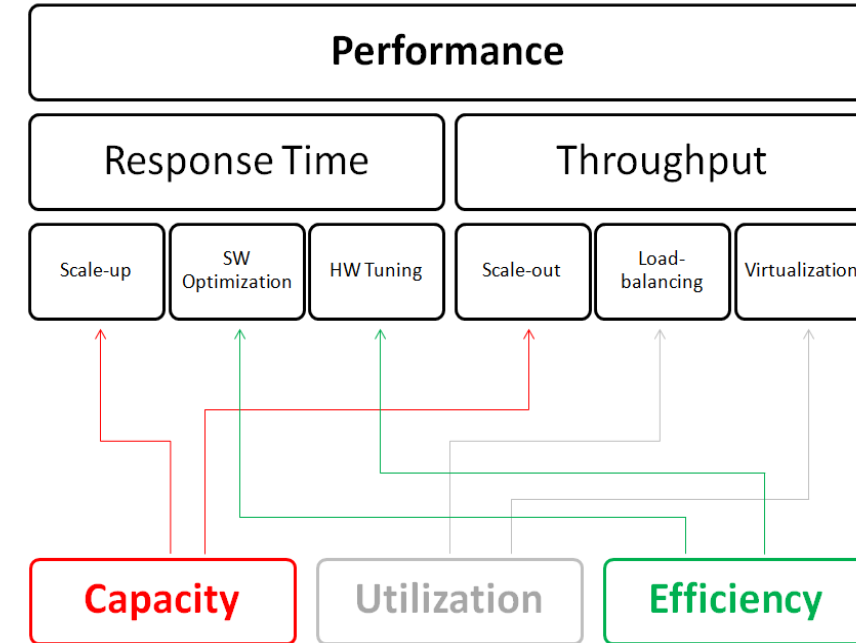


## Challenges in our Current Environment:

- Old unsupported hardware
- Decommissioning of Legacy servers
- Challenges for existing OVM hardware
- Hardware foot print reduction

## Exalogic Advantages:

- Hardware – Software together optimized for performance, especially for Oracle Products
- Improved Time to Market
- Specially engineered to host Oracle Fusion Middleware software with huge performance gains
- Centralized configuration, monitoring and diagnostics
- Integrated directly with ExaData Systems using Infiniband: Exalogic and Exadata together can provide complete “private cloud in a box” concept.





# *Our Exa-Stack Foot Print*

---



## *Exadata - 9 Racks*

One X2-2 ¼ Rack (HP – High Performance HDD)

Two X2-2 ½ Rack (HP – High Performance HDD)

Three X2-2 ½ Rack (HC – High Capacity HDD)

Three X4-2 ½ Rack (HC – High Capacity HDD)

## *Exalogic - 7 Racks*

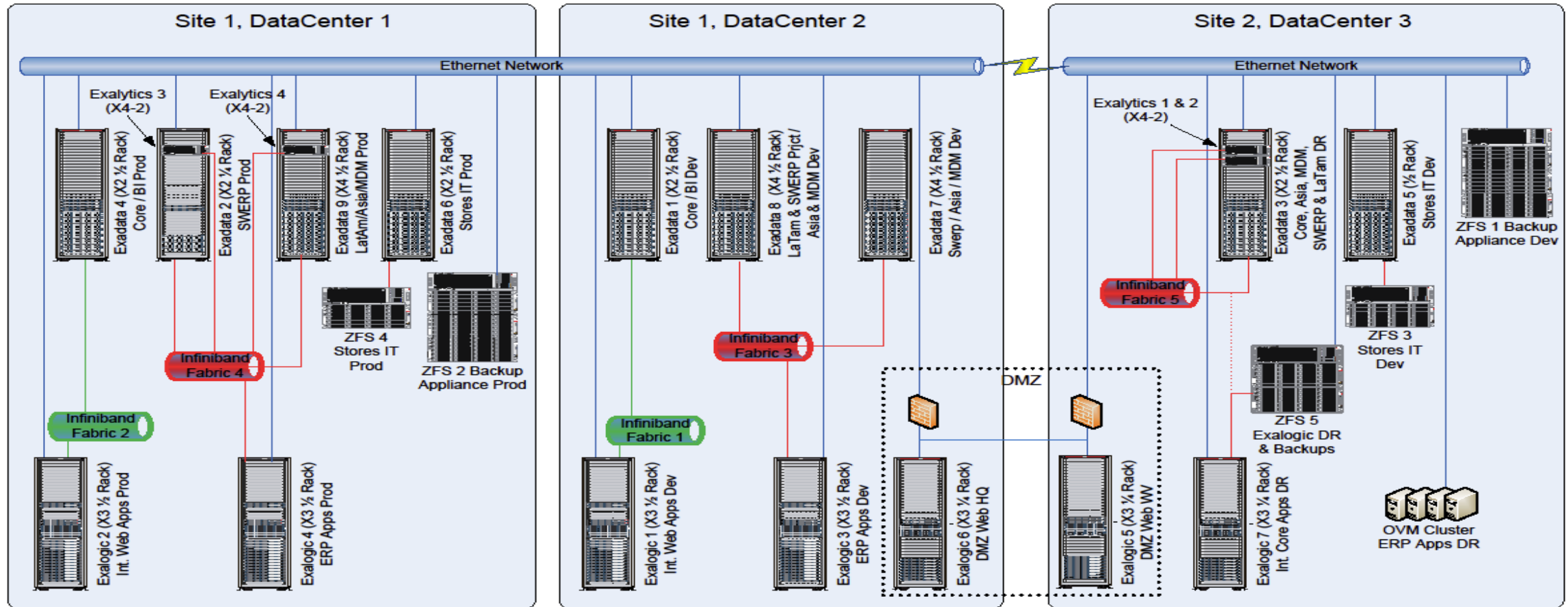
Three X3-2 ¼ Rack

Four X3-2 ½ Rack

## *Exalytics - 4 Machines*



# Our Exa-stack Foot Print







## Applications on Exalogic

- EBS
- SOA-AIA
- SOA-BPM
- SOA-OSB
- Webcenter/Spaces
- OBIEE
- Weblogic clusters(Custom Apps)
- OAM/OIM
- UCM etc...

## ***Few Non Functional Requirement(NFR)s That We Addressed***

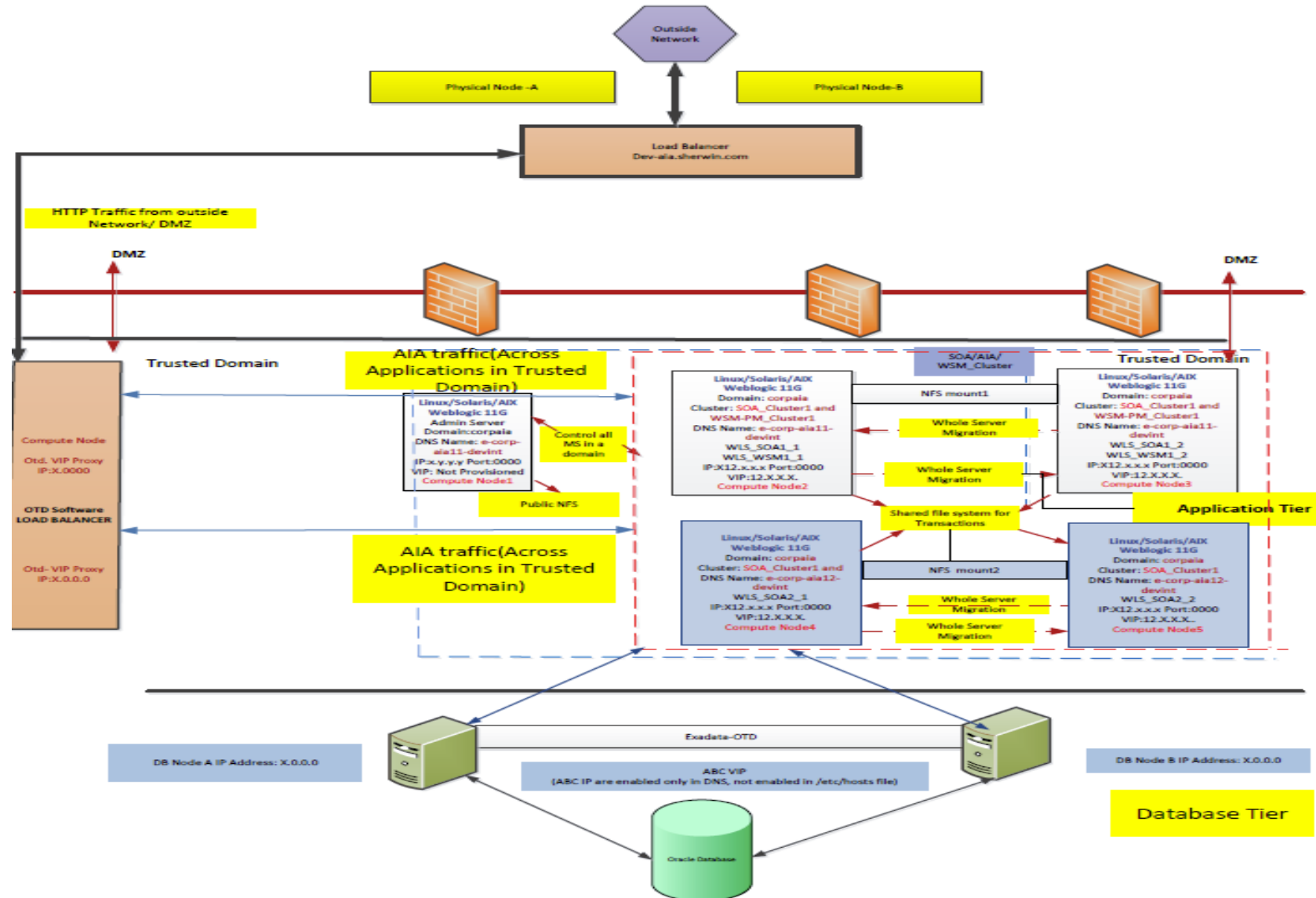
- *Audit/ Legal / Compliance:*
- *Better Supportability , enhanced SLA etc.*
- *Disaster Recovery/Backup and Recovery*
- *Capacity: Current and Forecasted*
- *Dependency*
- *Platform Compatibility*
- *Security*
- *Notification and Communication Plan*



# SOA-AIA Reference Architecture On Exalogic

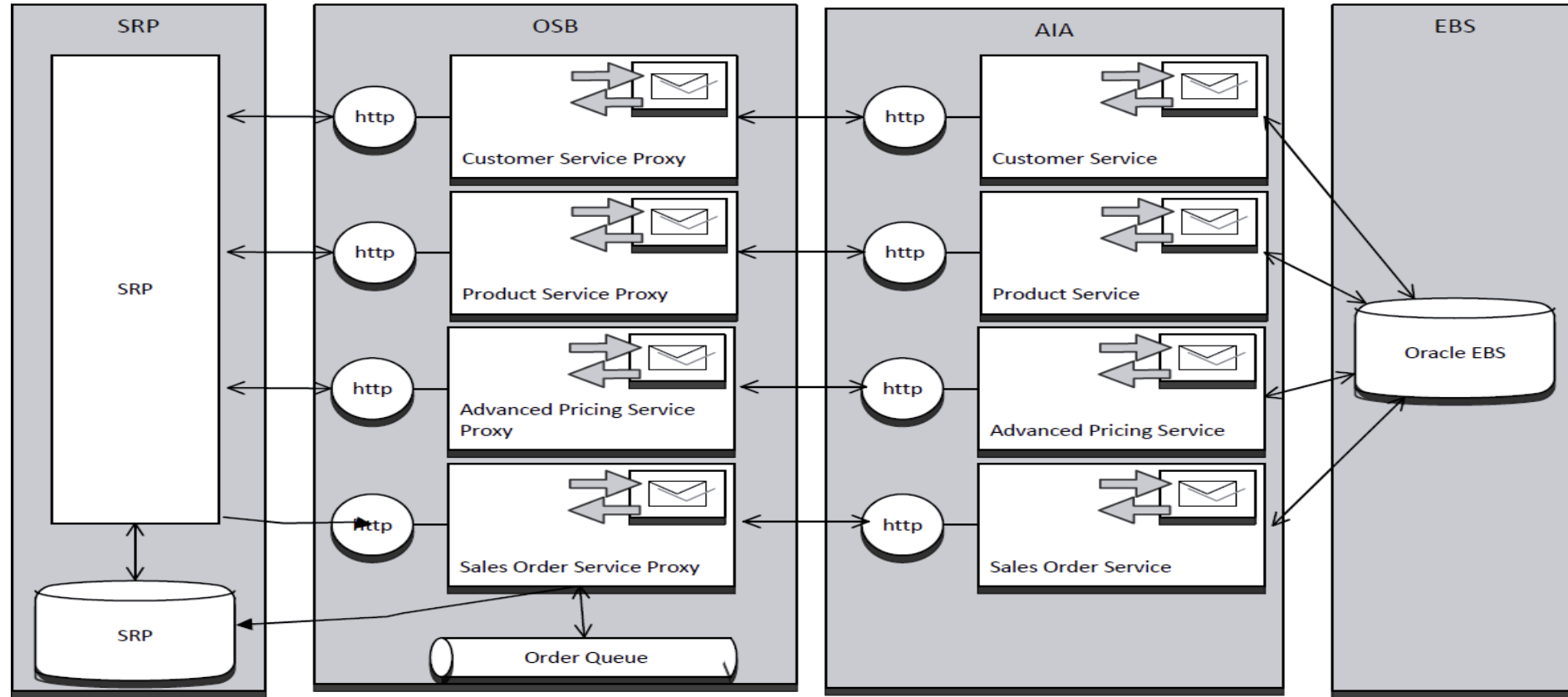


SOA-AIA Infrastructure Engineering Diagram





# Sample SOA-AIA Implementation – deployment pattern







## **Challenges We Faced:**

- Asymmetric DR
- Architectural changes
- Architectural guidelines and principles for applications
- Provisioning through Templates
- New Exalogic specific configuration

## **Best Practices We Followed :**

- Use of Oracle Traffic Director(OTD)
- Exadata and Exalogic connected using Infiniband Fabric
- Use of Socket Direct Protocol(SDP)
- Rolling upgrades of tech stack
- Virtualized Exalogic for application isolation.



# **Benefits : SOA-OSB-AIA On ExaLogic**



- *Higher level of reusability*
- *Higher level of security*
- *Easier lifecycle management .*
- *Enterprise level real time monitoring*
- *Effective and efficient usage of Exalogic specific optimization for SOA services leads to reduced resource need thus reduced cost*

## ***Better resource level ROI:***

- *80% efficiency gain of the PIP on Exa-stack*
- *70% reduction on Time To Market*
- *Reduced TCO*
- *Enhanced efficiency in patching and upgrades*
- *Minimal down time for business continuity*

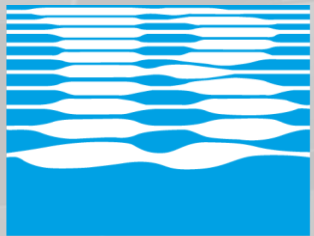


## Lessons Learned



- Sizing is crucial
- Future capacity planning
- Application team understanding of new tech stack
- Follow enterprise deployment guidelines
- Bad code is bad code
- Use V-server templates for consistent deployment
- Effective use of Oracle Platinum service
- Ramp-up time..get help





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*evolving your business*

**ORACLE®**

**Platinum  
Partner**

**ORACLE®**

**SOA Pillar  
Partner**

# Extreme SOA

Delivered on Oracle Exalogic

***Secure, Fast, Scalable, and Reliable***





# Bahwan CyberTek Overview



*We transform or enable transformation through Innovative products and services*

*Our Vertical Focus includes:*

- Engineering, Energy & Utilities
- BFSI
- Government,
- Mfg, SCM & Logistics
- Telco

*We implement industry leading technologies and Enterprise applications*

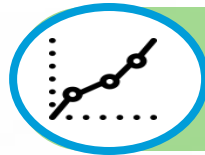
*We provide 24/7 technology and business processes managed services*



**2000+**  
ASSOCIATES



**550+**  
CUSTOMERS



**\$150+M**  
Revenue



**20** COUNTRIES  
**4** CONTINENTS



**SEI-CMMi**  
Level 5 v1.3



*Specialized  
Recognized by Oracle  
Preferred by Customers*



**Platinum  
Partner**



California  
Massachusetts  
Virginia  
Georgia



*Community Service  
Education for underprivileged  
Children  
Voluntary Health Services*



# The Customer

- Fortune 500 Company and a Global Biotechnology leader with \$6.9B revenue
- Headquartered in the US with a global presence.
- Grown substantially and has a large number of candidate drugs in its pipeline

## The Challenges

- Global expansion and exponential business growth
- Disparate systems, siloes of information, scattered data across a large number of IT systems (packaged and custom), spreadsheets and other repositories.
- Redundant work effort, competing versions of the truth and inhibited integrated planning, quality, manufacturing and supply chain business processes.



# Key Drivers

## Business Challenges

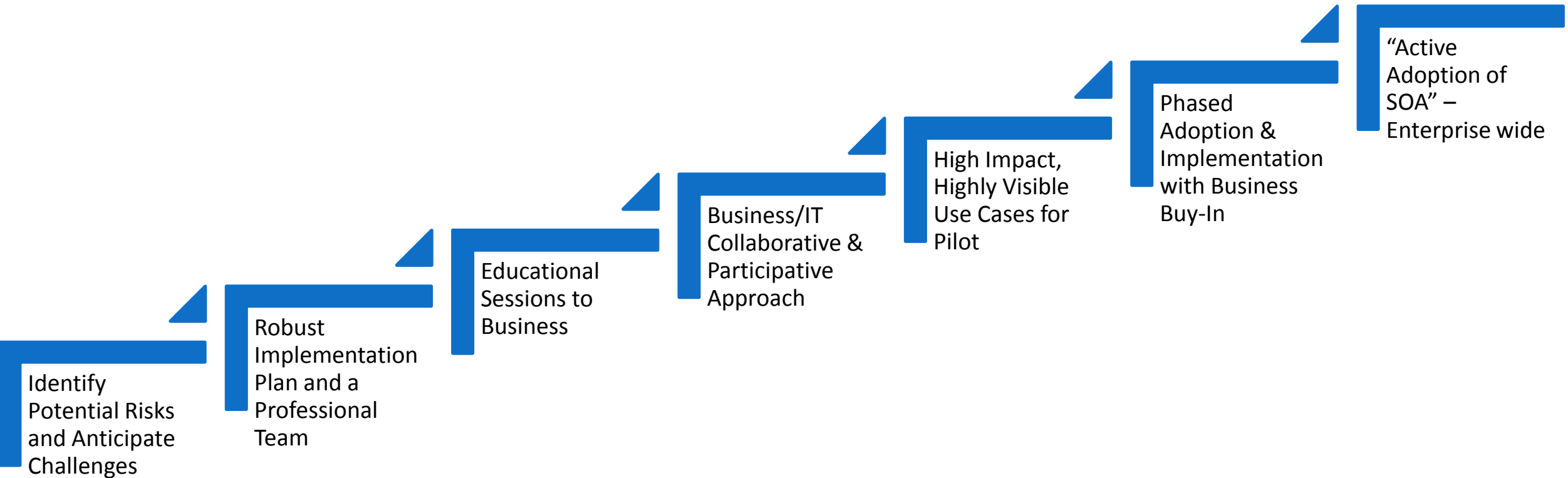
- Point to Point, Aging Integration Infrastructure
- Growing Application, Process, Data and Partner Integration Needs
- Faster Time to Market

## IT Enablement Objectives

- Seamless integration to increase efficiency
- Global Visibility of Business Processes
- Improve User Adoption & Experience
- Integrate Partners
- Provide Agility to Scale and Address Growing Business Needs
- Enable High Availability of IT to Business
- Improve IT & Business Interactions

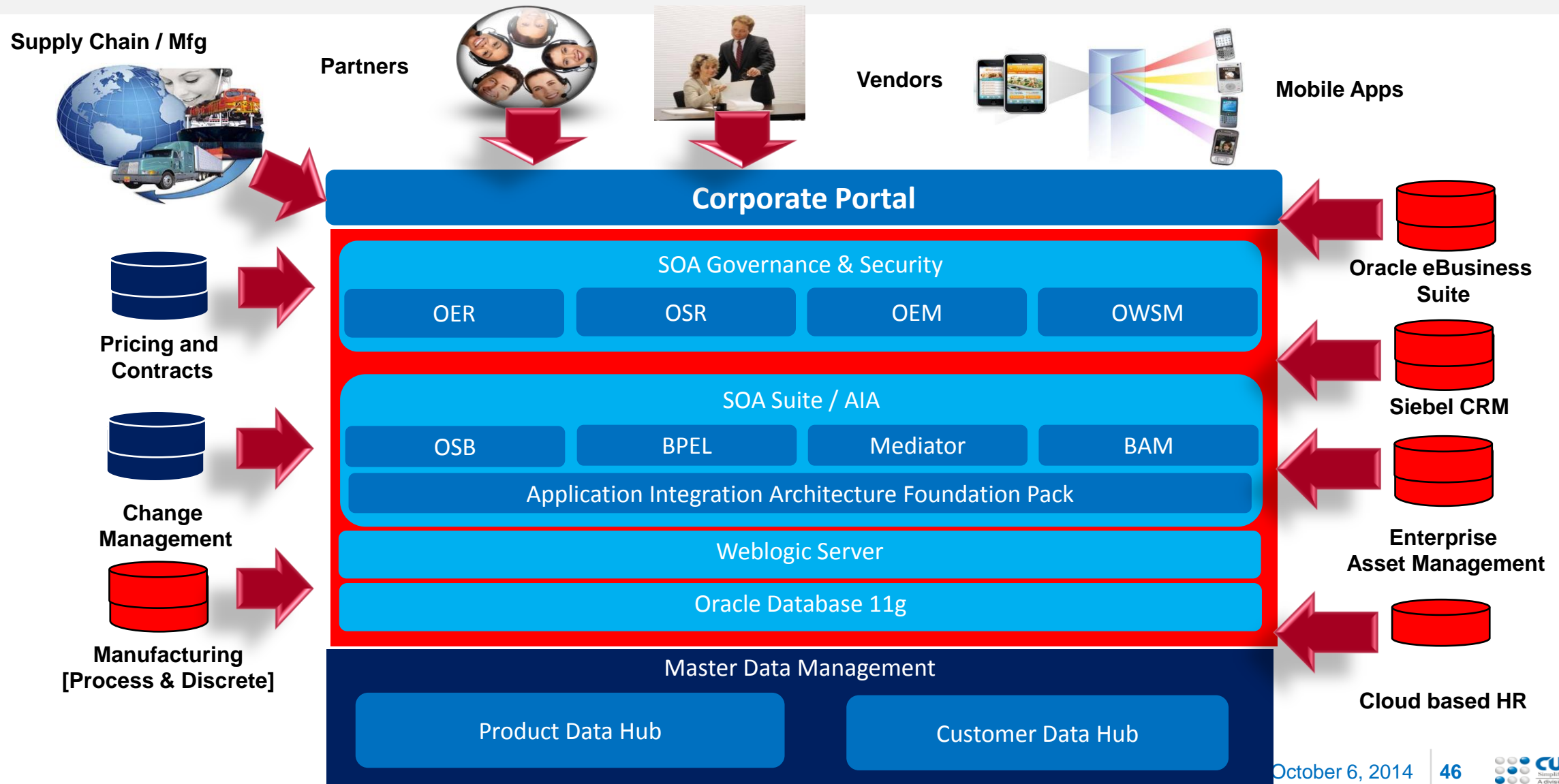


# SOA – How did they go about it?





# Integration Landscape





# In Summary.....

## The Solution



- ☐ 2+ Years in Production
- ☐ *Integration across 45+ Applications*
- ☐ 30+ Partners/Vendors
- ☐ 100+ Integrations
- ☐ 20 M Txn / Year (2013)

## Key Results



- ☐ Increased Business Process Efficiency
- ☐ Master Data Management – Quality Data and Single Source of Truth
- ☐ Scalable & Reliable Infrastructure
- ☐ Streamlined business processes
- ☐ Improved access to data
- ☐ Reduced TCO



**SOA – A De Facto Standard for Business & IT**



# Extreme SOA on Oracle Exalogic



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*evolving your business*





# Growth Challenges

- FMW is mission-critical to business and used globally with transactions running 24/7
- 3.9 M txns in 2012 → 4.6M txns in Q1 2013
- Continuous upgrade/addition of HW to support uptime, reliability and availability
- Exceeded capacity in Q4 '13 resulted in:
  - Poor Performance
  - Unplanned Outages / Extended Downtime
  - Process / Transaction Failures
- Increasingly concerned business community
- IT Support Staff working extended hours, nights & weekends to keep environment running
- EIG spend more time in restarting servers, managing downtimes
- New applications, partners, products in the pipeline → New projects → substantial increase in txn volume & load → More demand for higher performance & availability
- Existing Architecture couldn't simply support volume, real-time performance needs



## Middleware Modernization : Key Drivers

- Improve the stability and reliability of the Oracle Fusion middleware platform.
- Increase capacity to process high volume of transactions.
- Implement data encryption and data transport security.
- Reduce / minimize the time needed for maintenance downtimes and system outages.
- Redesign the code repository, code management and deployment processes.
- Implement ITQM SDLC processes and meet documentation requirements



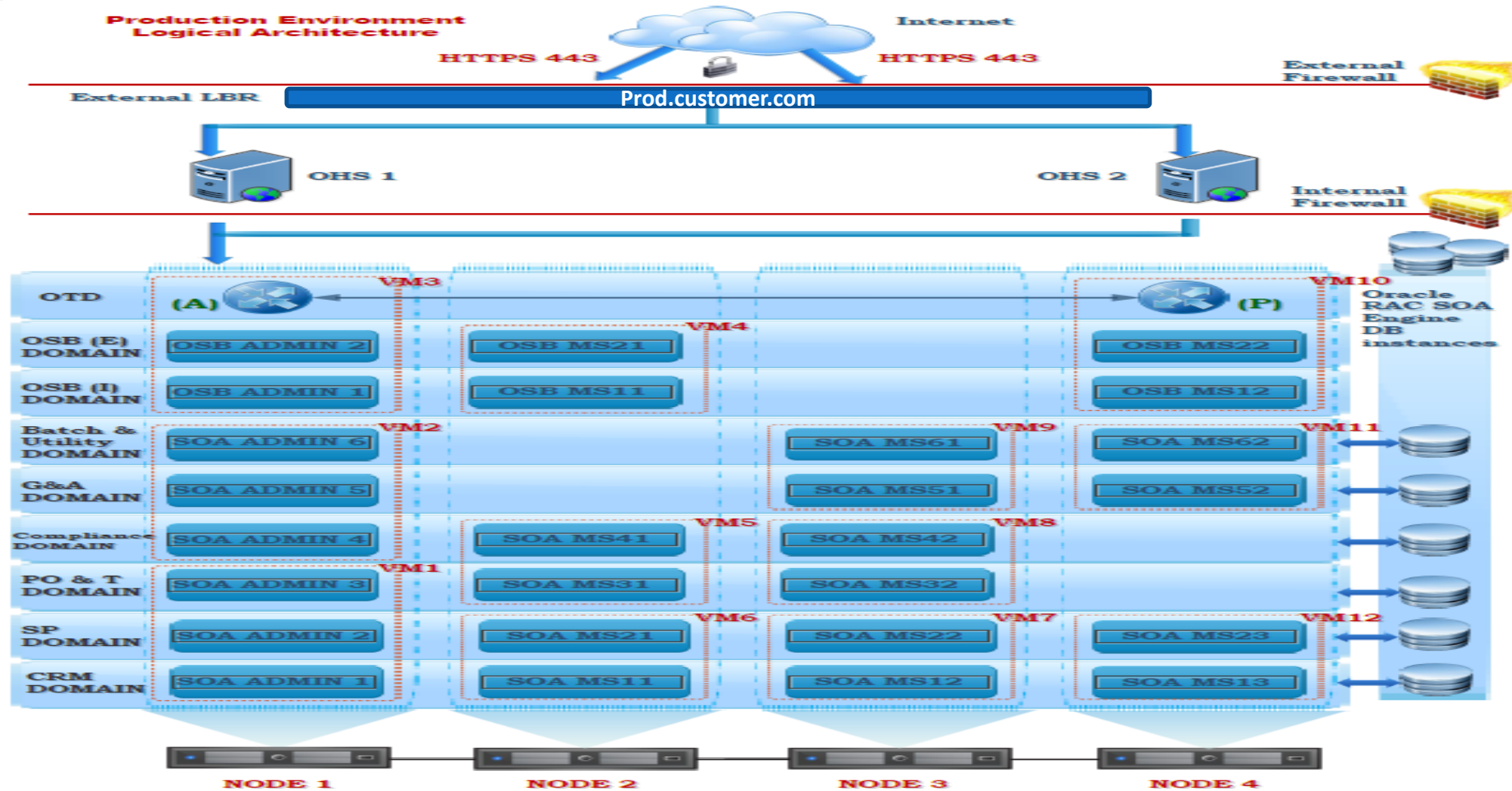
## The Solution: Oracle Exalogic Elastic Cloud

- *A high performance, scalable and flexible engineered system to alleviate the challenges posted by the legacy middleware infrastructure*



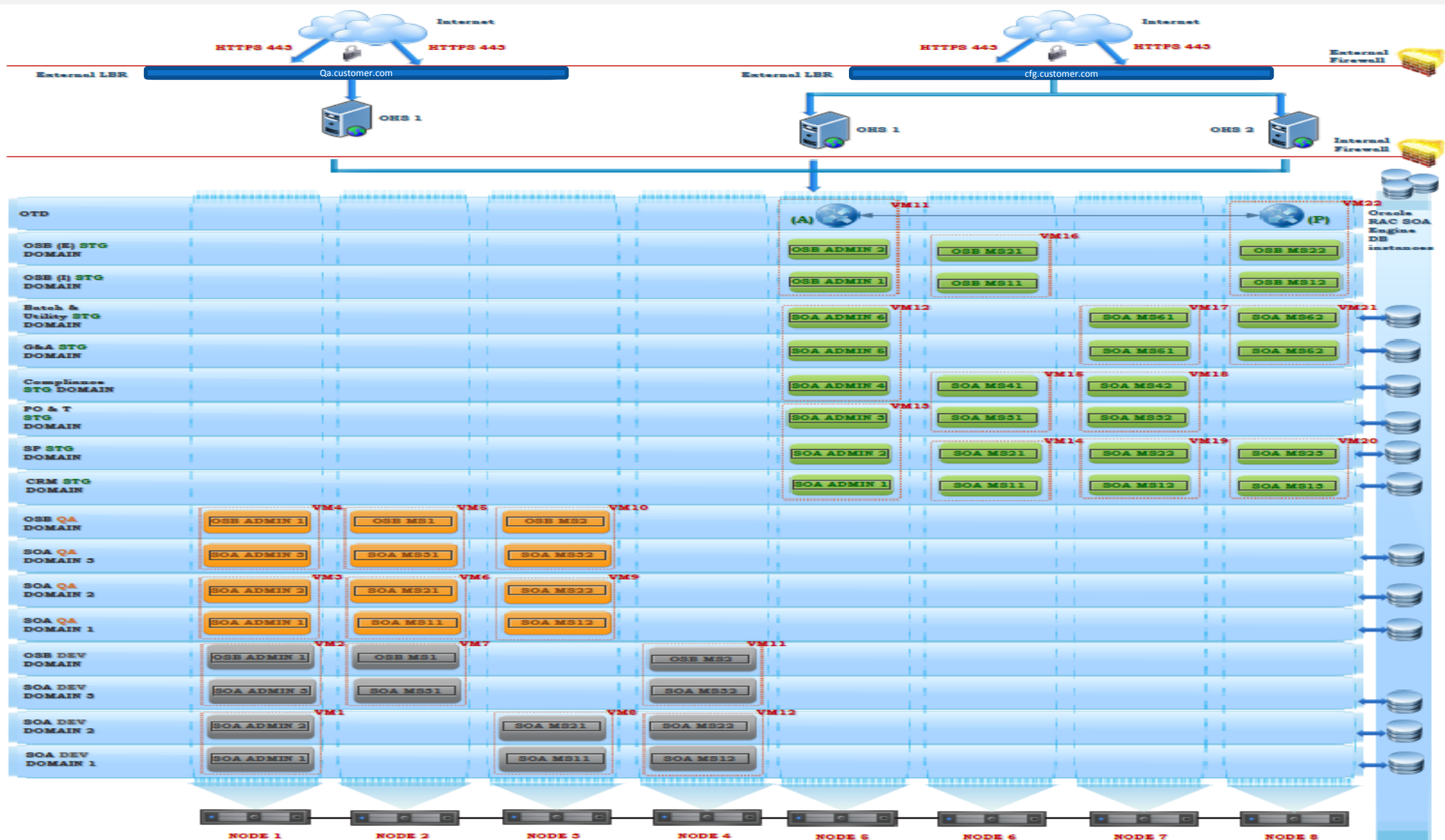


# Oracle Exalogic Production Architecture





# Non-Prod Environments





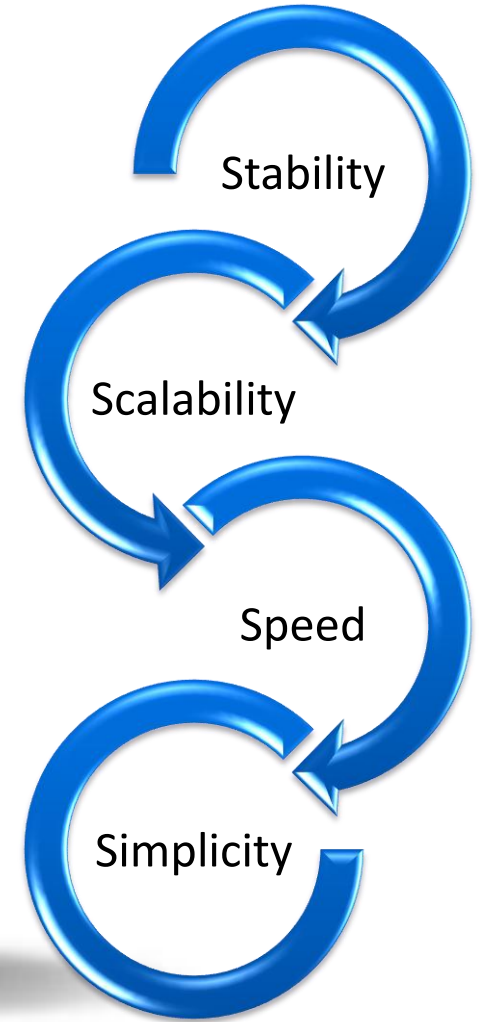
# Future Roadmap





# Key Benefits

- Capacity for Business Growth
- Highest Throughput
- Lowest Response time
- Reduction in Operational cost
- Platform Stability
- Scalability
- Lower Risk – Engineered System
- Pre-tuned stack for optimum performance.  
(Weblogic server Networking, Memory & thread management is optimized for Exalogic.)
- Multi-Tenancy using infiniband partitioning
- High Availability – redundancy at every level of the stack.
- Rapid Provisioning.





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