

Cloud. Pure and simple.

Integrated management lowers costs



IBM PureApplication System designed around complete lifecycle management



Procure and Design

- Pre-integrated, pre-tested, ready to run
- Optimized configurations with high availability
- Single part to order

Develop and Deploy

- System Up and running in hours
- Easily deploy new application and data services
- Rapidly replicate environments for development and test

Ongoing Management

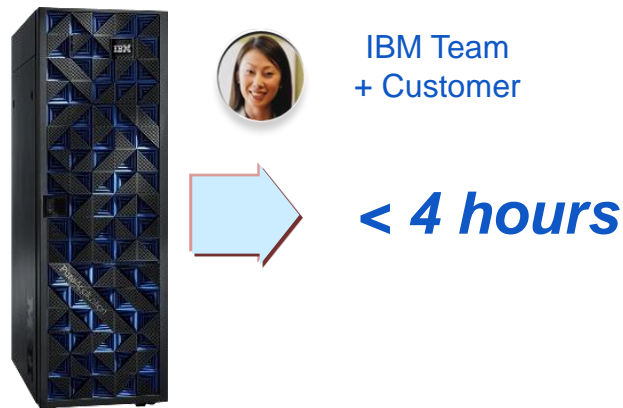
- Dynamically scale to meet changing demand
- Automatic failover and high availability
- Fully integrated management

Support and Upgrade

- Single support number
- System level updates and upgrades
- Simplified problem determination

The lifecycle starts with the fastest setup towards first workload deployment

IBM PureApplication System¹



Includes (at no additional cost):

- ✓ Hardware set-up and configuration
- ✓ Software set-up and configuration
 - ✓ First workload deployment²

Competitors are known to take days or even weeks before first workload deployment is achieved

¹ More about [IBM PureApplication System](#)

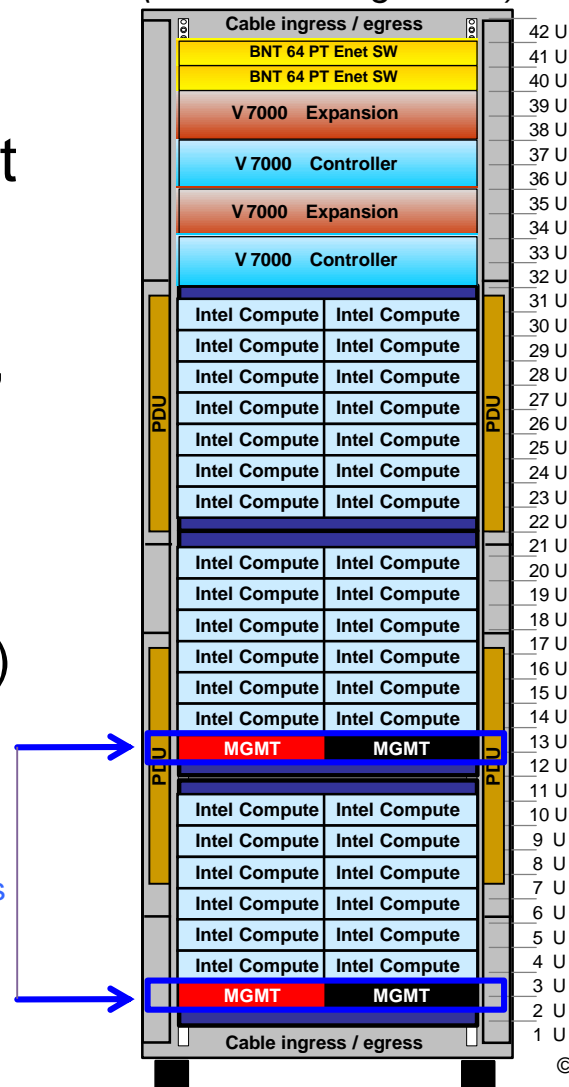
² Workload used was a simple Web stock trade application and database
See The 4 hours set-up by Jason McGee [YouTube video](#)

Easier administration starts with built-in PureSystems Manager

- Pre-installed, pre-integrated management appliance
- Single pane-of-glass management for both hardware, cloud and software
 - Simplified infrastructure configuration, management, monitoring and maintenance
 - Simplified cloud management
 - Simplified workload management (creation, deployment and monitoring)
- Built-in high availability

Dual redundant management nodes

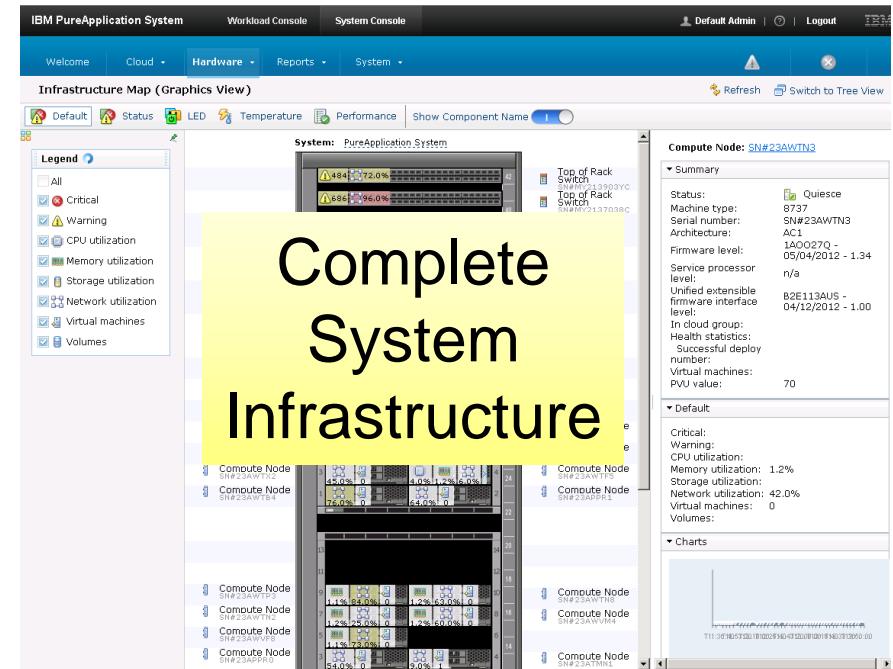
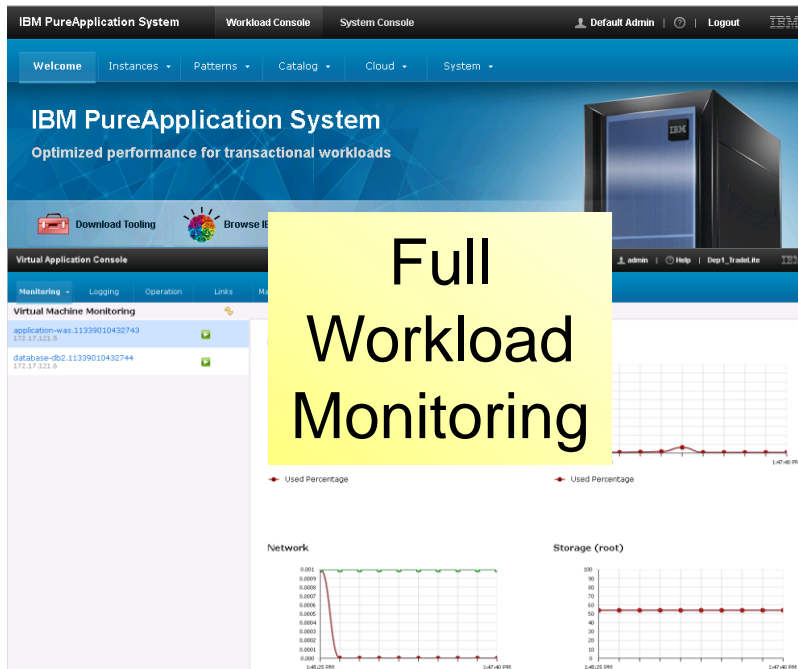
PureApplication System
(full rack configuration)



DEMO: Lifecycle Management is now a simplified experience

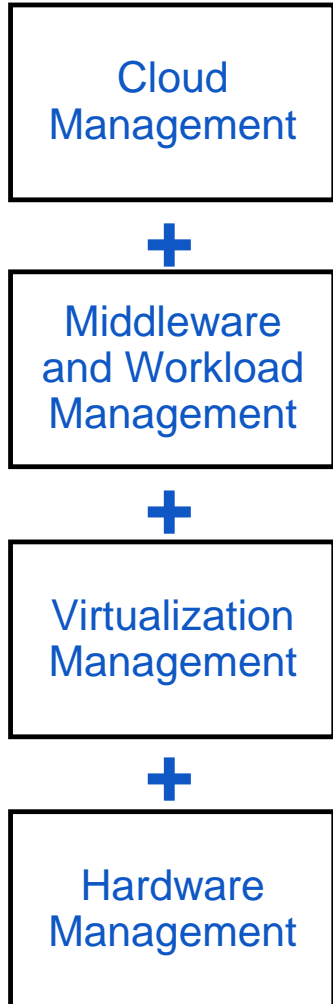
Integrated Management “Single pane of glass” Console for:

- Simplified workload creation, deployment and monitoring
- Simplified Infrastructure configuration, management, monitoring and maintenance



Significant assembly is required for Competitors' multiple management tools

PureApplication



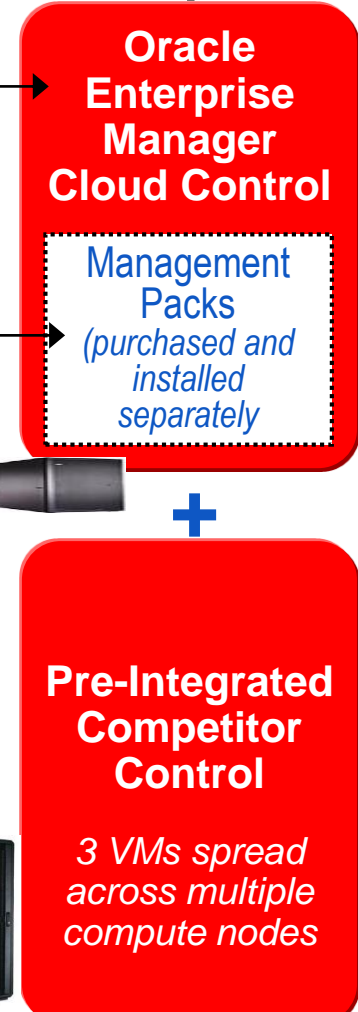
Coalition Competitor



Customer installed and maintained



Pre-Integrated Competitor



VCE Vblock System Management is a collection of tools to manage in itself

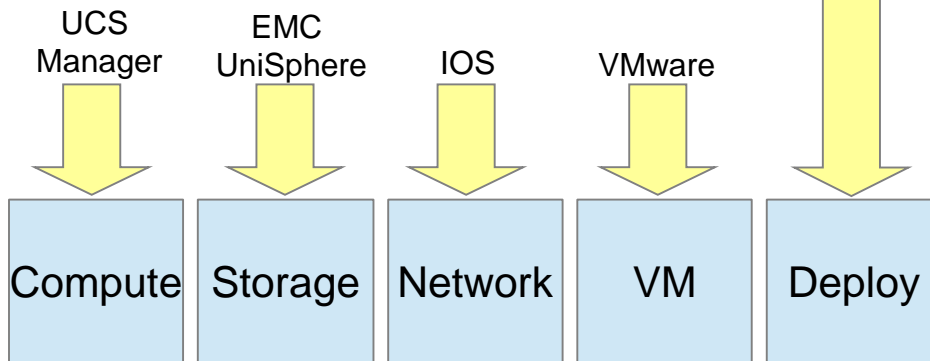
Enterprise Management Environment

VCE Vision Intelligent Operations

Integration tool enables single point of monitoring, reporting, API for third party

EMC Ionix UIM, UCS Director (Optional)

Optional management tools designed to simplify and automate provisioning



Non-integrated management tools required for component configuration, problem resolution, maintenance

Cisco UCS Manager has no knowledge of the hypervisor or guest VMs and cannot orchestrate operations with vCenter

I need to support multiple organizations and ensure that there is secure, isolated access between them...



Operations Manager

You can do this with **PureSystems Manager**.
Let's take a closer look...



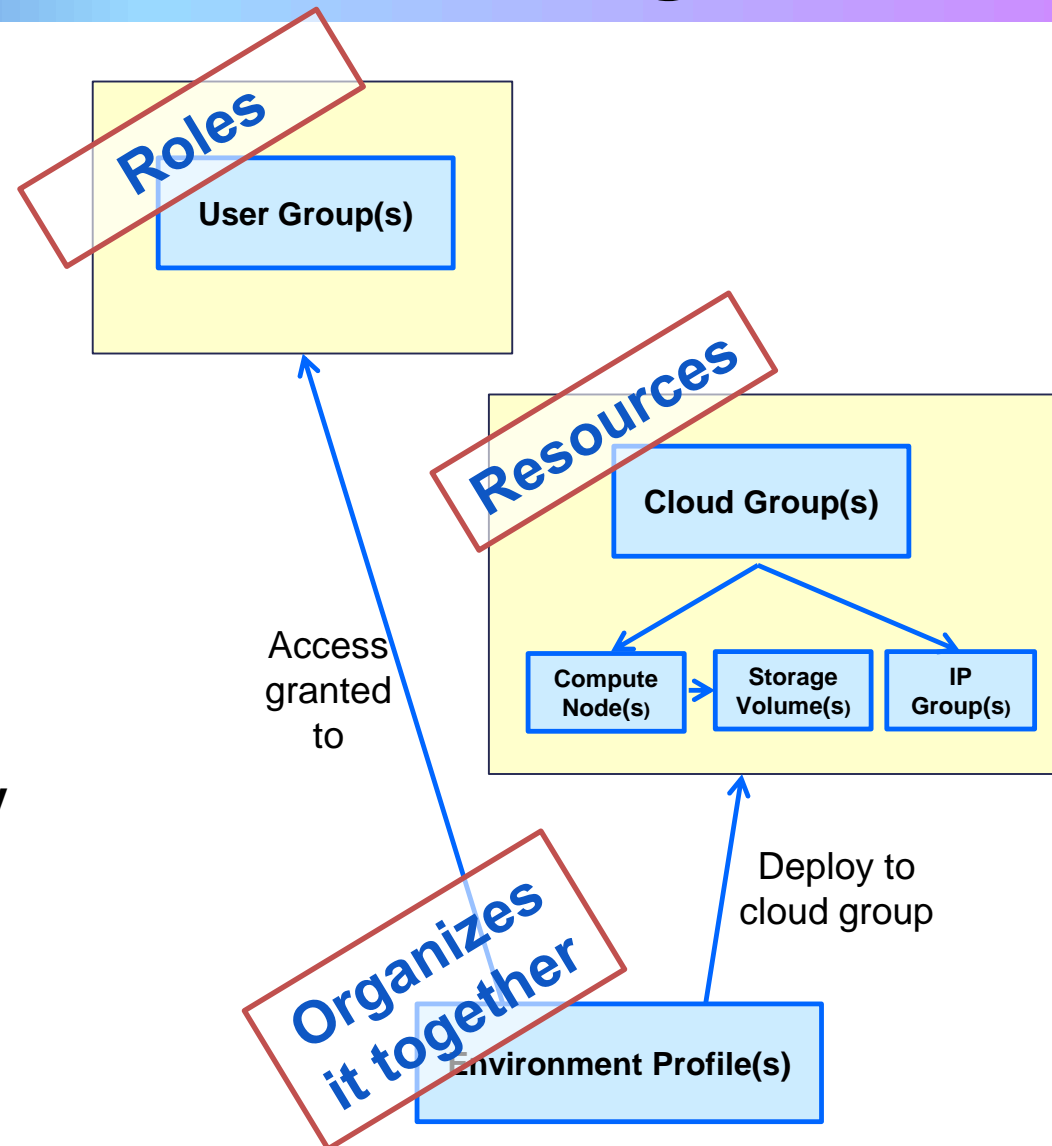
IBM

PureApplication System – Integrated Cloud Management for secure isolation

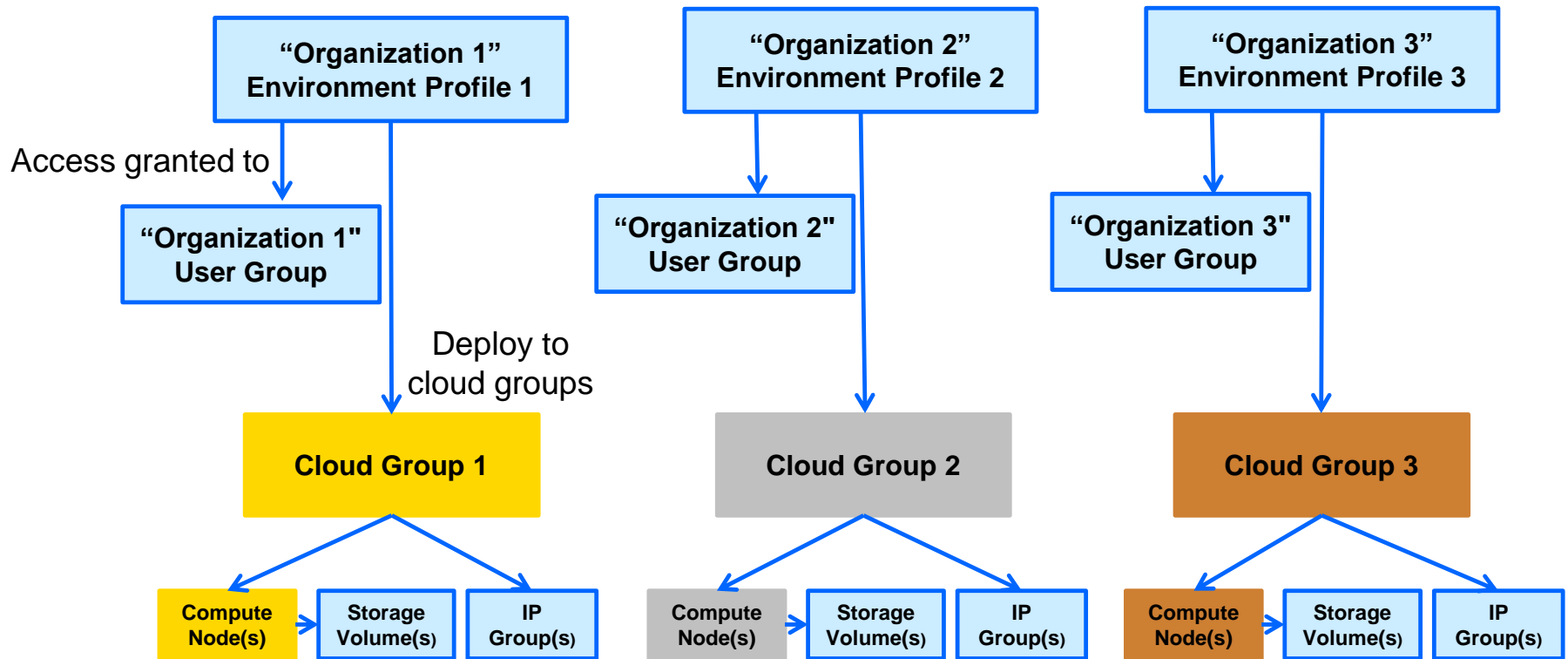
- Private clouds need to support multiple organizations and applications with secure and isolated access to computing resources and applications
 - How do you isolate compute resources?
 - How do you secure access to deployed applications?
 - What organization and user management security capabilities are available?
- PureApplication makes this easy!
 - No additional software to install
 - Simplified administration to setup security for multi tenancy

Groups and Profiles enable automatic and secure policy driven resource assignment

- **Create roles** for access and permissions to do specific tasks (User Groups)
- **Divide physical resources** into isolated clouds (Cloud Groups)
 - Compute nodes
 - IP address pool
 - Virtual machine assignment policy
 - Co-location policy
- **Specify where patterns deploy** and which role can do it (Environment Profiles)
 - Priority
 - Maximum resource limits (CPU, memory, storage)



Creating a Multi Tenant environment in PureApplication System is simple



Requirements

- Separate user groups
- Guaranteed resources per user group
- Group resources hidden from other groups (patterns, deployed instances)

DEMO: PureApplication was designed from the ground up to support resource isolation

The admin has secured separation by

- Defining user groups with specific permissions and tasks
- Isolating resources such as compute nodes

In this demo,

- dev-user1 has access to a pattern he has created
- test-user2 has access to the pattern she has created
- We will show that resource isolation can prevent dev-user1 and test-user2 from accessing each other's patterns, as well as deployed instances of their patterns



Multi-tenancy capability of PureApplication is superior to competitors



With PureApplication System

- Included out-of-the-box, self-contained tools to implement multi-tenancy
- Management skill level required: medium

With Vblock

- It's just infrastructure. No integrated software
- Need to buy 3rd party VMware vCloud Suite, install it and set it up
- Management skill level required: high

With Exalogic

- 1/8 rack (96 cores) is limited to a single virtual data center therefore cannot support isolation of resources for multiple organizations
- Must purchase a larger Exalogic rack

How can I tell if my applications are up and running, and operating properly?



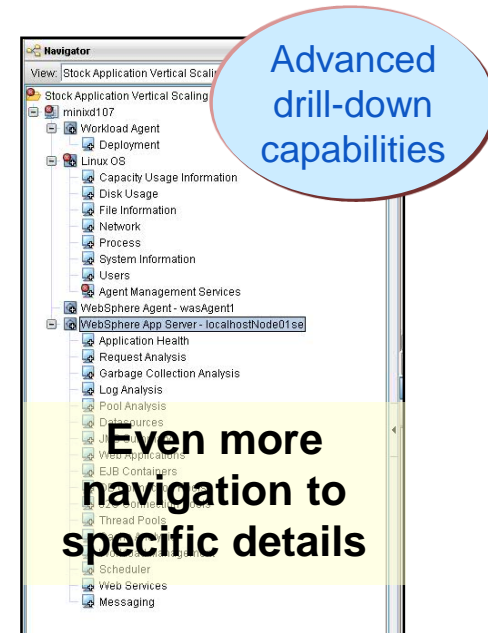
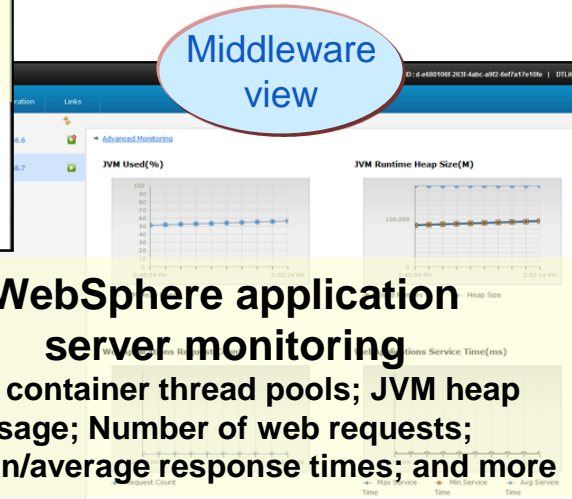
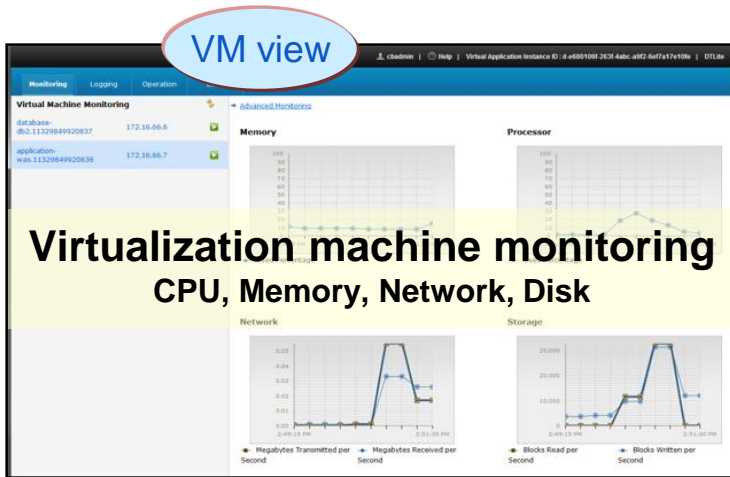
Developer

PureApplication lets you monitor your workloads, with context aware links for drill-down navigation to help in root cause analysis. Let's check it out...

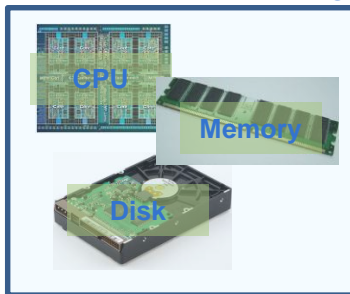


IBM

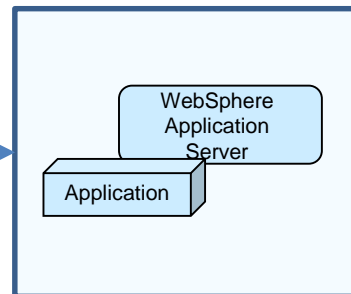
PureApplication System provides a full range of workload monitoring capabilities



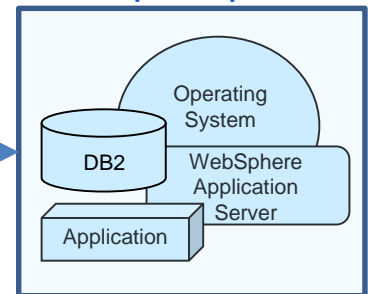
From the virtual image...



To middleware monitoring...



To deeper specifics

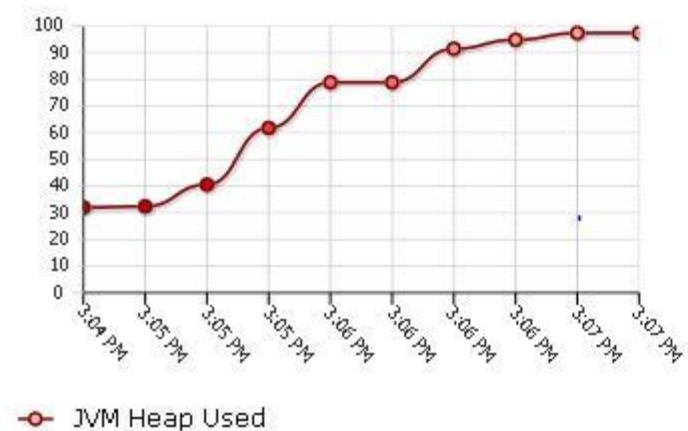


DEMO: Diagnose application memory leak with integrated workload monitoring

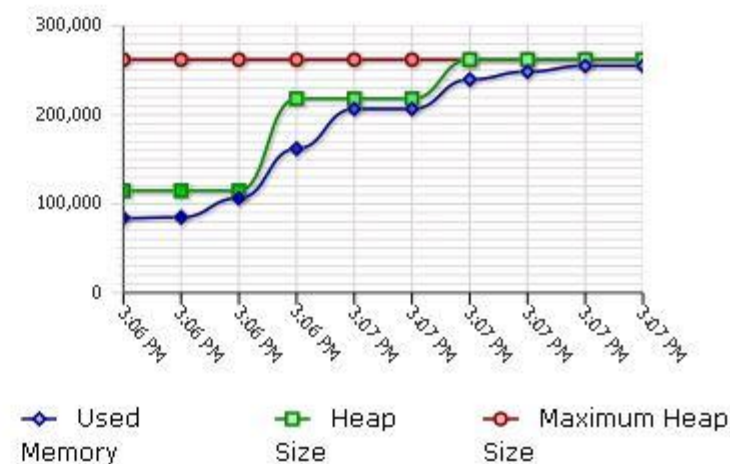
Diagnosing a possible memory leak in the application:

- Show the shopping cart application
- Show monitoring of the JVM heap
- PureApplication System shows JVM heap usage is increasing. That points to a potential code problem in the application

JVM Used(%)



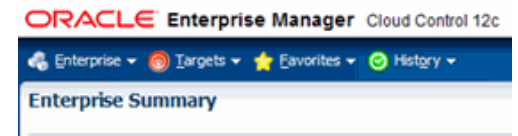
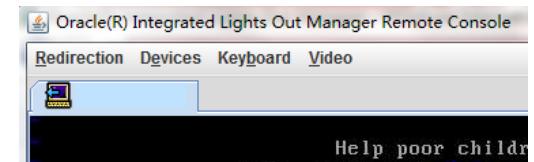
JVM Runtime Heap Size(M)



Competitors lack integrated workload monitoring capabilities

Oracle Exalogic

- Requires separate purchase, installation and configuration of OS, middleware and database monitoring capabilities
- Oracle Middleware Enterprise Management
 - Management Pack for WebLogic Server Advanced Edition
- Oracle Database Management
 - Management Pack for Diagnostics
 - Management Pack for Tuning



Vblock

- No middleware monitoring capabilities
- Customer must purchase middleware monitoring capabilities from a third party, then manually install and configure the monitoring components and agents



Systems need firmware updates, service level patches applied, and workload maintenance. These can be long, and boring yet skilled tasks.



Operations Manager

You're right but PureApplication makes it straight forward and simpler than manual methods. Let me show you...



IBM

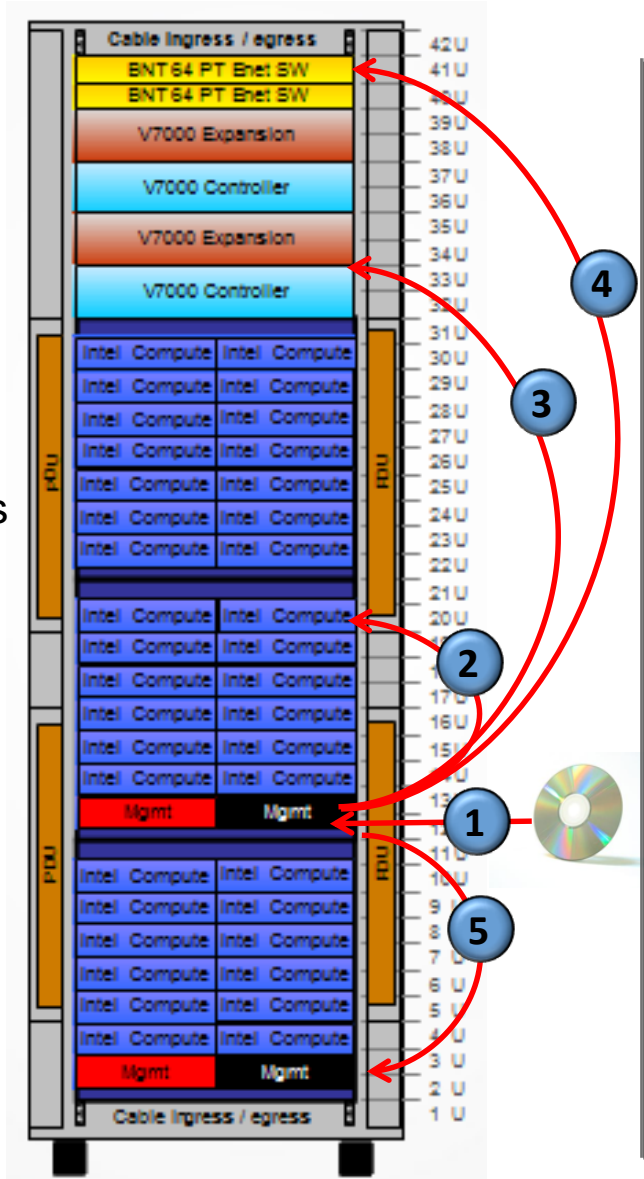
PureApplication simplifies system updates

IBM performs firmware and PureApplication Management Software updates for the customer *at no charge*

30
minutes labor
by IBM¹

Update scenario:

- Firmware (includes all components for the platform) and management software obtained by IBM
- Updates to compute nodes and adapters
- Storage updates (includes controller and drive firmware)
- Switch firmware updates
- Internal components updates
- Management software updates



Exalogic X2-2 (v1 to v2.0.0)

330
minutes labor
by customer

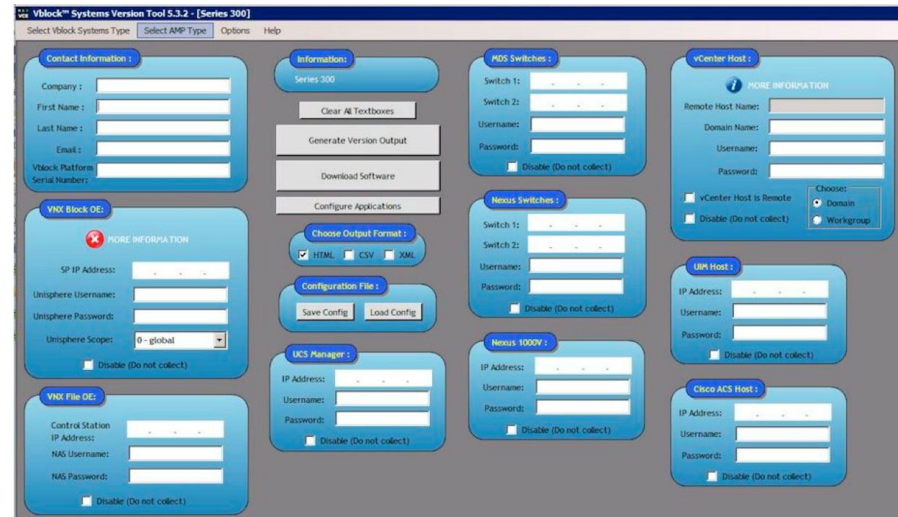
- 50+ page document
- Manual firmware updates for compute nodes, storage device, network switches
- Doesn't include management software upgrades

Latest Exalogic

Oracle does the upgrades now, *but charges you!*

Vblock firmware and driver updates are a manual process

- Software update process is **not integrated** via a single management console or tool
- Information and update software downloads requires manual visits to different sites for each component
 - support.vce.com
 - support.emc.com
 - cisco.com
 - vmware.com

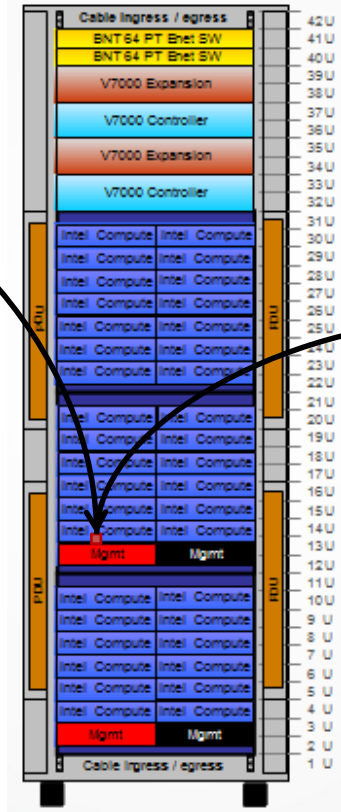


VCE only provides a System Version Tool to guide the manual download and update process

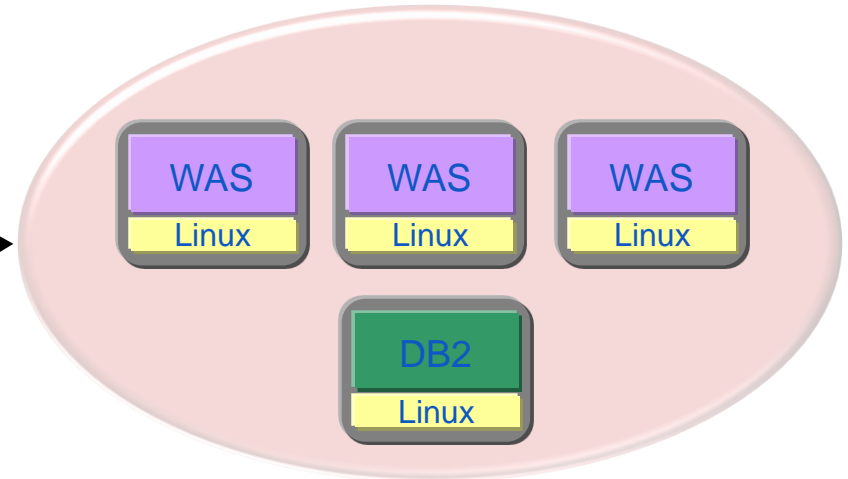
- **How do you update a Vblock “Integrated System”?**
 - **UCS Manager, Cisco blades, Cisco switches**
 - Find the installation guide for your version, and follow Cisco patching process
 - **EMC Storage (VNX5300), UIM**
 - Retrieve documents, schedule meeting with EMC support team
 - **VMware**
 - VCE directs you to support.vce.com for all VMware software updates

PureApplication simplifies maintenance of deployed instances

Images available from IBM



Deployed Systems



Hypervisor Edition Images are imported and service is extracted from the image

Maintenance can be applied to deployed virtual machines

User selects the deployment to update/upgrade and specify when to apply the service (time, date)

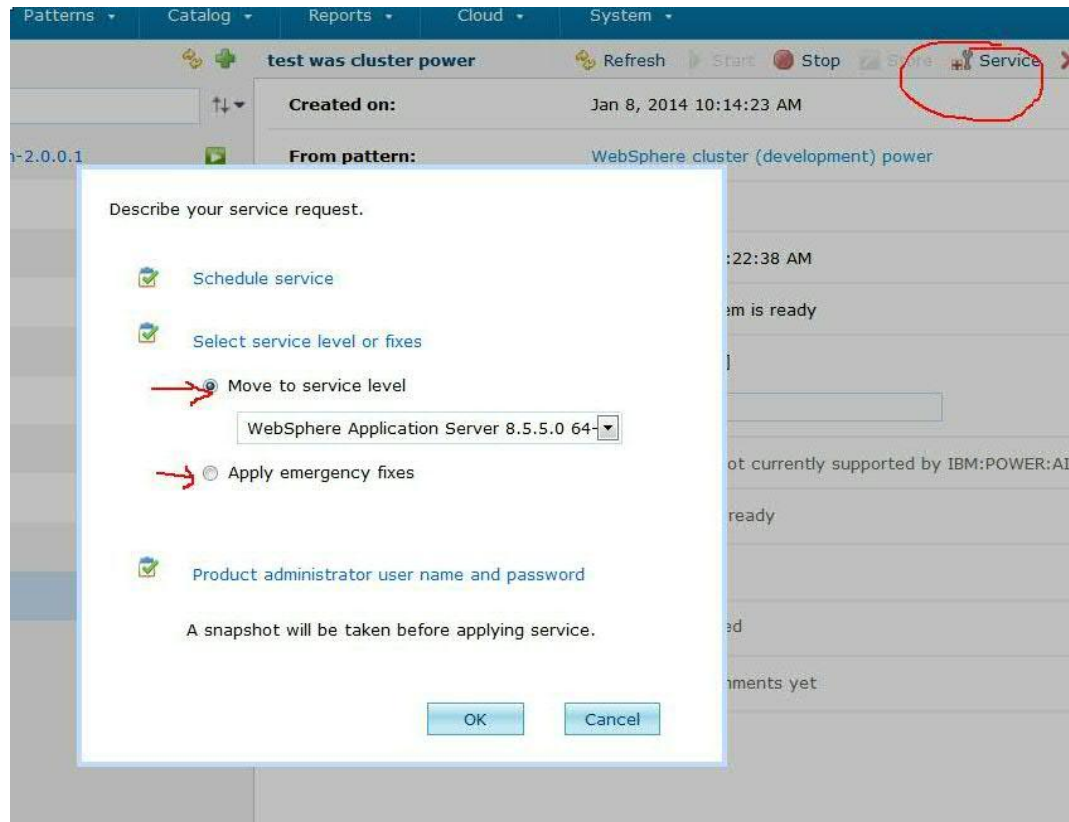
System is quiesced and a snapshot is taken

Maintenance is applied

If satisfactory, the maintenance is committed. If not, maintenance is rolled back.

Applying a service level patch for a running WebSphere Server is easy

Select a running VM and click on the **Service** button to launch a screen that allows an admin to apply the latest WebSphere patch



Our business needs to be on-line 24x7. But if something fails, we need an easy mechanism to restore it.



Operations Manager

PureApplication is designed for high availability, and has a simple DR solution. Let's see...



IBM

Built-in Expertise: High availability hardware with PureApplication System

■ Management Nodes

- Both run in active-passive mode, when a failure occurs the IP address is assigned to the new active one

■ Network Controllers

- Switches and cabling are redundant (2 of each)
- Failure of 1 leads to reduced bandwidth, not service

■ Storage Controllers

- All storage volumes are accessible from each controller
- If one fails, the other handles all I/O

■ Storage

- SSD storage is configured in RAID 5 array + spares
- HDD storage is configured in RAID 5 array + spares

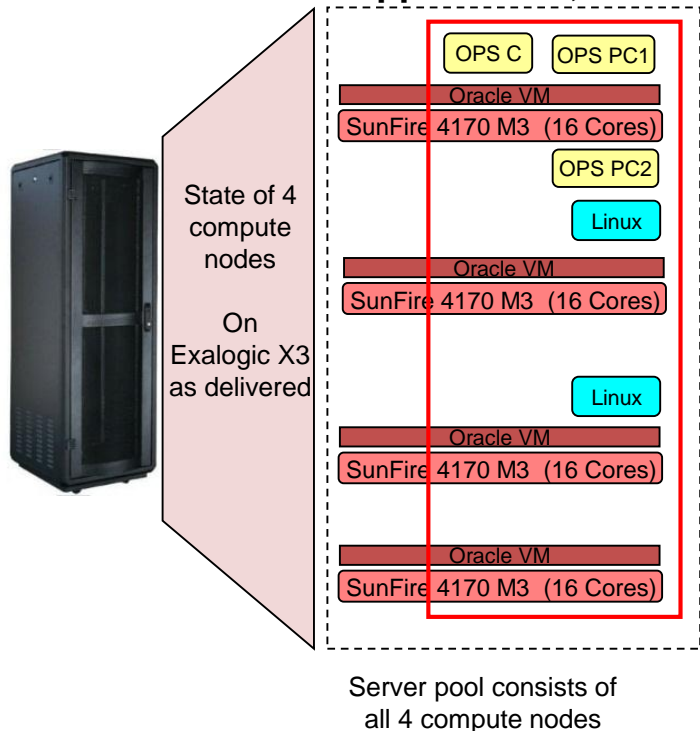
■ Compute Nodes (ITE)

- Management system will route around failed DIMMs or cores yielding reduced capacity (server rebalance)
- If entire node fails, VMs can be moved elsewhere (workload evacuation)



Exalogic Control: No dedicated compute resources; not delivered with high availability

Exalogic X3-2 1/8 rack (Virtualization) With OVAB support V2.0.,6.0.0



- Exalogic Control VMs are ***not isolated*** onto dedicated management nodes
- VM Manager is installed within the OPS Center VM, which runs on 2 nodes
 - If any one of these nodes goes down Ops Center is compromised
 - If VM Manager goes down, then the VM environment can no longer be managed
- OPS Center depends on nodes 1 and 2 being up at all times

Exalogic Control Virtual Machines

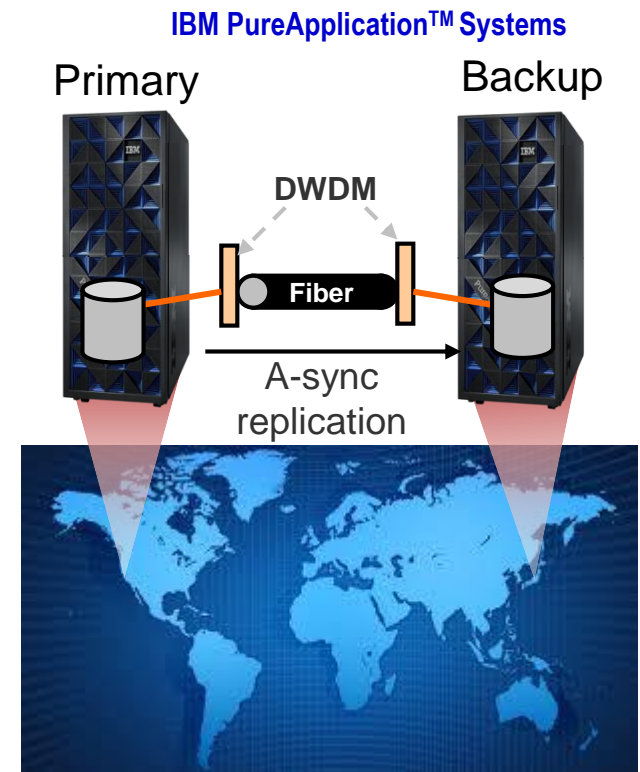
Run on same compute nodes that will host actual customer workloads limiting available vCPU, memory and disk space

	vCPU (32 total)	Memory (256GB Total)	Disk
OPS C	12 vCPU	32 GB	160 GB
OPS PC1	2 vCPU	4 GB	116 GB
OPS PC2	2 vCPU	4 GB	116 GB

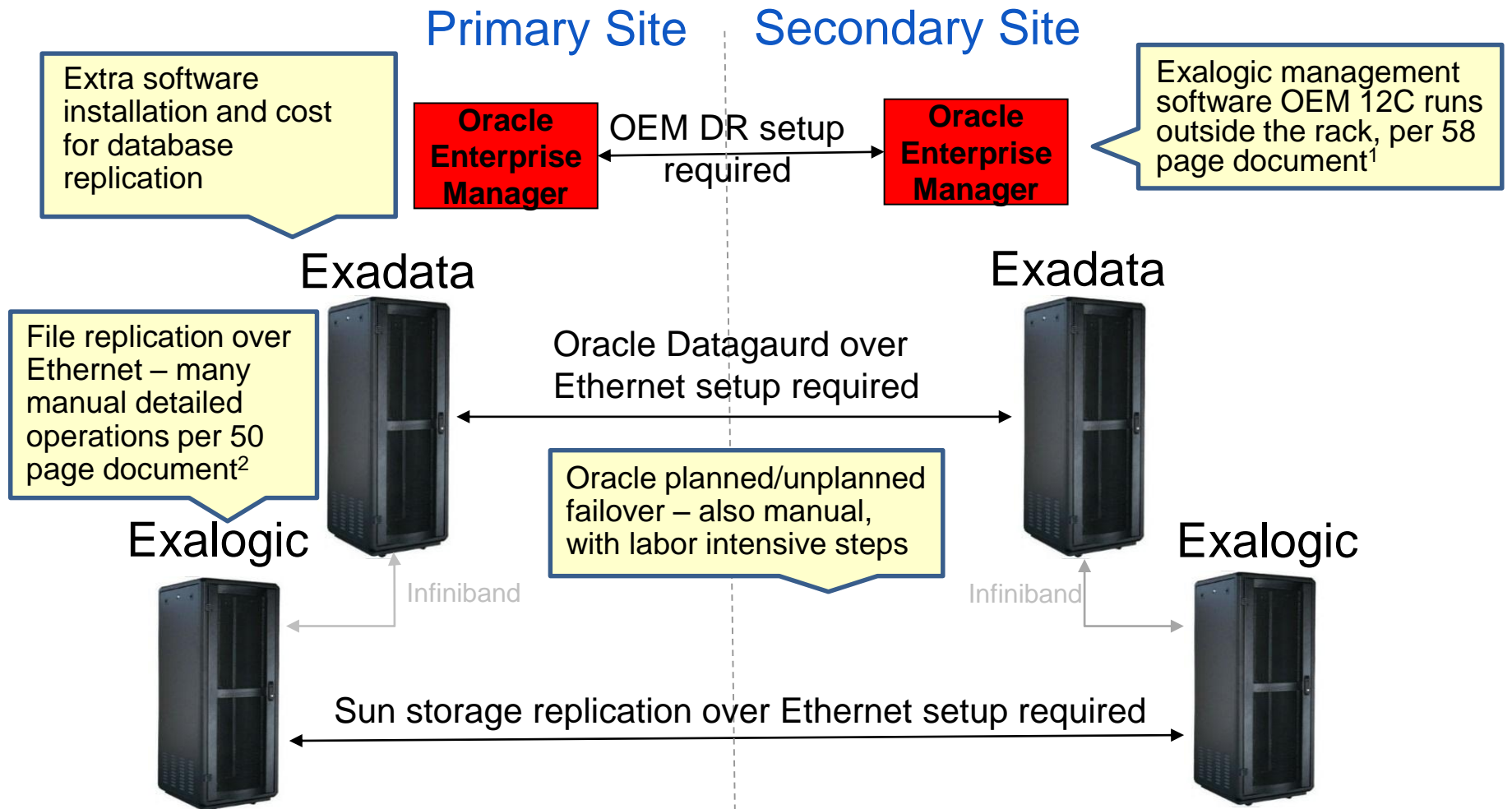
IBM disaster recovery is simple, integrated and automated on PureApplication

Easy, fast disaster recovery for applications
Setup in just 5 clicks!

- Up to 8,000 km between systems
 - Uses asynchronous replication for improved performance
- Recovery Point Objectives (RPOs):
 - Planned failover: **zero** data loss
 - Unplanned failover: **near zero** data loss
- Recovery Time Objectives (RTOs) vary on application startup time, between 2-8 hours
- Begin recovery from planned or unplanned failures with two simple steps via GUI



Each component of the Oracle solution requires its own manual disaster recovery setup



Three unique disaster recovery procedures where each requires deep, labor intensive, technical skills

Oracle's Cloud disaster recovery solution is 4+ times more expensive than IBM's

Production:
96 core Intel
PureApplication

Disaster Recovery:
96 core Intel
PureApplication

Production:
1/8 Rack Exalogic (96 cores)
1/2 Rack Exadata (96 cores)

Disaster Recovery:
1/8 Rack Exalogic (96 cores)
1/2 Rack Exadata (96 cores)



Total 3 year cost for both systems: \$7,344,000



Total 3 year cost for 4 systems: \$33,765,898¹

Compare equivalent production and DR systems that can handle 84 Web-facing workloads

- IBM: 96 core Intel PureApplication
- Oracle: 1/8 Rack Exalogic and 1/2 Rack Exadata (96 cores)

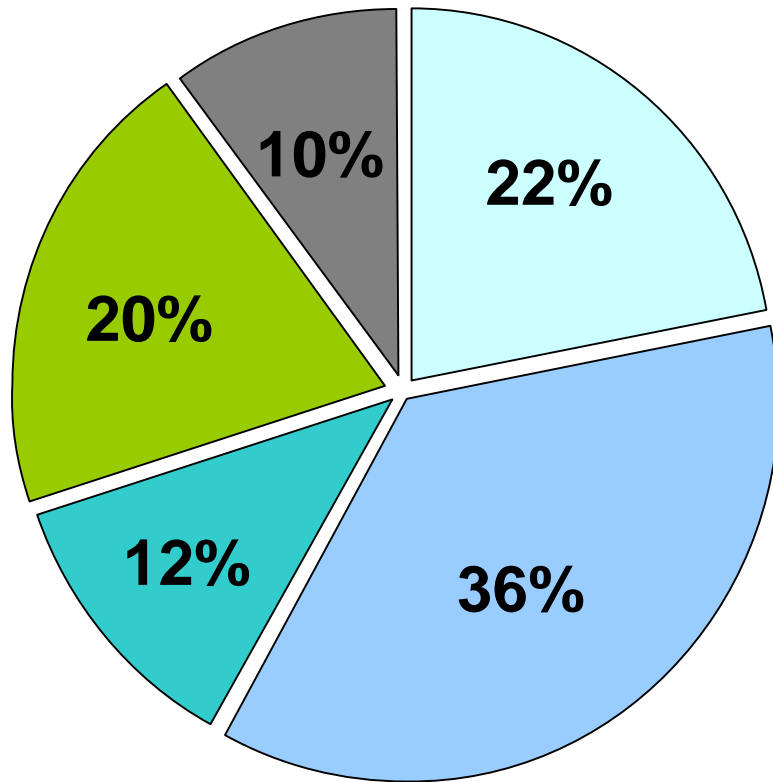
¹ Pricing based on publicly available list prices in US Dollar

Vblock does not have an integrated disaster recovery solution

- No DR solution out-of-the box
- Requires skills and time to install and configure multiple products from Cisco, EMC and VMware
 - Cisco UCS Manager
 - EMC RecoverPoint
 - VMware High Availability
 - VMware VMotion
 - VMware Distributed Resources Scheduler
 - VMware Site Recovery Manager (SRM)
 - VMware Fault Tolerance
- Once installed, pick from two complicated approaches that offer no central control point for DR
 - Frequent snapshots using EMC RecoverPoint continuous remote replication
 - Active/active synchronous storage replication between two Vblocks leveraging VMware High Availability, VMotion, and Distributed Resources Scheduler

**Not much better than
“roll your own” DR
solutions**

How to save labor? Five key IT management processes to consider



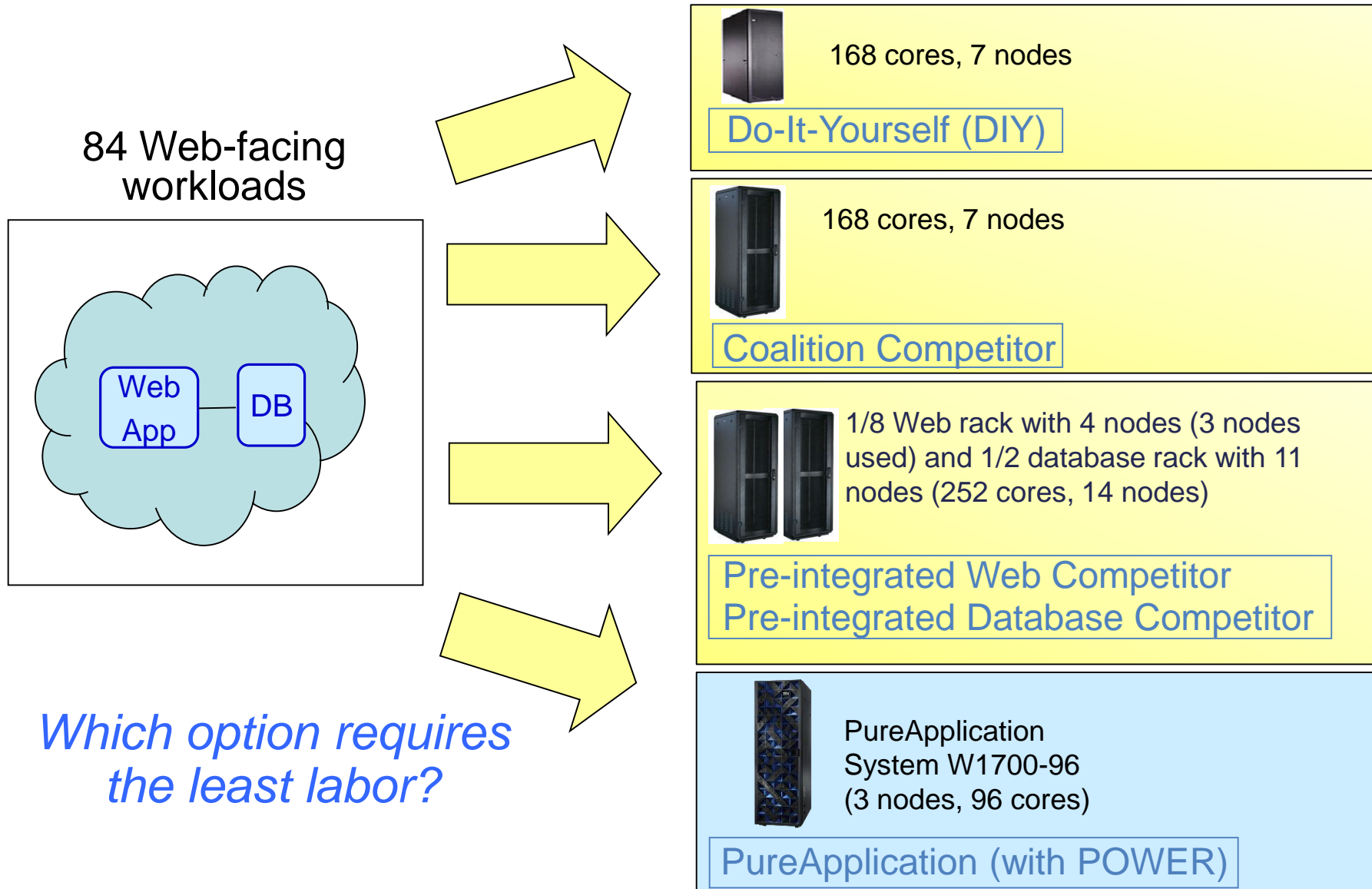
Typical percentage of time administrators spend on each task category

Allocation based on customer data from IBM study

- Deployment Management**
– Hardware set-up and software deployment
- Incident/Capacity Management**
– Monitor and respond automatically
- Asset Management**
– Hardware and software asset tracking
- Security Management**
– Access control
- Change Management**
– Hardware and software changes

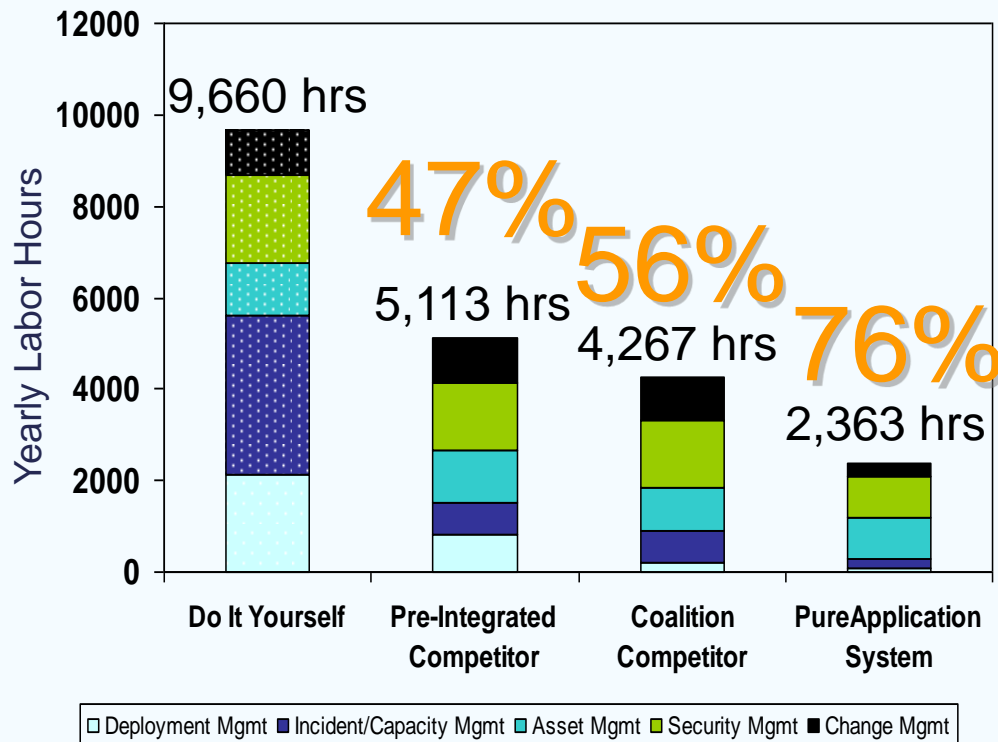
ITIL = Information Technology Infrastructure Library

Compare the customer labor to manage 84 Web-facing workloads



IBM PureApplication System reduces labor costs across its IT lifecycle

Labor hour estimates based on 84 workloads
IBM PureApplication is 76% better than DIY

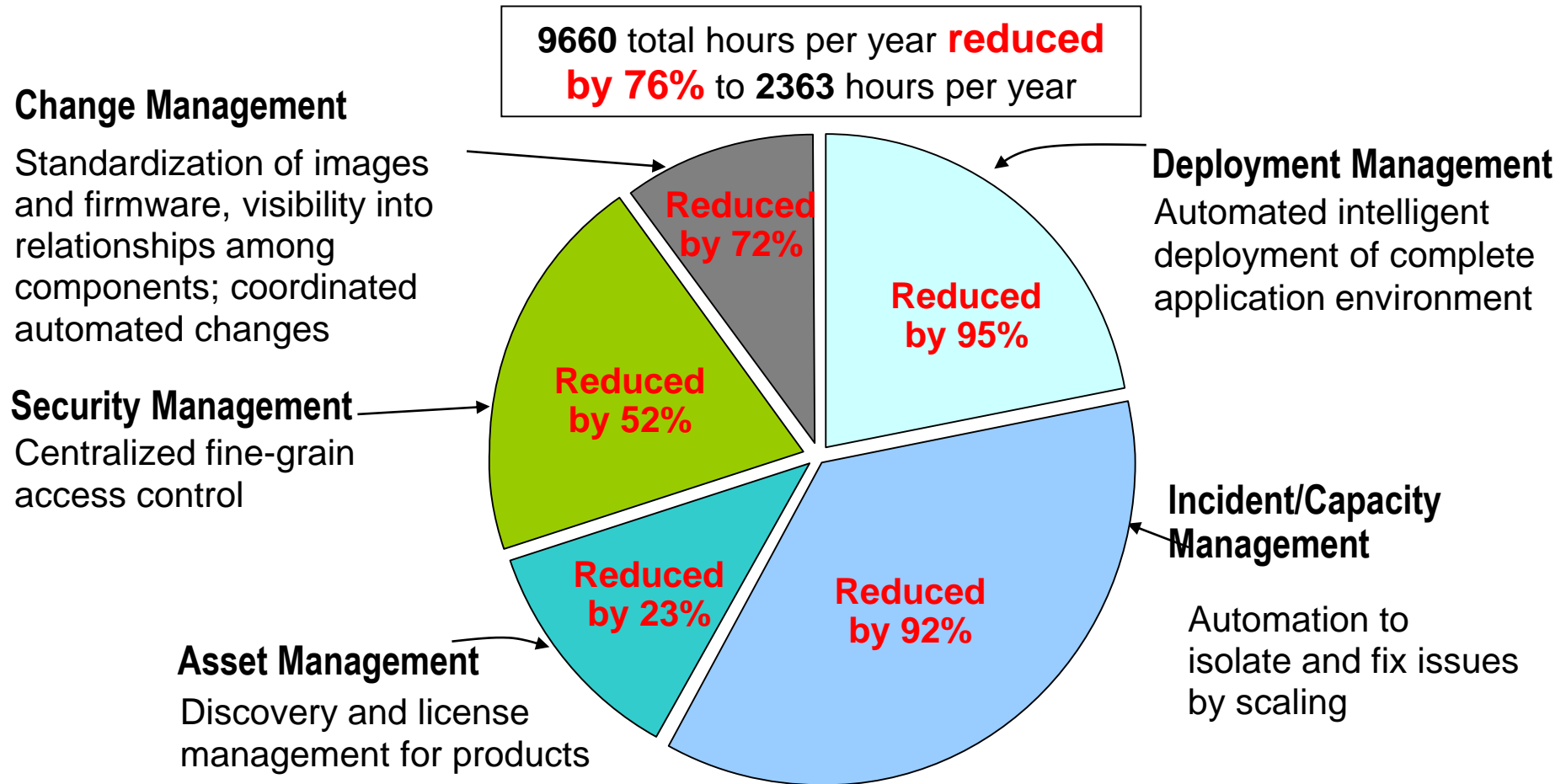


How does PureApplication System achieve this?

- Deployment
 - Fully assembled and configured
 - Pre-installed management software
 - Fast pattern-based deployment
- Incident/capacity
 - Centrally monitor and resolve issues with automatic scaling
- Asset
 - Track license usage of products
- Security
 - Centralized access control
- Change
 - Visibility into relationships of virtual images in a workload
 - Automatically apply changes to desired virtual servers

Note: Do It Yourself and Coalition Competitor used 7 blades (168 cores). Pre-Integrated Competitor used 14 pre-integrated nodes (252 cores). IBM PureApplication System (POWER) used 3 nodes (96 cores). Each system has the capacity to run 84 workloads where each workload can sustain a peak throughput of 1545 page elements per second. The labor savings and assumptions herein are estimates based on a labor model that uses data obtained on the percentage of time customers spend on certain IT lifecycle tasks. It is not a benchmark. As such, actual customer results will vary based on customer applications, differences in stack deployed and other systems variations as well as actual configuration, applications, specific queries and other variables in a production environment.

Summary: PureApplication System labor savings for case study



North American retail chain rapidly delivers new services and reduces costs through consolidation

20% savings

versus build-your-own alternative

70-80% reduction

in ongoing management costs
(maintenance, monitoring,
provisioning)

**Faster time-to-
value**

for new solutions and increase in
business agility and
sustainability



Business Challenge:

A major retail chain in the US was introducing new healthcare services to its pharmacies and needed to replace legacy systems and traditional the IT processes in order to rapidly adopt business process management (BPM) and operational decision management (ODM) solutions.

Solution components
IBM® PureApplication™ System

PureApplication lowers costs through integrated management



- ✓ Fastest Setup
- ✓ Integrated system monitoring
- ✓ Integrated workload monitoring
- ✓ Simplified software maintenance
- ✓ Simplified disaster recovery setup
- ✓ Lower labor across IT lifecycle by up to three quarters