Benefits of IT Consolidation with HP and Oracle

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EMEA HP/Oracle Competence Center

ORACLE 10g DATABASE

hp invent

Centralization

Adaptive Infrastructure

IT Consolidation

Utility Computing

Virtualization

GRID COMPUTING

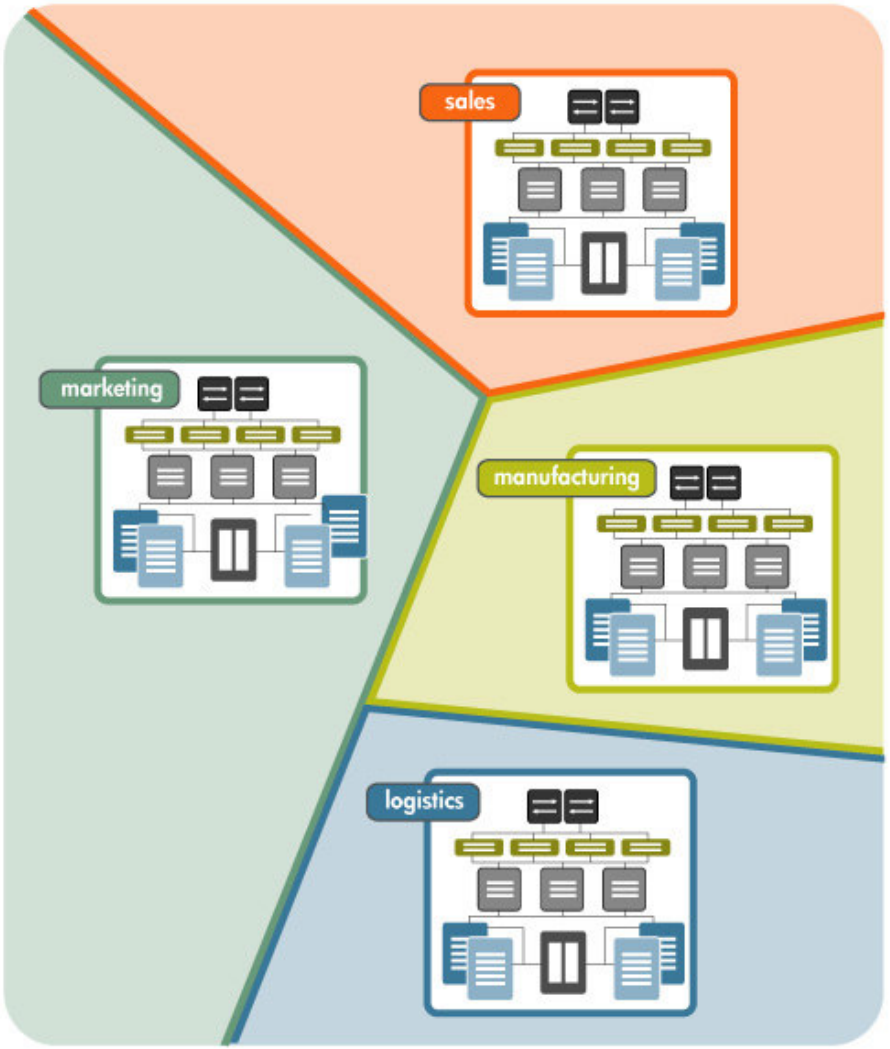
HP WORLD 2004
Solutions and Technology Conference & Expo

Agenda

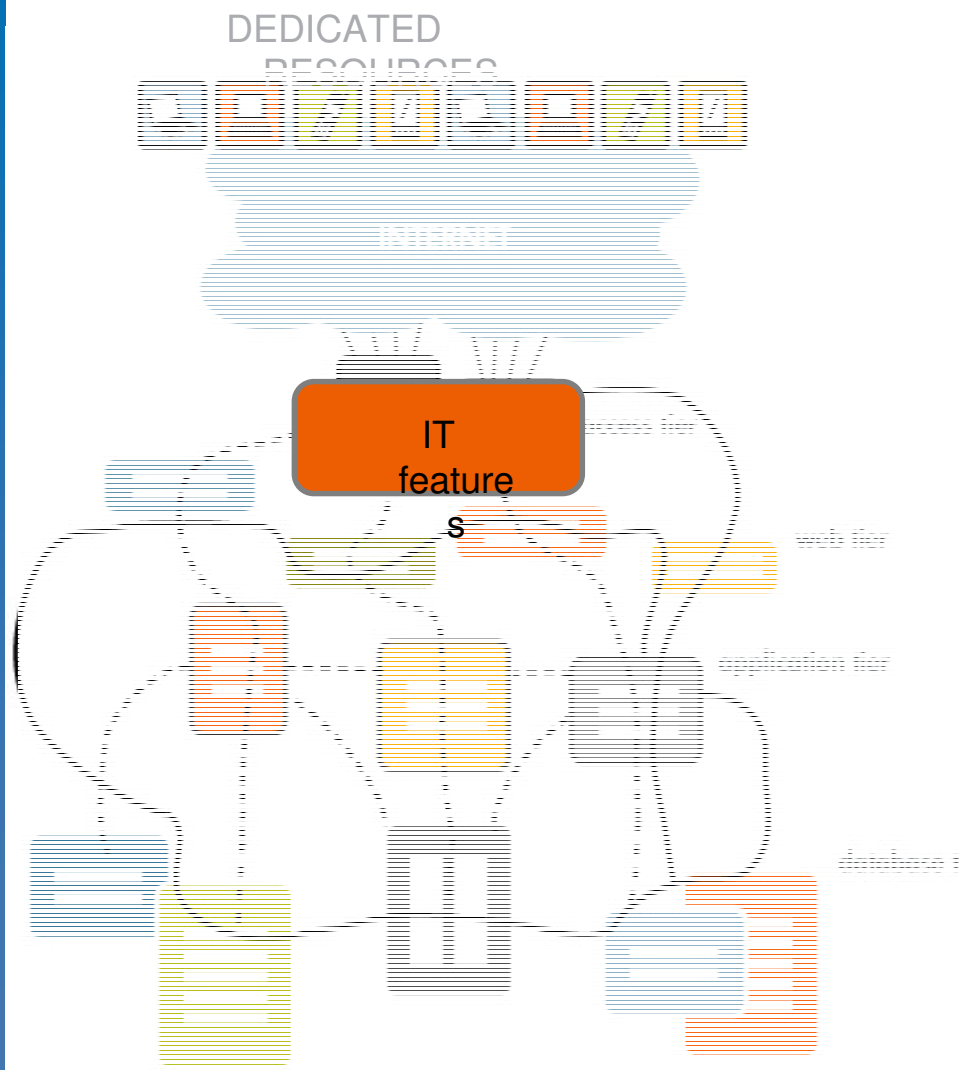
- Why IT Consolidation
- The IT Consolidation Journey with HP and Oracle
- Technology Enablers that support Consolidation
  - Partitioning
  - Clustering with 10g Real Application Clusters
- Summary

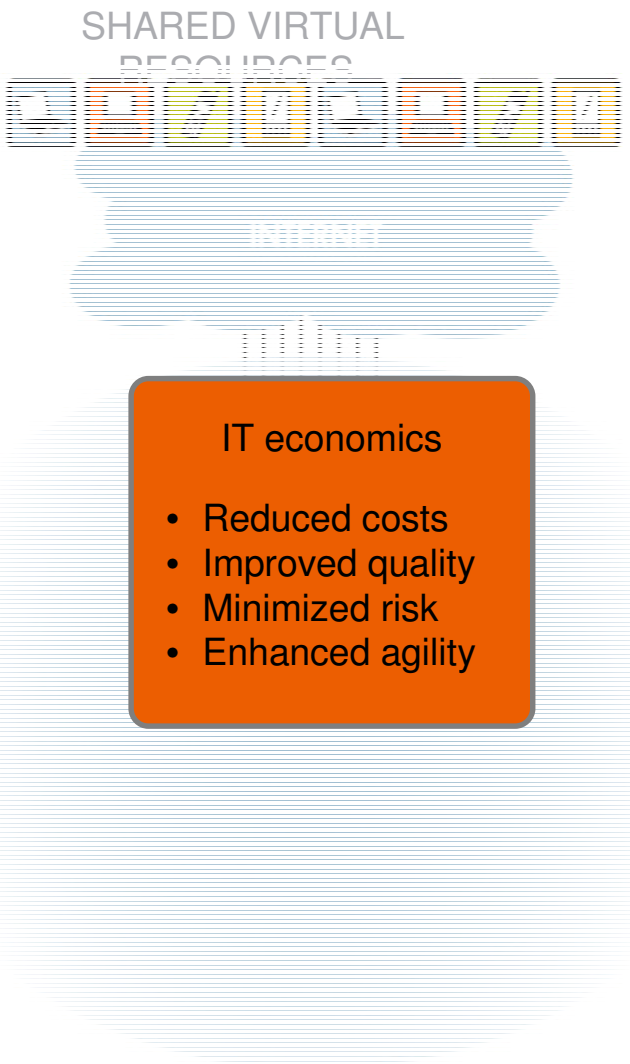
“Traditional” IT Challenges

- Geographically dispersed
- Focused on IT features
- Applications tied to platform
- Applications own platforms
- Dedicated test, production, and disaster recovery environments
- Limited scalability
- Each environment sized for expected peak load
- Hard to integrate data
- Support staff needed for each platform



Adaptive infrastructure vision for best RoIT



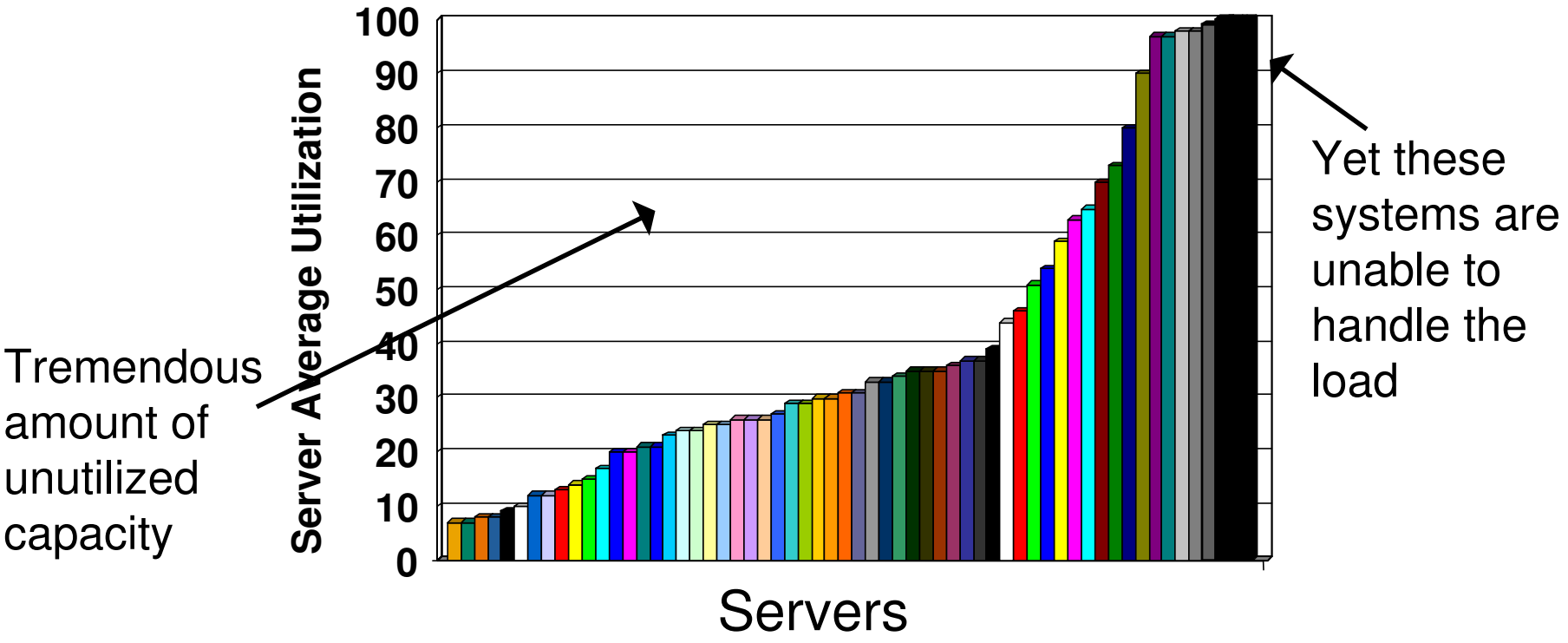


IT economics

- Reduced costs
- Improved quality
- Minimized risk
- Enhanced agility

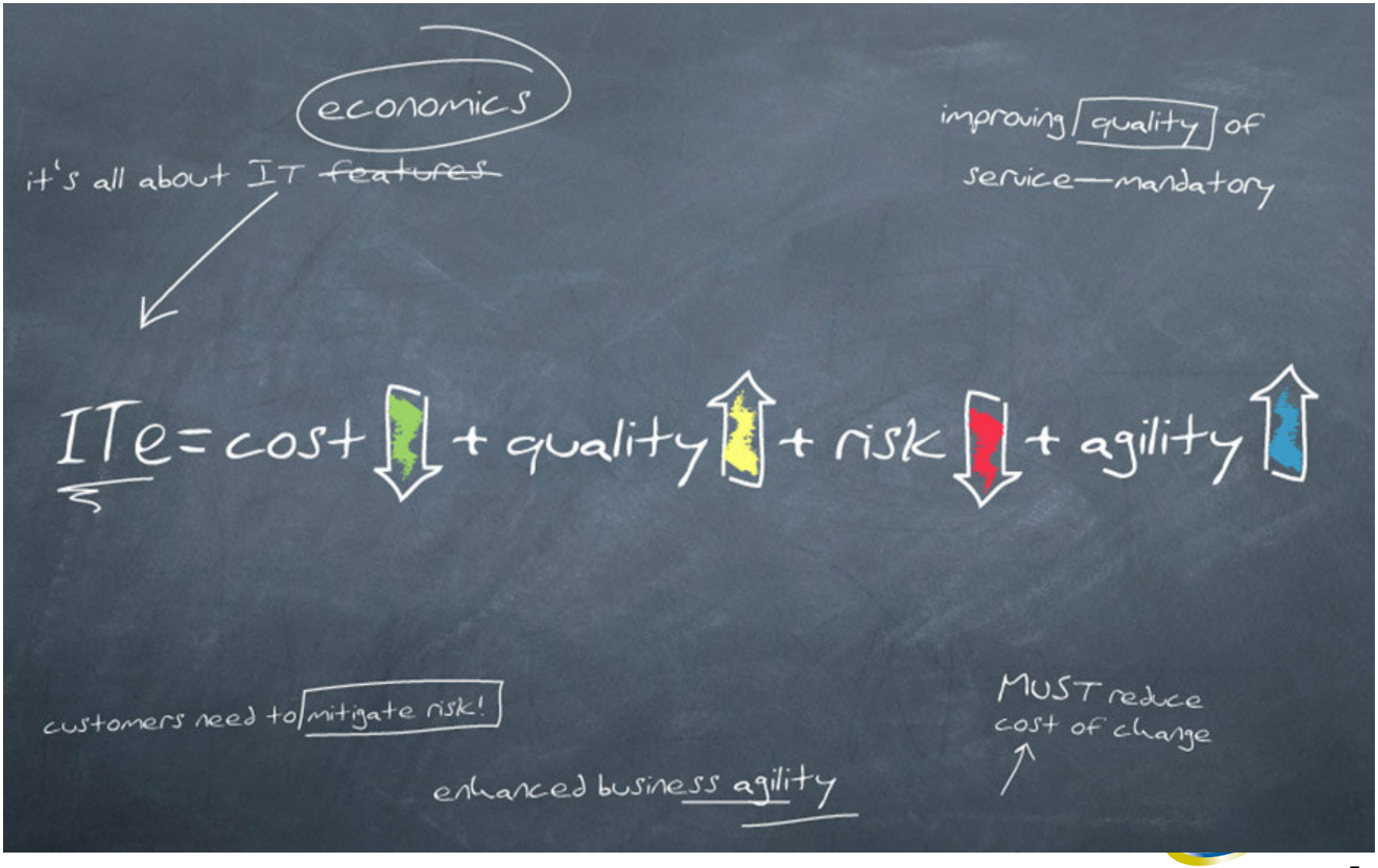
Challenge: Enterprises have unused server capacity yet still can't meet demand

Utilization at an actual HP customer



Most reports put average utilization at approx 30%

Why IT Consolidation? Focus on IT economics



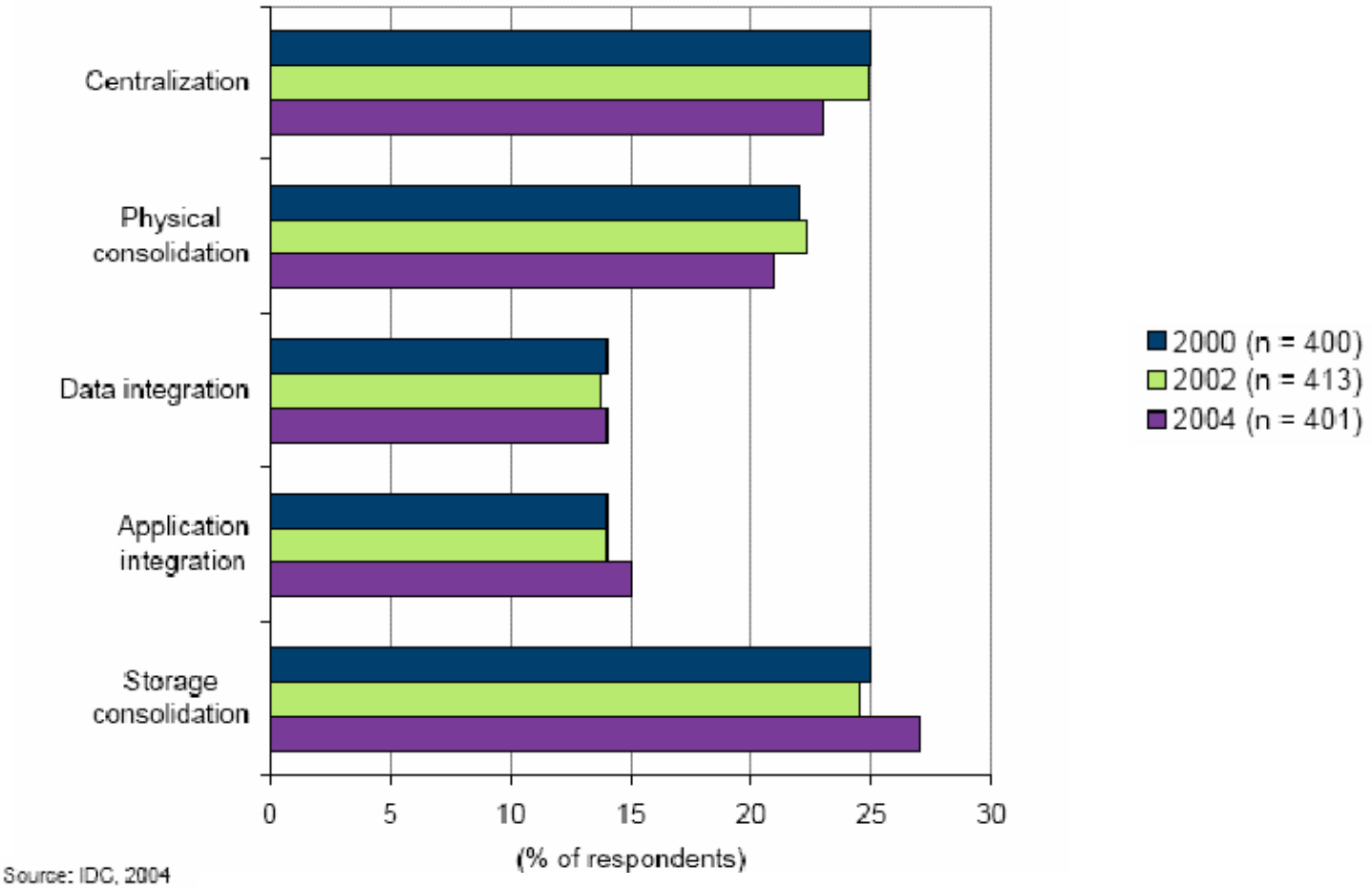
Market View …

- IT Consolidation market is set to more than quadruple from $1 billion to $4.6 billion by 2007 (IDC)
- Main drivers are:
  - Complexity reduction
    - reduce number of suppliers and products
  - Cost control/reduction
    - consolidate proliferation of servers and software license
  - Opportunity realization
    - consolidate business information e.g. CRM, ERP
- Infrastructure consolidation follows industry consolidation i.e. mergers, acquisitions and downsizing.
- Advances in IT technology are presenting IT users with an opportunity to extend the scope of their consolidation activities further into their IT infrastructure.

Source: IDC Worldwide Server Consolidation Forecast and Analysis, 2002 - 2006

Primary Types of IT Consolidation

Q: What activities would you describe as your primary server or storage consolidation strategy today?



Source: IDC, 2004

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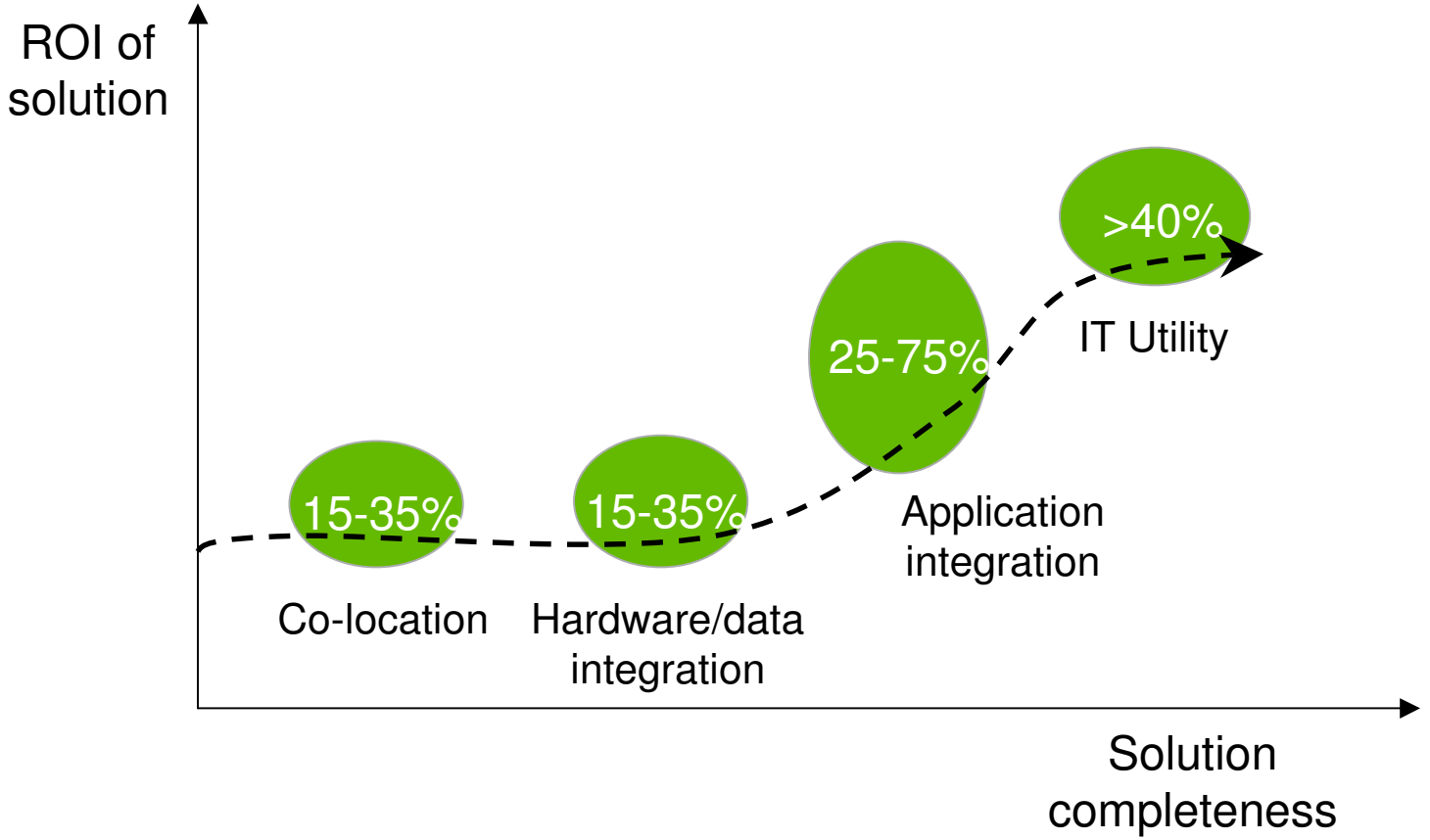
AE / Grid Journey –
Return on Investment

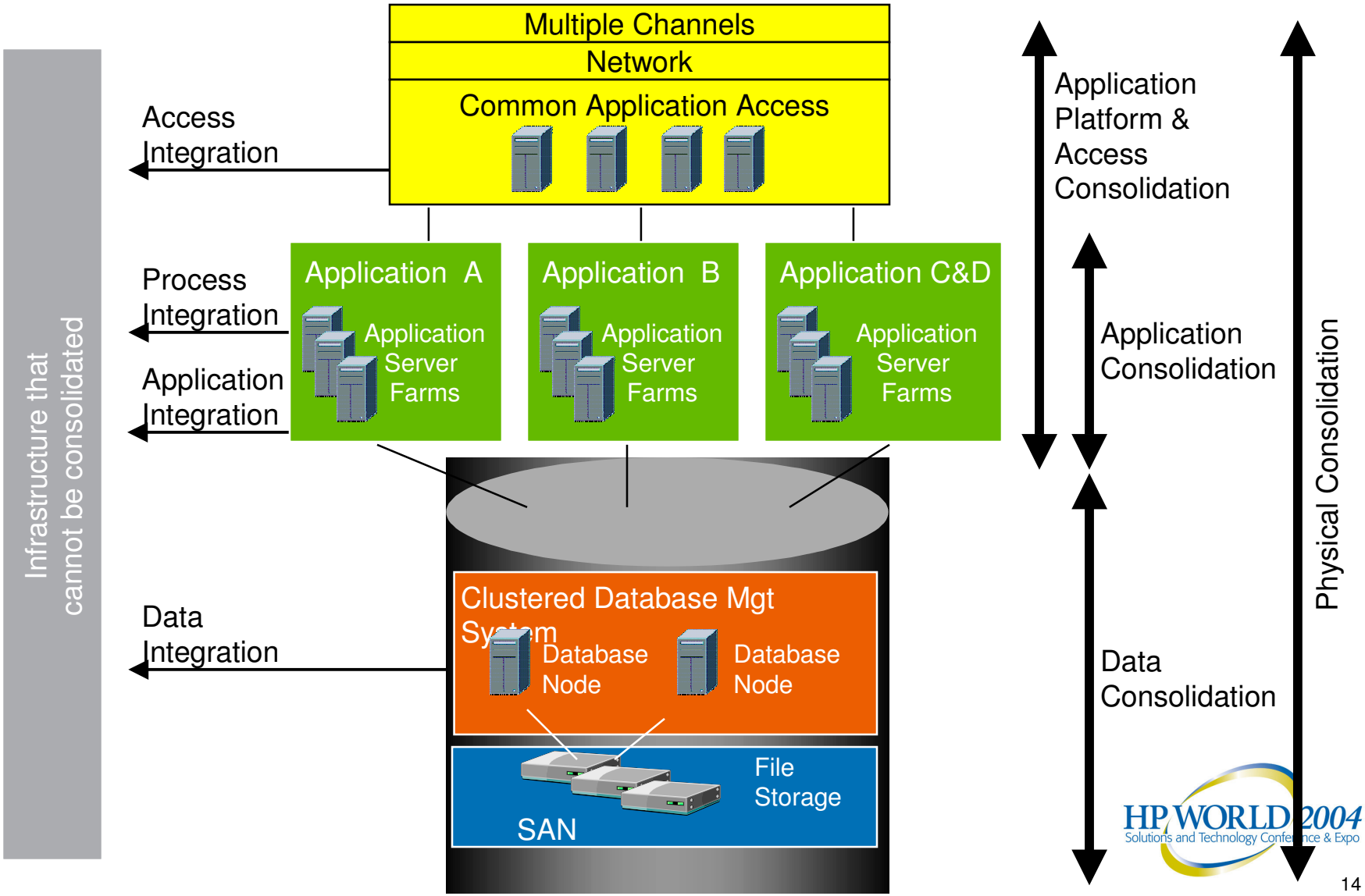


ROI increases as additional journey steps are made!

Joint HP/Oracle's consolidation view

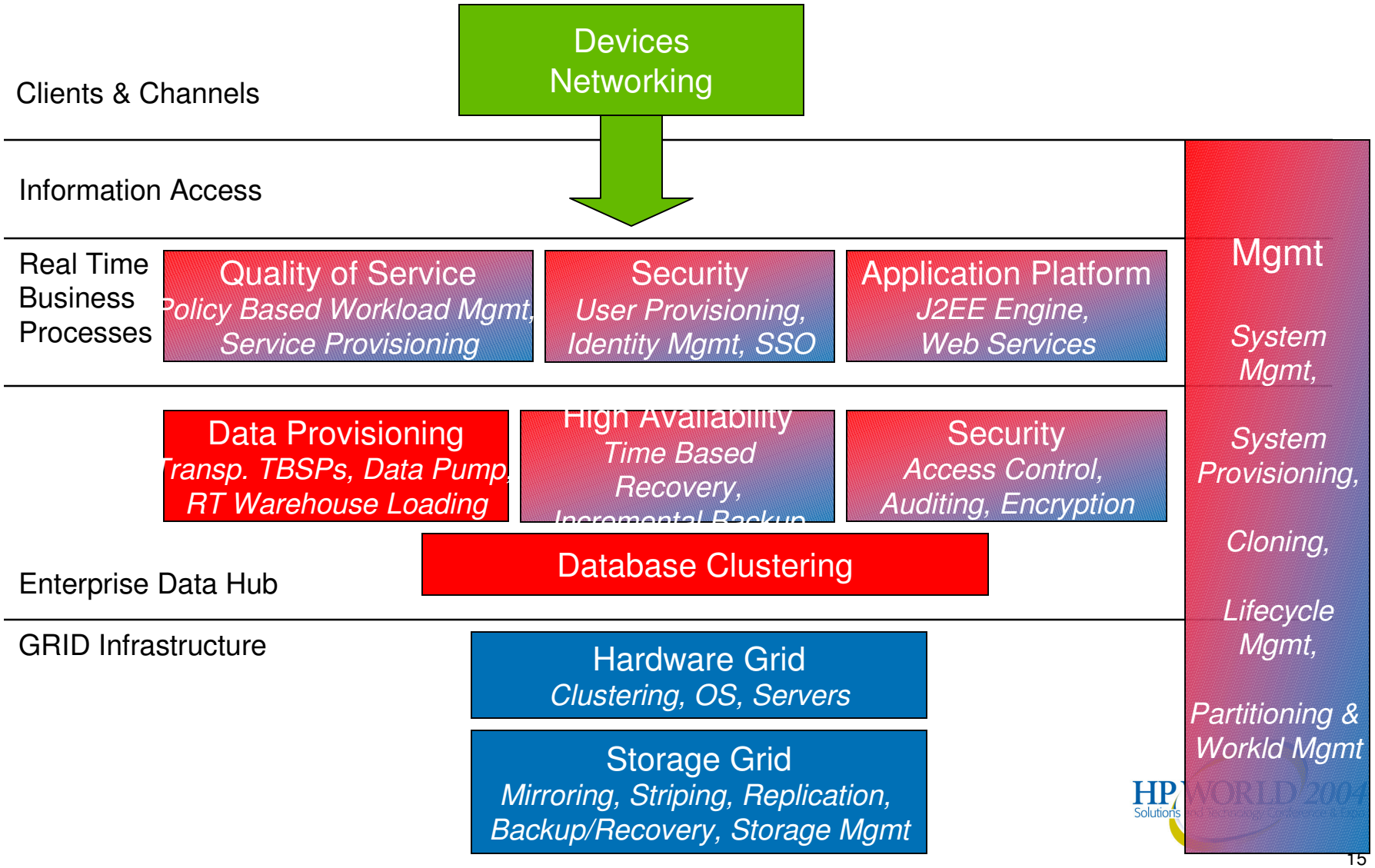
- Level 1 = Physical Consolidation
  - Relocating existing servers to fewer sites
  - Reducing number of servers supporting entire IT infrastructure
- Level 2 = Data Consolidation
  - Physically combining a wide variety of fragmented data into a single repository
- Level 3 = Application & Application Platform Consolidation
  - Migration of multiple applications onto a new platform supporting mixed application workload
  - Common applications used across the enterprise and shared with customers, suppliers etc.
  - Multi-channel access to the same applications

HP/Oracle Consolidation Blueprint

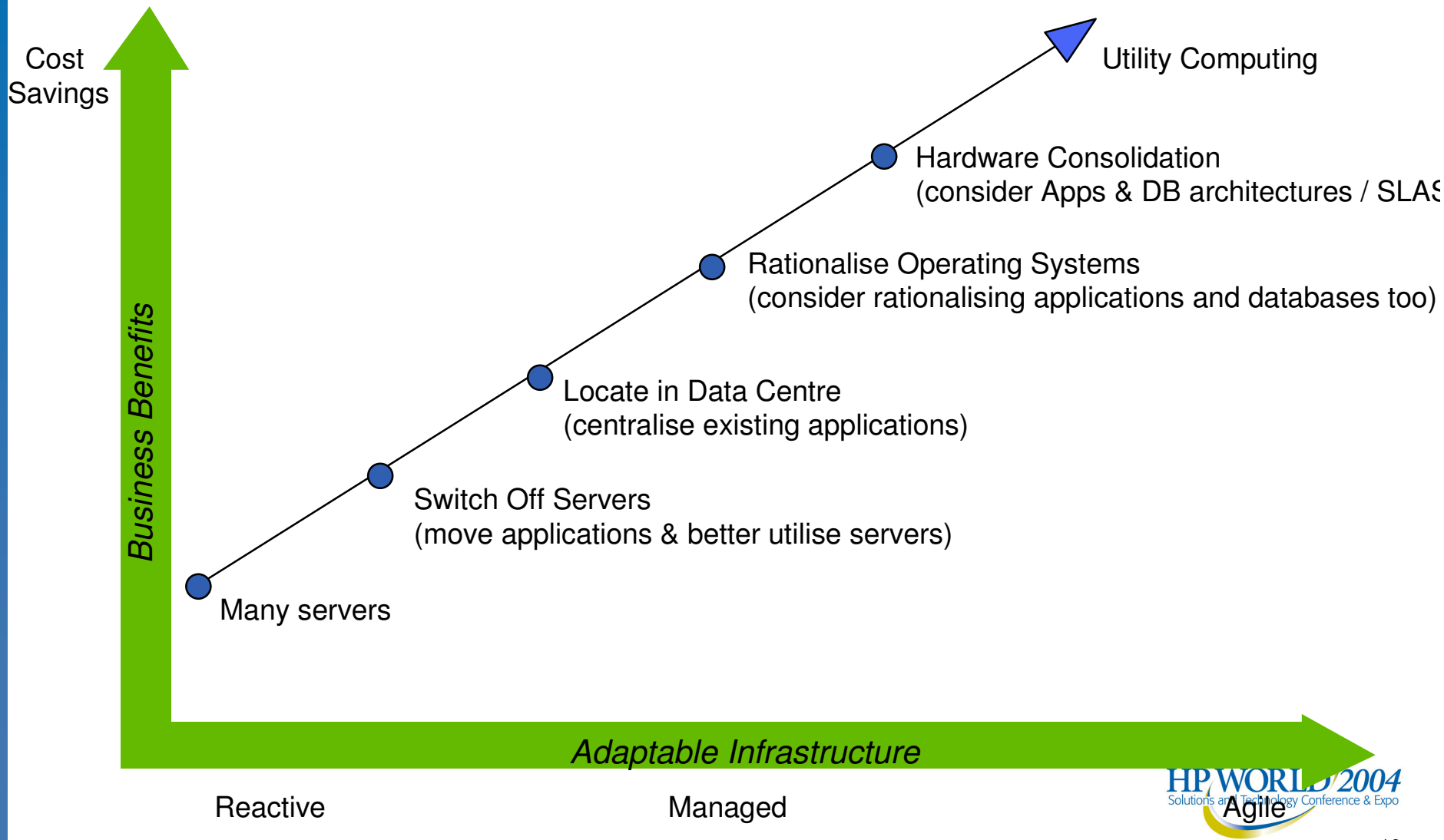


HP/Oracle Solution Blueprint

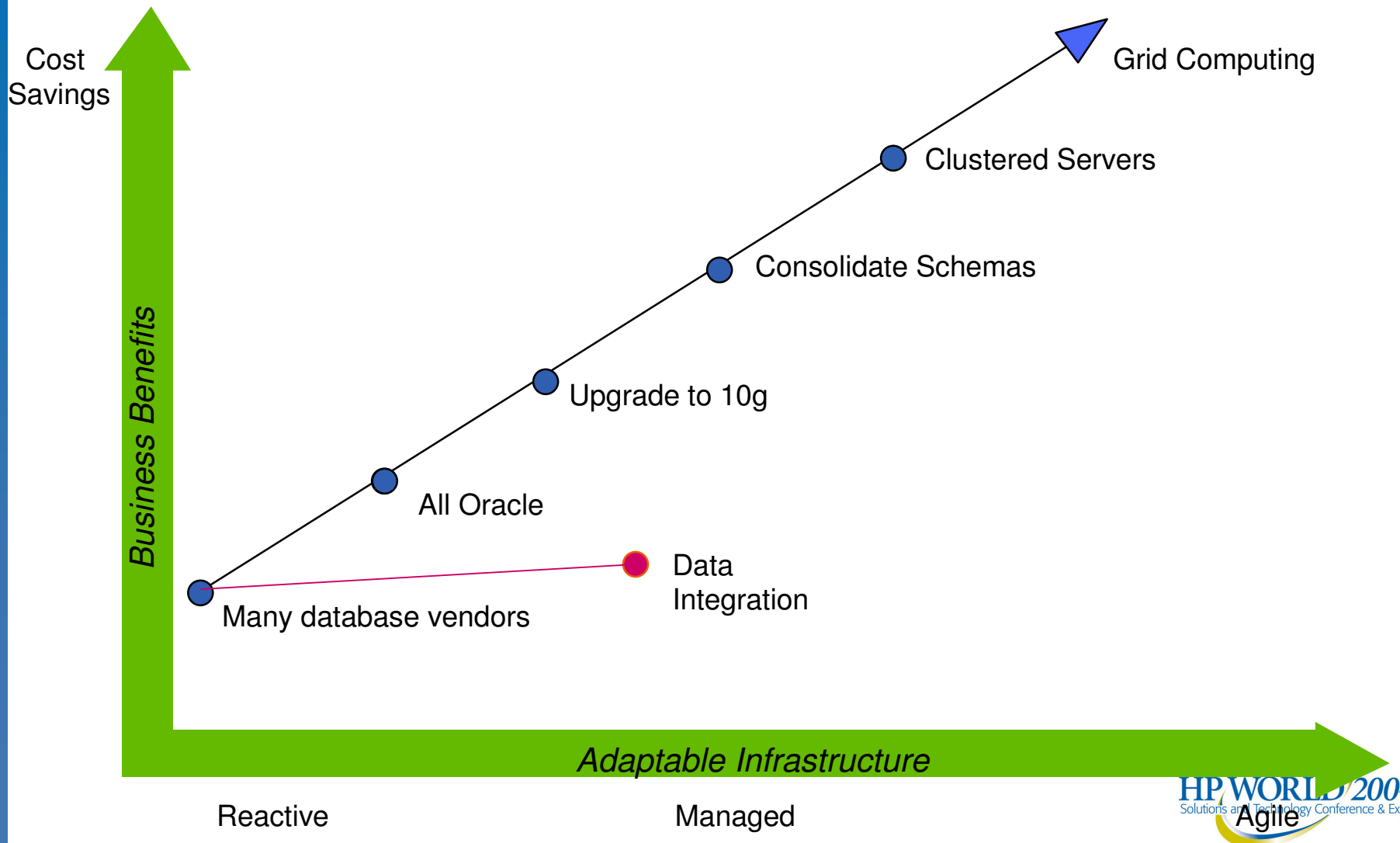
Grid Infrastructure View



Level 1: Physical consolidation



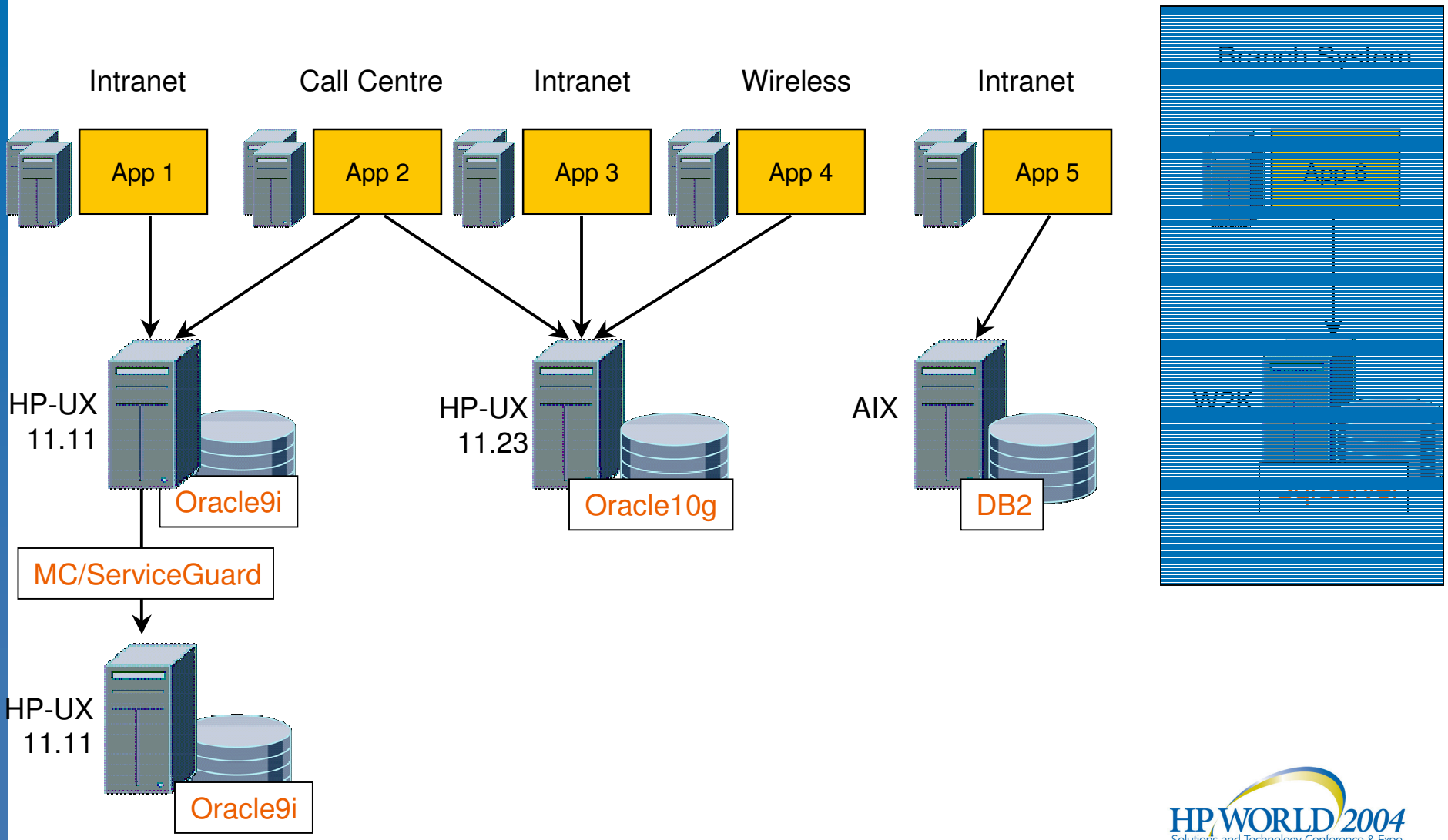
Level 2: Data consolidation



Consolidate Data and …

- … Reduce Cost of Downtime
  - Eliminate Single Point of Failure
  - Ensure High Availability
  - 99% availability equates to up to 87 hours downtime per year
  - Oracle Real Application Clusters ensures 99.99% availability
- … Reduce Maintenance Costs
  - Apply patches to one database – saving DBAs time & effort
  - Reliable centralized security model
  - Make database upgrades straightforward
  - “Version consolidation” - management of single version of database
  - “Vendor consolidation” - many databases, many vendors

Typical Customer Situation



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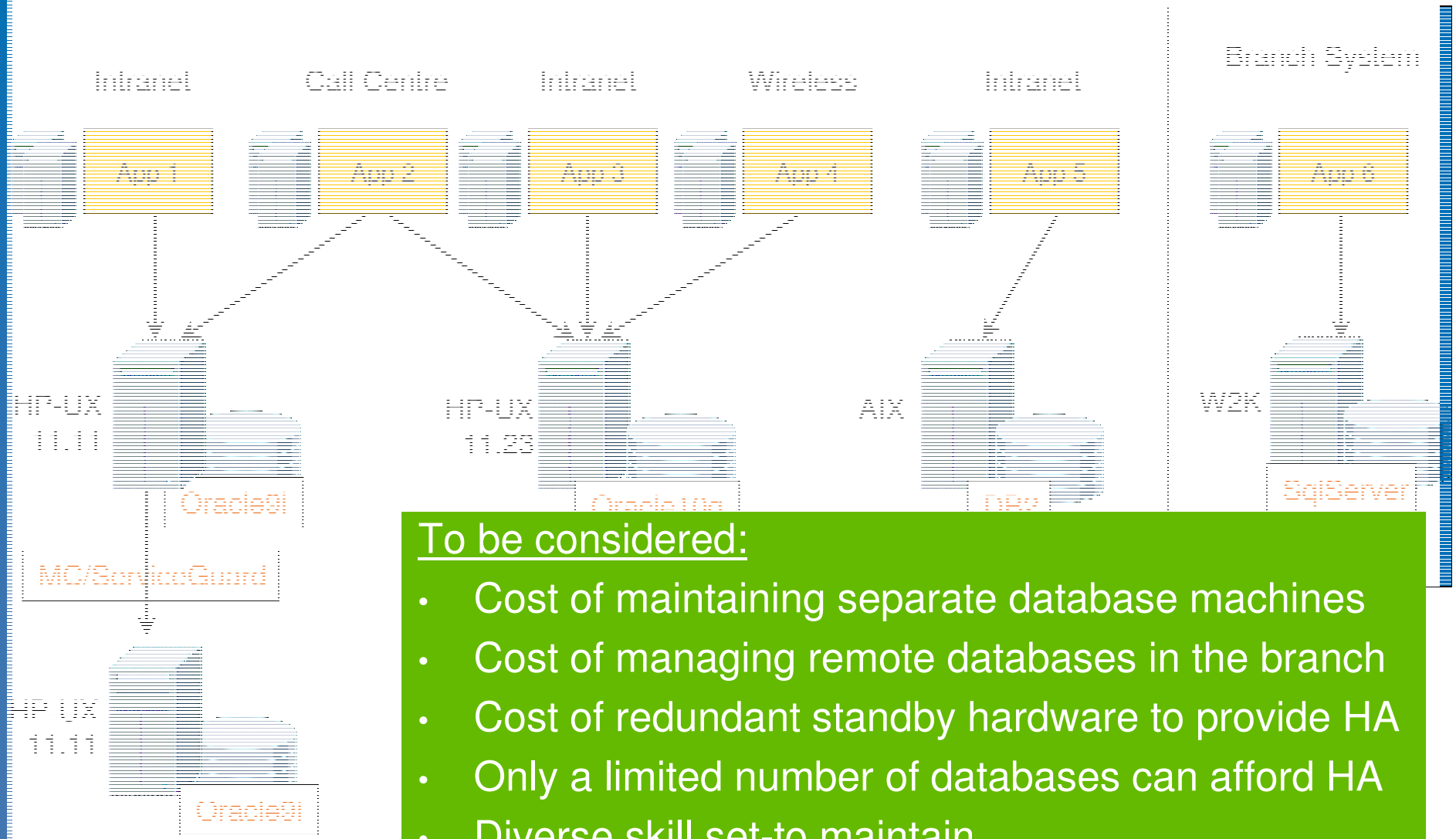
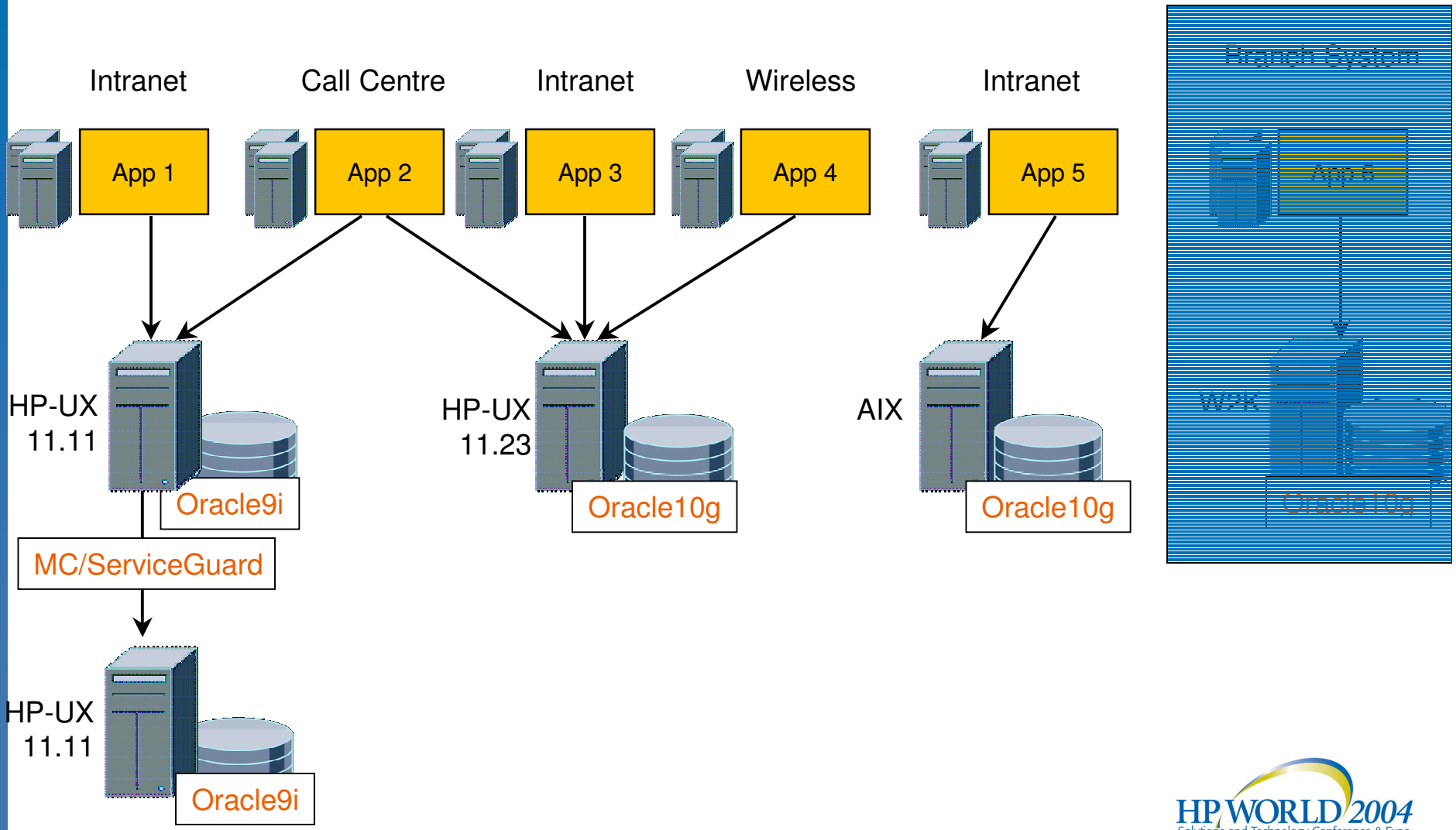


To be considered:

- Cost of maintaining separate database machines
- Cost of managing remote databases in the branch
- Cost of redundant standby hardware to provide HA
- Only a limited number of databases can afford HA
- Diverse skill set-to maintain

Consolidate all DBs to Oracle



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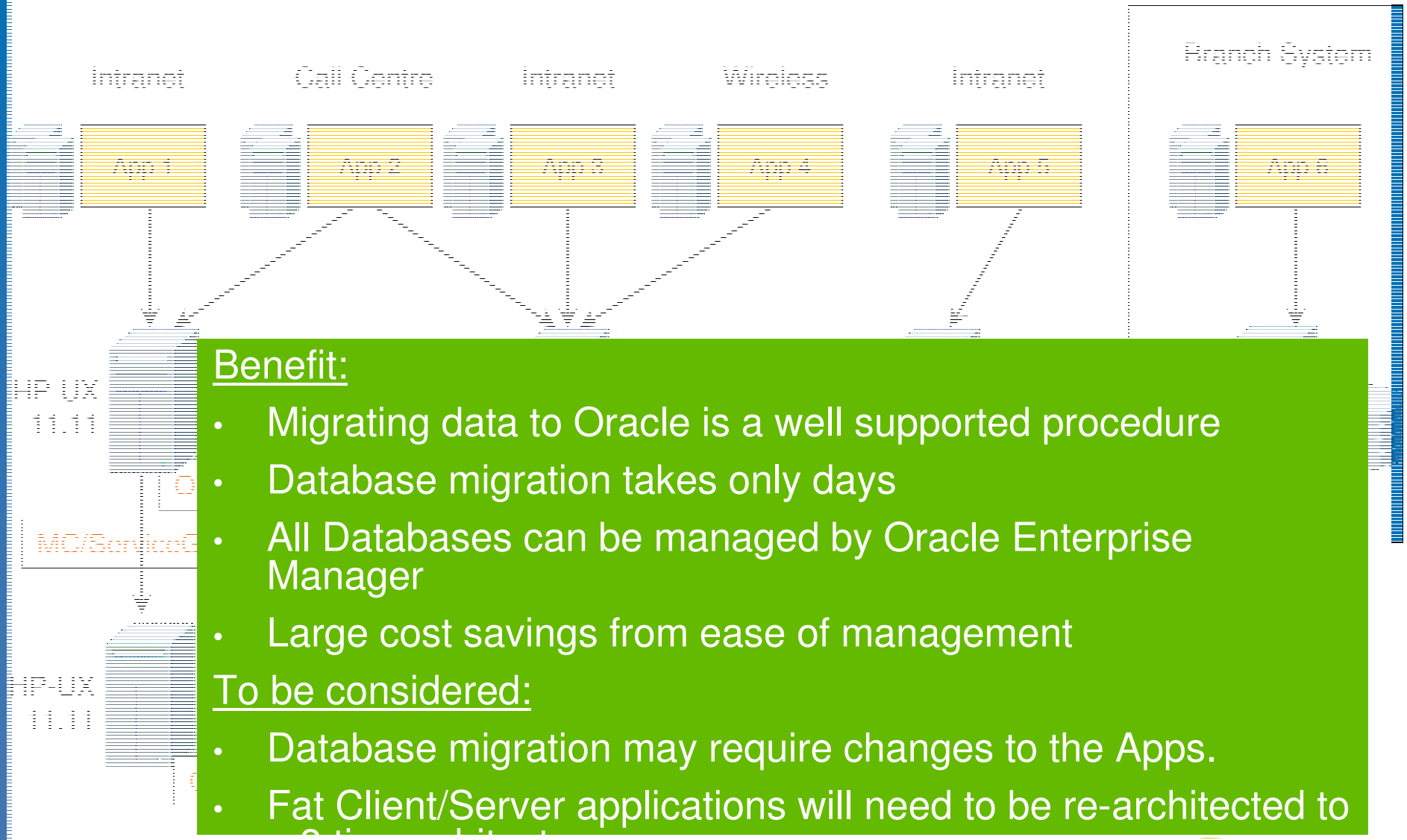


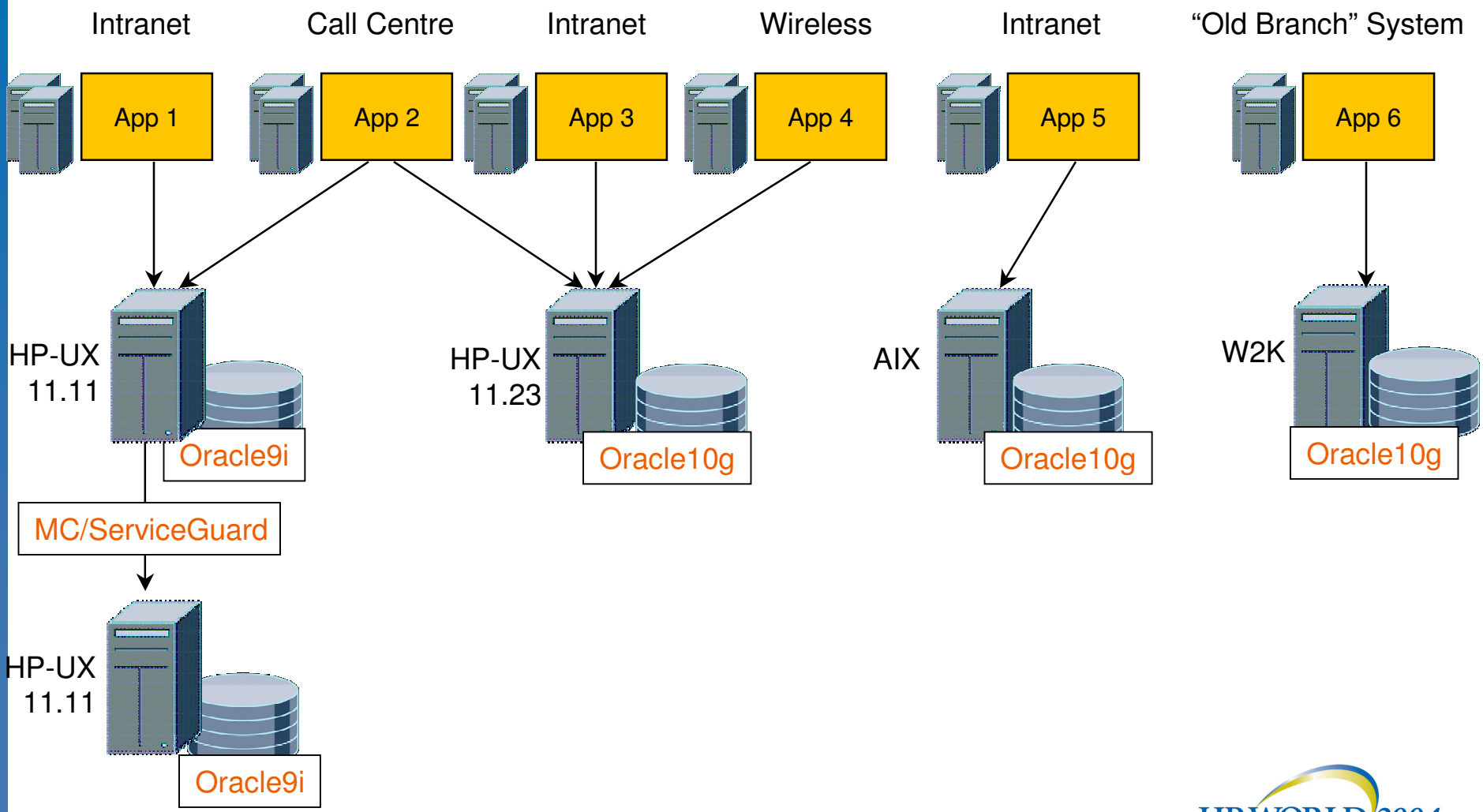
Benefit:

- Migrating data to Oracle is a well supported procedure
- Database migration takes only days
- All Databases can be managed by Oracle Enterprise Manager
- Large cost savings from ease of management

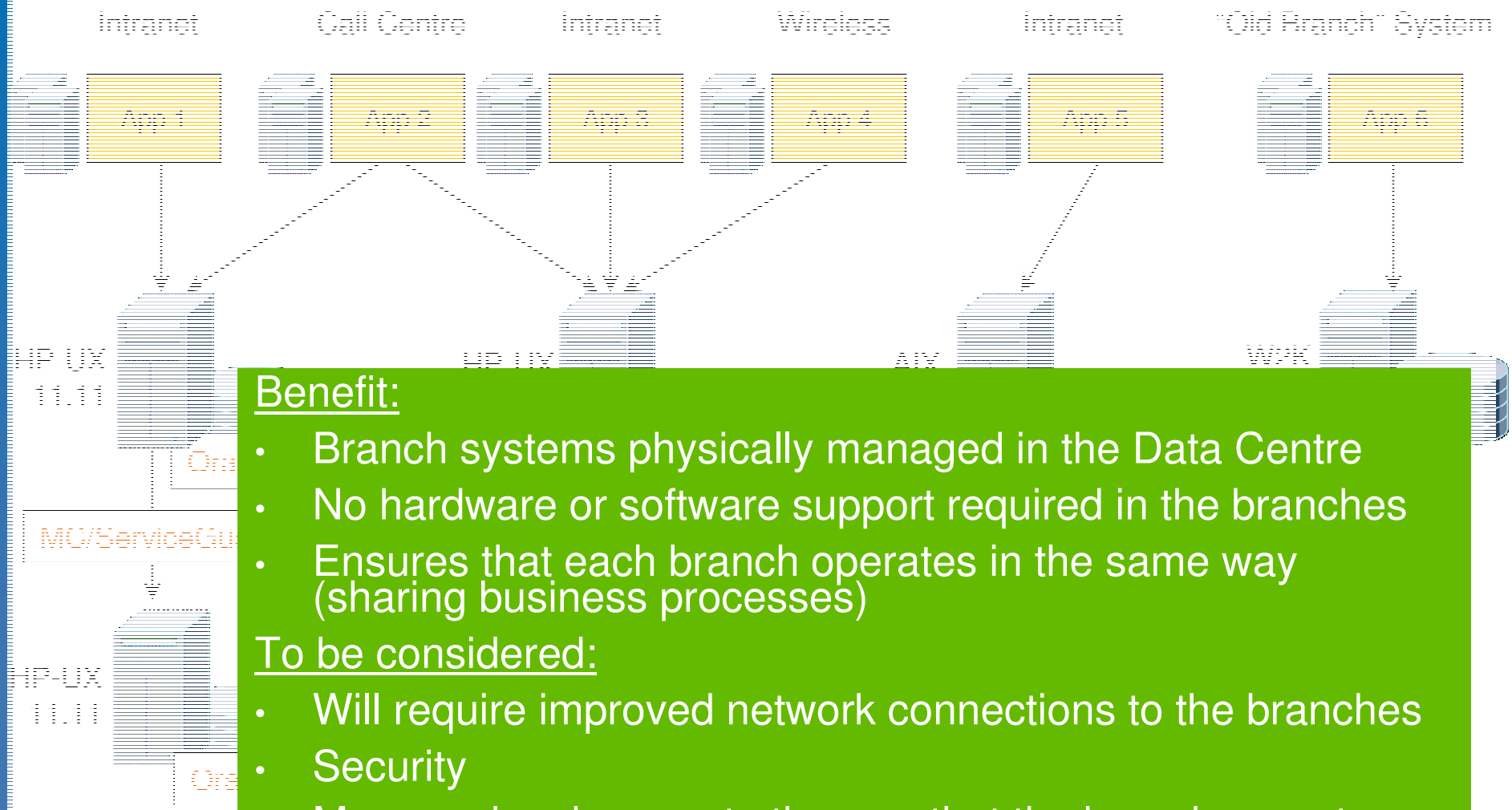
To be considered:

- Database migration may require changes to the Apps.
- Fat Client/Server applications will need to be re-architected to

Centralize physical servers & applications



Centralize physical servers & applications



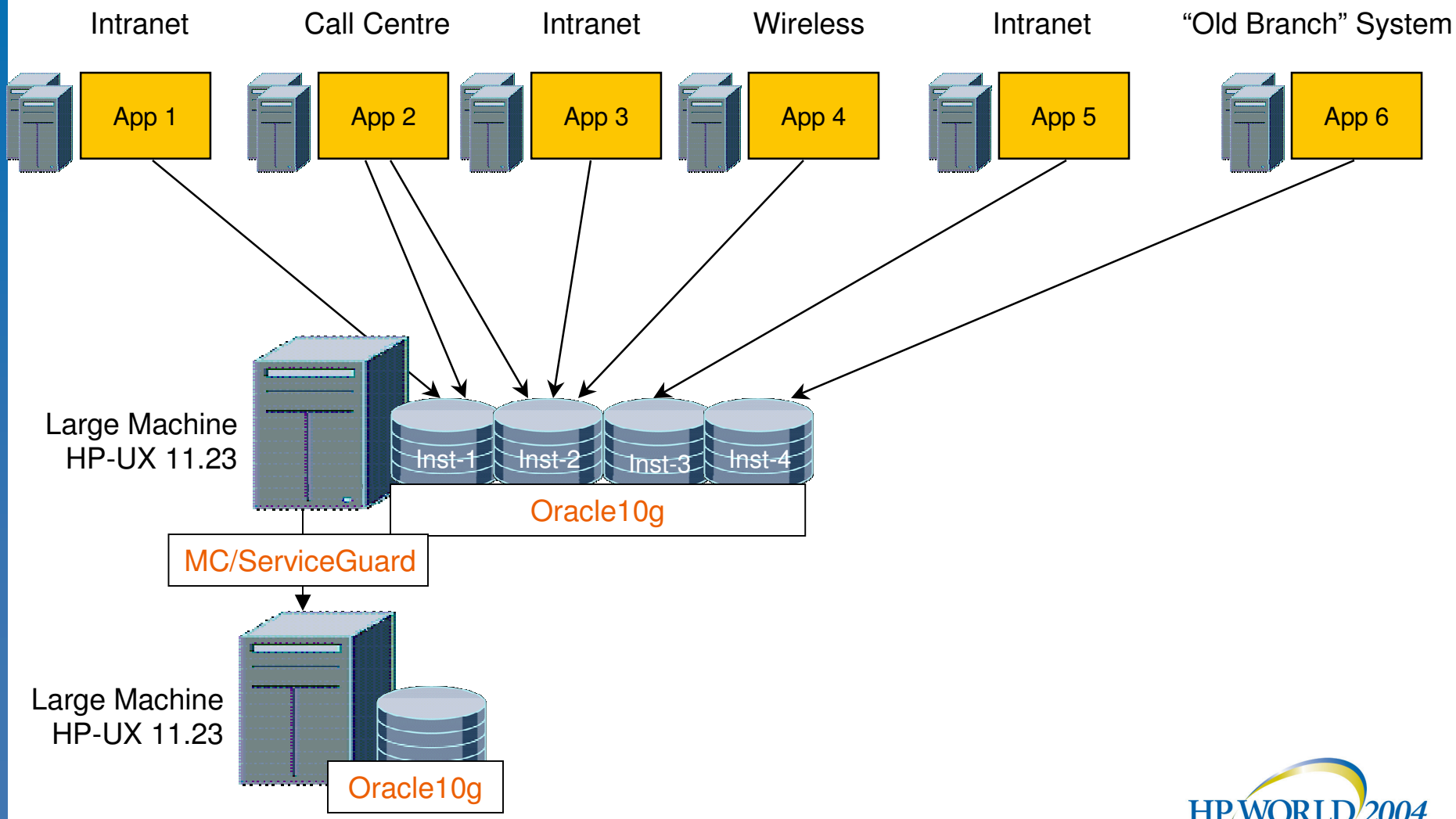
Benefit:

- Branch systems physically managed in the Data Centre
- No hardware or software support required in the branches
- Ensures that each branch operates in the same way (sharing business processes)

To be considered:

- Will require improved network connections to the branches
- Security
- May require changes to the way that the branch operates (Change Mgt)

Upgrade all databases to same platform & Oracle10g



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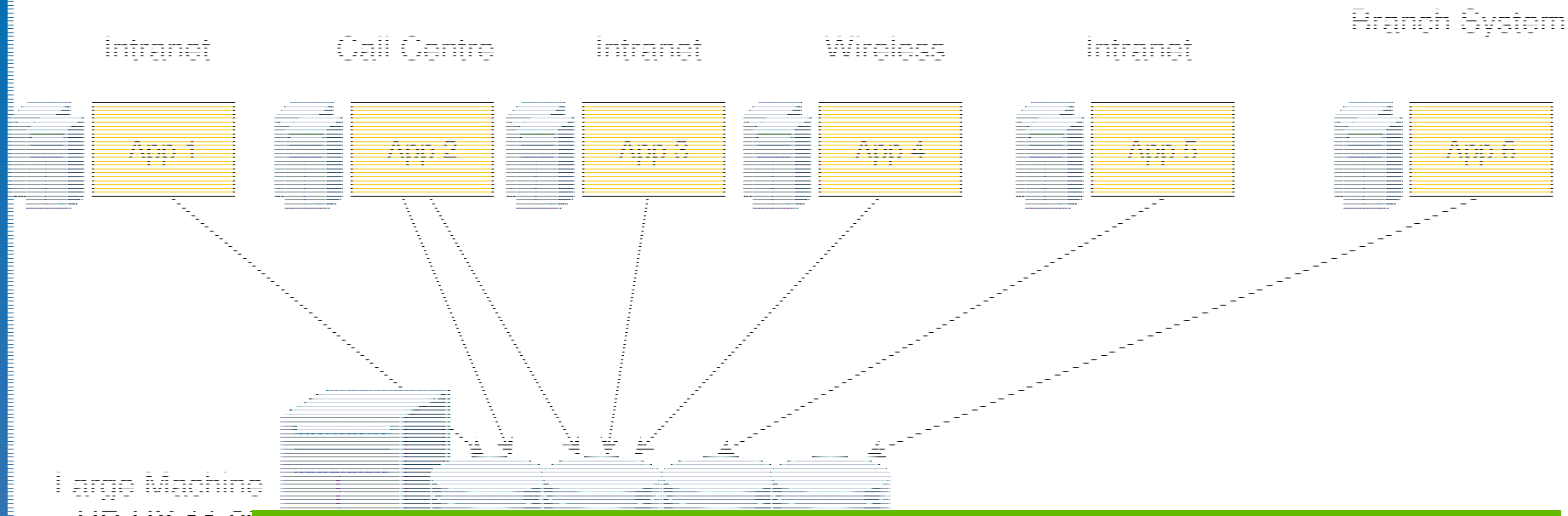


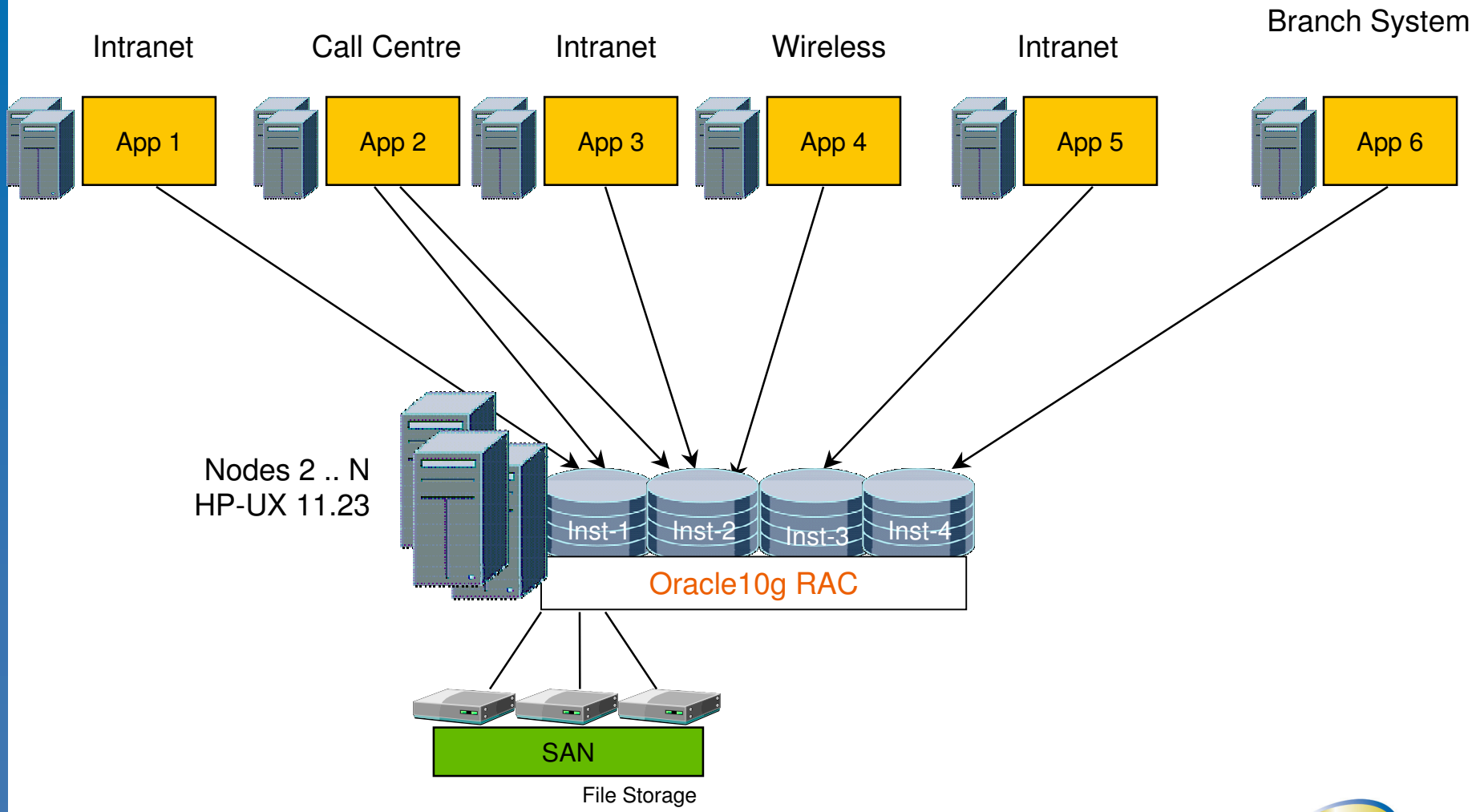
Benefit:

- Upgrade to latest version to take advantage of 10g features
- Assign hardware & OS resources to individual instances
- Allows a larger machine to efficiently share resources
- Can facilitate dynamic partitioning dependant upon workloads

To be considered:

- Dependencies with other applications

Upgrade to Oracle10g RAC



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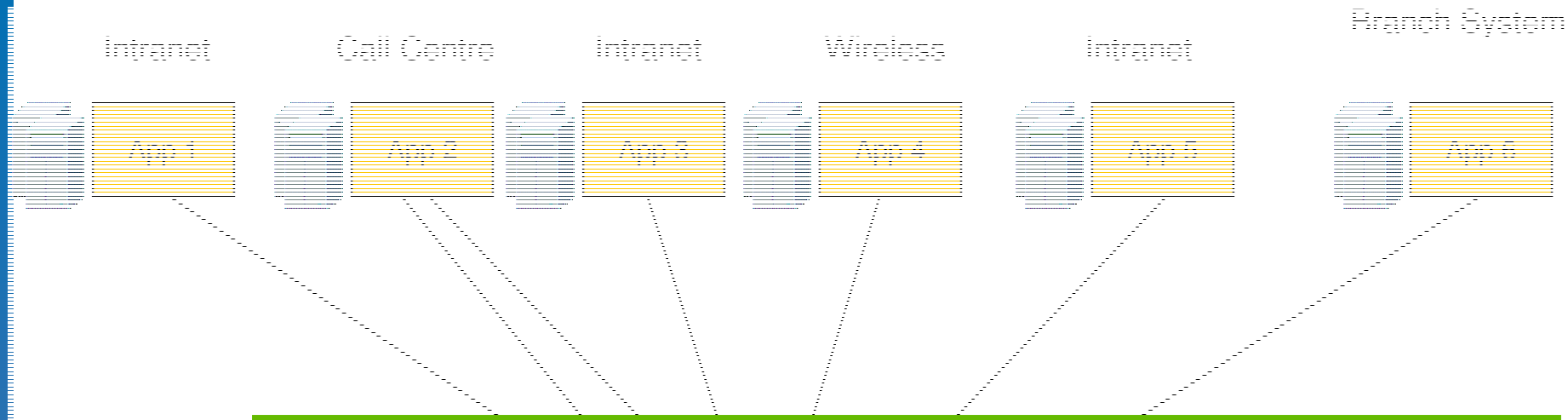


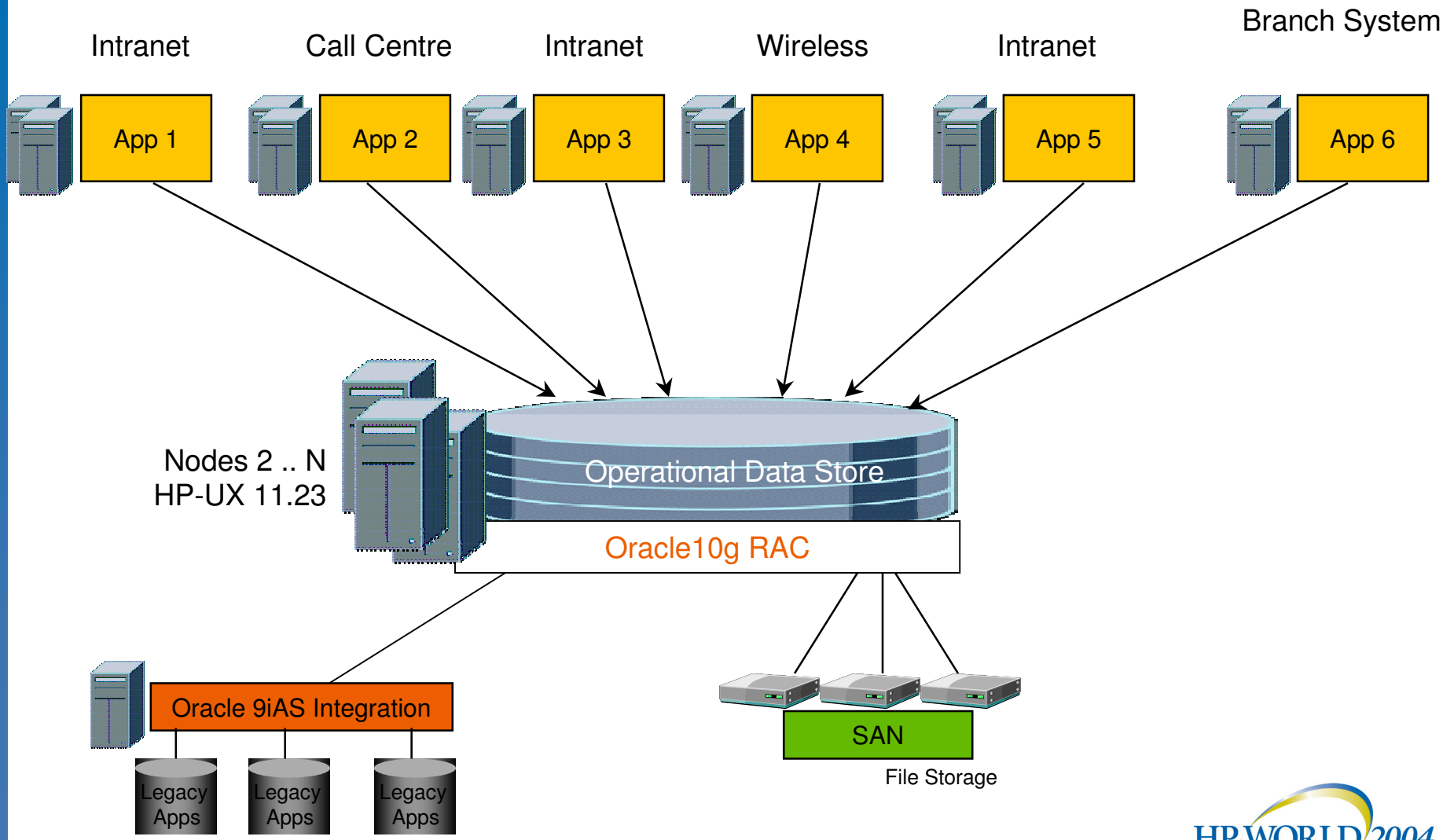
Benefit:

- Reduce the dependency on large machines
- Scalable central database management
- Add hardware as and when required
- No need to calculate headroom up-front
- Provides HA without cold standby
- No redundant hardware costs for standby

To be considered:

- Additional software cost for RAC

Consolidate data schemas



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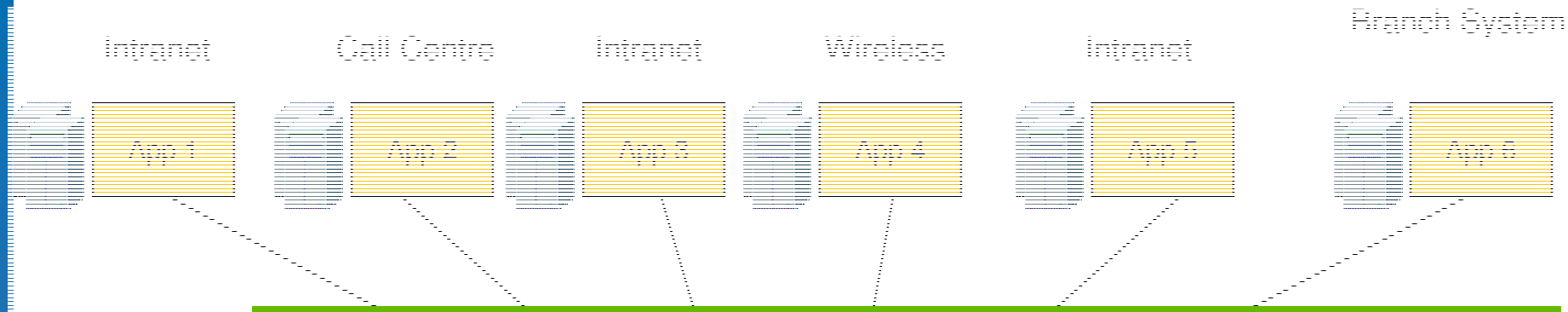


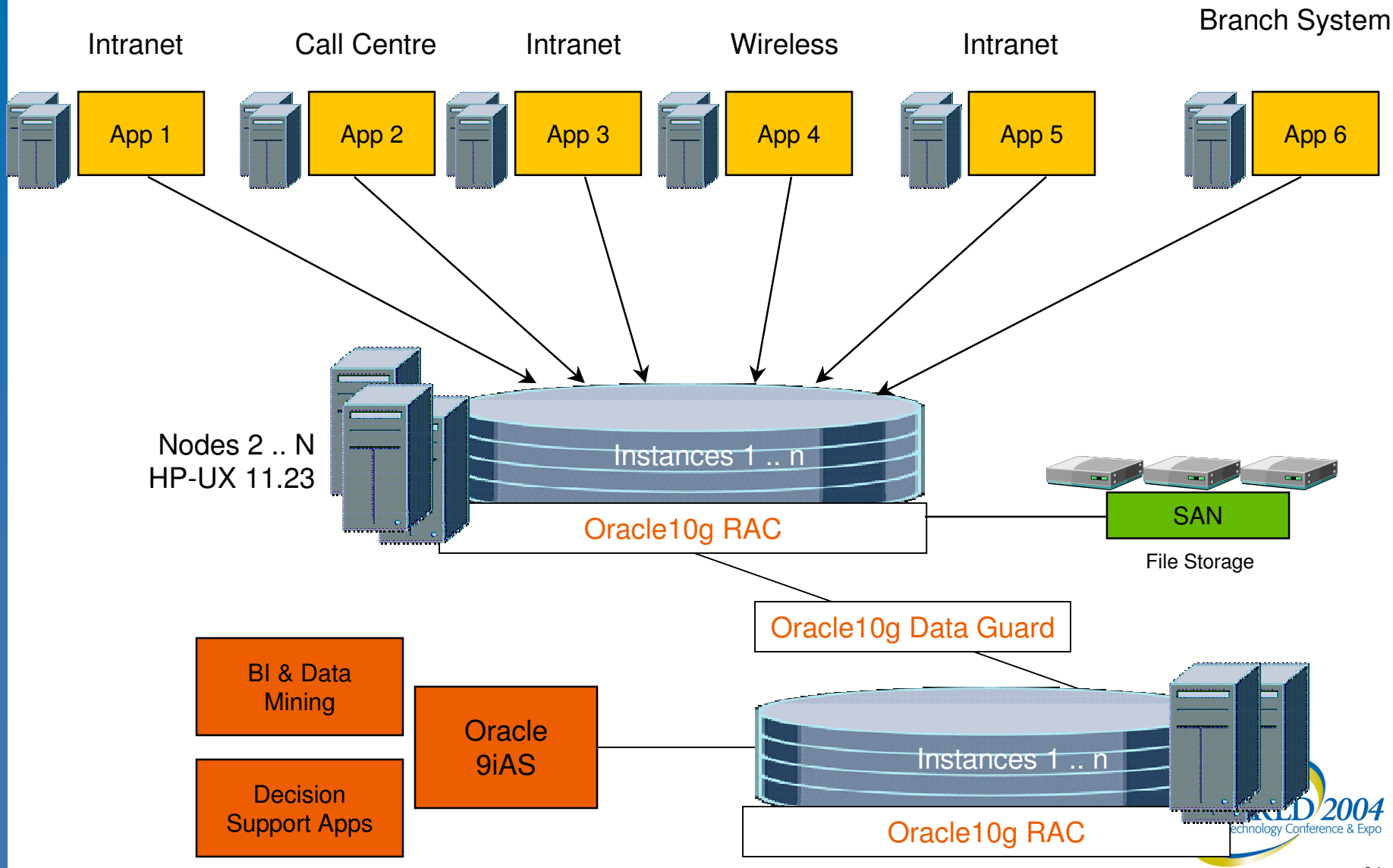
Benefit:

- Single view of the customer across all channels
- Real-time business intelligence
- Improved quality of data
- Ability to cleanse operational data
- Ability to implement common business processes
- Better utilization of infrastructure resources

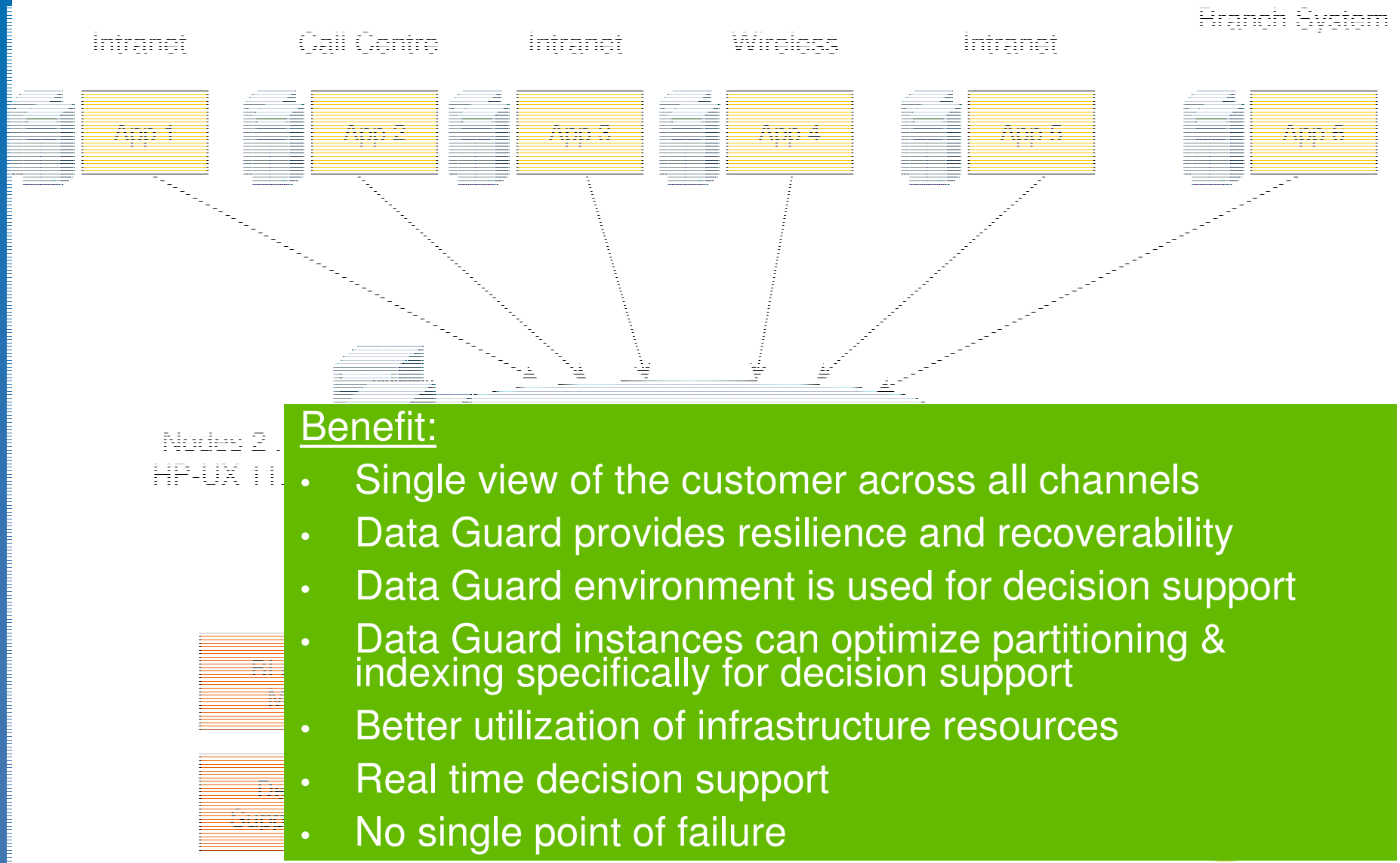
To be considered:

- Applications may have to be changed
- May not be possible for 3rd party applications
- Integration is required to keep legacy data sources in sync

Enterprise Information Architecture



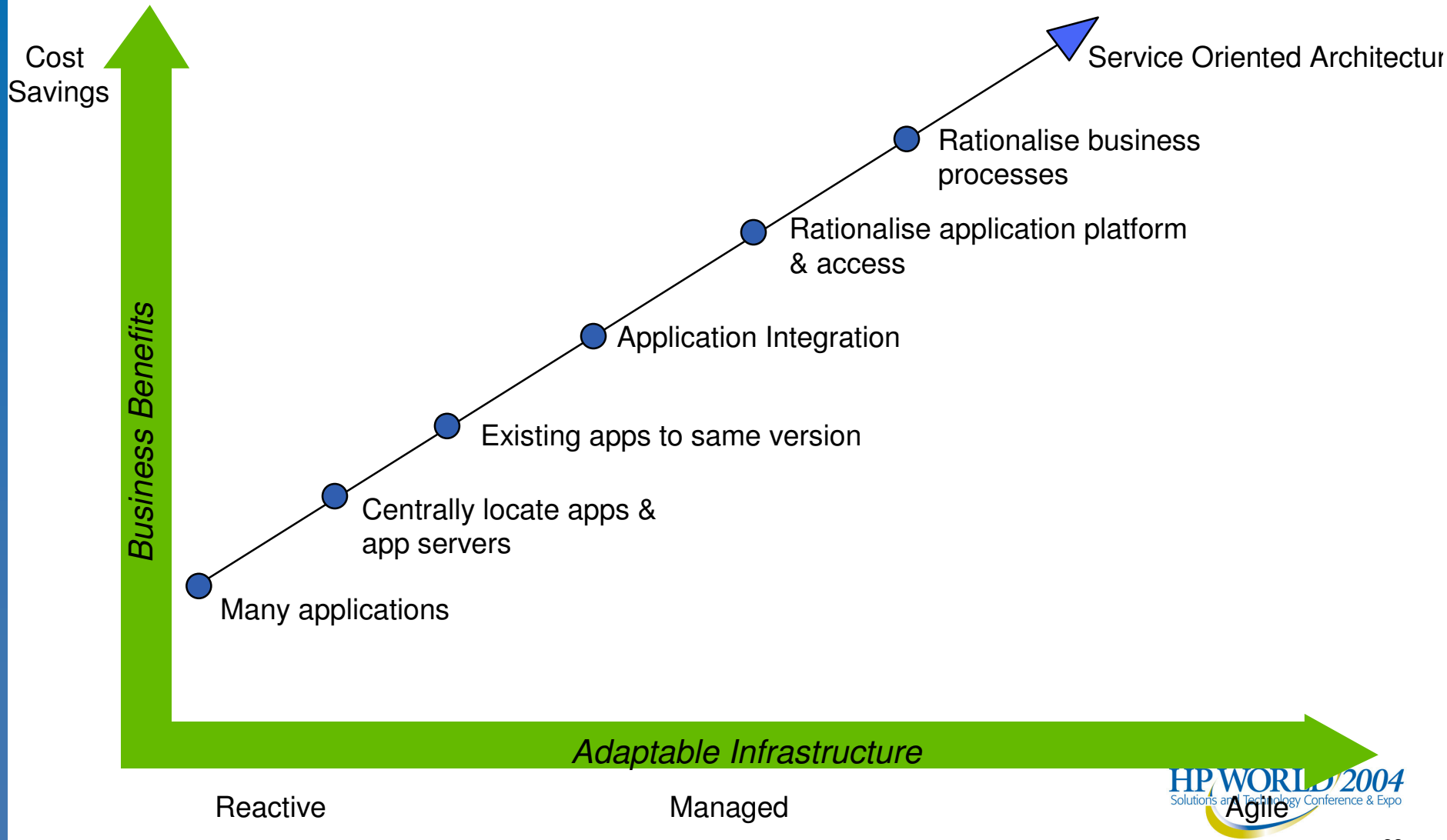
Enterprise Information Architecture



Benefit:

- Single view of the customer across all channels
- Data Guard provides resilience and recoverability
- Data Guard environment is used for decision support
- Data Guard instances can optimize partitioning & indexing specifically for decision support
- Better utilization of infrastructure resources
- Real time decision support
- No single point of failure

Level 3: Application & Application Platform Consolidation



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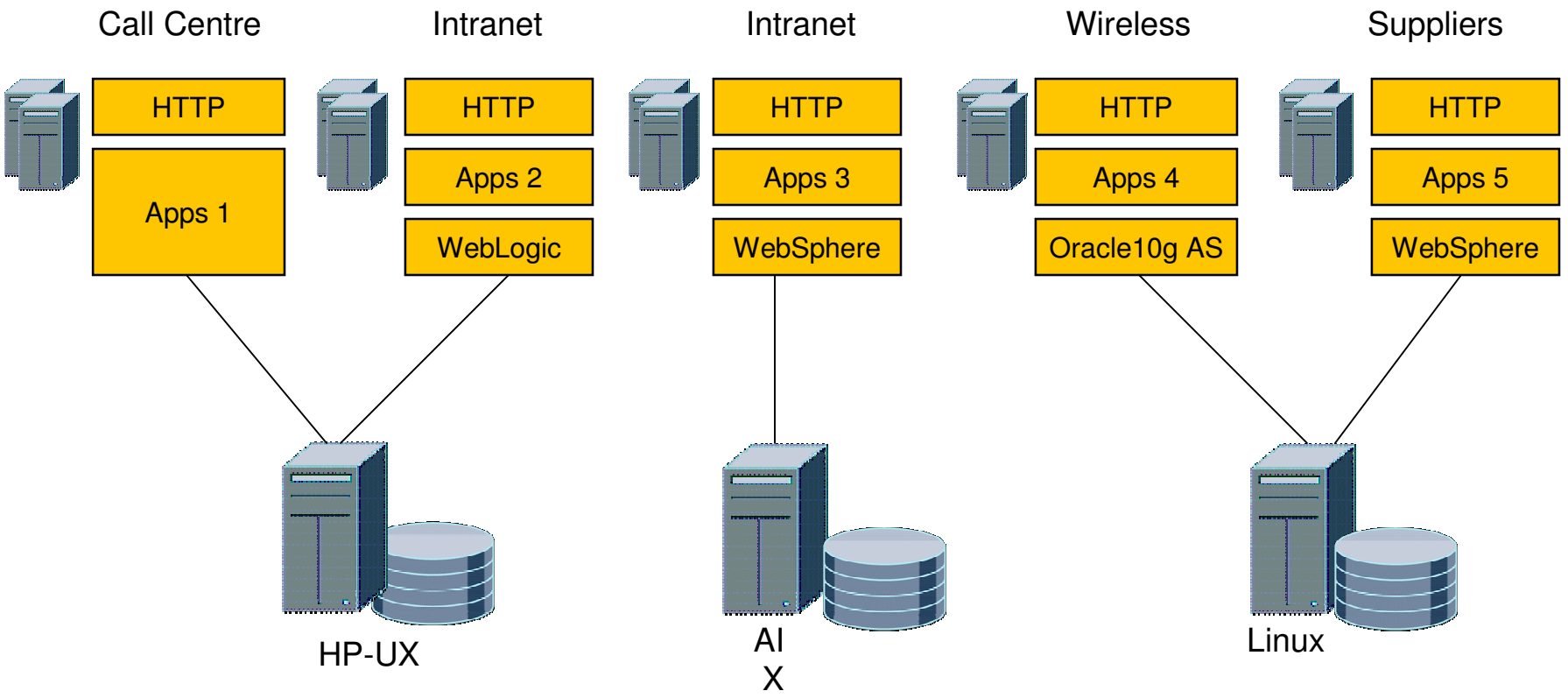

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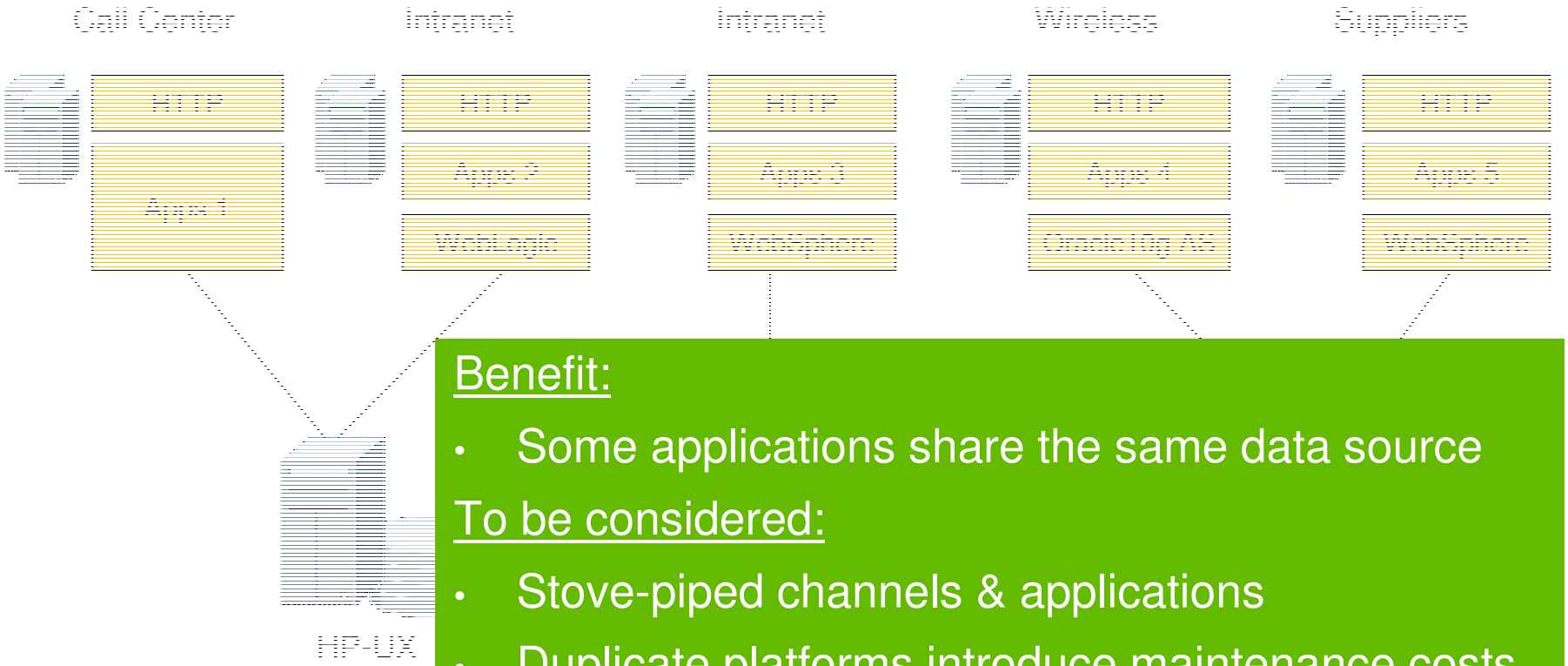


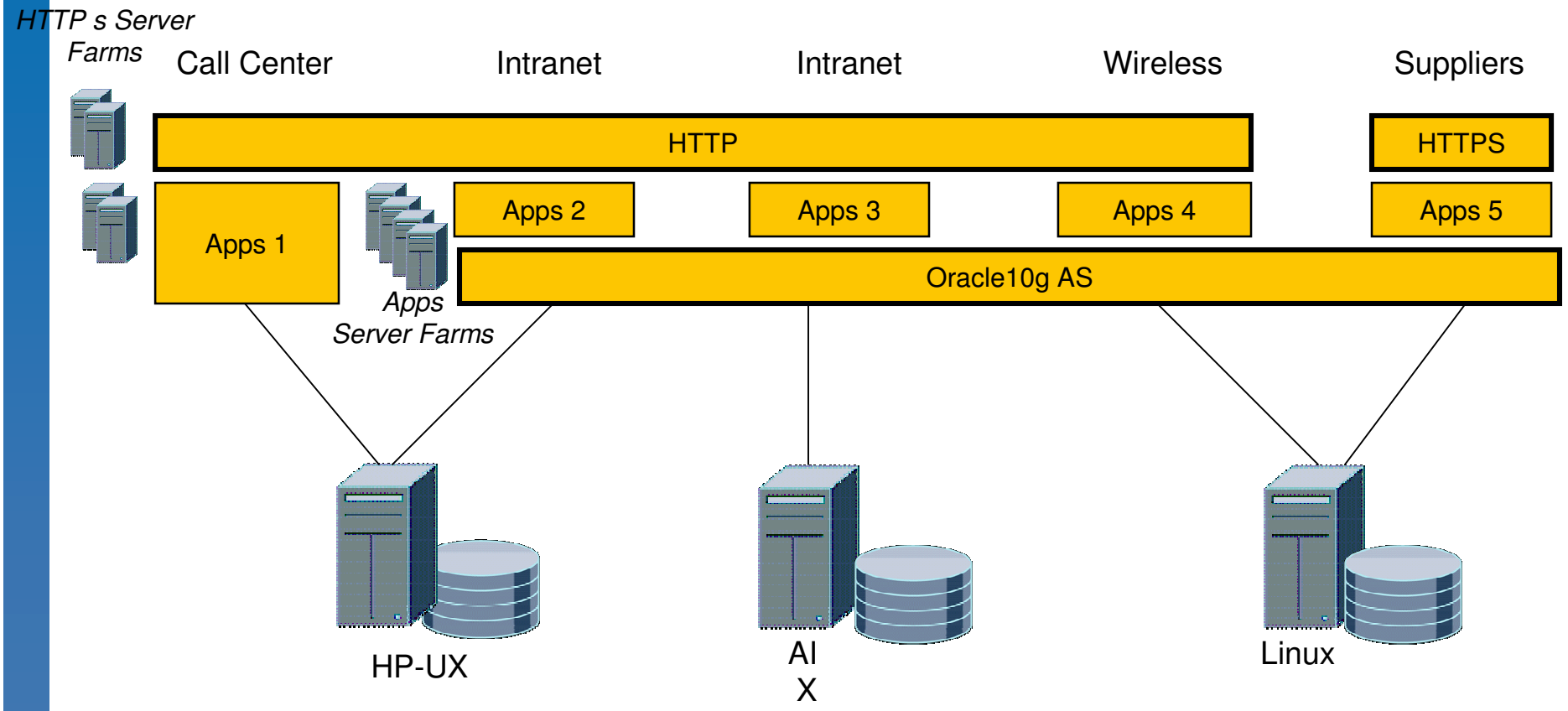
Benefit:

- Some applications share the same data source

To be considered:

- Stove-piped channels & applications
- Duplicate platforms introduce maintenance costs
- Cost of maintaining different application platform
- Vendor costs

Rationalize Web Servers



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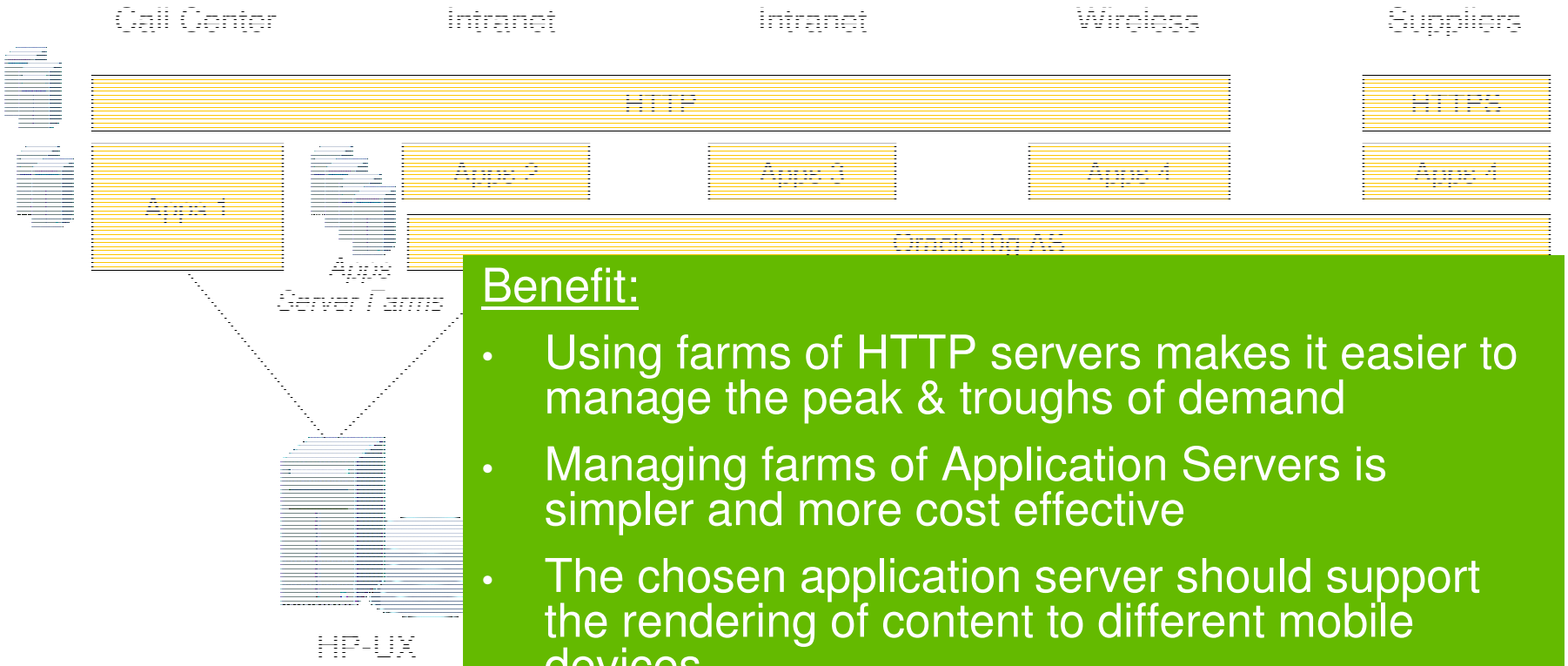


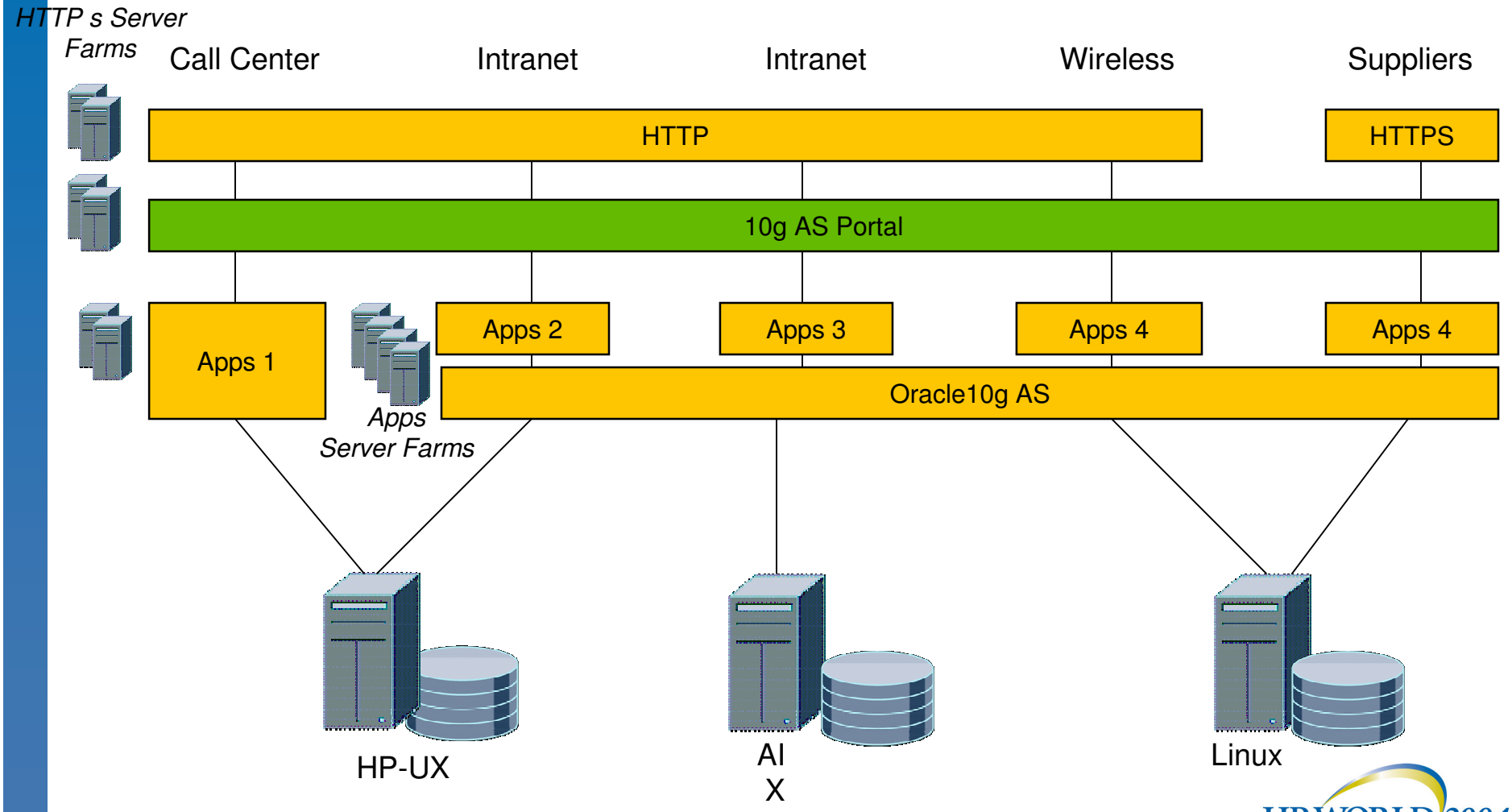
Benefit:

- Using farms of HTTP servers makes it easier to manage the peak & troughs of demand
- Managing farms of Application Servers is simpler and more cost effective
- The chosen application server should support the rendering of content to different mobile devices

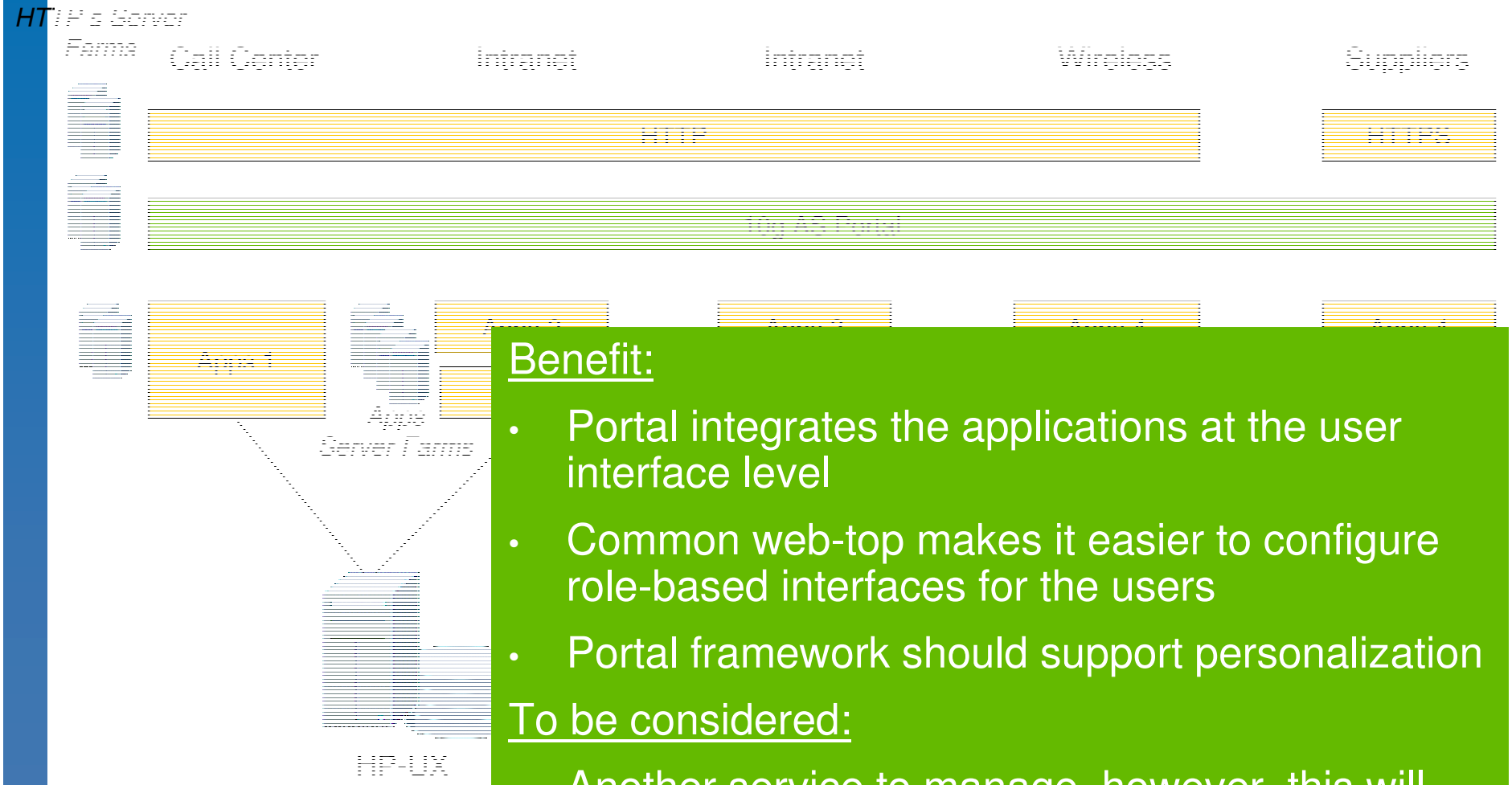
To be considered:

- May need additional hardware load balancing

Web-top for all Applications



Web-top for all Applications



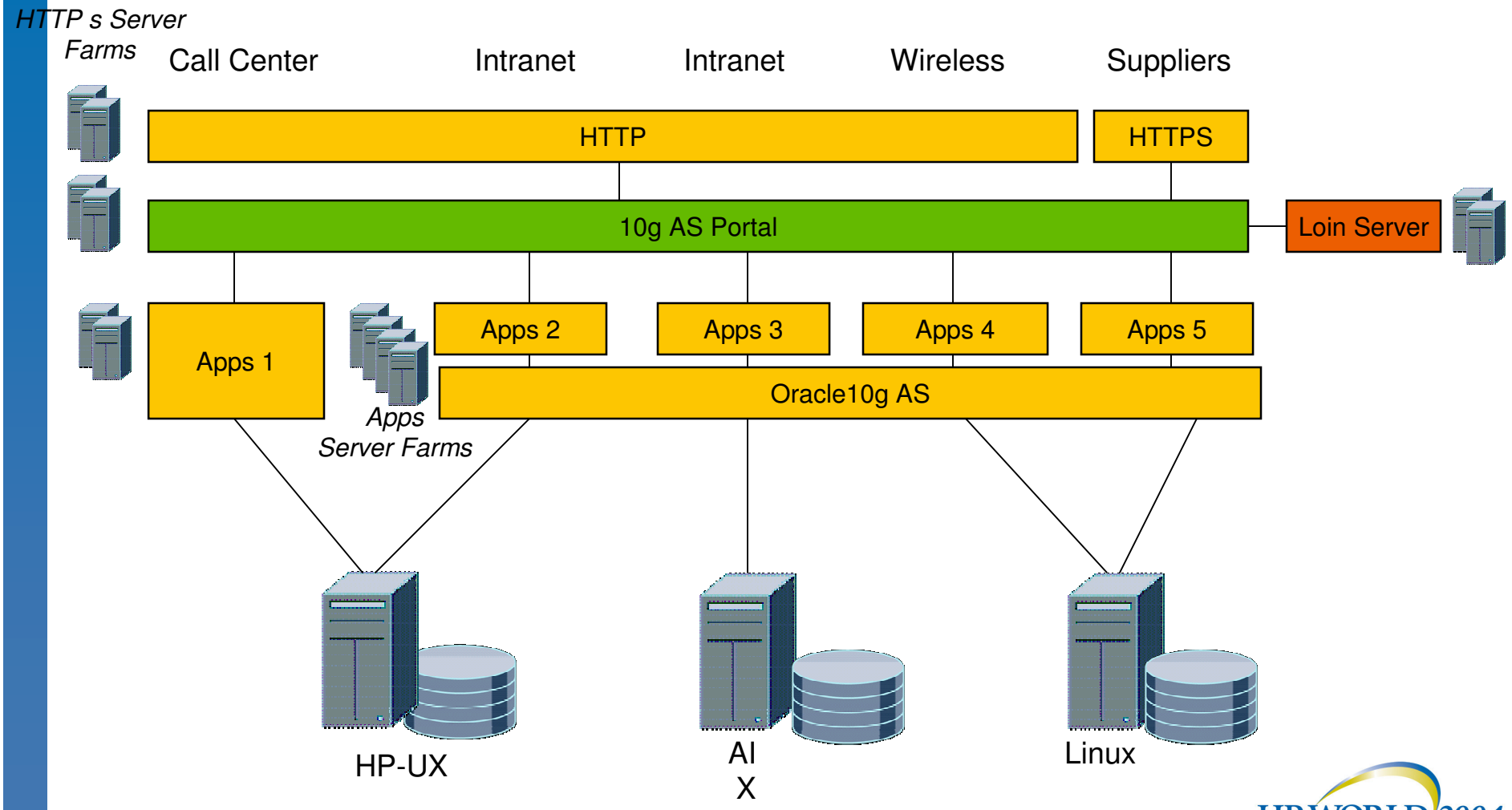
Benefit:

- Portal integrates the applications at the user interface level
- Common web-top makes it easier to configure role-based interfaces for the users
- Portal framework should support personalization

To be considered:

- Another service to manage, however, this will improve the overall manageability of applications

Single Sign-On



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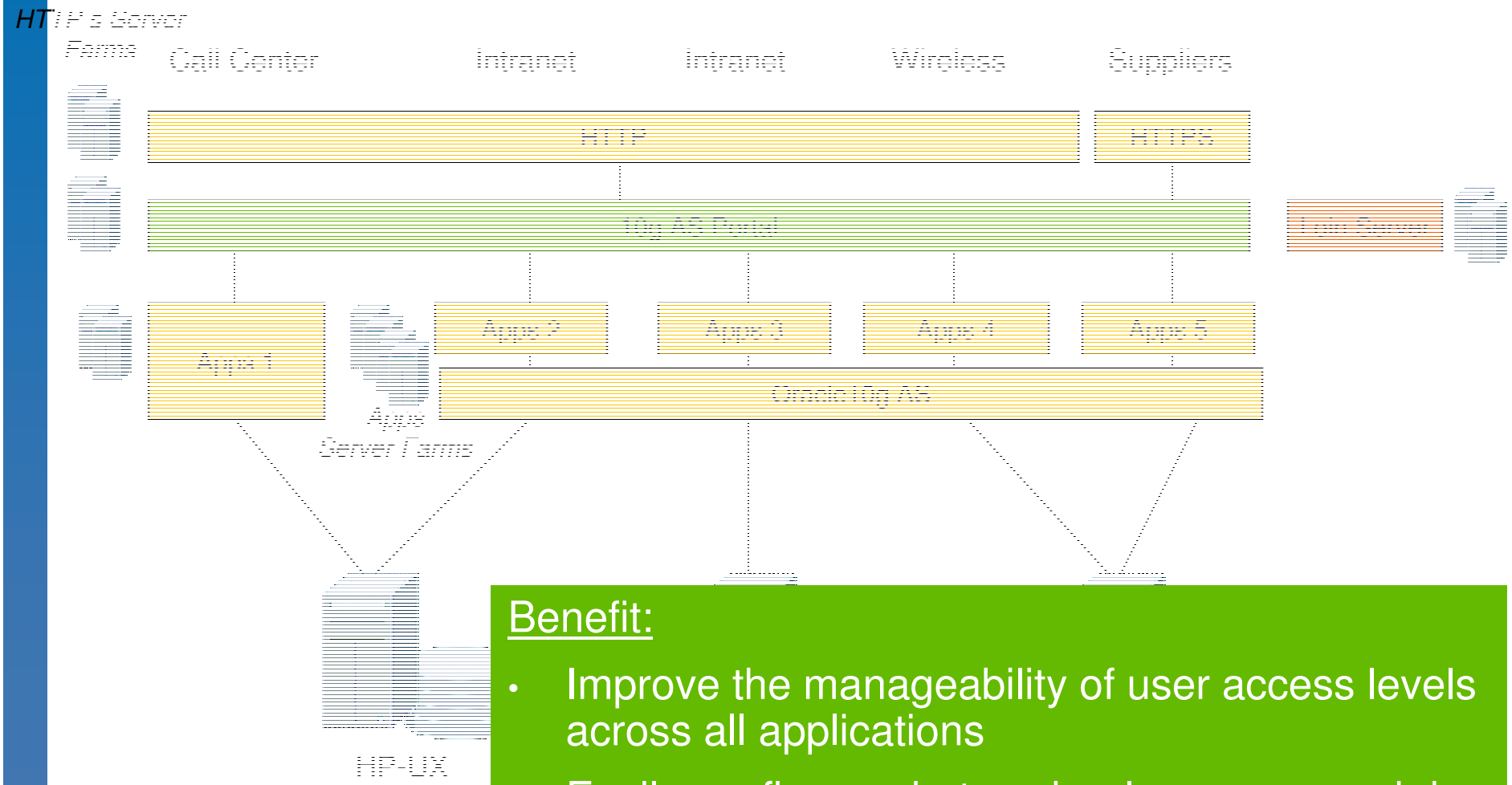
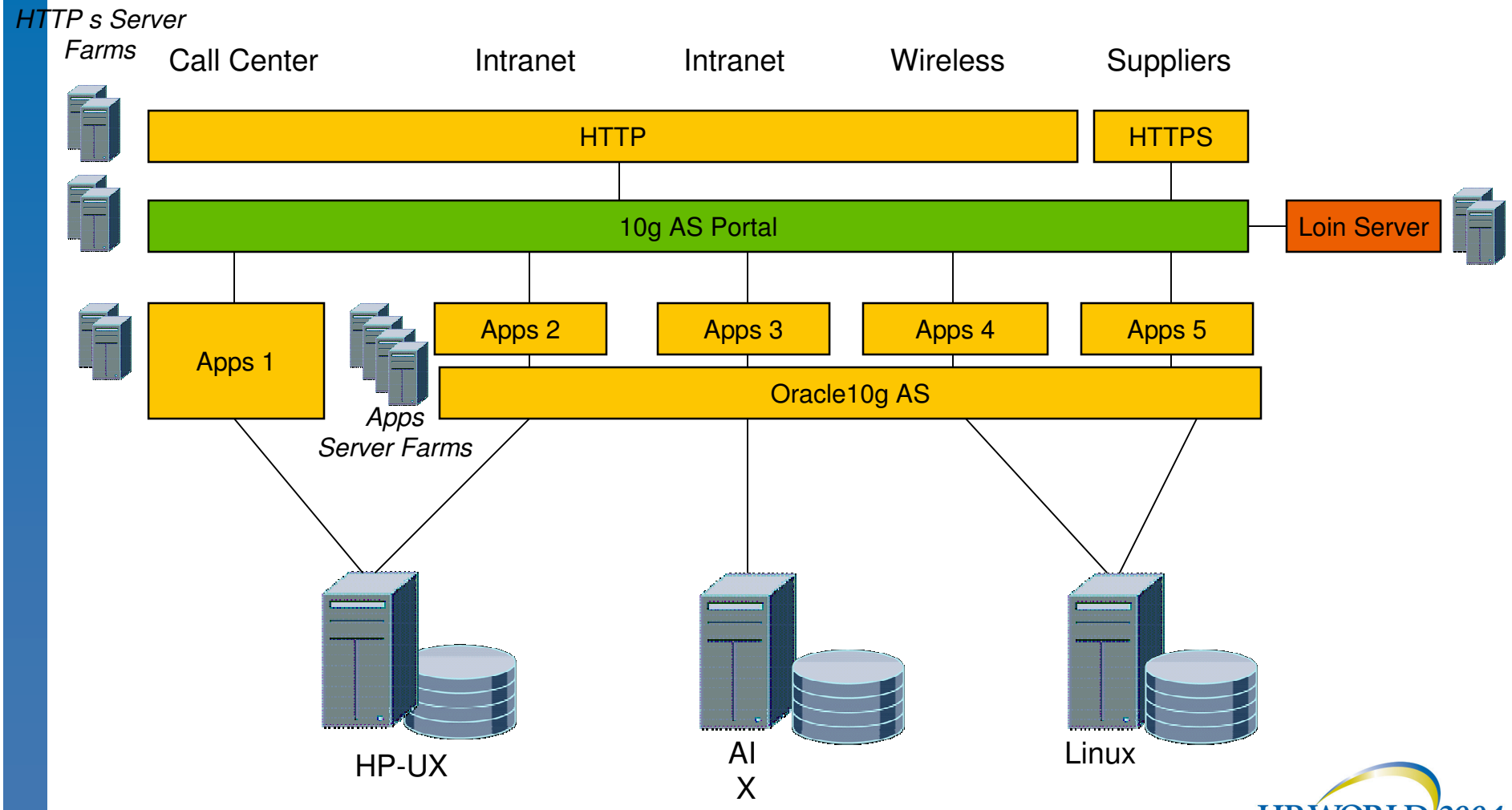


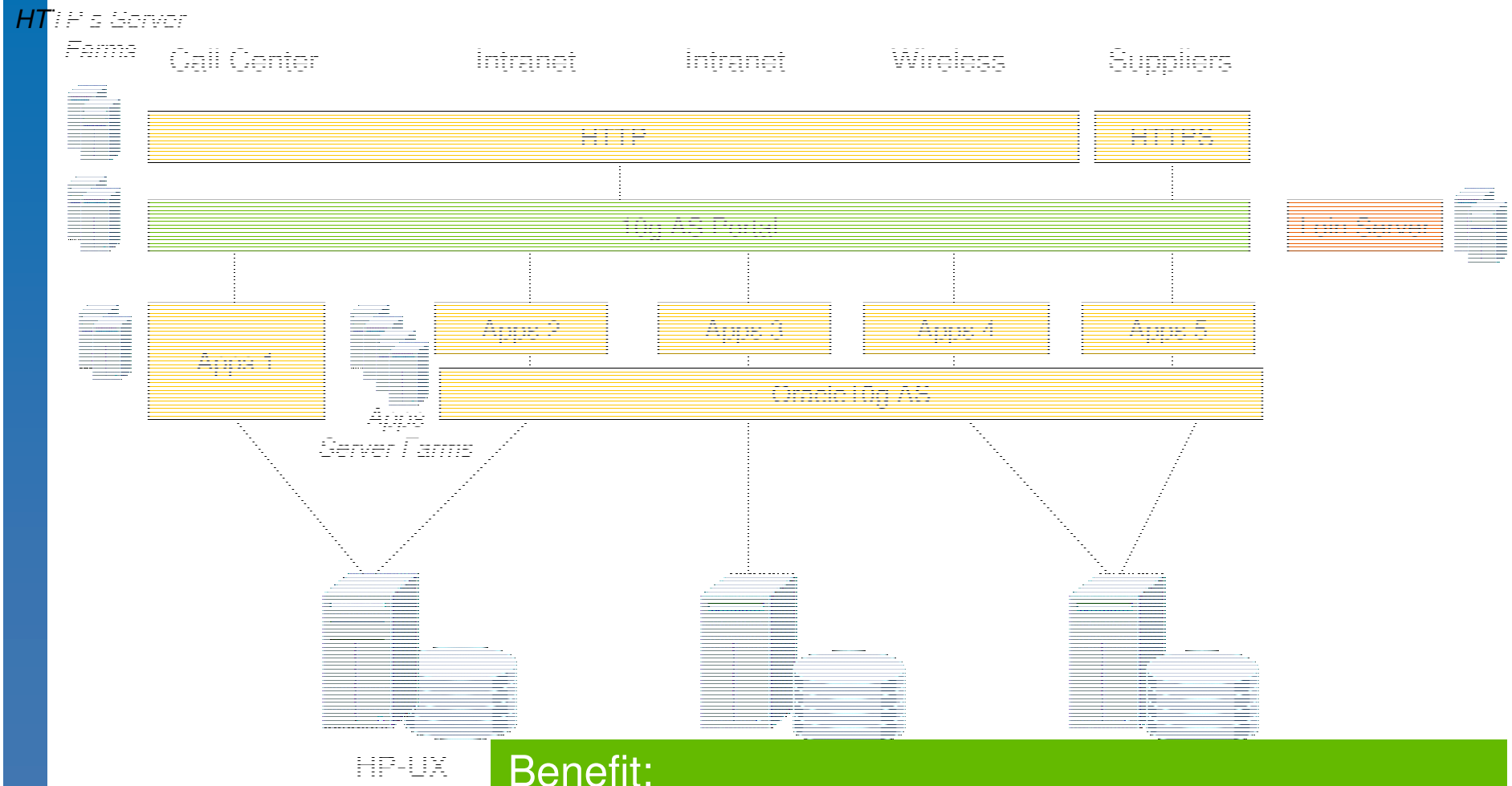
Benefit:

- Improve the manageability of user access levels across all applications
- Easily configure what each role can see and do to the enterprise systems

Mobile & Wireless



Mobile & Wireless



Benefit:

- Enable multi-channel access to all applications

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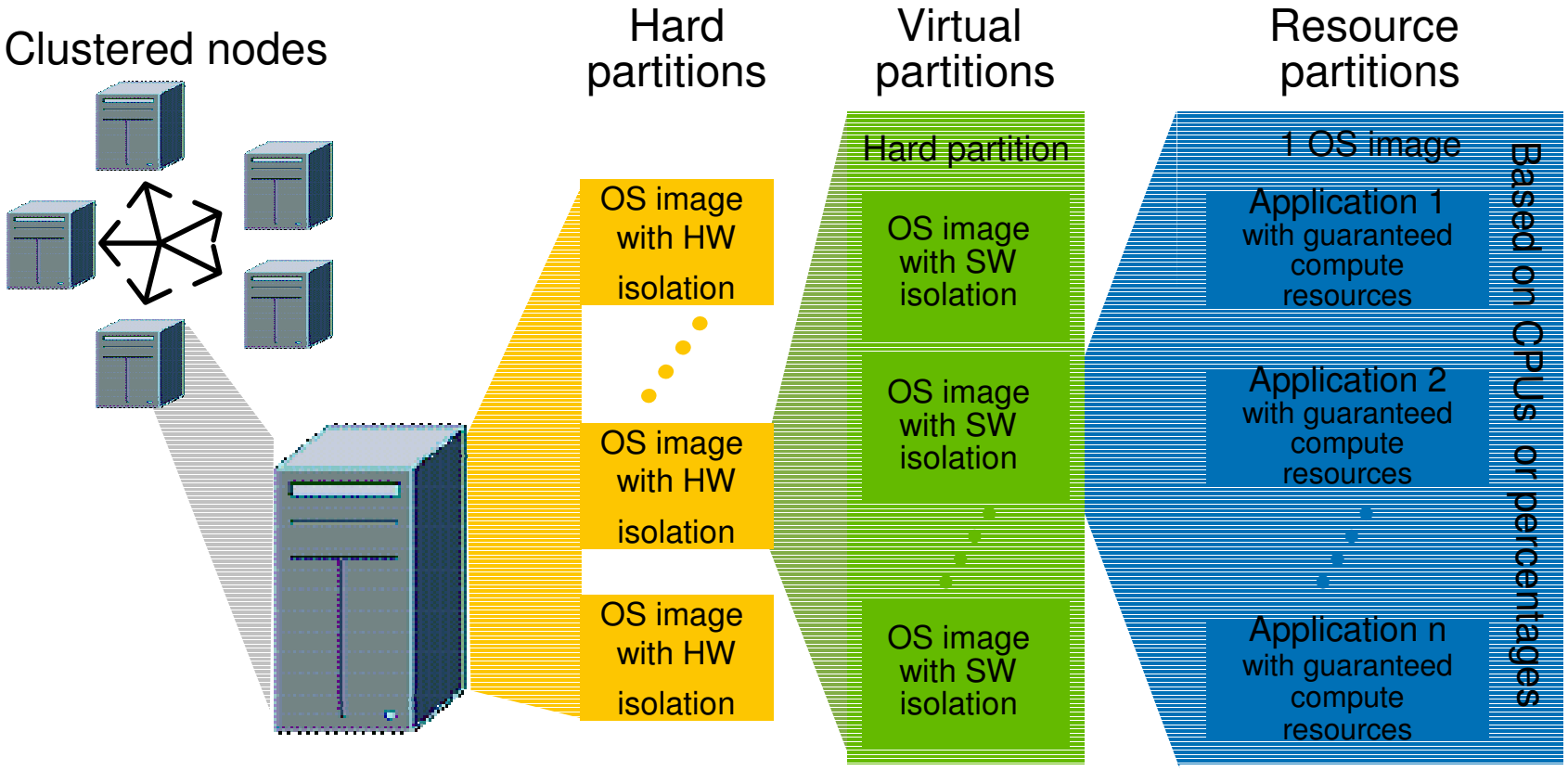
HP's Partitioning Continuum for HP UX



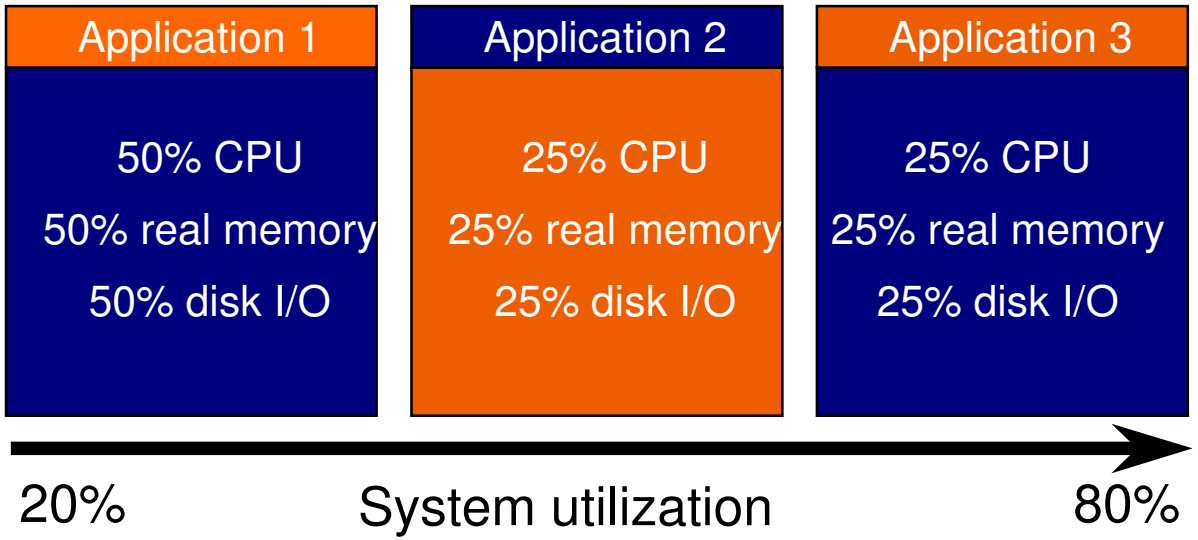
HP-UX Workload Manager

Isolation
highest degree of separation

Flexibility
highest degree of dynamic capabilities

HP Process Resource Manager (PRM)
Predictable service level management

Resource partitions within a single OS image



PRM allows you to drive up system utilization by running more applications per server: the result is a better ROI

HP-UX Workload Manager (WLM)

Examples of Service Level Objectives (SLOs)

Application A	Application B	Application C
Response time SLO	Response time SLO	Job duration SLO
Transactions will complete in less than 2 seconds.	Transaction will complete in less than 3 seconds	Batch job will finish in less than 1 hour.
Priority 1	Priority 2	Priority 3

HP-UX WLM automatically reconfigures CPU resources to satisfy SLOs in priority order

Managing the HP Partitioning Continuum for HP-UX

The power of HP Systems Insight Manager and HP OpenView

nPartition 1
for production environment 1

nPartition 2
for production environment 2

vPar A

vPar B

HP System Insight Manager
- Single-point, multi-system management
- Management for rapid deployment and consistency
- Grouping functions of commands for multi-systems
- Role-based security

Parmgr & vParmgr
- Creates & configures partitions
- Maps partition architecture

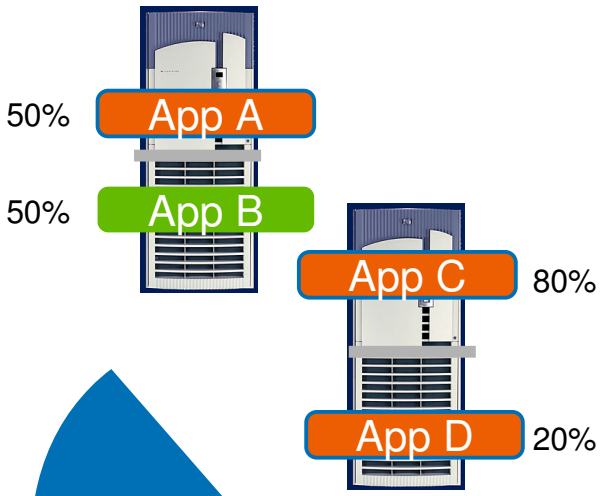
Ignite-UX
- Rapid deployment

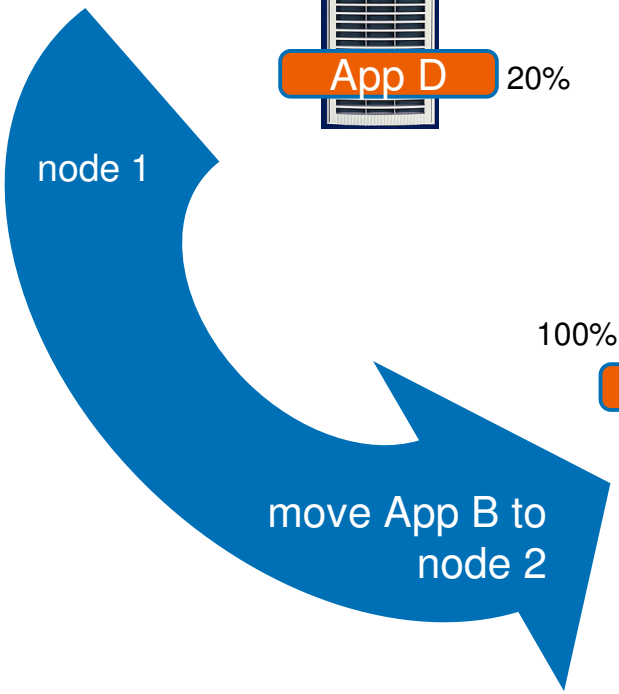
HP-UX Workload Manager
- automatic workload management by pre-defined Service Level Objectives

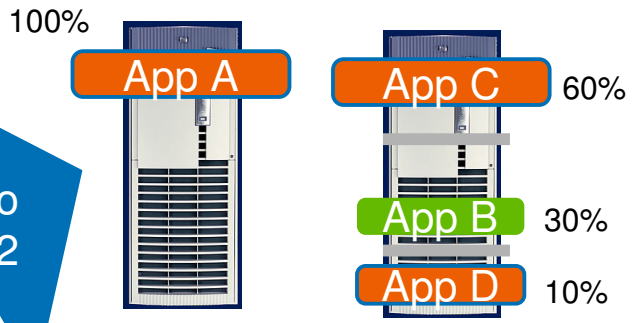
HP OpenView GlancePlus Pak
- Monitors performance of each partition

HP OpenView Operations
- Monitors events on each partition

HP Virtual Server Environment in action: Optimized utilization in a clustered environment







- Serviceguard package transfers from one node or partition to another – for maintenance or in case of failure
- HP-UX Workload Manager automatically reallocates resources
- Based on HP-UX 11i Mission Critical Operating Environment

HP Virtual Server Environment in action
Customer scenarios

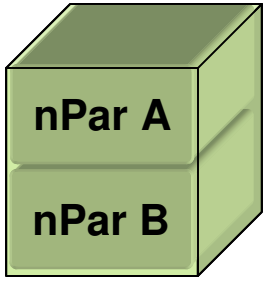
A

Optimizing cluster utilization within a data center

B

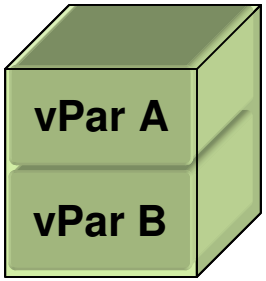
Optimize utilization across data centers for disaster tolerance

C



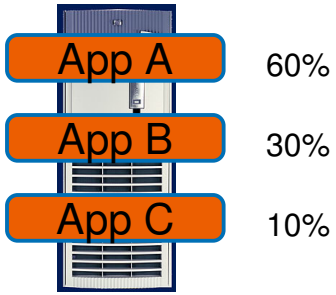
Consolidating multiple production environments on the same server

D



Consolidating of test/ dev and production on the same server

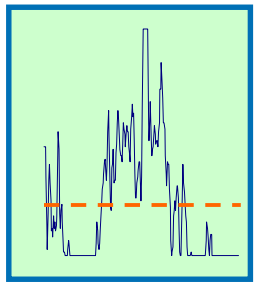
E



node 1

Consolidation through application stacking within the same OS image

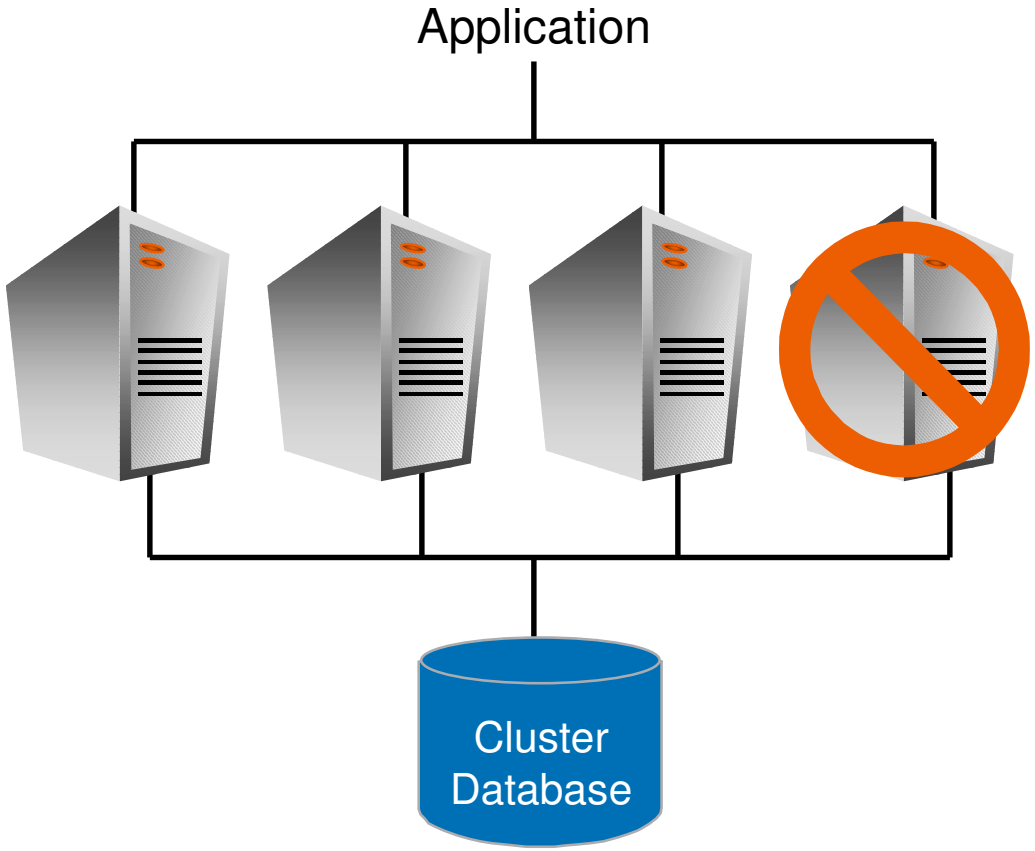
F



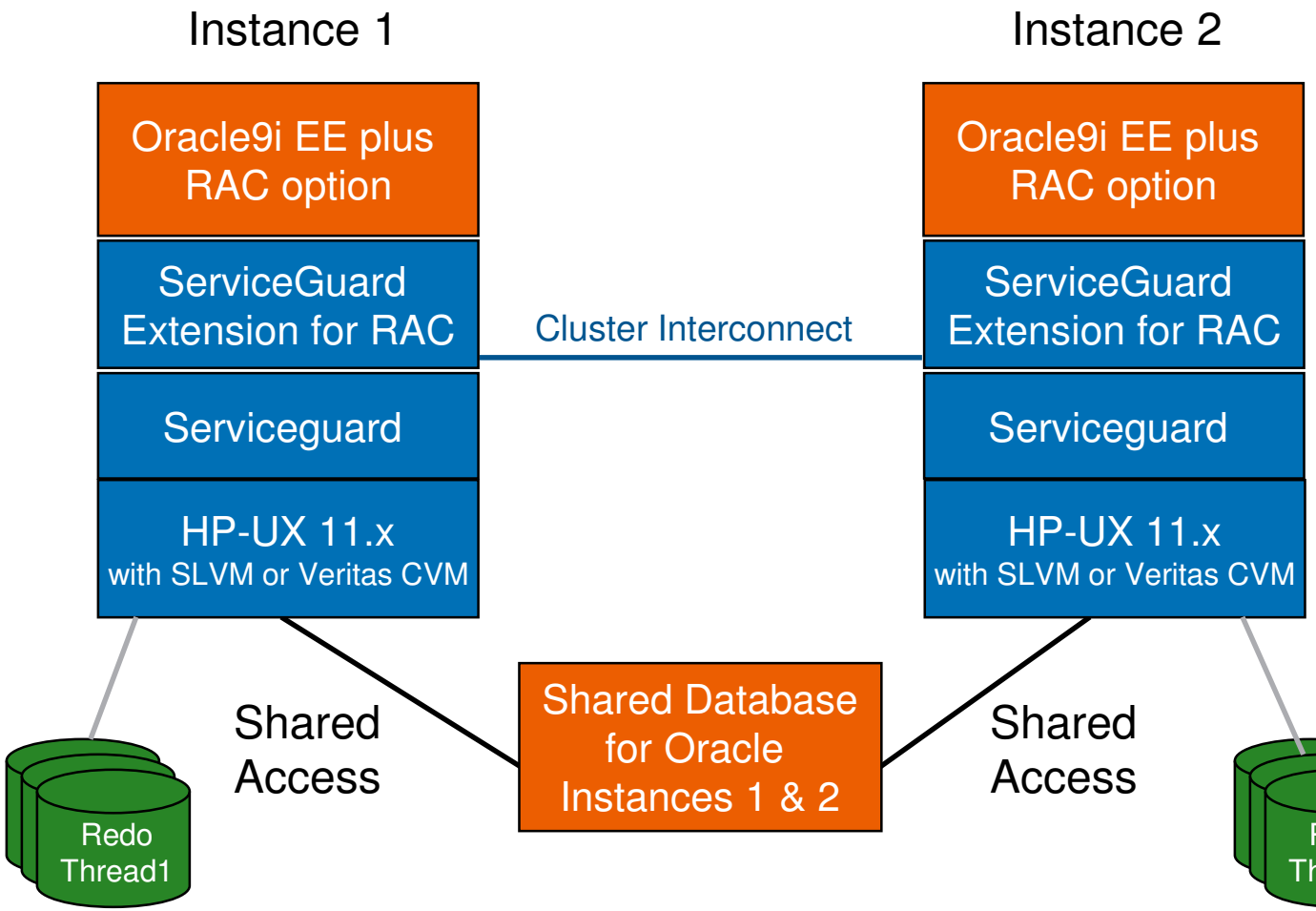
- Instantaneously available resources for a growing environment - iCOD
- addressing high fluctuation - PPU

Oracle9*i* Real Application Clusters

- High Availability - more computers = more reliable
- Scalability - more computers = more speed



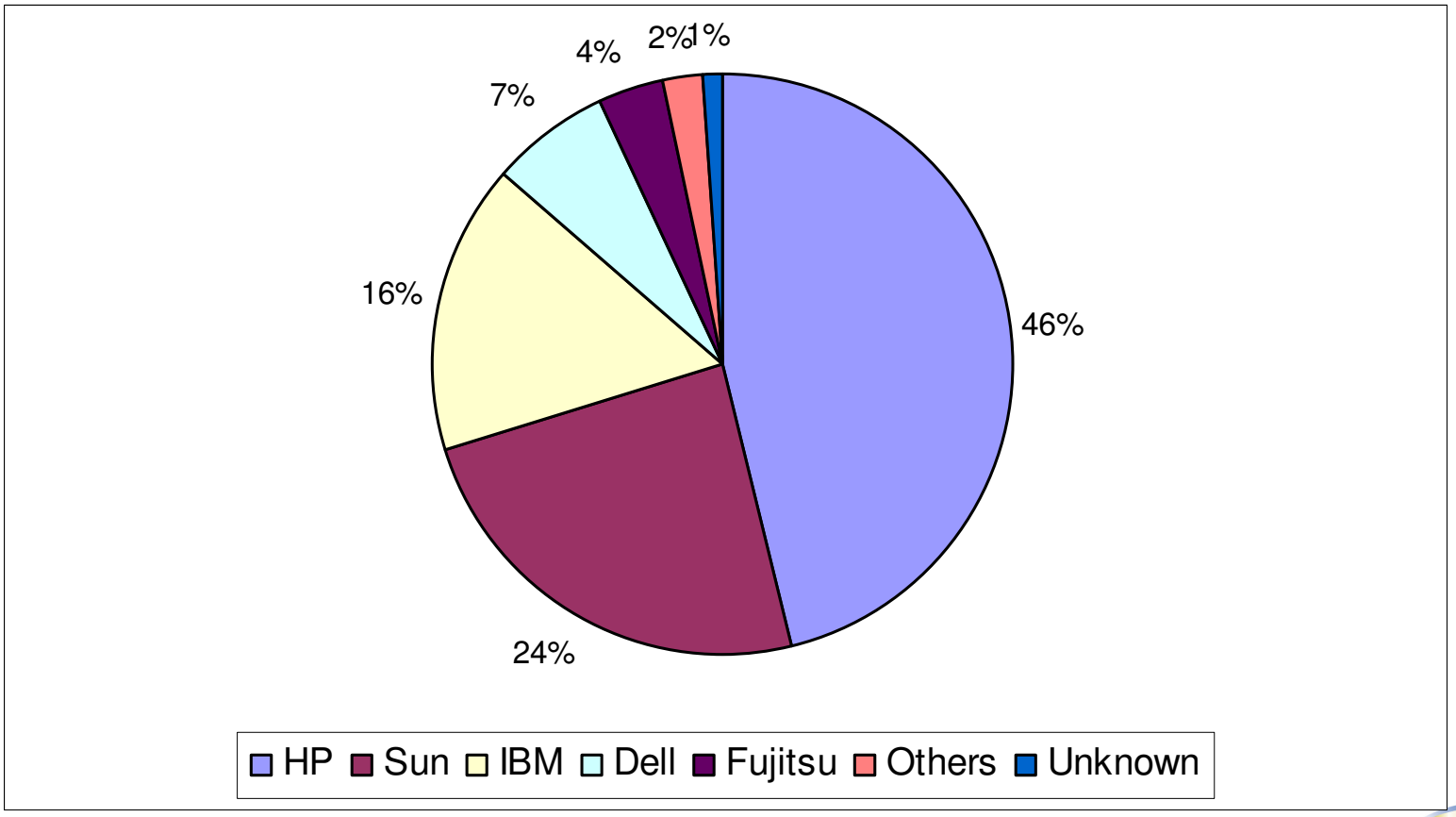
Oracle9*i* RAC Software Stack on HP-UX



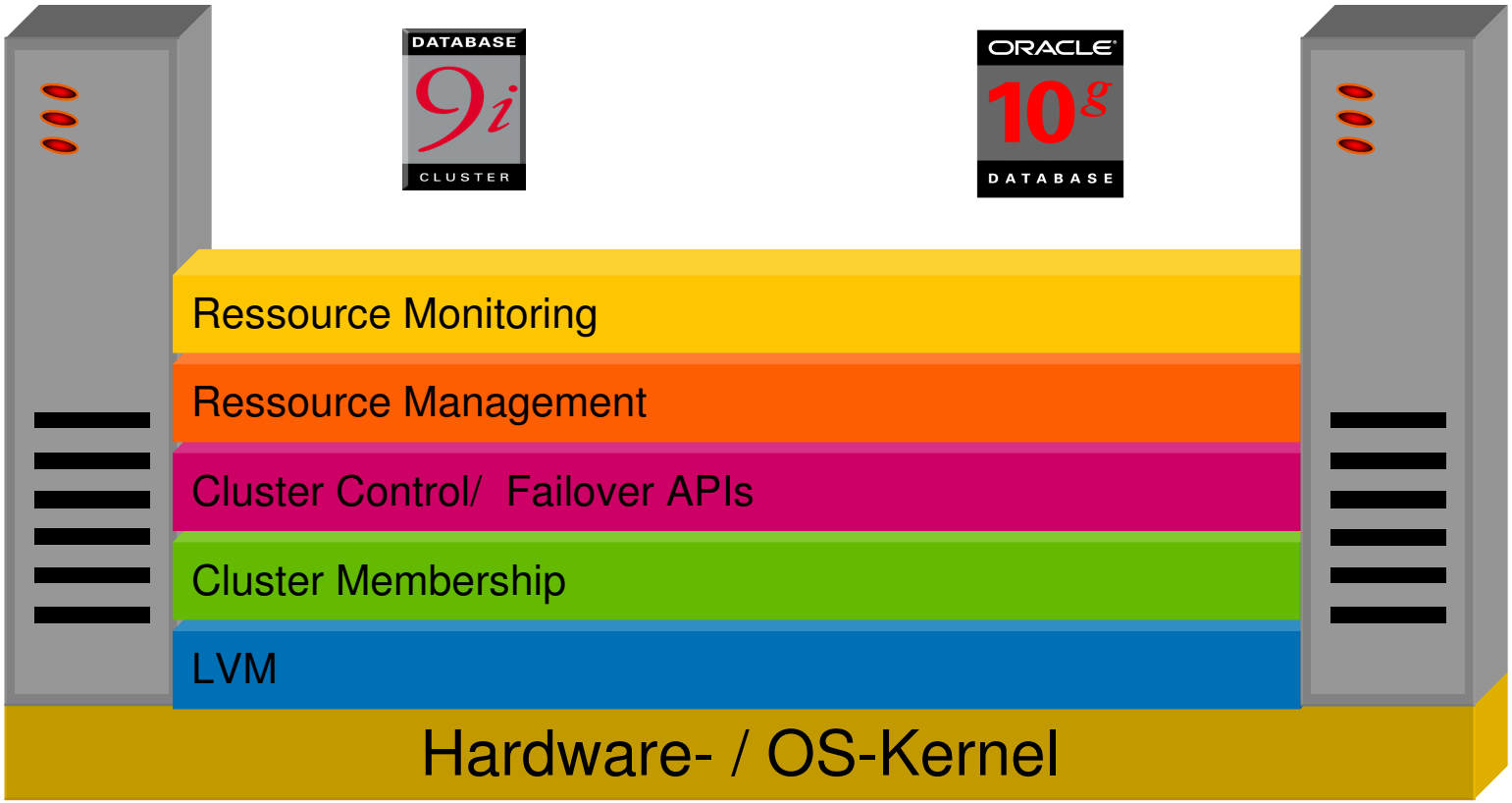
Oracle9i RAC on HP

- ✓ Fully engineered solutions
  - Benchmarking
    - Oracle Applications on HP-UX with scalability of 1.9
    - TPC-C Benchmark on Linux and Windows
    - SAP Benchmark on HP Tru64 with scalability of > 1.85)
  - Oracle versions certified on HP platforms
  - Pre-configured & pre-tested configurations
  - Best practices Blueprints
- ✓ Full Range of offerings
  - From ProLiant up through SuperDome
  - HP-UX, Tru64 Unix, Windows & Linux, OpenVMS
- ✓ References

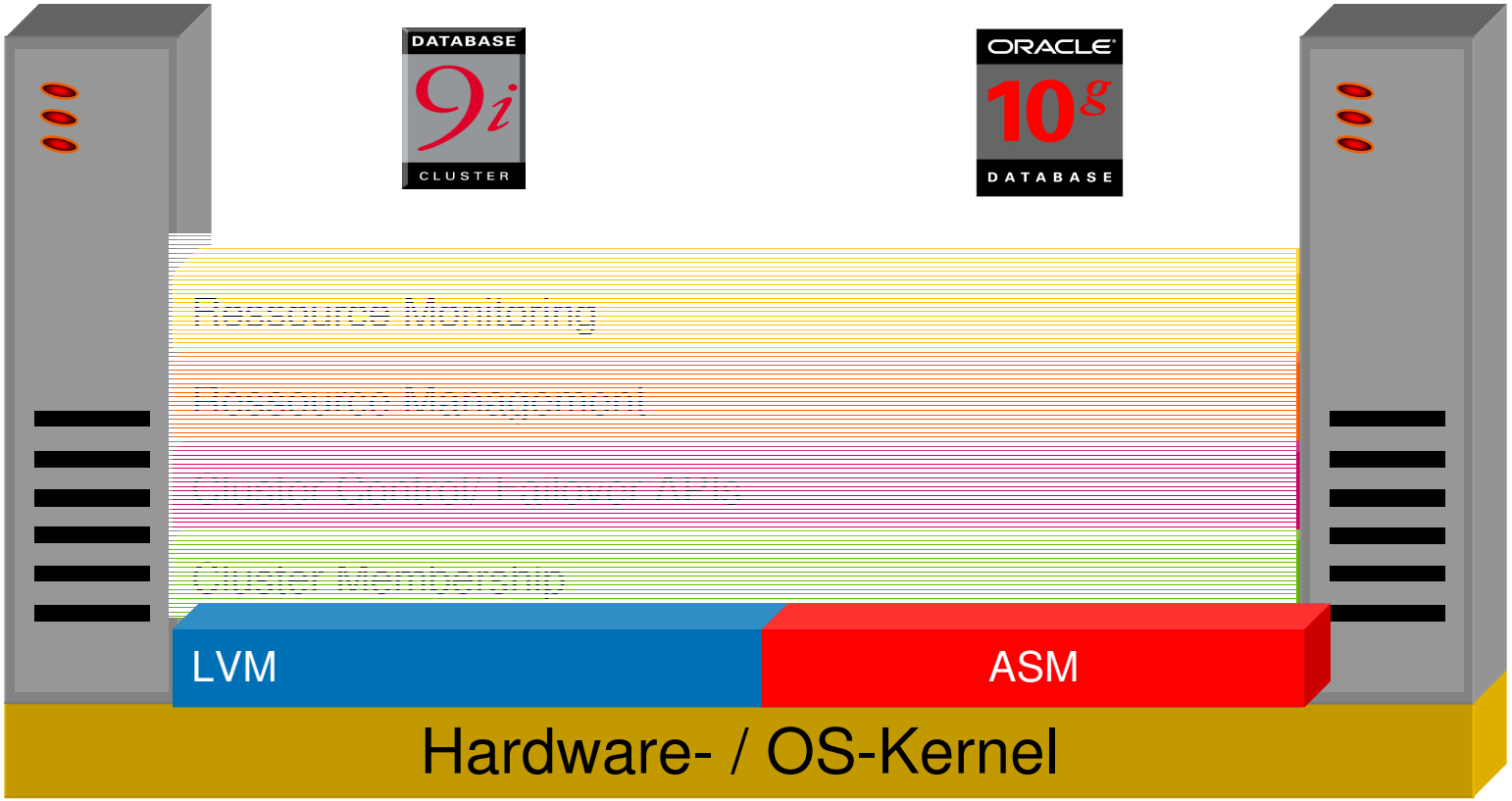
9i RAC installations per platform



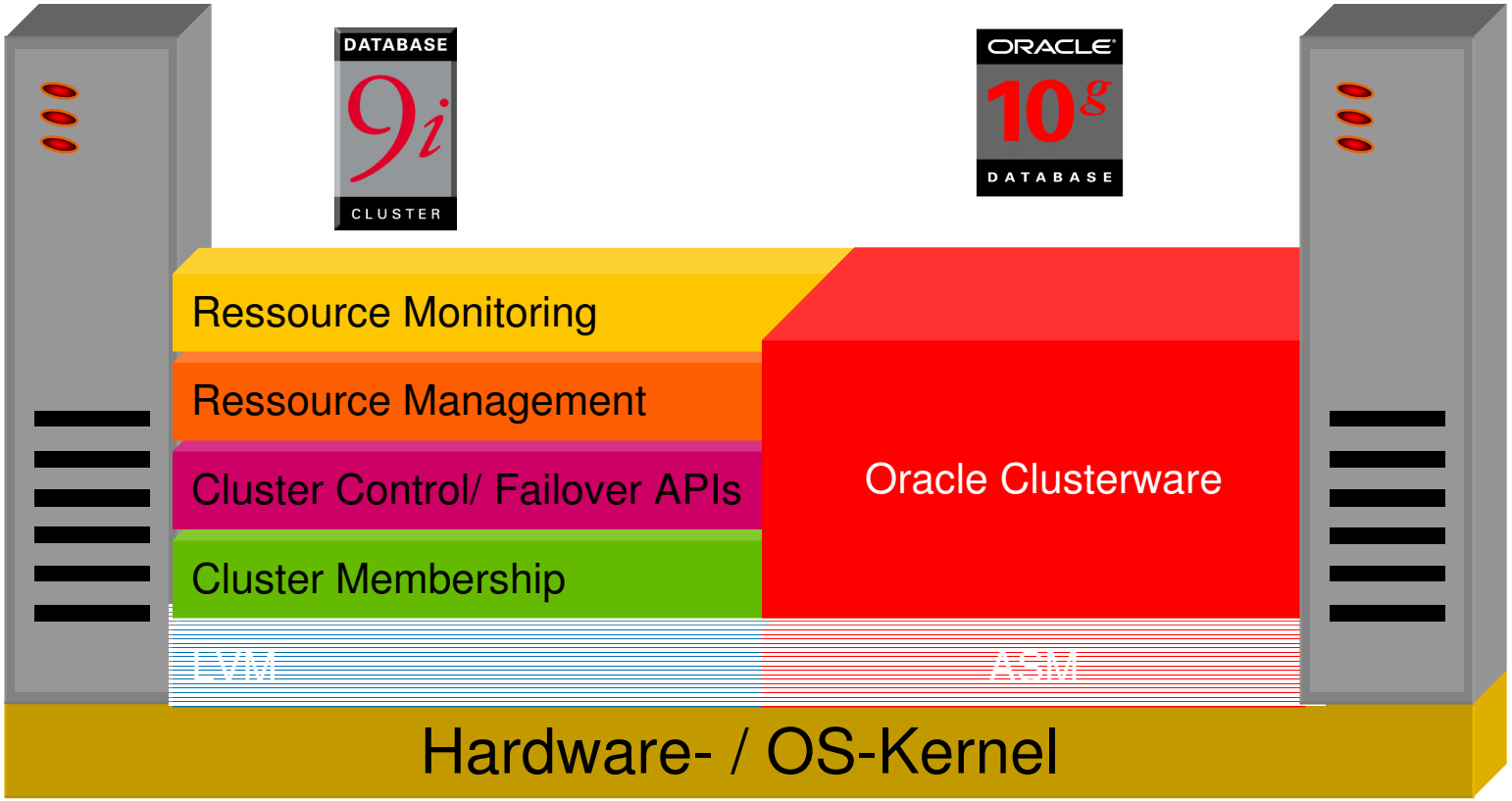
Oracle10*g* RAC Architecture



Oracle10*g* RAC Architecture
new Automatic Storage Management



Oracle10*g* RAC Architecture
new Oracle Clusterware



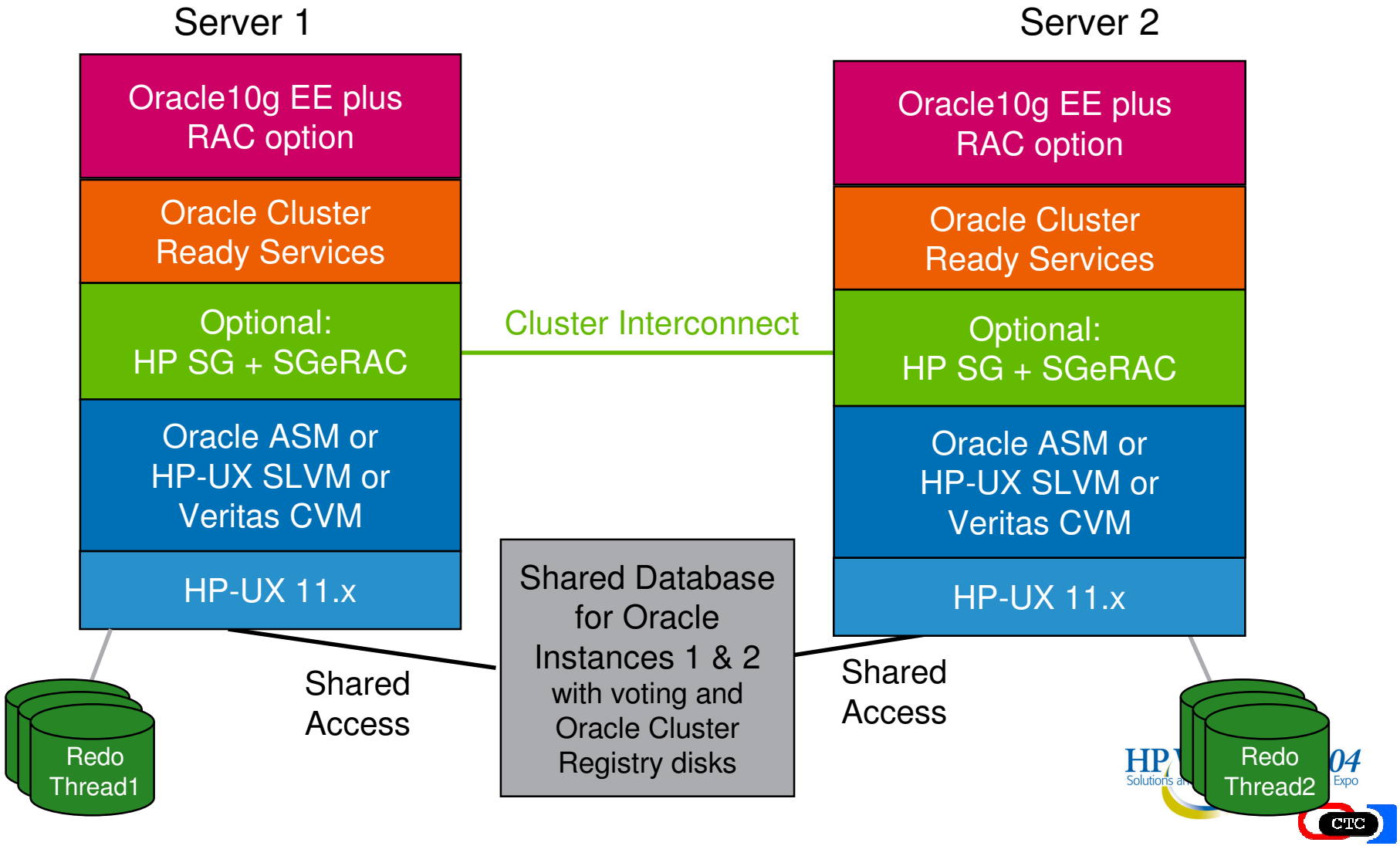
How does Oracle Clusterware relate to HP Serviceguard?

- CRS provides many of the monitoring and failover capabilities seen in Serviceguard.
- However, CRS is intended for use primarily with Oracle database services and resources.
- HP Serviceguard is still recommended for high availability of 3rd party applications.
- SG runs at a realtime priority to provide reliable node membership information even on very busy systems. CRS does everything at a user level and, therefore, has some disadvantages when compared to Serviceguard.
- Serviceguard is required for any customer that is using (S)LVM or CVM for their shared storage.

How does Oracle Clusterware relate to HP Serviceguard?

- CRS network monitoring has limitations
  - Ping only ensures that the IP is configured locally. Even if there are serious network failures (cable disconnect, failed NIC, subnet failure, etc) a ping of the local VIP will continue to return success because the network stack simply goes into loopback mode.
  - CRS only monitors the VIP addresses. It does not monitor any other network interfaces on the system.
  - CRS does not monitor the cache fusion cluster interconnect.
  - CRS does not support IPv61.
- SGeRAC can improve the reliability of the network under CRS.
  - If a backup NIC is configured, SGeRAC can failover the LAN and all of its associated IP addresses (including the VIP) so that client connections won't know the difference.
  - SGeRAC can also be used to monitor and provide increased availability for other networks on the system, incl. the cluster interconnect and IPv6 networks.
- In a non-SGeRAC environment, HP's LAN Monitor (LM) product can also be used to eliminate SPOF in the network.

Oracle10*g* RAC
software stack on HP-UX

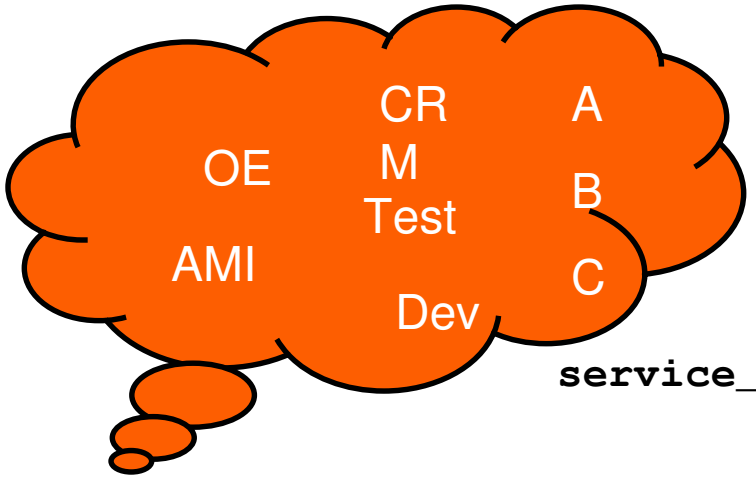


Automatic Workload Management

- Application workloads can be defined as Services
  - Individually managed and controlled
  - Services specified in TNS connect data
  - Assigned to instances during normal startup
  - On instance failure, automatic re-assignment
  - Service performance individually tracked
  - Rules specify automatic resource allocations
    - PREFERRED instances during normal conditions
    - AVAILABLE instances should failures occur

Workload Management and New Service Concept

Customer Applications

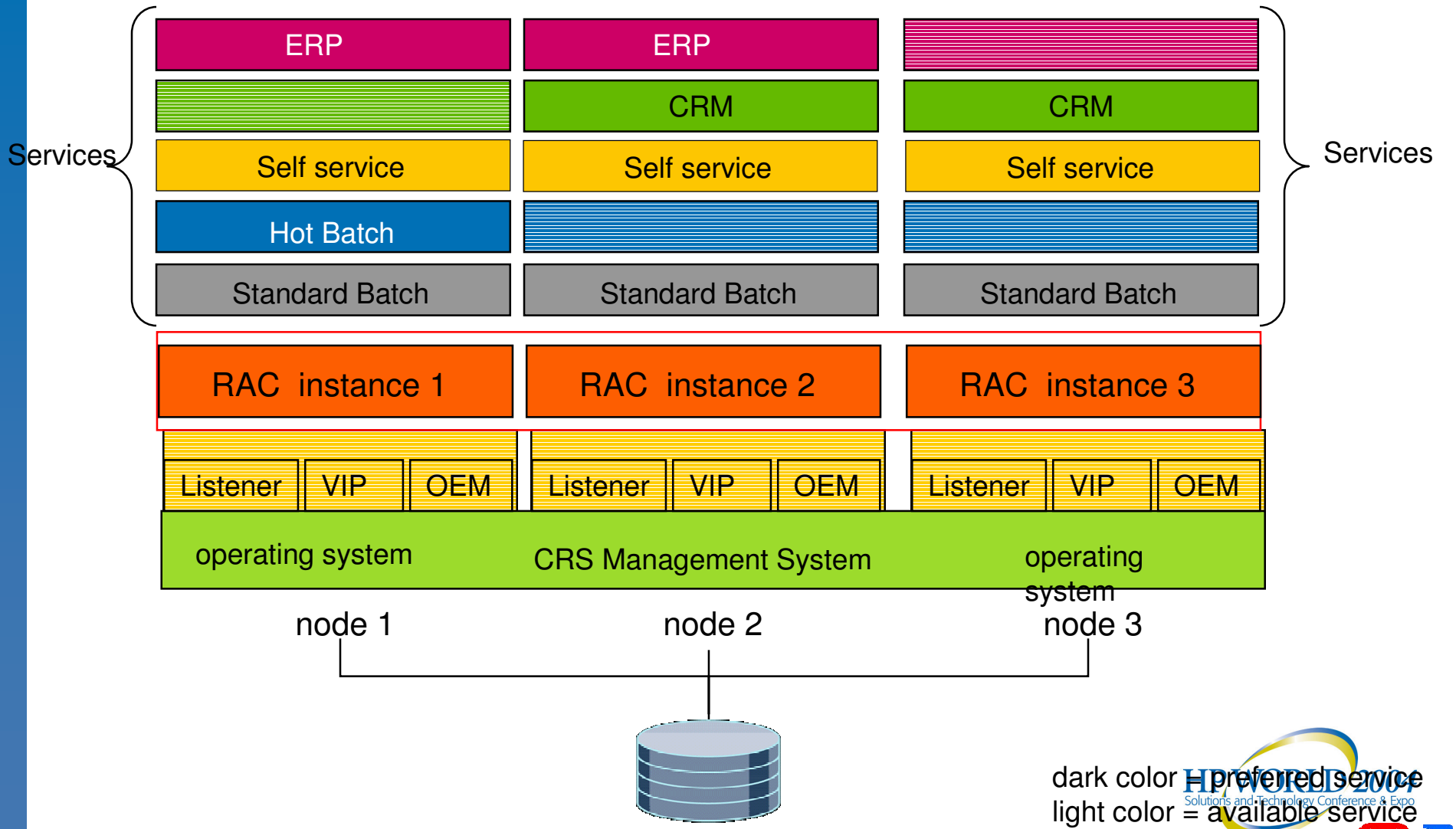



```
service_name = RAC
```

Database Server

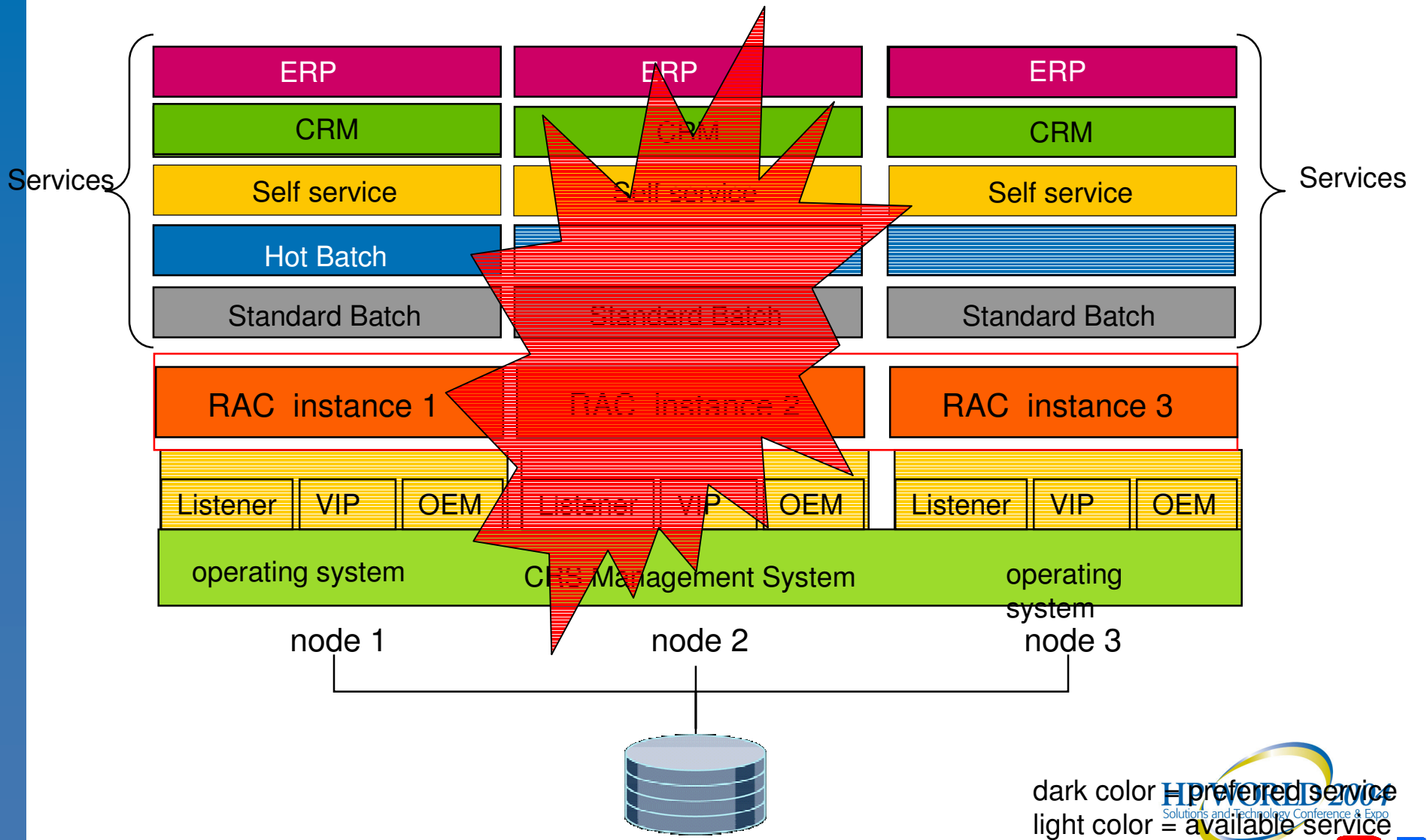
Shared Storage

RAC 10*g* Instances and Services



dark color = preferred service
light color = available service

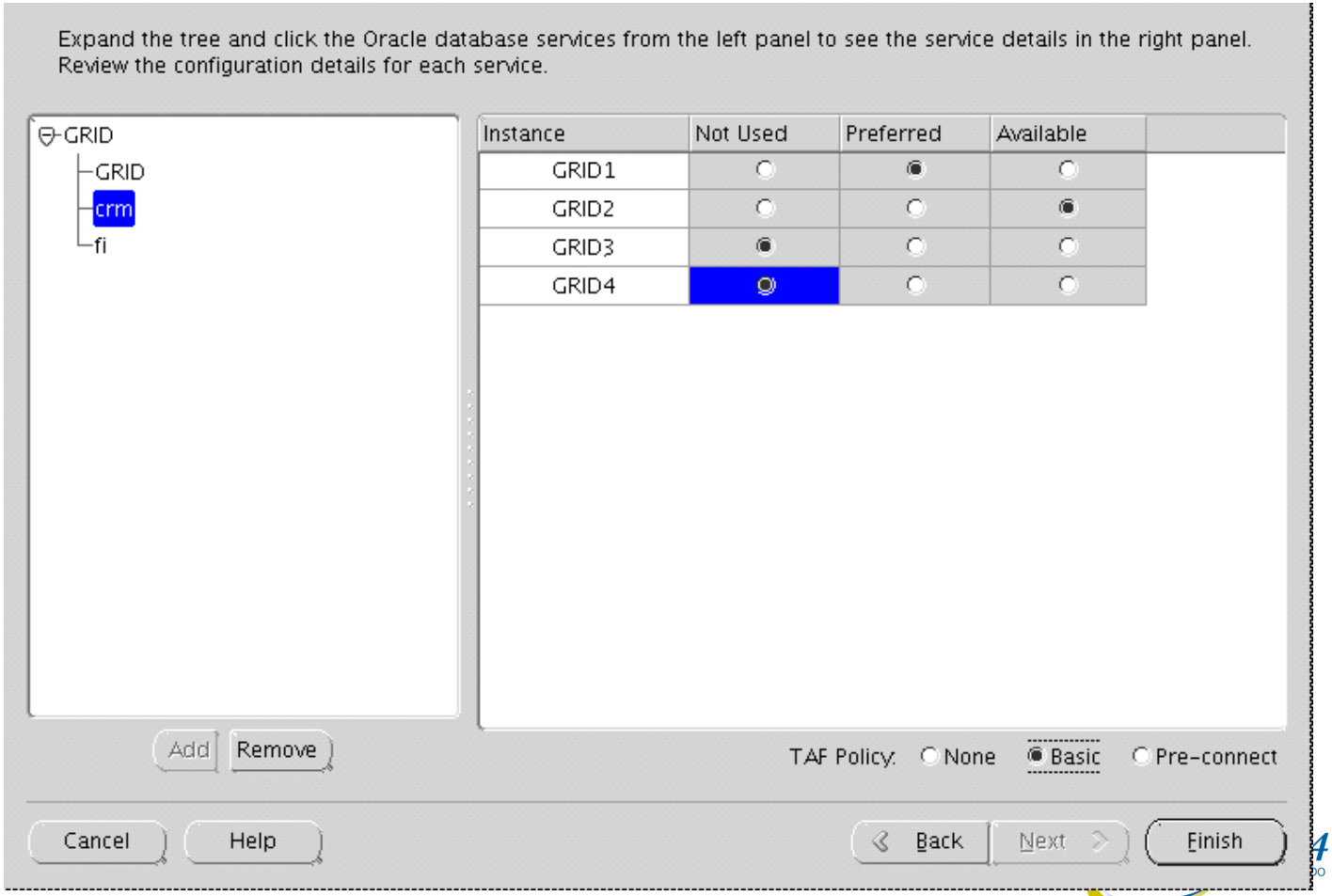
RAC 10*g* Instances and Services



dark color = preferred service
light color = available service

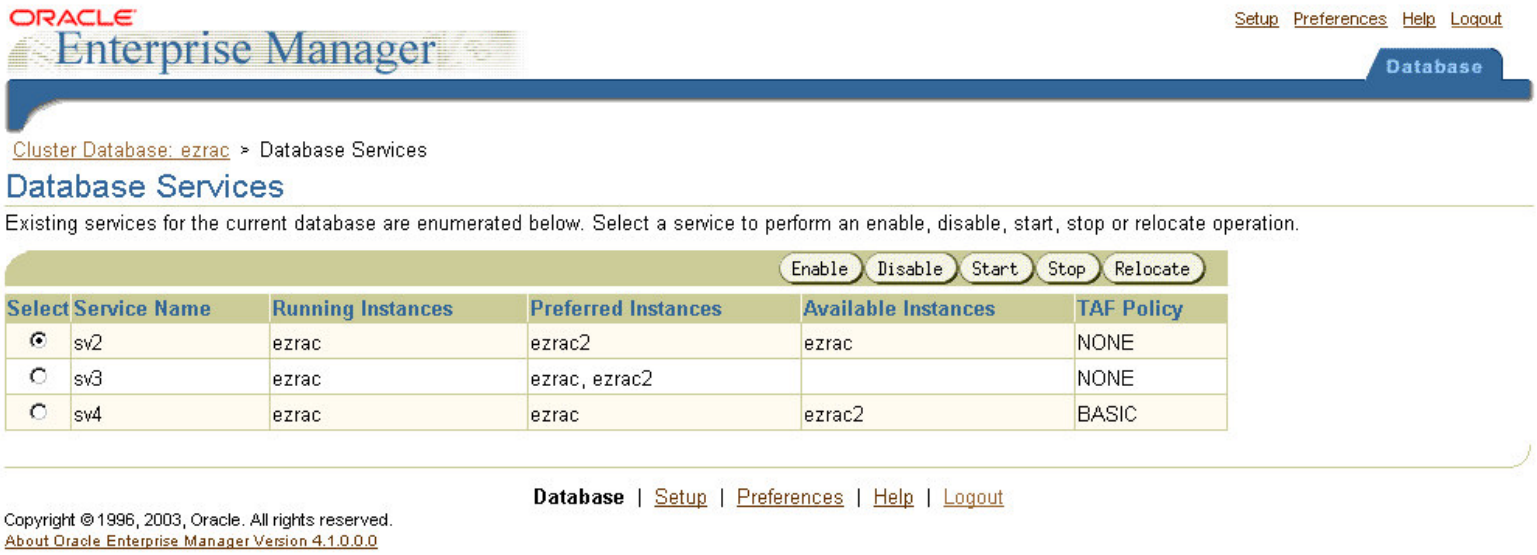
Oracle RAC 10*g* Service Definition via DBCA

- DBCA is the recommended tool for configuring services

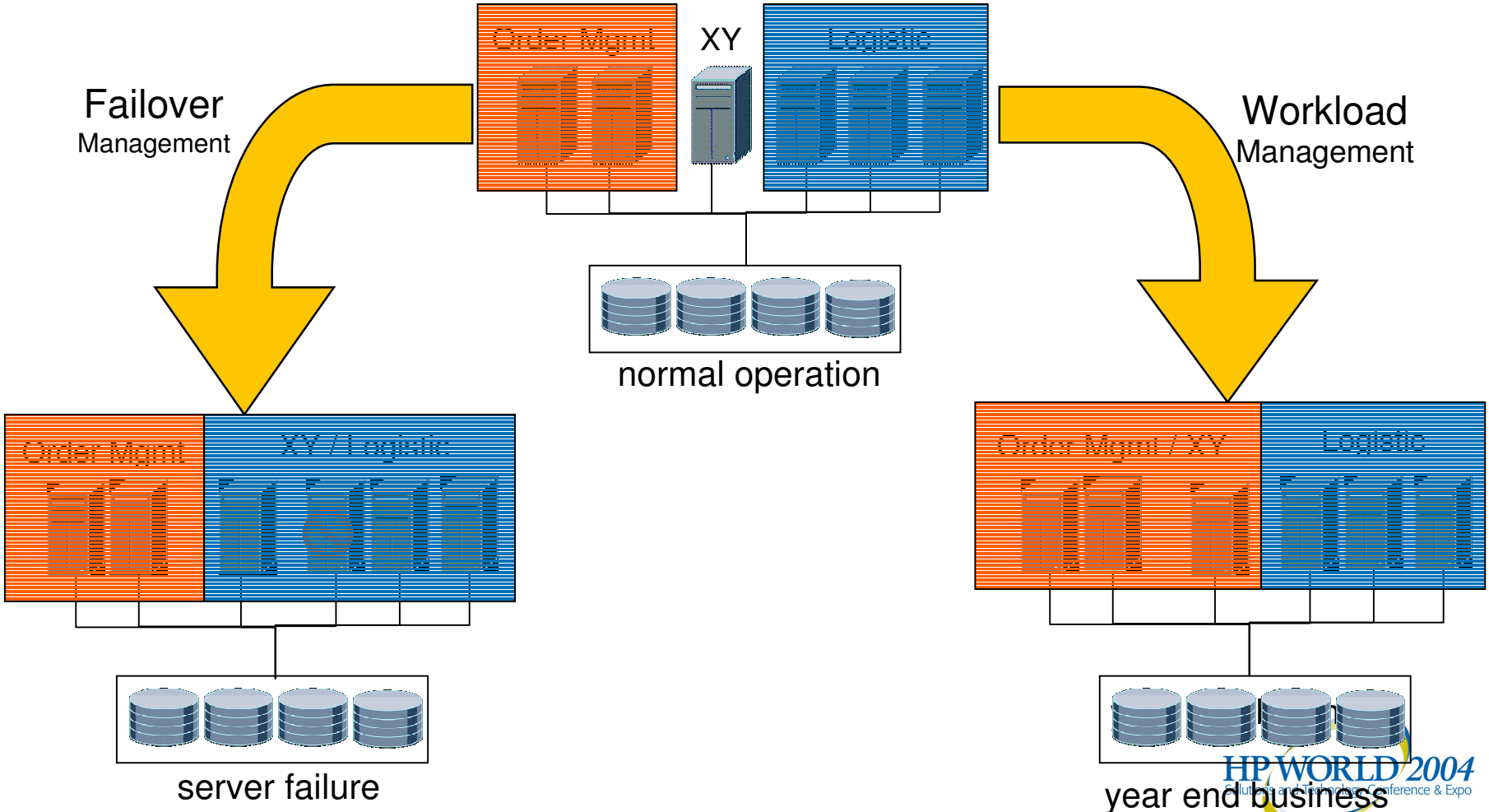


Automatic Workload Management
Enterprise Manager Controls

- Performs service operations
  - Start / Stop; Enable / Disable; Relocate
- View service status
  - Including automatic resource allocation rules



RAC 10*g*
Automatic Workload & Failover Management



Agenda

- Why IT Consolidation
- The IT Consolidation Journey with HP and Oracle
- Technology Enablers that support Consolidation
  - Partitioning
  - Clustering with 10g Real Application Clusters
- Summary

Customer Proof Point

Green Mountain Power consolidated all of its database systems into one large system using Oracle 9i Real Application Clusters and HP. Over the last 5 years Green Mountain Power has undergone a 50% saving in staffing costs…

Customer Proof Point

Atos Origin manages over 200 systems cost effectively with Oracle Enterprise Manager. OEM automates and simplifies the daily tasks of the department's 20 database administrators who manage more than 200 systems for customers around the world.

Customer Proof Point

Schachter & Namdar consolidated their global operations from 6 databases to 1 and achieved near 100% uptime by consolidating on Oracle9i RAC.

"Downtime could cost us $1M per day. That's why we use Oracle9i RAC."

David Wenner, Manager, Information Systems, Schachter & Namdar.

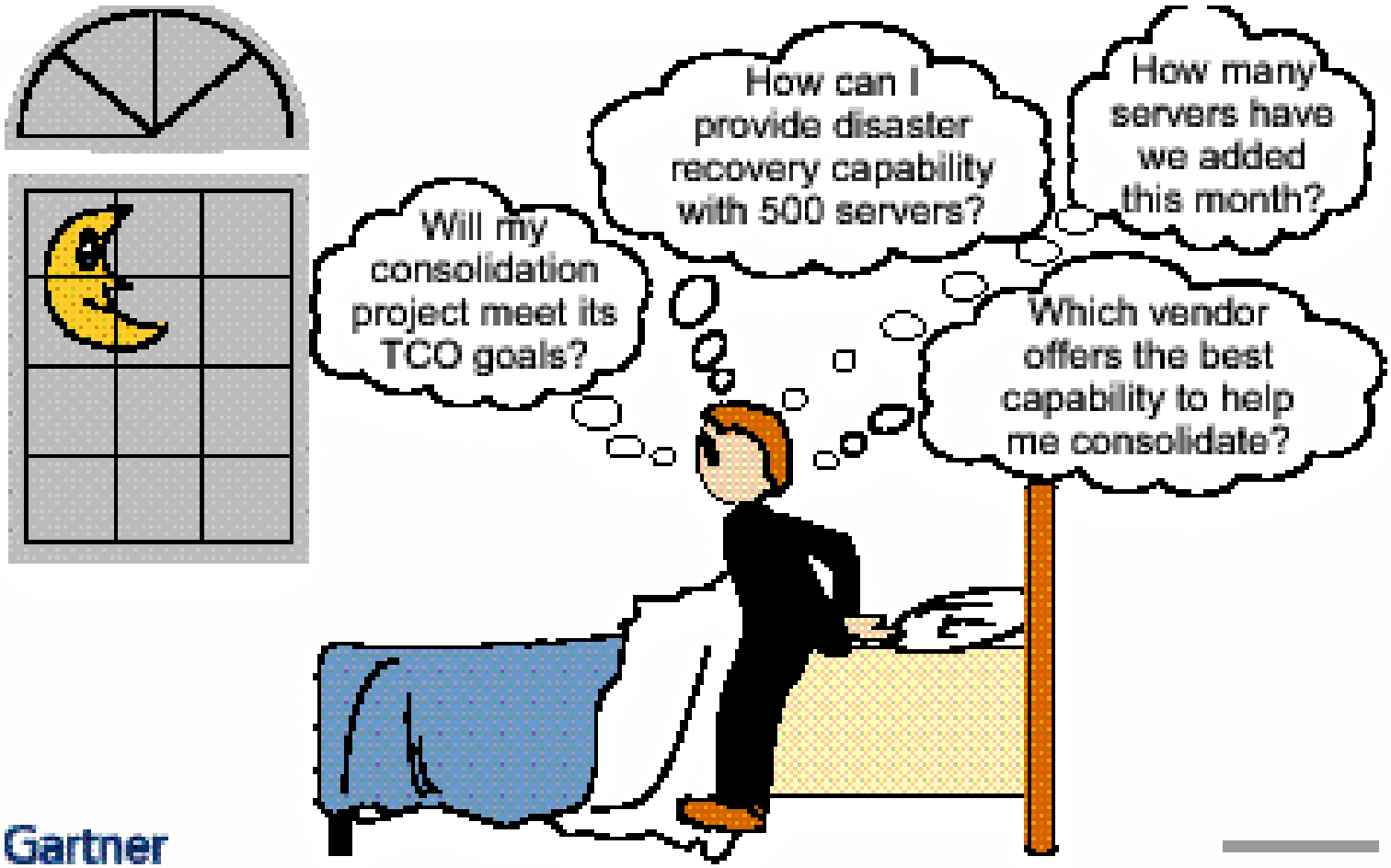
Customer Proof Point

- European government agency - Deployed
- Business need
  - Tracking criminals 24 x 7
  - Maintain application availability, DB consistency and accessibility
  - Continual operations in the event of a disaster
- Configuration
  - Oracle RAC running in the datacenters for high availability
  - Continentalclusters for disaster tolerance capabilities between data centers located 25 kms apart
  - Continuous Access data replication is provided synchronously with the ability to failover in either direction

Summary

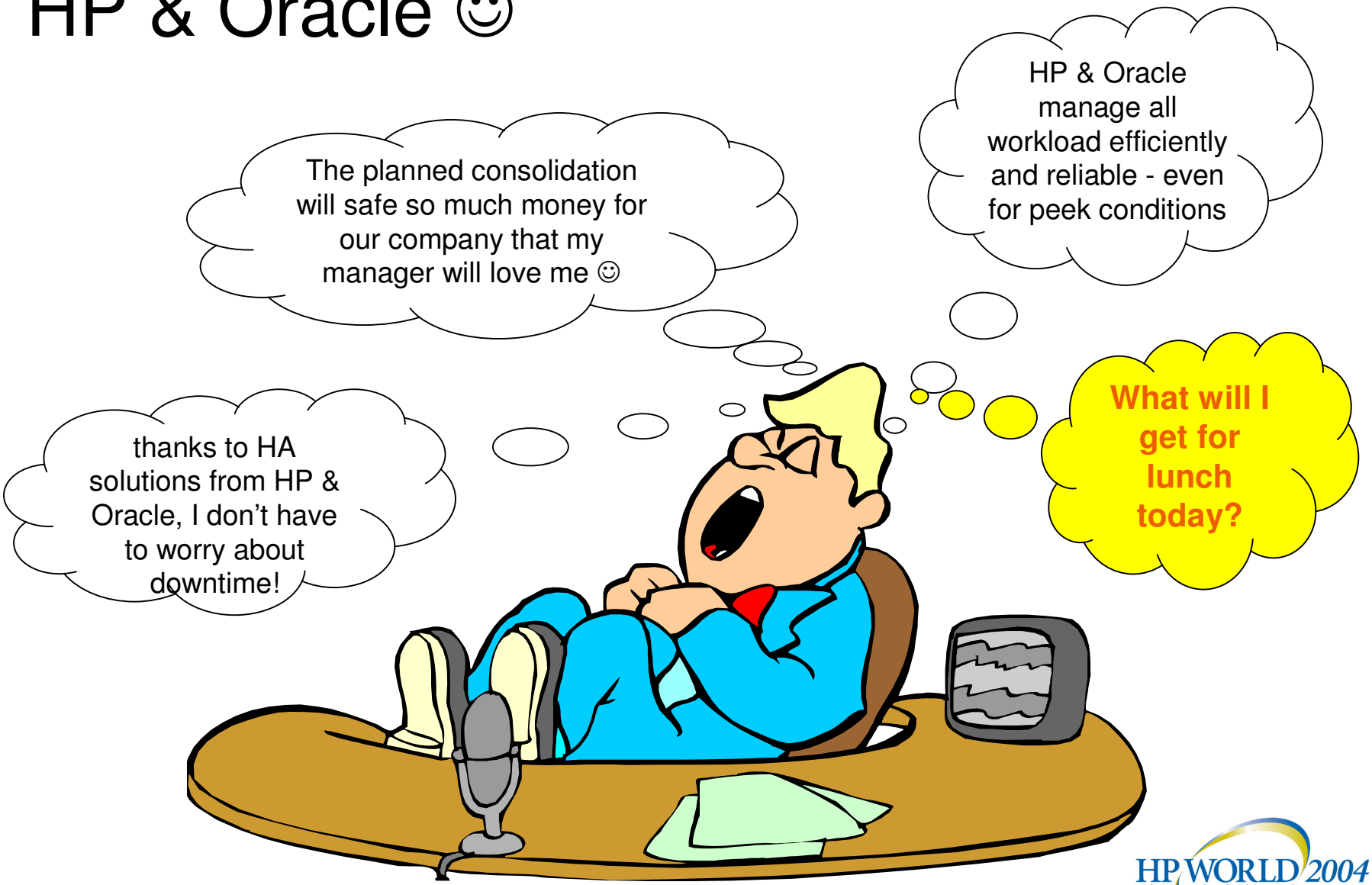
- Consolidation is a pre-requisite before deploying a Grid Computing infrastructure
- Consolidation is about clustered solutions – this is why Oracle RAC and Grid Computing are so important
- There are key steps to be taken before a deploying a Grid Computing infrastructure

Server Consolidation Moved to No. 1 on the Worry List



Gartner

Sleep tight with solutions from HP & Oracle ☺



Q&A

Any questions later?

Just send me an email: rebecca.schlecht@hp.com

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The IT problem …

- "Recent studies show that information technology costs will have increased by 220% between 1996 and 2001, whereas between 1990 and 1995 these same costs only increased by 56%"
  (Source: ITG).
- "Recurring costs continue to represent at least 70% of TCO on a 5-year basis, and the portion is expected to grow to nearly 90% in 2-3 years"
  (Source: Meta Group).
- One major cause in the growth in IT costs is the growth of numbers of servers in companies.

The response …

- In IDC's 2000 survey, 52% of the sites contacted reported undertaking server and storage consolidation activities. By 2004, this percentage had increased to a remarkable 79%.
- For this reason, TCO and IT "accounting" will remain top priorities until at least 2004 *(Source: Meta Group 2003)*.
- By 2004, 75% of IT organizations will add server unification strategies to their continuous infrastructure portfolio improvement cycle *(Source: Meta Group)*.

Top Drivers for Consolidation by Company Size

	Total	SME	Large	Very Large
Improve system availability	4.09	4.16	4.18	4.02
Ease of management	4.08	4.15	4.04	4.06
Improved disaster recovery	3.94	4.08	3.89	3.91
Optimize system performance	3.92	4.02	3.89	3.88
Improved security	3.89	3.93	3.91	3.88
Reduce spending on hardware	3.76	3.78	3.73	3.76
Reduce spending on infrastructure	3.59	3.48	3.71	3.63
Operating platform standardization	3.58	3.47	3.55	3.69
Reduce spending on software	3.45	3.41	3.56	3.41
Reduce spending on applications	3.32	3.26	3.40	3.29
Investment protection	3.20	3.33	3.23	3.13
Moving away from platform	2.97	2.95	2.82	3.08
Reduce number of IT staff	2.60	2.32	2.44	2.90
Merger or acquisition	1.87	1.65	1.86	2.06
n =	397	131	88	170

Note: SMEs are companies with 100–999 employees; large companies are those with 1,000–9,999 employees; and very large companies are those with 10,000+ employees.

Source: IDC, 2004

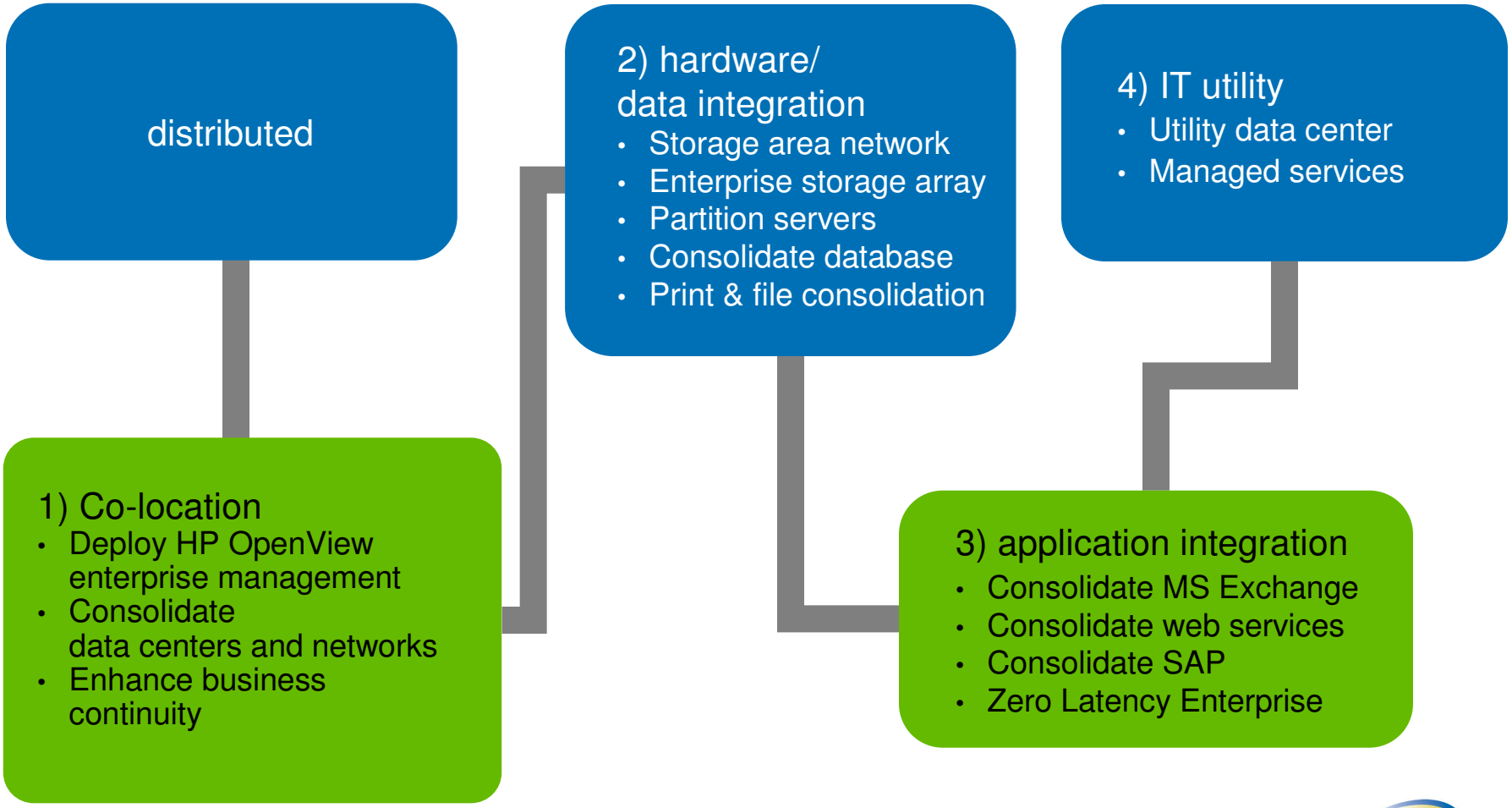
Vendor perceived as IT consolidation leader by IDC Study 2004

Q. Which vendor do you consider to be the leader in server and storage consolidation?

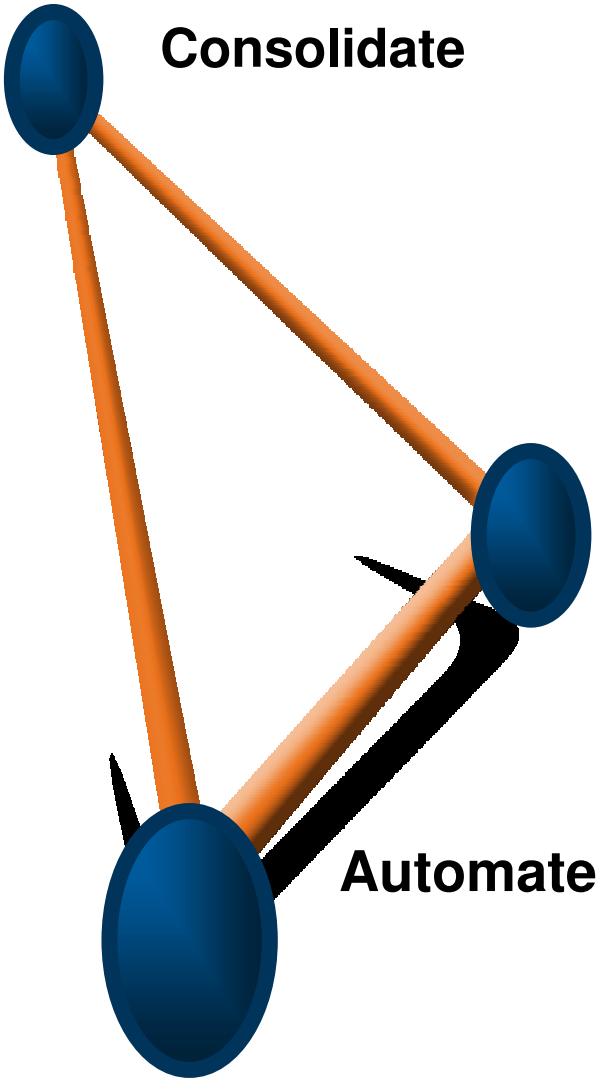
	Server Consolidation Leader	Storage Consolidation Leader
HP	28.2	19.5
Dell	26.2	14.0
IBM	16.2	13.5
Sun	6.7	2.2
EMC	1.2	19.4
Network Appliance	0.5	2.2
Other	7.3	12.7
Don't know	13.7	16.5
n =	401	401

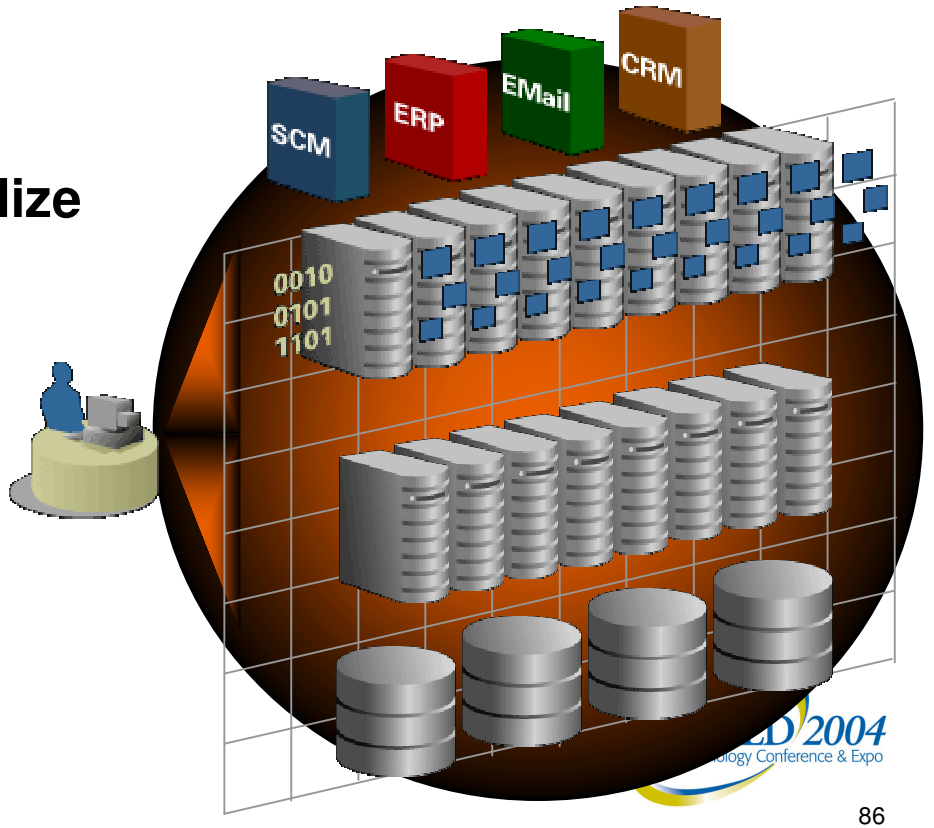
Source: IDC, 2004

HP's IT consolidation journey



Oracle's consolidation strategy
transition strategy to Enterprise Grid Computing





Oracle's consolidation strategy Integration to Legacy Systems

Infrastructure that cannot be consolidated