

# BAC Guidelines



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# Agenda

Architectural Review

BAC 7.0 Deployments

Sizings

VMWare

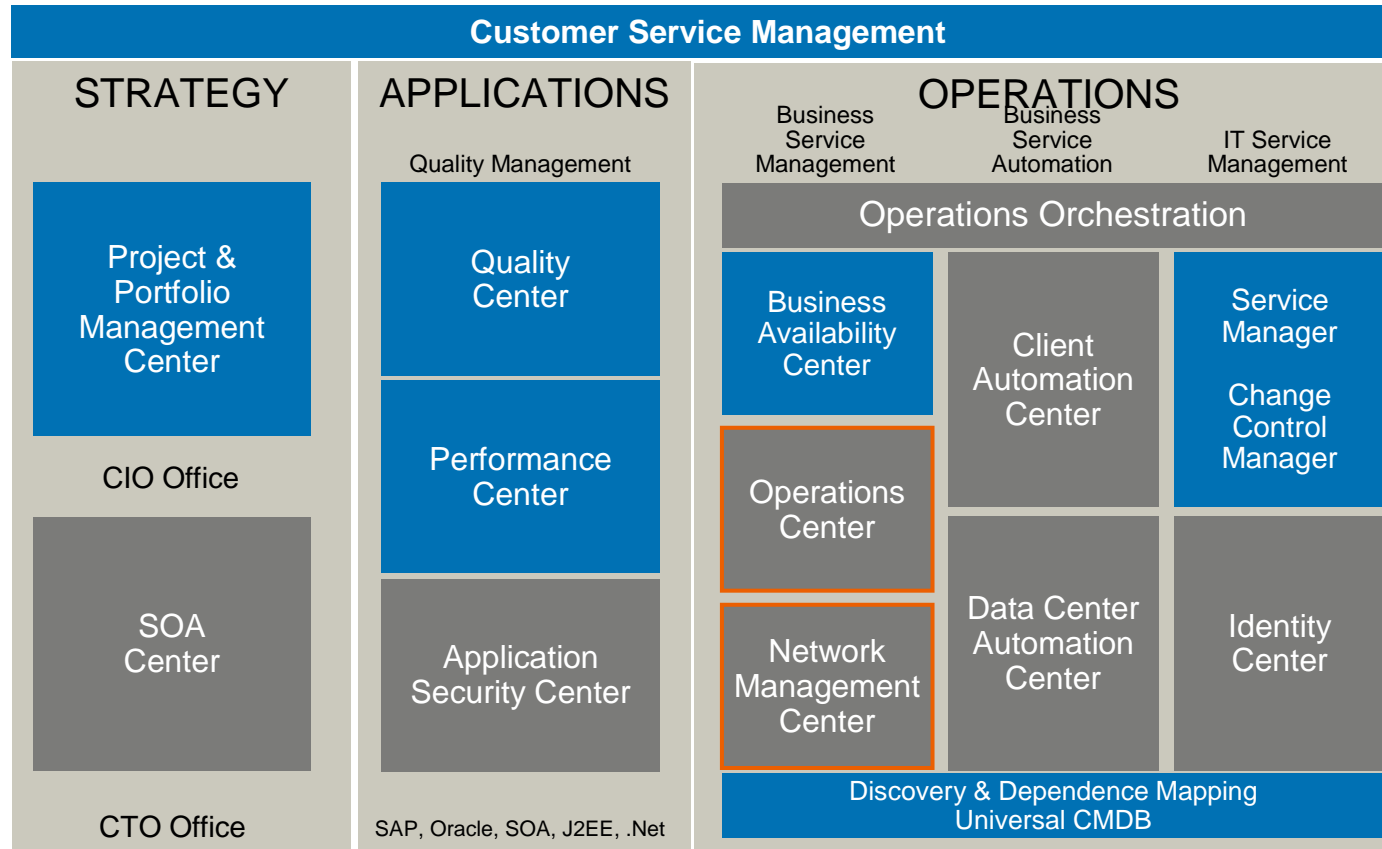
High Availability / Disaster Recovery

Upgrade Paths

# BAC 7.0 Architecture Review



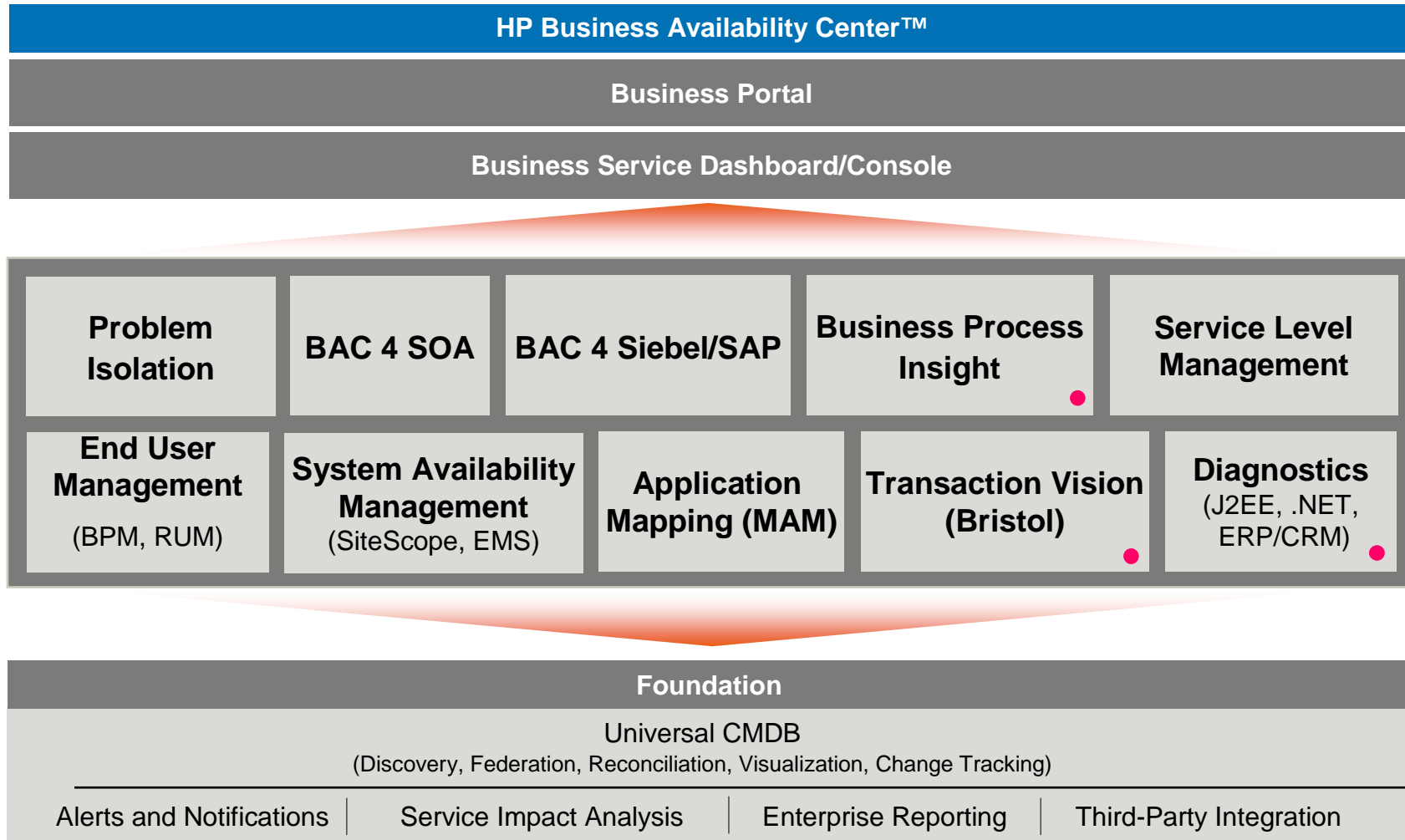
# HP Software BTO Portfolio



■ Offered by HP SaaS    
 ■ Integration supported today



# BAC Blueprint



● No usage of shared BAC Platform



# Comparing Monitoring Types



End-User Monitoring (EUM) involves BAC evaluating the performance of an application as an end-user performs tasks with the application.

BAC uses a combination of active business process emulation and real-user monitoring to provide real-time visibility into the user's quality of experience (QoE).

# Comparing Monitoring Types



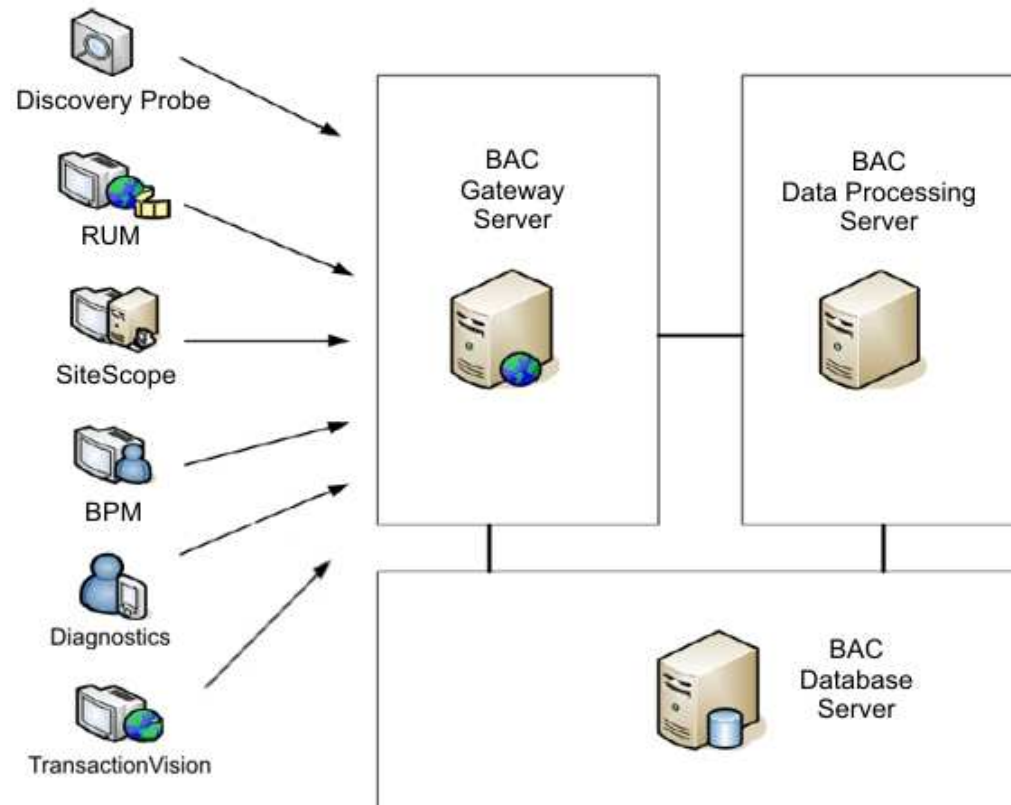
Infrastructure monitoring involves BAC gathering and evaluating the private system or application metrics published by applications, operating systems, and network devices.

BAC uses SiteScope to provide infrastructure monitoring, a tool for monitoring the IT infrastructure components that support and application.

# Basic Architecture and Technology

## Architecture Components

The high-level architecture of BAC includes two primary components: BAC data collectors and BAC servers (a Gateway server, a Database server, and a Data Processing server).



# HP Business Process Monitors

- **BPMs:**
- Are installed on host machines located
  - On your local network
  - On the Internet at global locations
- Use a recorded script to run synthetic transactions
- Send the collected data to BAC
- Use the HTTP(S) protocol for connection
  - Collected Data
  - Configuration
- Run independently as a service on the host machine

# HP SiteScope

- **SiteScope:**
- Monitors infrastructure components
  - Servers, network elements, services
- For IT infrastructure, SiteScope uses standard protocols:
  - HTTP and HTTPS for Web servers
  - POP3, IMAP, FTP DNS
  - WMI, Telnet and SSH for Operating Systems
  - Many others...
- Can monitor higher level services
  - Weblogic, Websphere, Oracle
- SiteScope uses HTTP(S) to communicate metrics back to BAC
- SiteScope interface can be accessed over ports 8888 and 8080

# HP SiteScope Features

- **SiteScope features include:**
  - Monitors
  - Monitor Templates
  - Alert Types
  - Report Types

# HP SiteScope Protocols

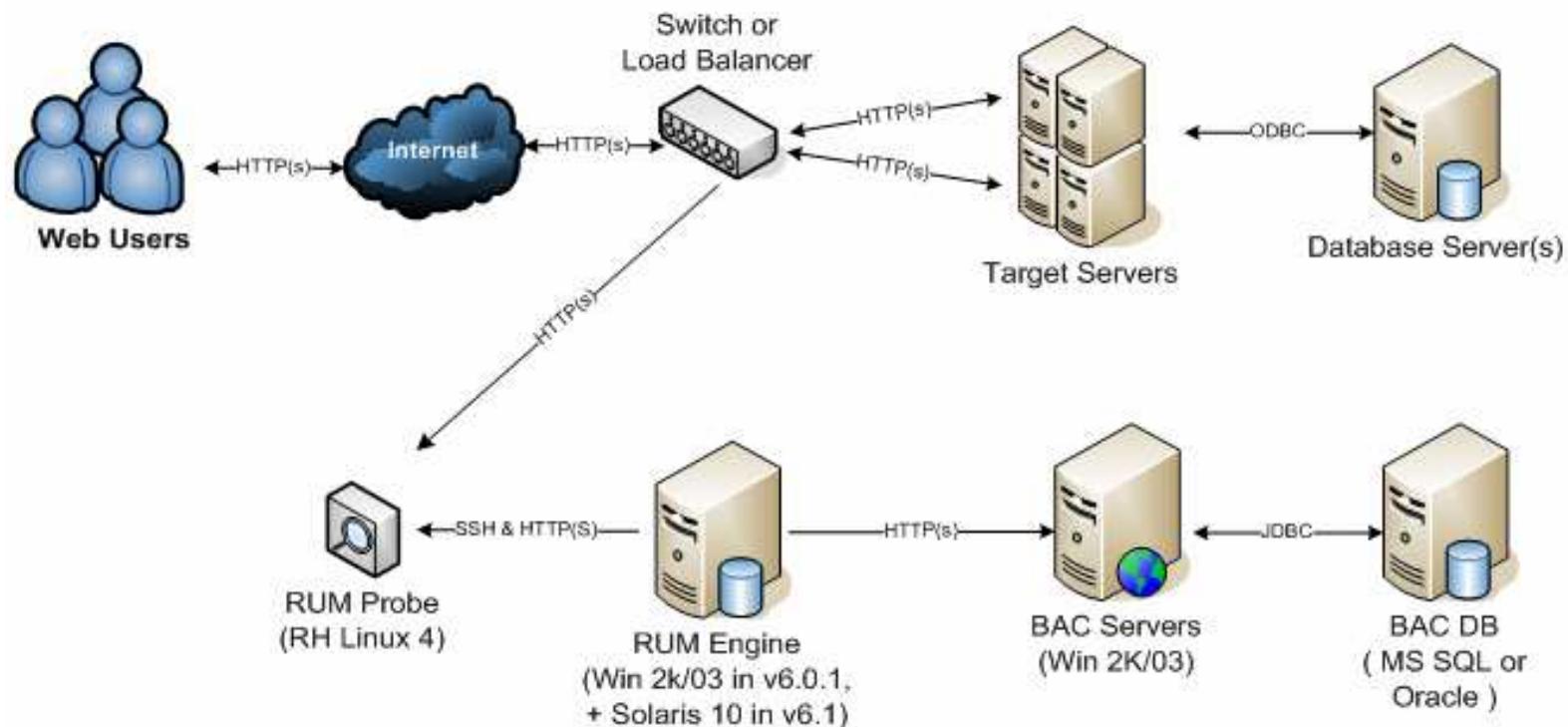
- **SiteScope protocols include:**
- HTTP and HTTPS for Web servers
- Post Office Protocol (POP) and Internet Message Access Protocol (IMAP) for mail servers
- File Transfer Protocol (FTP) and Transmission Control Protocol/Internet Protocol (TCP/IP) for ~~FTP, Telnet and Domain Name Servers (DNSs)~~

# HP Real User Monitor

- **RUM uses the following components:**
- RUM Probe
  - Passively monitors the requests and responses sent to and from a monitored Web server
- RUM Engine
  - Configures the RUM Probe
  - Receives data collected by the RUM probe using SSH
  - Filters information based on configuration
  - Stores data samples in a database
  - Sends page, transaction, user, server data samples to BAC over HTTP(S)
- MySQL Database
  - Provides a repository for RUM data
  - Stores session details, and session summary

# HP Real User Monitor Architecture

- RUM listens to the conversations of network traffic by copying the traffic using a spanning port or a tap. The engine reassembles the requests similar to a reverse web engine.



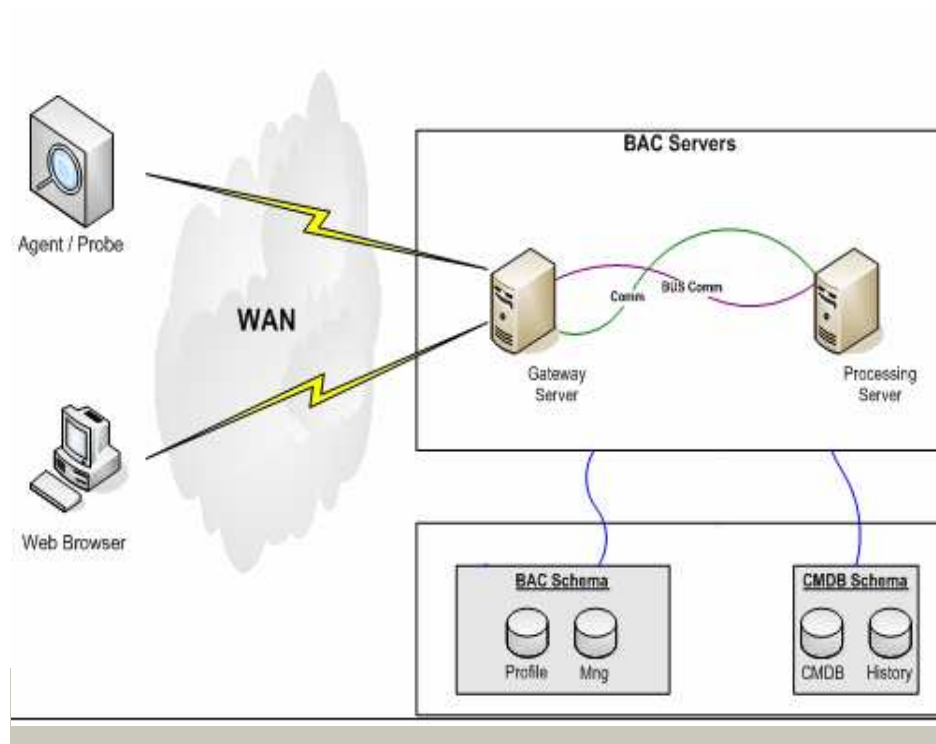
# HP Discovery Probe

- The discovery process is an ongoing, automatic process. The discovery process uses the following components to discover elements:
  - Discovery pattern
  - Discovery module
  - Discovery probe
  - BAC servers

# BAC 7.0 Deployments



# Standard & Enterprise Production Environments



- 2 server implementation serves as the “base” deployment
- POC/Extended POC: =>1 Server
- Scale by adding Gateway Servers where needed
- Only 1 DPS server required for any implementation
- 2 DNS entries recommended (users & data collectors)
- Reverse proxy recommended for outside the firewall data collectors

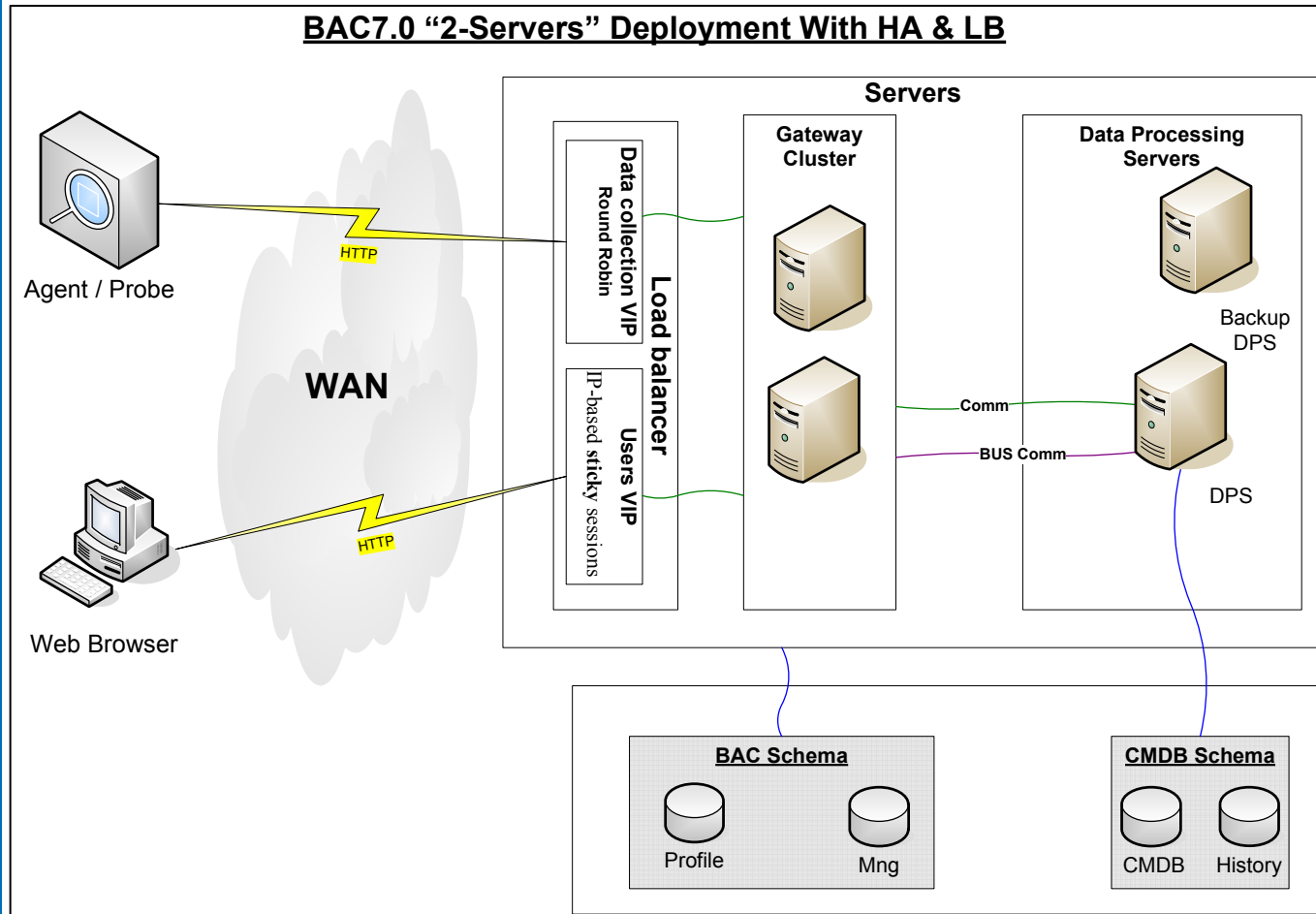
Section	Enterprise	Standard
Gateway	4 CPU cores 8GB of memory	2 CPU cores 4GB of memory
DPS	4 CPU cores 8GB of memory	2 CPU cores 4GB of memory

# Hardware Guidance and Changes

BAC Servers (Gateway and Data Processing)		
	Enterprise Deployment (Standard Recommendation)	Standard Deployment (Minimum recommendation)
Computer/Processor	<i>Windows:</i> 4 Processor cores; 3.0 Ghz+ <i>Solaris:</i> Sun Fire T1000 Server Single 1.0 GHz 8 Core UltraSPARC T1	<i>Windows:</i> 2 Processor cores; 2.0 Ghz+ <i>Solaris:</i> Sun Fire T1000 Server 1.0 Ghz 6 Core UltraSPARC T1
Operating System	<i>Windows:</i> 32 Bit OS; Windows server 2003 SP1, SP2 or Windows Advanced Server 2000 SP4 <i>Solaris:</i> Sun Solaris 9 or 10 with entire distribution and latest recommended patch cluster	
Memory	8 GB	4 GB
Free Hard Disk Space	20 GB	
Supported Database (recommended versions are listed, other versions are supported)	Oracle is recommended for any deployment with more than 200 events per second. Recommended Version: Oracle Enterprise Edition 10.2.0.1	MS SQL Enterprise 2000, 2005 SP1 or Oracle Enterprise Edition 10.2.0.1 64bit versions are supported

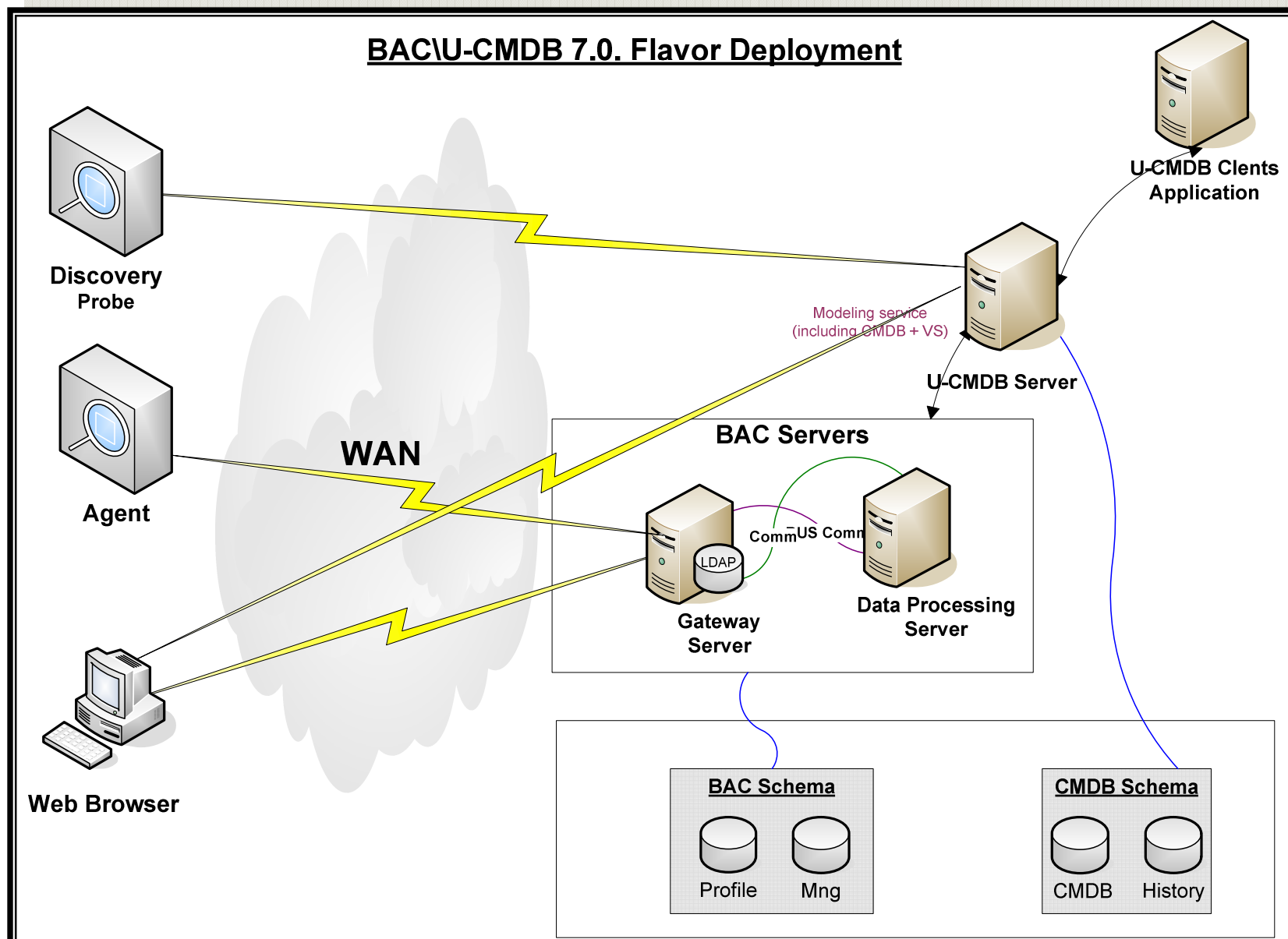
- Changes from 6.x to 7.x:
  - Recommended Hardware
    - HP ProLiant DL360 G5
  - CPU and Memory requirements increased
  - Provides greater scalability
  - Using 6.x hardware is possible but not recommended
  - 6.x Deployment styles should not be used in 7.0

# High Availability – Architecture



- Basic architecture is 4 servers
- Load balancer configuration:
  - Requires 2 VIPs (Sticky and round robin)
  - Only hardware load balancing supported
  - Assign DNS entries for all VIPs

# BAC w/ External UCMDB deployment



# External UCMDB Deployment

## Functional and technical guidelines for splitting uCMDB / BAC

### Functional Considerations

- External CMDB deployment should be used where Monitoring or BAC is not the focal point
- Where ITIL, Change, Config, or Service Center is the main usage
- Federation or 3rd party is the primary usage
- Existing MAM customers

### Technical Considerations

- Enterprise or Carrier class customers
- More than 7,000 Hosts
- Need to use at least a Quad core multi processor server

### Planning

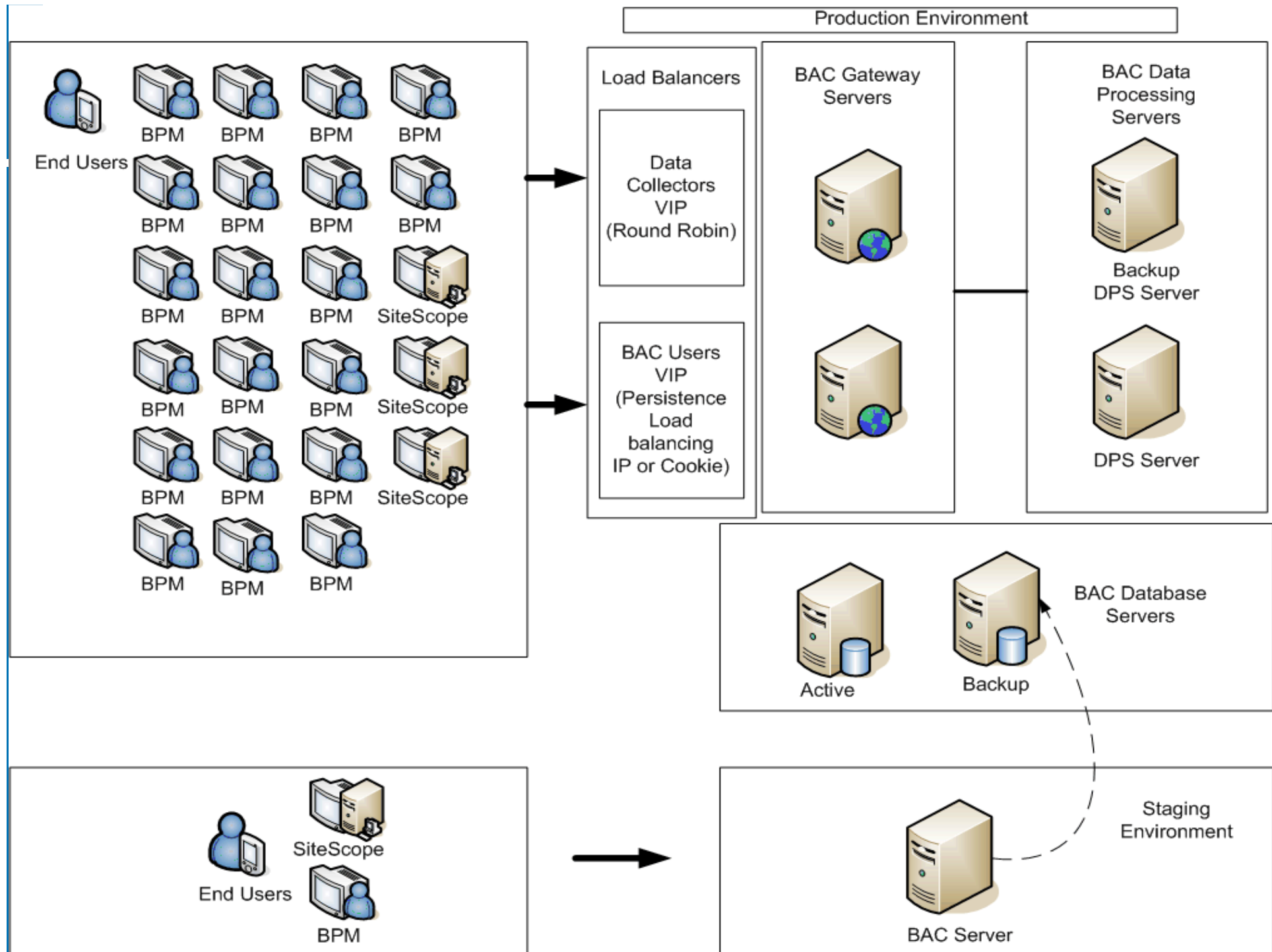
- Once installed you can't switch between separate and consolidated UCMDB modes

# Sizing Factors



# Sizing Guidelines

Section	Standard	Enterprise
Logged-in users	120(20 dashboard)	150(40 dashboard)
Dashboard CIs	100K (150K KPIs)	300K (500K KPIs)
Hosts	2000	15K
EPS	300	700 (1000 w/reduction)
SLAs	2000 CIs, 25 SLAs	25K CIs, 500 SLAs



# Rule of Thumb Sizing Considerations

- Add additional Gateway Servers for:
  - More than 120 (40 Dashboard) simultaneous users
  - More than 350 events per second
  - More than 75 BPM's
  - More than 8 SiteScope's
- Use UCMD External Deployment
  - Environments with over 7000 hosts
- Database considerations
  - Use fastest disk array that is available, the very first bottleneck is the speed of the database disks
  - Use 64 bit Enterprise versions of Oracle or MS SQL 2005
  - Separate the CMDB schemas to another instance if using Discovery

# SiteScope Guidelines

- 8000 Monitors max per instance of SiteScope
- Maximum run rate of 1,000 monitors per minute
- Run rate = Total # of monitors / Avg Interval

Example: 5000 / 10 mins = 500 monitors per minute

\*\*Based upon standard HP equivalent h/w we recommend today (Single 3.0 GHz dual core Xeon processor, 2 GB Mem, Ultra SCSI 10K RPM drives)

# RUM Guidelines

- 1 Probe
  - ~ 40 Mbs http (w/ full Snapshot w/ full text pattern events)
  - ~ 65 Mbs http (w/ full Snapshot, w/o text pattern events)
  - ~120 Mbs http (without Snapshot/events)
- 1 RUM engine
  - ~ 500 pages/sec (recommended splitting engine and repository)
- Rule of Thumb:  
20 Mbs/Sec ~ 100 Pages/Sec ~ 50 samples/Sec

**\*\*Based upon standard HP equivalent h/w we recommend today (Dual dual core 3.0 Ghz Xeon, 4 GB Mem, dual gig NIC cards, Ultra SCSI 10K RPM drives)**

# Sizing Factors - Database

- Database Sizing
  - Continue using the BAC 6.x Sizing calculator
  - Used to define data retention policy
  - Oracle recommended for implementations over 200 EPS
  - DB sizing should be

analyzed for all implementations

		<i>Total Size of Database</i>		<i>Total Size of Database</i>		<i>Total Size of Database</i>	
		After	1 Week	After	2 Weeks	After	3 Weeks
		<i>MS SQL</i>	<i>Oracle</i>	<i>MS SQL</i>	<i>Oracle</i>	<i>MS SQL</i>	<i>Oracle</i>
<b>GB</b>		6.0600	7.1978	11.1738	13.2330	16.2876	19.2683
<b>TB</b>		0.0059	0.0070	0.0109	0.0129	0.0159	0.0188

		<i>Total Size of Database</i>		<i>Total Size of Database</i>	
		After	3 Months	After	6 Months
		<i>MS SQL</i>	<i>Oracle</i>	<i>MS SQL</i>	<i>Oracle</i>
		43.3914	50.0234	44.4671	51.2141
		0.0424	0.0489	0.0434	0.0500

		<i>Total Size of Database</i>		<i>Total Size of Database</i>	
		After	2 Years	After	5 Years
		<i>MS SQL</i>	<i>Oracle</i>	<i>MS SQL</i>	<i>Oracle</i>
		49.9218	57.3147	52.0886	59.5139
		0.0488	0.0560	0.0509	0.0581

	<b>Database Retention Policy</b>	
69	Amount of time to retain raw transactions	1 Month
70	Amount of time to retain WebTrace totals	3 Months
71	Amount of time to retain WebTrace hops	3 Months
72	Amount of time to retain raw SiteScope measurements	1 Week
73	Amount of time to retain hourly aggregation of transactions	3 Months
74	Amount of time to retain hourly aggregation of SiteScope measurements	3 Months
75	Amount of time to retain daily aggregation of transactions	2 Years
76	Amount of time to retain daily aggregation of SiteScope measurements	1 Year
77	Amount of time to retain raw RUM data	3 Months
78	Amount of time to retain daily aggregation of RUM data	1 Year

# Impacts to the BAC System

Components	Gateway Server	DPS Server	Database Server
Users	Medium	None	Minimal
BPM Transactions	Medium	Medium	Medium
RUM Pages	Medium	Large	Large
SLA's	Minimal	Large	Medium
CMDB Discovery	Medium	Large	Large
SiteScope Monitors	Medium	Medium	Large
Dashboard Views	Medium	Medium	Medium
J2EE Diagnostics	Minimal	Minimal	Minimal
EMS	Medium	Medium	Medium

VMWare



# BAC on VMWare Support Matrix

Product & Version	Current Support	Future or Continued Support
BAC Servers	VMWare ESX Server 3 or greater	Caveats on the next slide.
Business Process Monitors	Conditional Support*	VMWare's abstraction layer can negatively impact BPM's <i>user time</i> metric. BPM can run on VMWare but it is not a realistic measurement platform since it can impact the application performance measurements and is not a representation of how end users interact with applications. HP will not resolve any issue relating to transaction times, transaction performance, or BPM performance issues. Customers should understand this risk.
Real User Monitor	Not Supported	Virtualization is especially ill-suited for RUM since RUM relies on having direct control of the hardware and real time OS function. Virtualising I/O would lead to "lost" users if packets are missed.
SiteScope	VMWare ESX Server 3 or greater	Sizing recommendations can be found in the following KB article: <a href="#">KB Article 34432</a>

# Recommendations & Caveats

- Performance of BAC components on VMWare can be expected to be slower than in a regular installation by as much as 30% or more, you must set expectations with customers.
- BAC capacities and performance will vary according to the various server resources, such as CPU, memory, and network bandwidth, allocated to the BAC components.
- VMWare Host machines need to support the recommended virtual machine requirements below, it's also recommend not to have more than 2 virtual machines per physical server.
- Minimum VMWare virtual machine configuration must include a dedicated processor, 4 GB of Memory, dedicated gigabit NIC card and it's highly recommended to have the virtual disk files stored on a SAN array.
- ESX Server version 3 or higher should be used
- It is strongly recommended that you do not run a database server containing BAC databases on VMWare if the database files reside on a VMWare virtual disk
- VMWare can be used for Small & Medium sized deployments, but VMWare is not an option for Enterprise Deployments.
- HP will not resolve any performance related or VMWare related issue with BAC and it's components installed on VMWare. The limitations outlined thus far is not an inclusive list. Customers should understand the risk and contact VMWare support to resolve any performance or virtual machine issue.
- These limitations are due to the nature and architecture of VMWare itself.

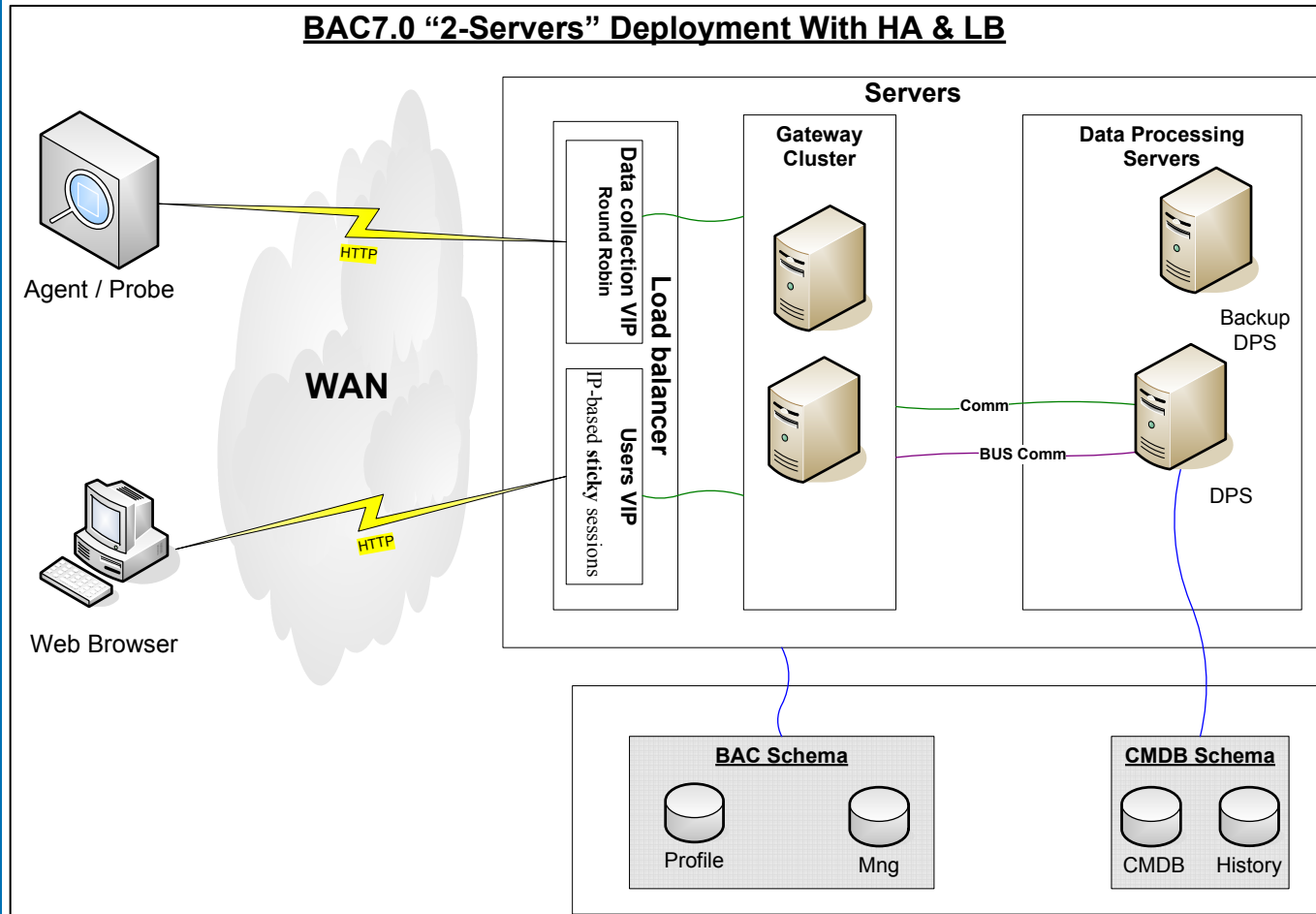
# High Availability & Disaster Recovery



# High Availability – Definition

- In this presentation we refer to High Availability (HA) as a deployment of a BAC system, where all servers reside in the same data center and with every server type (GW, DPS, DB) duplicated
- The failover process is mostly automated
- It is possible to implement HA across multiple data centres (thus removing the need for DR) but:
  - Complex solution
  - BAC is not well suited for this scenario due to potential latency
  - Very expensive, so most customer are unlikely to go down this path
- You may hear other definitions from customers

# High Availability – Architecture



- Basic architecture is 4 servers
- Load balancer configuration:
  - Requires 2 VIPs (Sticky and round robin)
  - Only hardware load balancing supported
  - Assign DNS entries for all VIPs

# High Availability – Gateway Server

- Load balancer provides HA for the gateway servers.
- You need to configure load balancing for both data collectors (core) and users (center)
- For details on setting up a load balancer refer to product documentation or the LB setup guide on Knome
- All data collectors must point to the load balancer VIP
- Data collectors will cache data when they cannot connect to the gateway
- If the gateway server fails to process data it will be cached on disk until the problem is resolved
- User dashboard sessions will fail over to a second gateway server (a short delay is possible)
- LDAP repository resides on the 1<sup>st</sup> Gateway to “connect to DB” and is a Single Point of Failure (SPOF)
  - LDAP details will be discussed later

# High Availability – LDAP

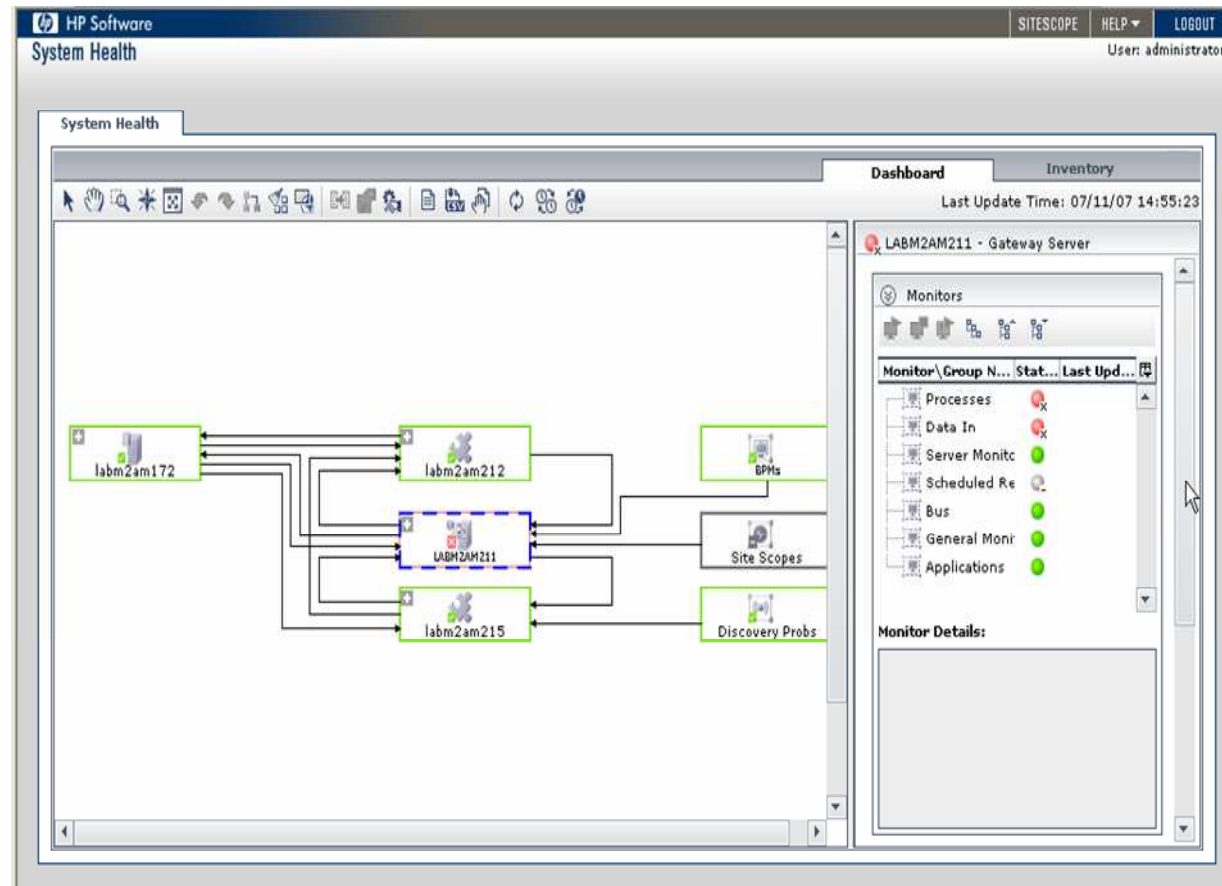
- LDAP is the repository for Monitoring Admin. It resides on the 1<sup>st</sup> Gateway to “connect to DB” (aka LDAP master), in <HPBAC>\openladp\bdb
- There is only 1 master LDAP
- Synchronize <HPBAC>\openladp\bdb folder between both gateway servers
  - Option #1 – use a batch file to copy the files periodically
  - Option #2 – use openldap replicator (slurpd.exe) to replicate changes from master to slave. For details refer to product documentation or the LDAP failover guide on Knome
  - Option #3 – use tape backup
- When failing over change LDAP URL in infrastructure settings to point to slave

# High Availability – Data Processing Server

- DPS must run in an Active/passive configuration (only 1 active server allowed)
- Install the System Health console to manually manage service assignment
- You can configure automatic failover via System Health
- CDM adapter files are a SPOF and require special consideration
  - Option #1 - Use a shared drive for both DPS servers to access <HPBAC>\CMDB
  - Option #2 - Synchronize \HPBAC\CMDB folder between both DPS servers
  - If shared folder fails BAC defaults to \HPBAC\CMDB
  - CDM services are slated for removal in later versions
  - CMDB folder does not change much → copy in advance and reduce recovery time

# High Availability – System Health

- Provides independent monitoring & alerting capabilities
- Separate installation strongly recommended for HA
- Used to configure automatic failover for DP server
- Manually migrate DPS services



# High Availability – Data Collectors

- BPM
  - Largely not required due to sheer number of BPMs and hence data points
  - Deploy multiple BPMs per location, even if you have enough capacity. BPM HW is usually a desktop → cheap
  - Only recommended for critical BPMs or locations
- SiteScope
  - Use SiteScope HA installation
  - One SiteScope backup server can support multiple production instances but there is risk that it won't be able to handle the load if multiple primaries fail
- RUM
  - Manual failover using a set of backup HW
  - Must maintain IP addresses of probe and engine
  - All data kept in MySQL repository will be lost unless MySQL is running on a dedicated server

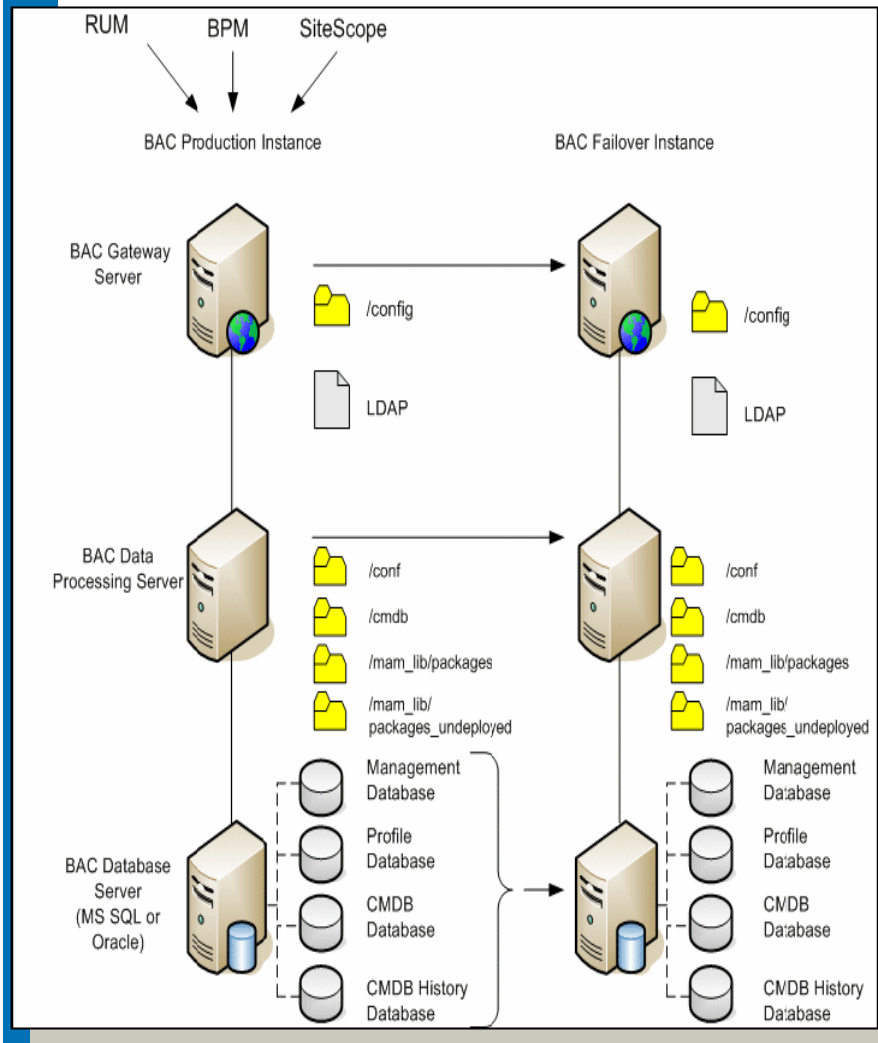
# High Availability – DB

- Use commercially available clustering solutions. E.g.:
  - Microsoft Cluster (MSCS)
  - Oracle RAC
  - Veritas
- HW based clustering solutions are fine
- SW based clustering solutions
  - Only Oracle RAC is supported

# Disaster Recovery – Definition

- In this presentation we refer to Disaster Recovery (DR) as the process of failing over between 2 identical, self-contained deployments of a BAC system, where each system resides in a different data center
- You may hear other definitions from customers

# Disaster Recovery Planning – BAC Failover Process



- DR Process now documented
- Full duplicate of production required
- Minor adjustments required for implementations other than 2-server
- Manual failover from one instance to another
- Copy Files
  - LDAP configuration (same as HA)
  - CONFIG and CDMB folders (same as HA)
- Database recovery
- Update DB tables as documented
- Connect to DB
- Re-point data collectors

# Upgrade Paths

- **Read BAC Documentation !!**
- **Backup db's and files before preceding**
- **Staging Utility Planning**
- **BAC 6.4 and Previous**
- **BAC 6.5 and Greater**
- **Upgrades that utilize the Shared CMDB**

# Upgrades to BAC 7



# Upgrade in 7.0

- Upgrade Wizard
  - New automatic upgrade wizard that has a GUI
  - Step by step upgrade steps that guide the user
  - Sensitive to server type (processing, gateway, ...)
  - Prevents possible upgrade failures by not allowing moving to next step when not possible, or performing out of order steps
  - Comprehensive logging to help with troubleshooting
  - Direct or staging modes can be used
  - New documentation guide

## Upgrade in 7.0

- Supported Upgrade Paths
  - 6.5 or greater → 7.0
  - Any 5.x version to 6.1 → 6.2 → 6.5 → 7.0

# Direct versus Staging modes

- Direct upgrade – an upgrade procedure that is performed directly on customer's BAC 6.X production environment
- Staging mode – an upgrade procedure that is performed on a *copy* of BAC 6.x production databases that work with a separate installation of BAC 7.0 that is installed on a replicated environment (usually same hardware and software like production environment). In this case, both production & staging environments are working side by side.

# Direct mode

- High Level Procedure:
  - BAC 6.x is stopped.
  - Needed files are backed up (according to documentation)
  - BAC 6.x is uninstalled
  - 7.0 version is installed on **same** servers.
  - Upgrade process is executed.
  - 6.x Production database Schemas are upgraded.
  - New BAC is up & running on production.

## Staging mode

- High Level Procedure:
  - 6.x Production database schemas are replicated.
  - 7.0 version is installed on **different** servers.
  - Upgrade process is executed on staging environment
  - Data is coming from SDR (Repeater) that copies it from production
  - Alerts and scheduled reports are not sent from staging environment.
  - When 6.x production is shut down - staging environment becomes the production environment.

A black and white photograph showing a stack of papers. Each paper has a large, bold, black question mark printed on it. The papers are slightly offset from each other, creating a sense of depth. The word "Questions" is written in a white, sans-serif font in the bottom-left corner of the image.

Questions