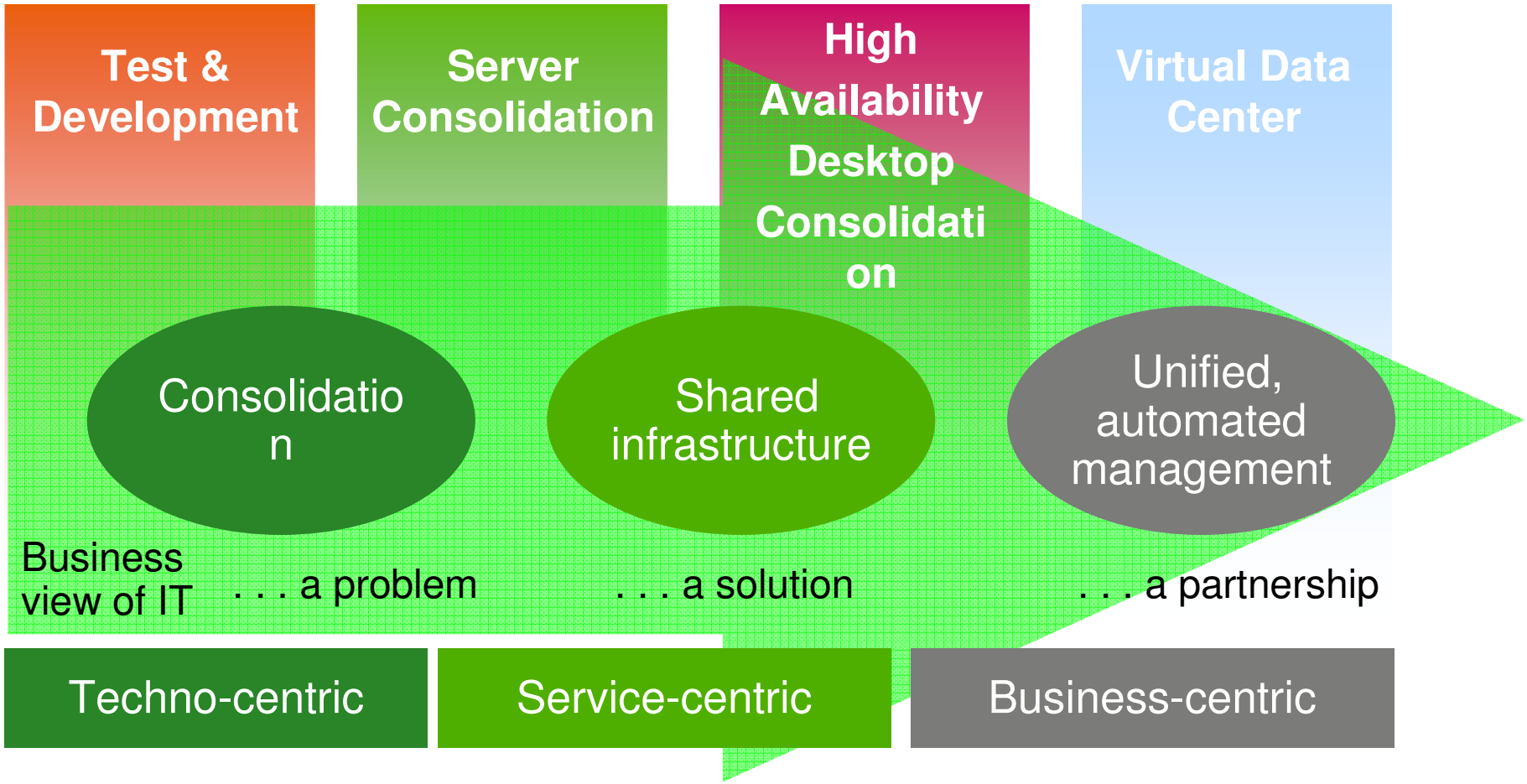
End to End Virtualization with HP

Vishal Chandane

The Evolution to a Virtual Datacenter



Consolidate IT resources: server, storage, applications

Create a shared infrastructure utility that can used by several lines of business

Manage and administer multiple forms and platforms of virtualization

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What is a virtual data center ?

Traditional Data Center	Virtual Data Center
Designed to Last	Designed to Change
Tightly Coupled Stack of Project & Application/Infrastructure	Loosely Coupled, Agile and Adaptive
Manages Physical Resources	Manages Virtual Resources
Integrate Silos	Compose Data Center Services
Under utilized & Over-provisioned with Static Workloads	Shared & Pooled with Policy Based Dynamic Workload Mgmt
Storage Directly Attached	Virtual Storage Grids
Reactive Problem solving	Proactive: Service Level Management
Long deployment Cycle	Rapid Deployment Cycle
Cost centered	Business &delivered as **IT Shared Services**

Peering Into the Paradox: How Benefits Become Challenges

- Enhances availability
- Improves utilization
- Reduces costs
- Speeds provisioning
- Increases consolidation
- Reduces staffing
- Creates optimism

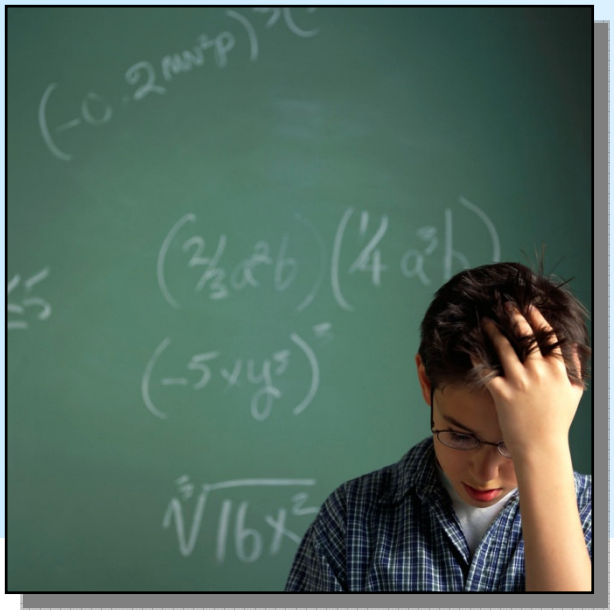
- Magnifies failures
- Affects performance
- Encourages sprawl
- Handicaps compliance
- Creates "pods"
- Requires new skills
- Engenders skepticism

Virtual machines help you to recover from your mistakes…
but not necessarily in preventing them!

Virtualization Economics: Keeping It Real!

The New Math: $V_{cost} = \mathbf{Free}$ ***One client alluded to it as being "addictive."***

The Real Math: $V_{cost} = f$ **(Design, Testing, Administration, Monitoring, Security, Compliance, Optimization)**



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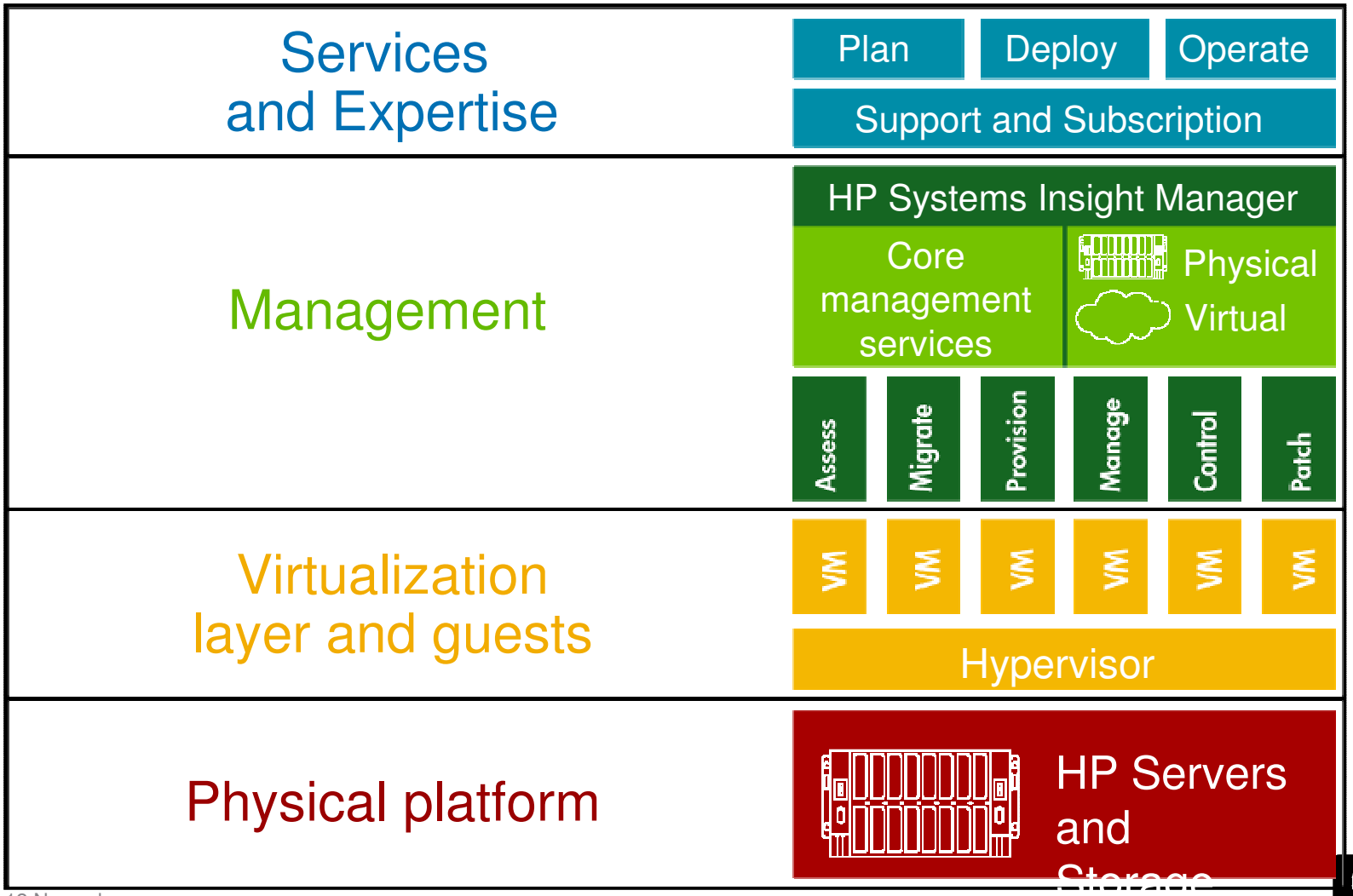
Virtual Datacenter and HP

HP Virtualization Solution Building Blocks



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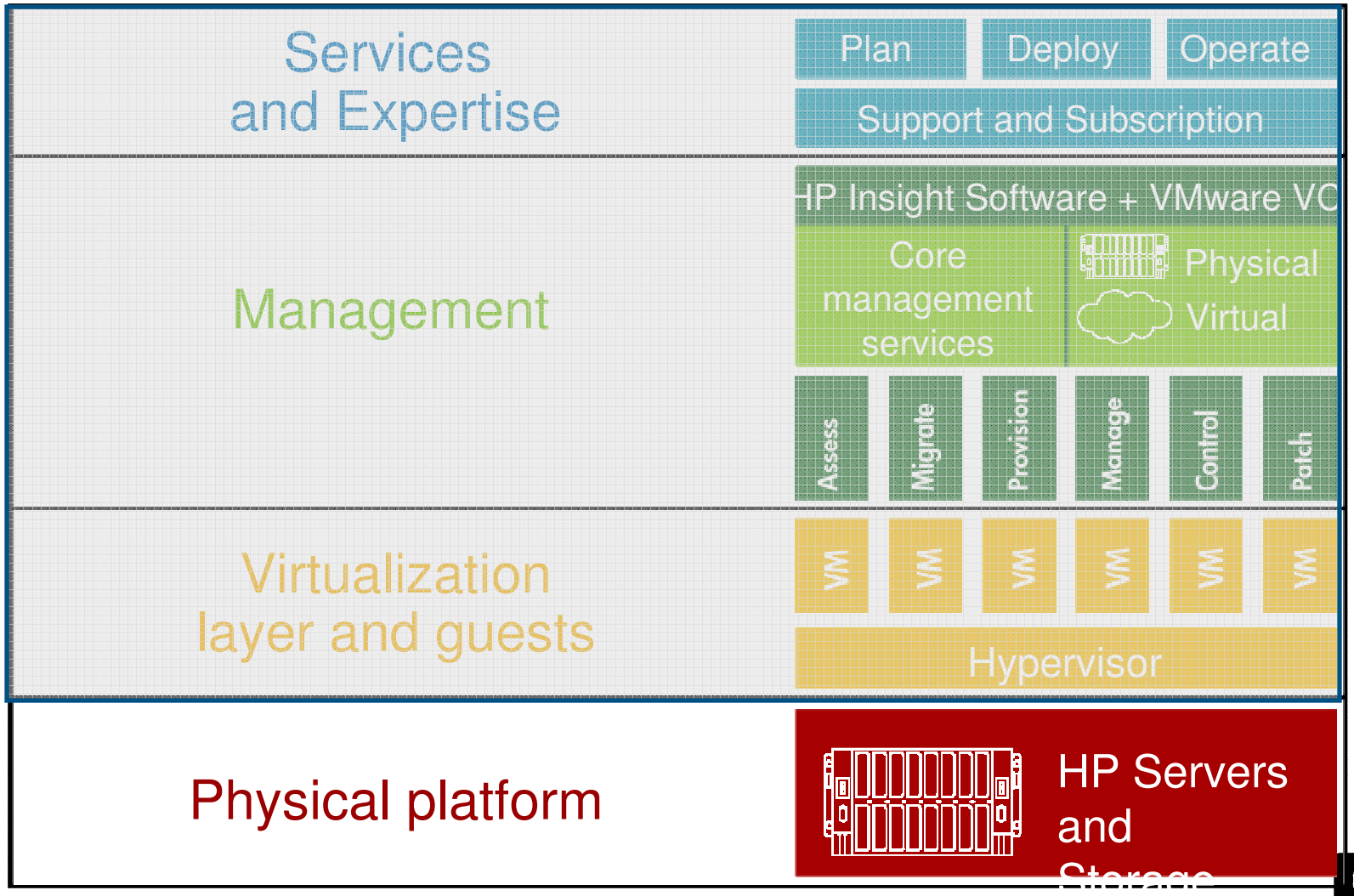
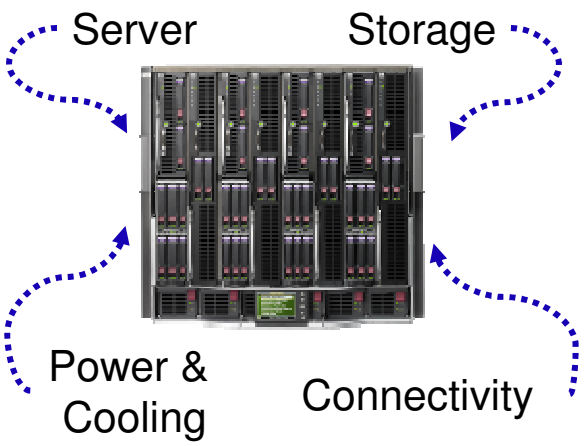
Physical Platform



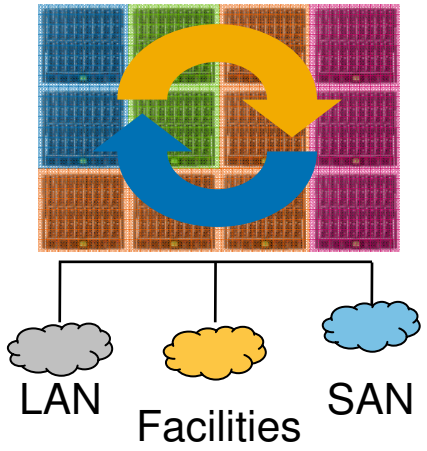
The HP BladeSystem approach to simplify infrastructure

Consolidate



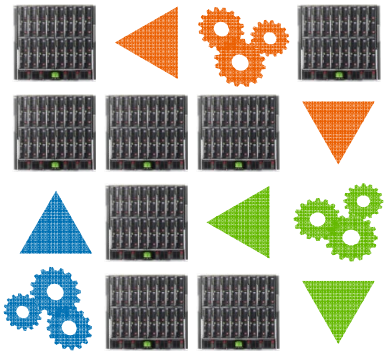
- Modularize and integrate components
- Surround with intelligence
- Manage as one

Virtualize



- Create logical, abstracted connection to LAN/SAN
- Pool and share server, storage, network, and power

Automate



Policy and Task

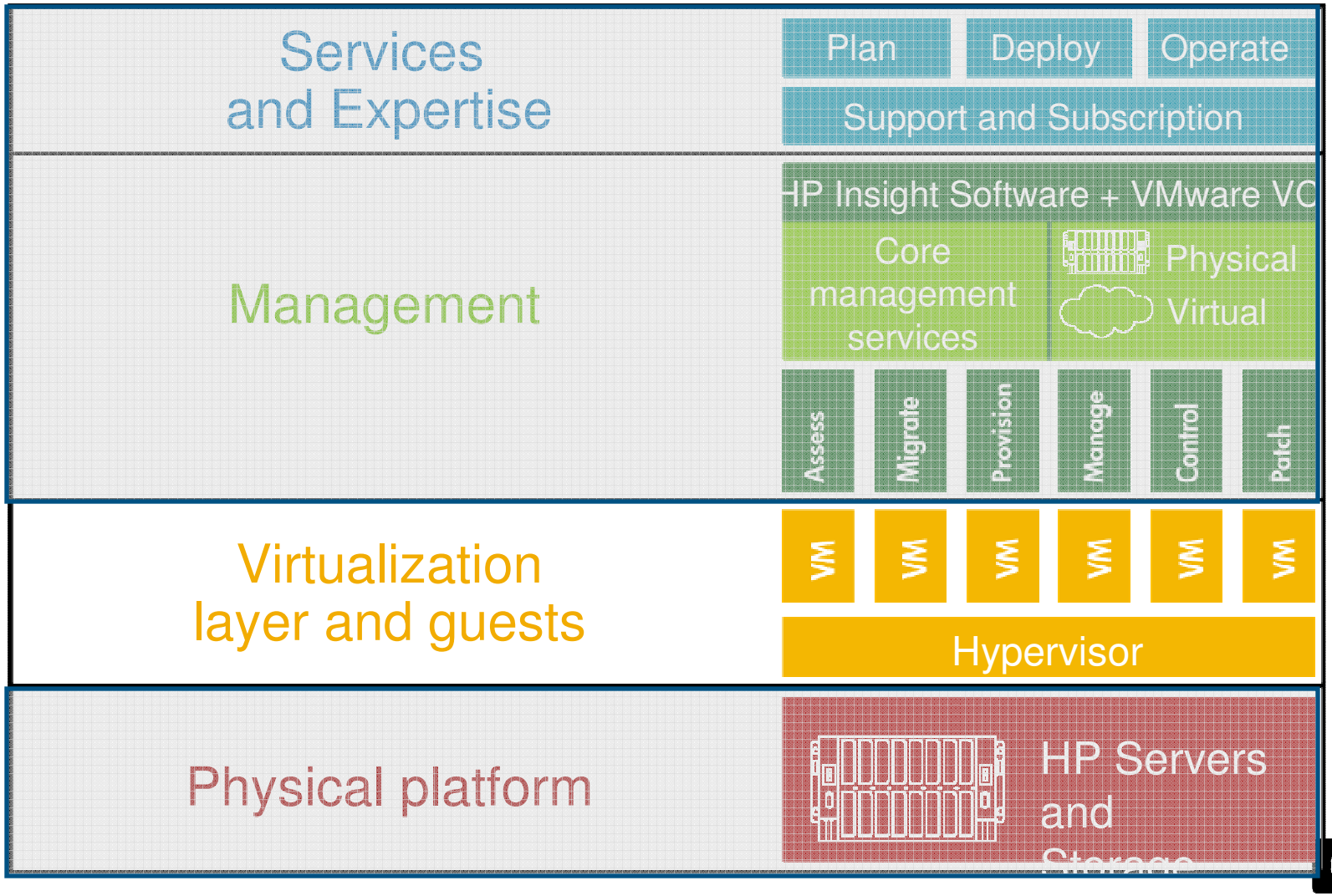
- Simplify routine tasks and processes to save time
- Keep control

Reduce time and cost to buy, build and maintain

Greater resource efficiency and flexibility

Free IT resources for revenue bearing projects

Vmware with HP



HP and VMware Leadership Facts

- **HP has the most VMware certified servers**: nearly as many as Dell and IBM combined, and twice as many servers certified for VMware ESXi.
  - *VMware Systems Compatibility Guide 3 SEP 08*

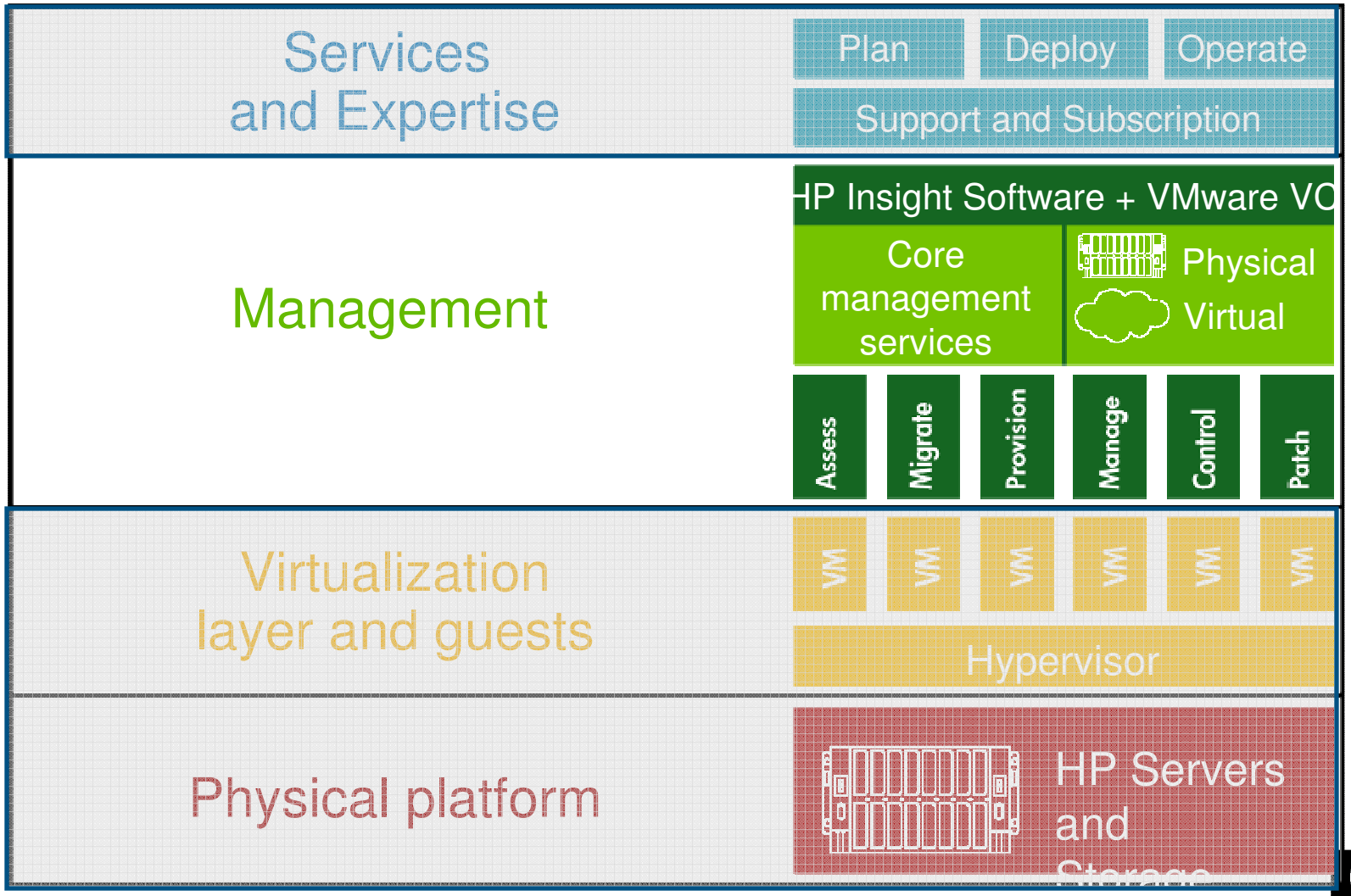
- *The DL785 G5 and DL585 G5 have the **leading VMmark performance** results in their class. The DL785 8-socket ran the largest # of VMs ever on an x86 platform – 96, nearly 600 VMs per 42U rack. The DL585 G5 ran 60 VMs to achieve a new record.*
  - *VMware VMmark results, 4 SEP 08*

- HP has **more VMware Certified Professionals (VCPs)** than anyone – except VMware. The exact number is 655 (486 from HP and 169 from EDS). EDS plans to add 330 VCPs in the next 15 months.
  - *VMware*

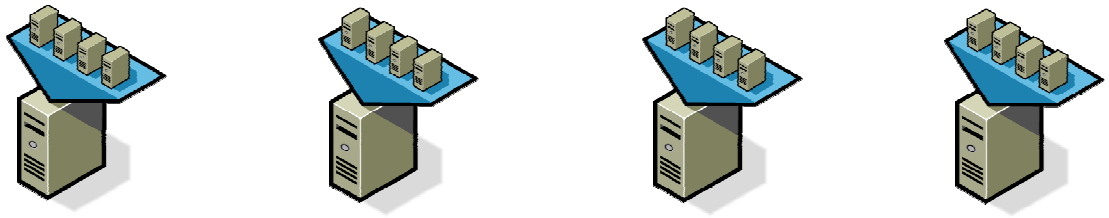
- *IDC names HP the **Global Leader of Thin Clients Worldwide.***
  - *IDC, Q1 2008 WW Ent. Thin Client Q-View, MAY 08*

- **HP is the first** VMware Authorized Training Center to **train more than 10,000 students** on VMware certification courses**.**
  - *VMware*

Infrastructure Management



Running virtual infrastructure…



Is a physical server infrastructure

How do you optimize…

BladeSystem Networking Abstraction Layer

Server availability	Server rapid recover	VMware ESX deploymen	Sufficient power for workloads	Physical and virtual performance	Physical infrastructur e warranty & service contracts
Remote resource management	Server & power capacity planning	Server repurpose and migration	Planned Maintenance		

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The HP Insight Software Portfolio

Continuously controlling and optimizing HP platforms

Targeted functionality

Business critical

Core services and unified console included with the platform

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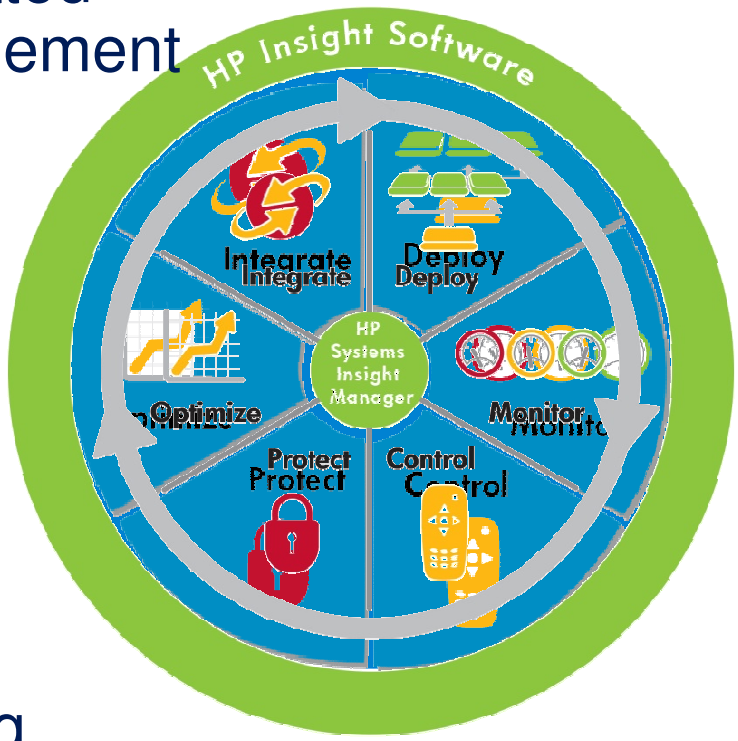
All just by using HP Insight Control

Your total solution to controlling time and your infrastructure

It's deploying in less time

And save time by using integrated management tools

It's optimizing your infrastructure (virtualization, energy & cooling)



Monitoring smarter and faster

Less time worrying about Security

Saving time by administering remotely

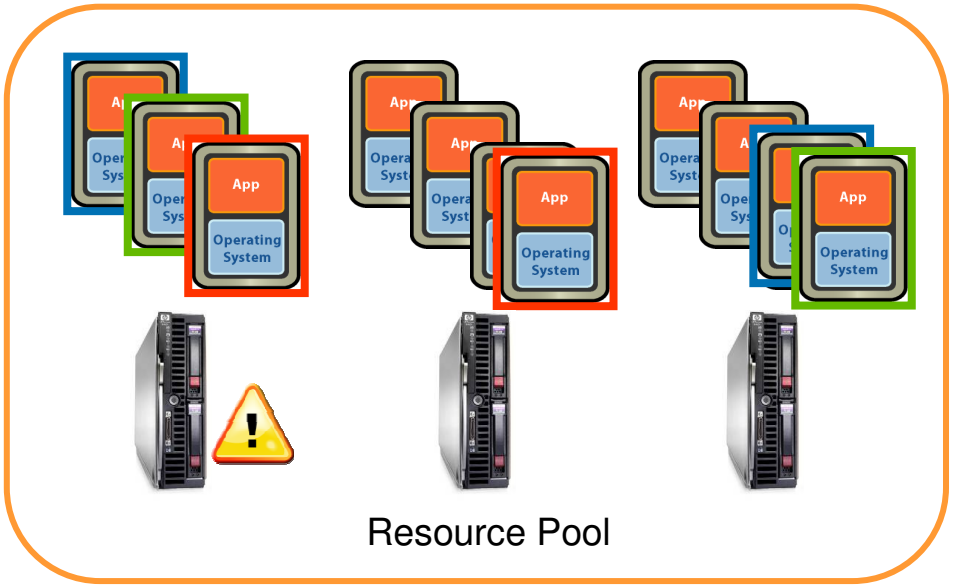
Power of HP + VMware

High Availability in failure AND pre-failure conditions

Only HP provides out of box solution

HP Insight Control Management Suite

VMware VirtualCenter

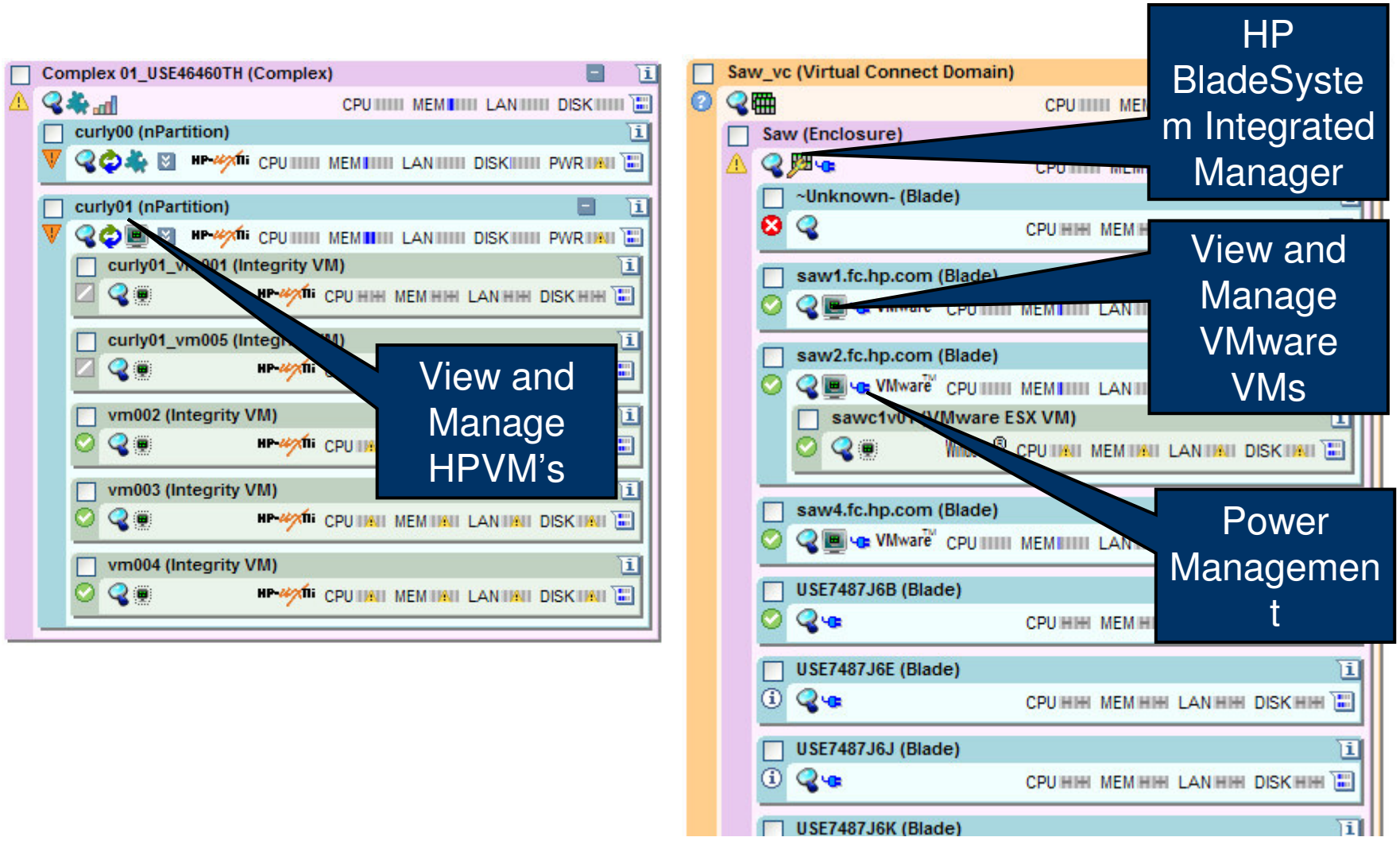


VMM + SIM as part of HP Insight Control Management Suite provides unified physical and virtual server management

- Physical: HP SIM receives ProLiant pre-failure hardware alerts
- Virtual: VMM works with VMware VirtualCenter to move VMs BEFORE server failure
- Integrates with VMware Distributed Resource Scheduler (DRS)
- VMware HA restarts VMs AFTER server failure

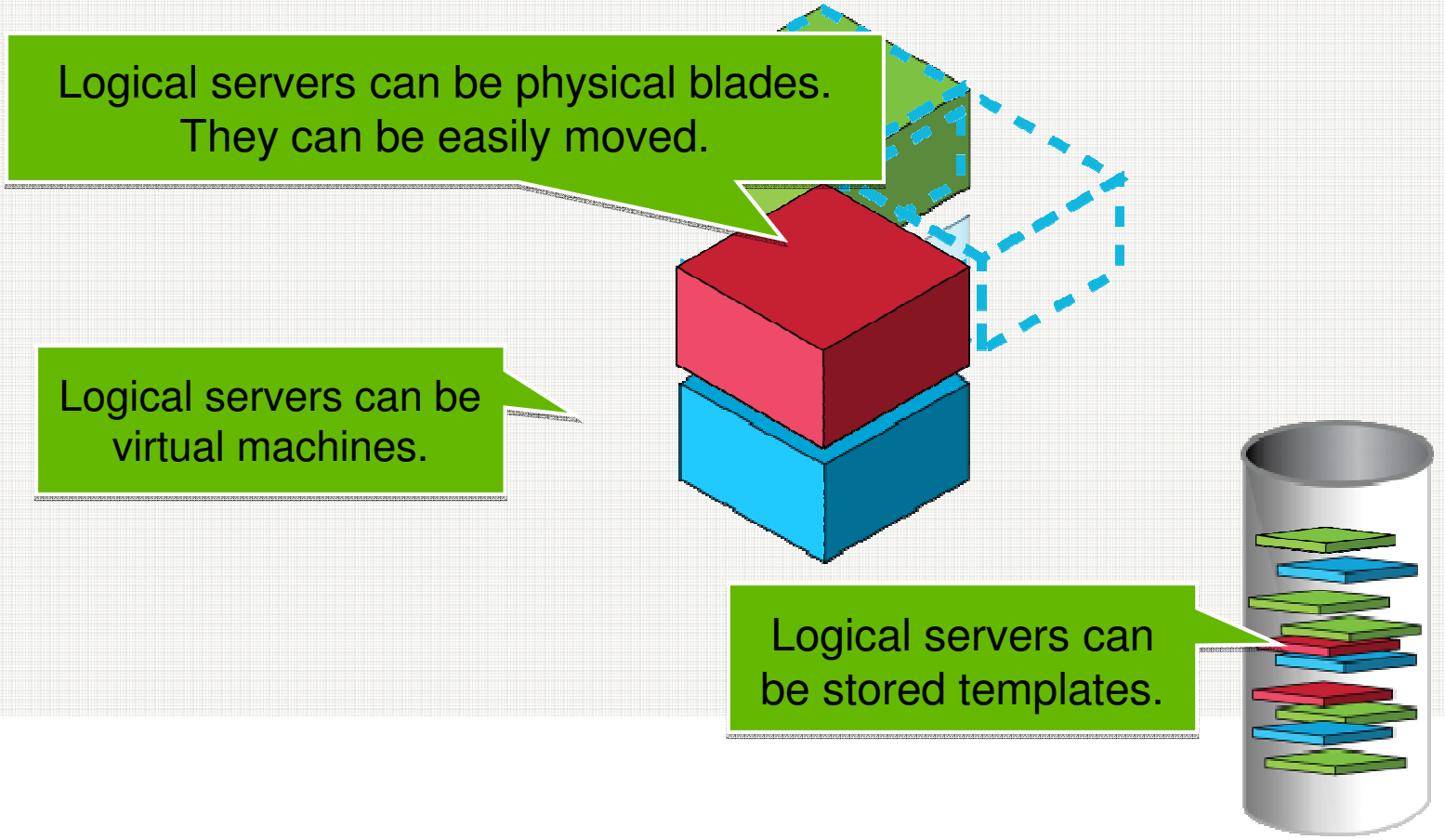
HP Virtualisation Manager

Control physical and virtual resources in the same way



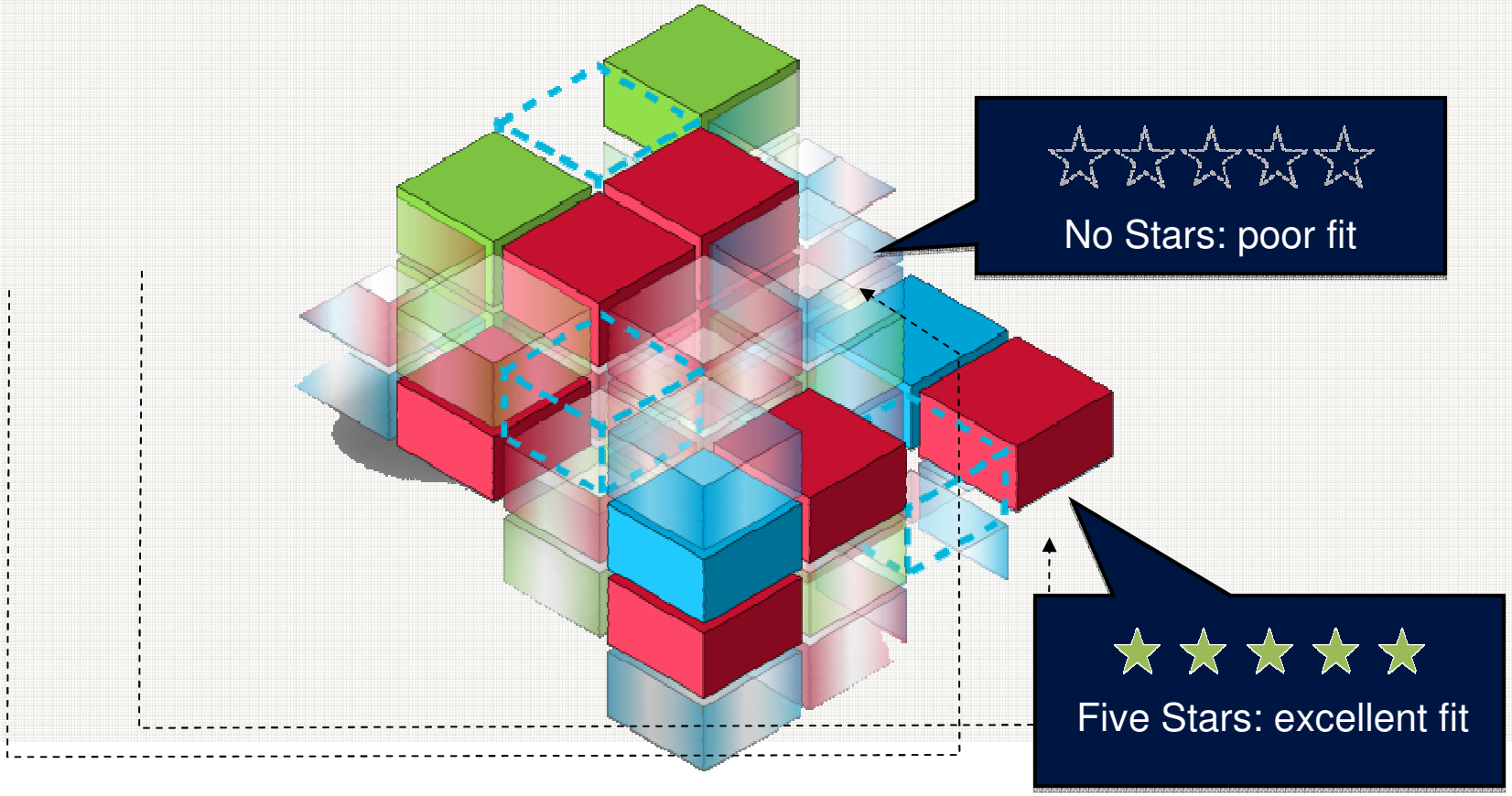
New HP Insight Dynamics - VSE: In action

- Logical server: A server profile that is easily created and freely moved across physical and virtual machines



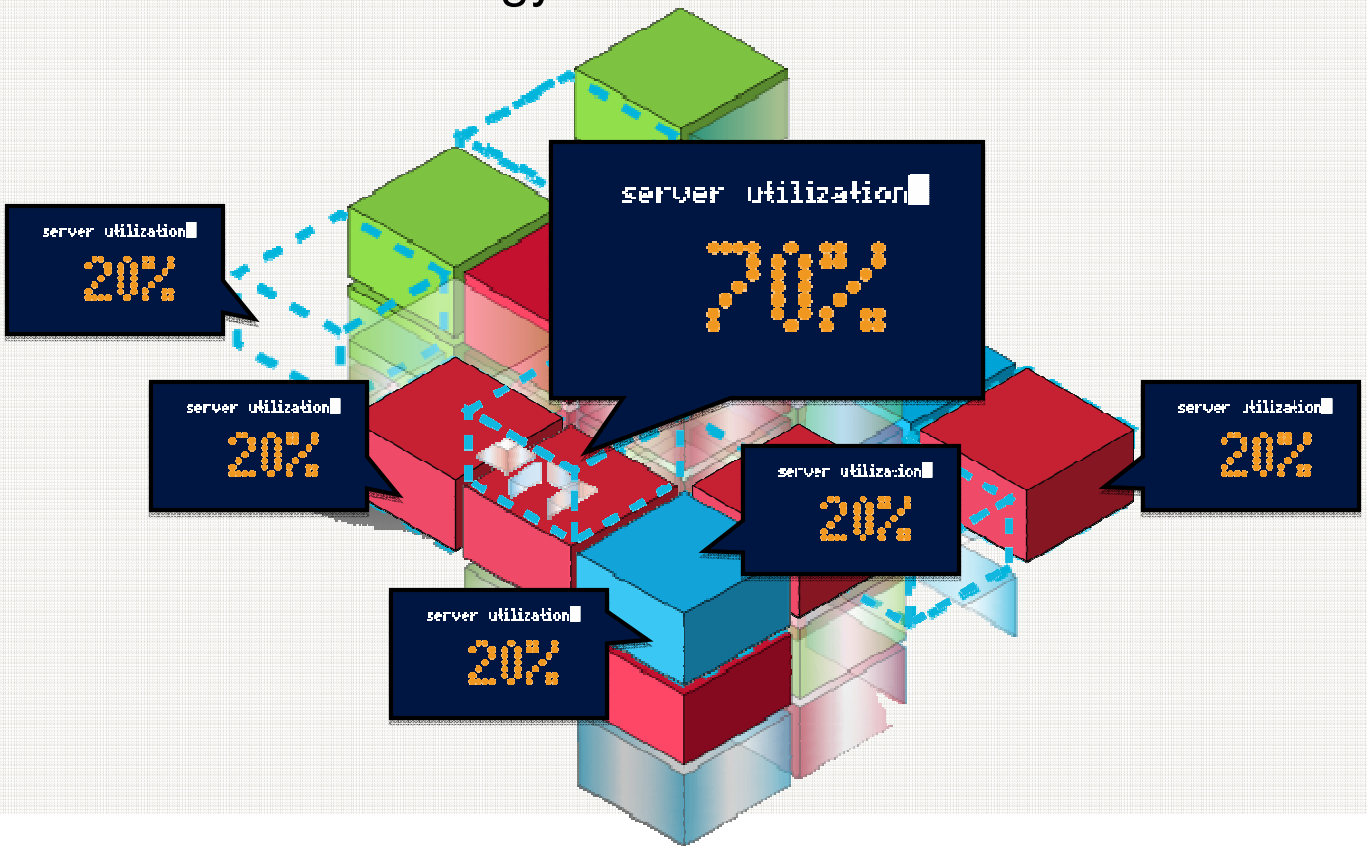
New HP Insight Dynamics - VSE: In action

- 5-star rating system makes it easy to identify best-fit placement



New HP Insight Dynamics - VSE: In action

- Capacity planning for larger consolidations in hours with Smart Solver technology



HP capacity planning with easy-to-use 5-star ratings Servers are provisioned and redeployed based on best fit algorithms

Moving Workload:

Name	CPU Utilization	Memory Utilization	Network I/O Utilization	Disk I/O Utilization	CPU Multiplier	Memory Multiplier	Forecast Growth Rate CPU / Memory / Network I/O / Disk I/O	Contained In
new_app_server	N/A	N/A	N/A	N/A	1.0	1.0	0% / 0% 0% / 0%	Not Assigned/Parked

Note:
The current simulation contains both historical and projected data.
Parked workload utilization values are not relevant until the workload has been moved to a system.

To: (Selected System)

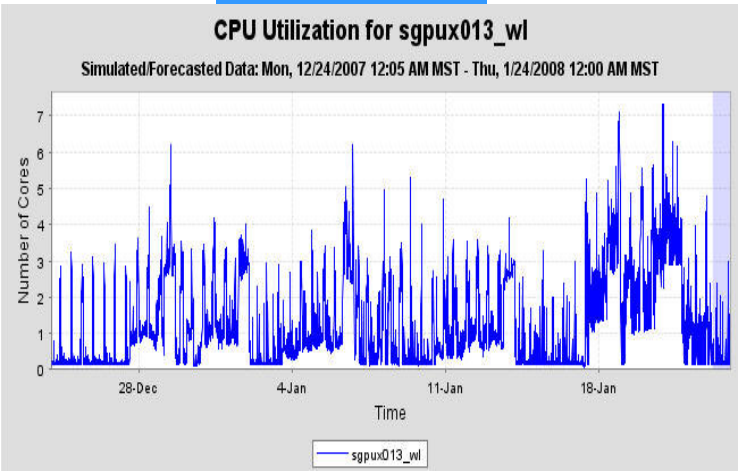
	System Name • workload	Headroom Rating	CPU Utilization	Memory Utilization	Network I/O Utilization	Disk I/O Utilization	Platform	System Type
◉	akroyd01 • akroyd01.fc.hp.com	★★★☆☆	33.29/38.64 % of 2 Cores @ 2.01 GHz	76.00/80.40 % of 2.00 GB	99.66/103.96 % of 838.86 Mb/s	6.37/9.71 % of 1,638.40 MB/s	Windows® ProLiant DL145 G2	Server, Windows Server, HP ProLiant
○	akroyd05 • akroyd05.fc.hp.com	★☆☆☆☆	73.93/76.75 % of 1 Core @ 2.00 GHz	76.48/98.77 % of 1.00 GB	98.82/112.57 % of 837.69 Mb/s	8.09/12.92 % of 1,638.40 MB/s	Windows® ProLiant DL145 G2	Server, Windows Server, HP ProLiant
○	akroyd02 • akroyd02.fc.hp.com	☆☆☆☆☆	60.20/66.35 % of 1 Core @ 2.01 GHz	85.85/108.46 % of 1.00 GB †	98.21/110.36 % of 838.86 Mb/s	8.40/12.43 % of 1,638.40 MB/s	Windows® ProLiant DL145 G2	Server, Windows Server, HP ProLiant
○	akroyd03 • akroyd03.fc.hp.com	☆☆☆☆☆	89.38/92.93 % of 1 Core @ 2.01 GHz †	82.88/102.93 % of 1.00 GB †	35.15/100.93 % of 837.69 Mb/s	15.05/16.83 % of 1,638.40 MB/s	Windows® ProLiant DL145 G2	Server, Windows Server, HP ProLiant
○	akroyd04 • akroyd04.fc.hp.com	☆☆☆☆☆	95.49/99.65 % of 2 Cores @ 2.01 GHz †	79.08/89.64 % of 2.00 GB	41.85/101.12 % of 837.69 Mb/s	14.13/17.41 % of 1,638.40 MB/s	Windows® ProLiant DL145 G2	Server, Windows Server, HP ProLiant
○	akroyd06 • akroyd06.fc.hp.com	☆☆☆☆☆	100.00/110.70 % of 1 Core @ 2.01 GHz †	99.17/121.76 % of 1.00 GB †	40.15/102.21 % of 837.69 Mb/s	3.30/7.25 % of 1,638.40 MB/s	Windows® ProLiant DL145 G2	Server, Windows Server, HP ProLiant

Note:
The current simulation contains both historical and projected data.

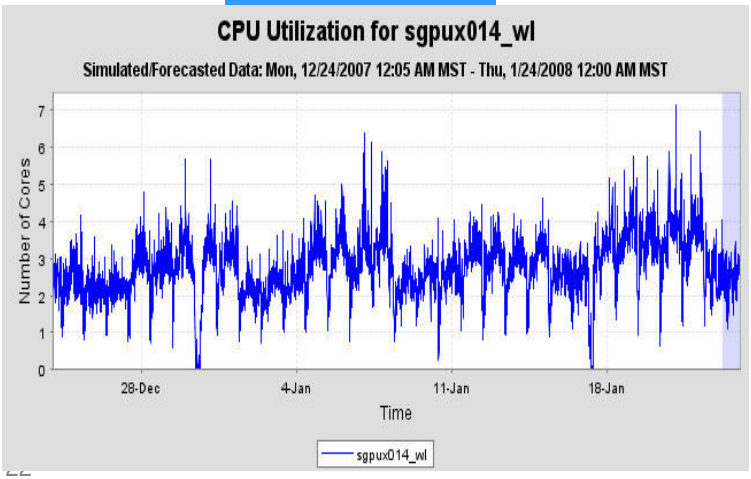
HP Insight Dynamics – VSE: Capacity planning to optimize utilization

The new math: 8+8 = 12

8 Core Peak



8 Core Peak



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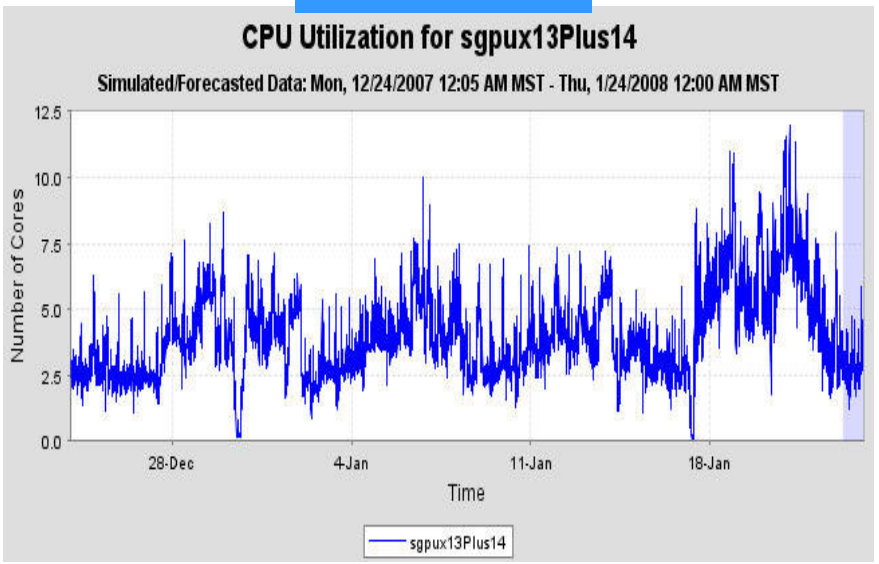
- Peaks for different workloads do not all happen at the same time.

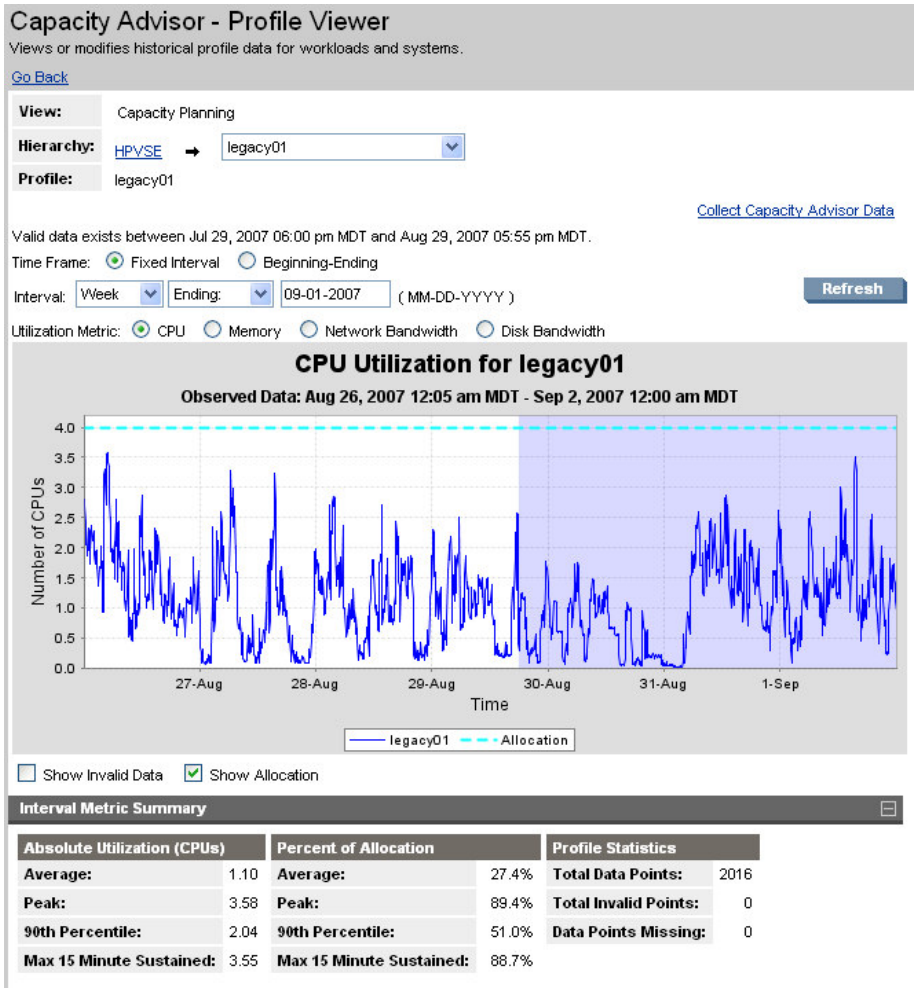
12 Core Peak



- Two workloads each have an 8 CPU peak demand but the peak of their sum is 12 CPUs.

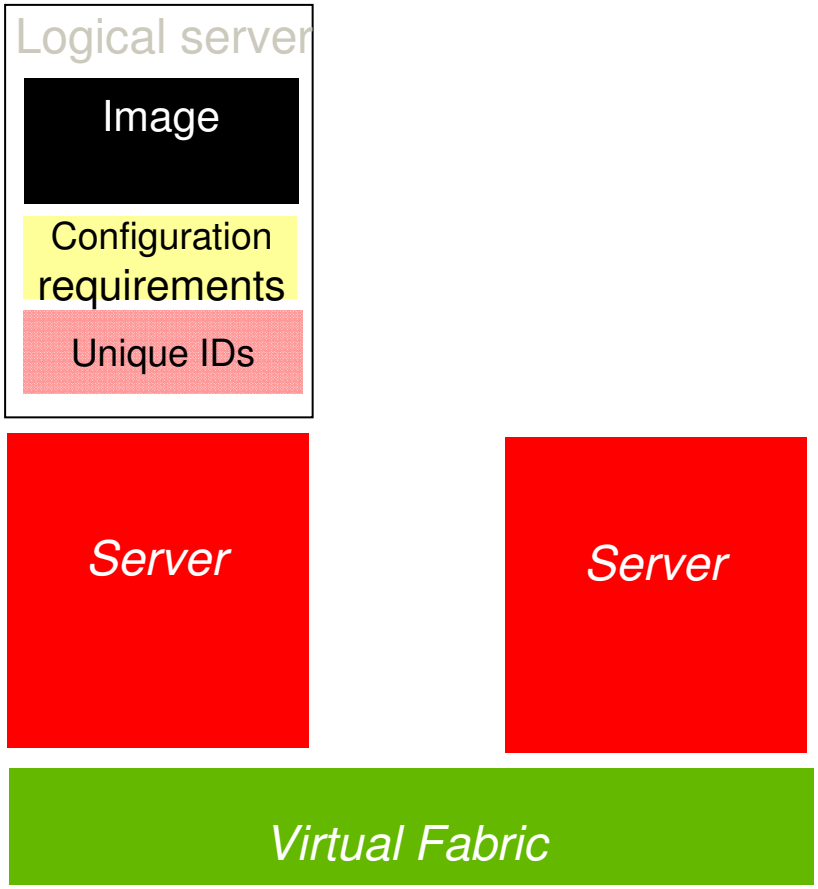
Forecasting utilization is easy

- Enter a growth rate for a workload we will synthesize a trace for it
- Trending analysis will help find the growth rate when there is no business plan




There will be some physical servers in your datacenter !!!

Bring flexibility of virtualization to physical servers



HP Logical Server technology

- A server profile that is easily created and freely moved across physical and virtual machines

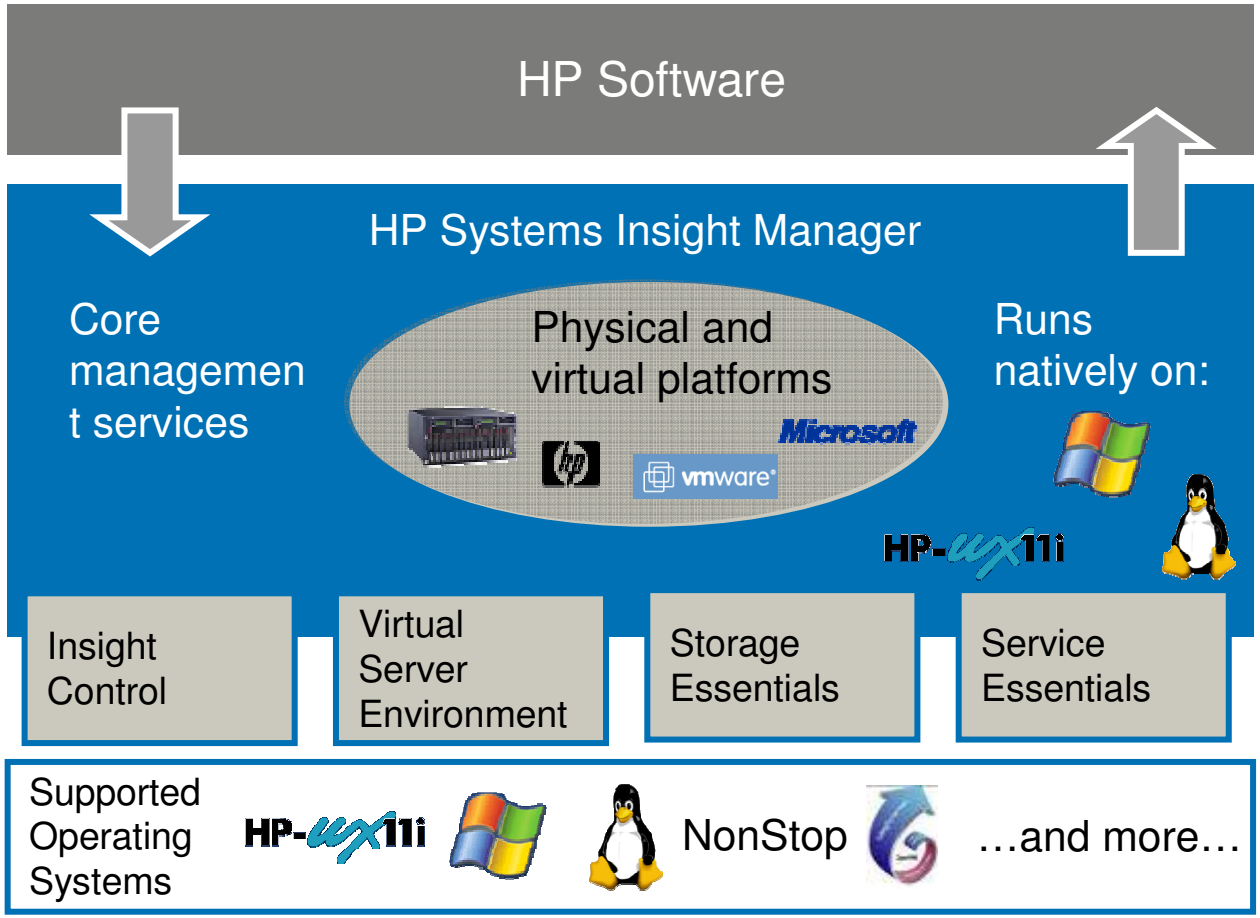
Logical servers can be:

- Active physical blade servers
- Active virtual machines
- Offline templates

Unified Infrastructure Management

Operation and management of servers and storage across multiple platforms from a single interface

Eliminate management complexity



HP SIM users see real results

- Server to administrator ratio doubled
- Administration costs declined by 29%
- Downtime reduced 77%

Source: IDC study of HP SIM users, June 2007

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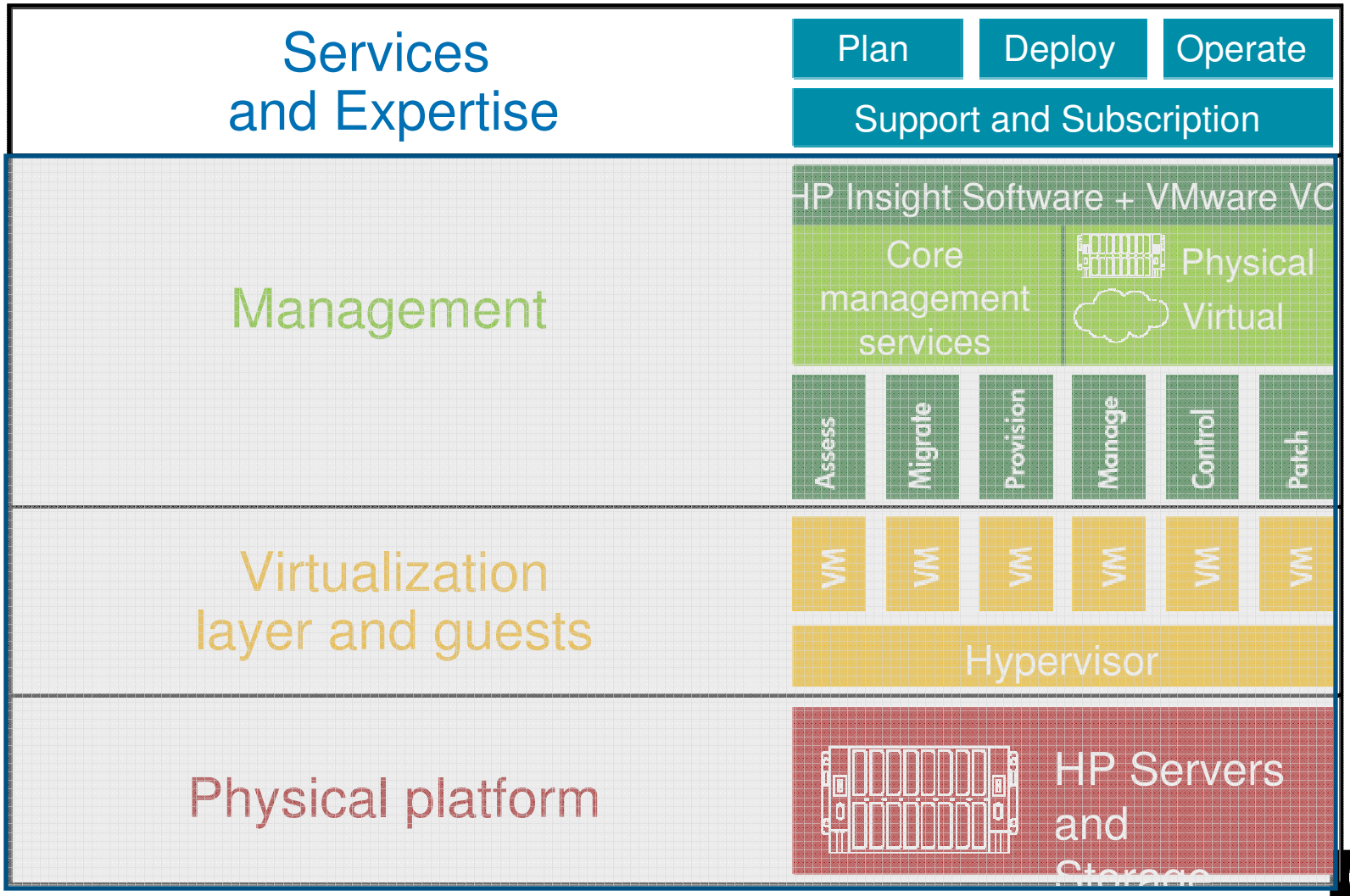
Services and Expertise



Virtualization Steps

1. Virtualization solution design
2. Getting infrastructure ready
3. Operation integration
4. Service delivery and monitoring
5. Maintaining SLA for the service
6. Managing server migrations
7. Reporting

Virtualization Consulting Services

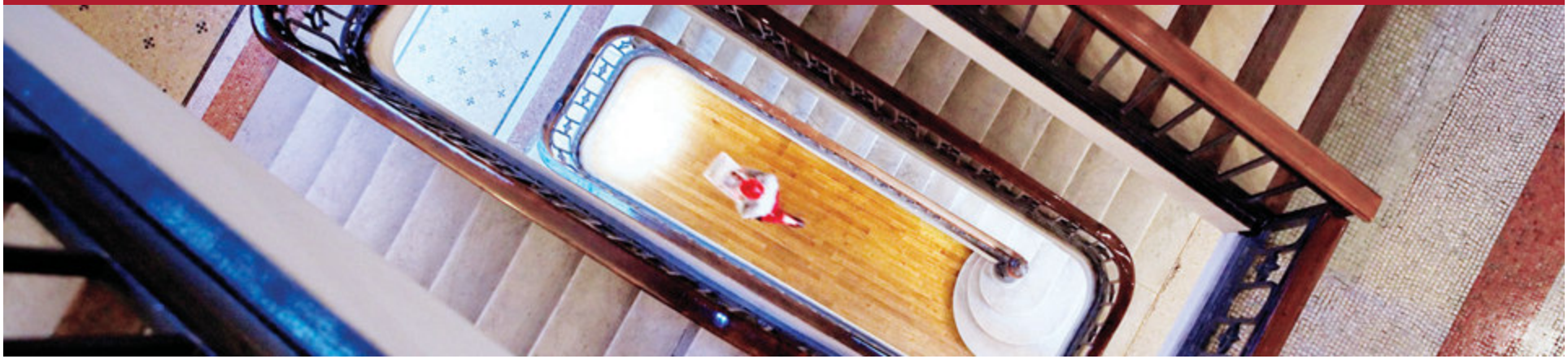
- Design virtualization solution
- Virtualization Service delivery design
- Operation orchestration process
- Service monitoring and reporting
- Service chargeback design and integration
- Service security design

“HP was one of the first companies to recognize the importance of virtualization and is a leader in this area. The power of HP’s virtualization strategy lies with its integrated approach, including hardware, management software and services, to offer a complete and flexible solution.”

Vernon Turner

Vice President and General Manager

IDC Group



Technology for better business outcomes