AE and UDC: HP's Vision for the Next Generation of Computing

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HP WORLD 2003

Solutions and Technology Conference & Expo

The Fine Print and the Usual Caveats....

- *Sad but true, the lawyers require me to say all these things!*

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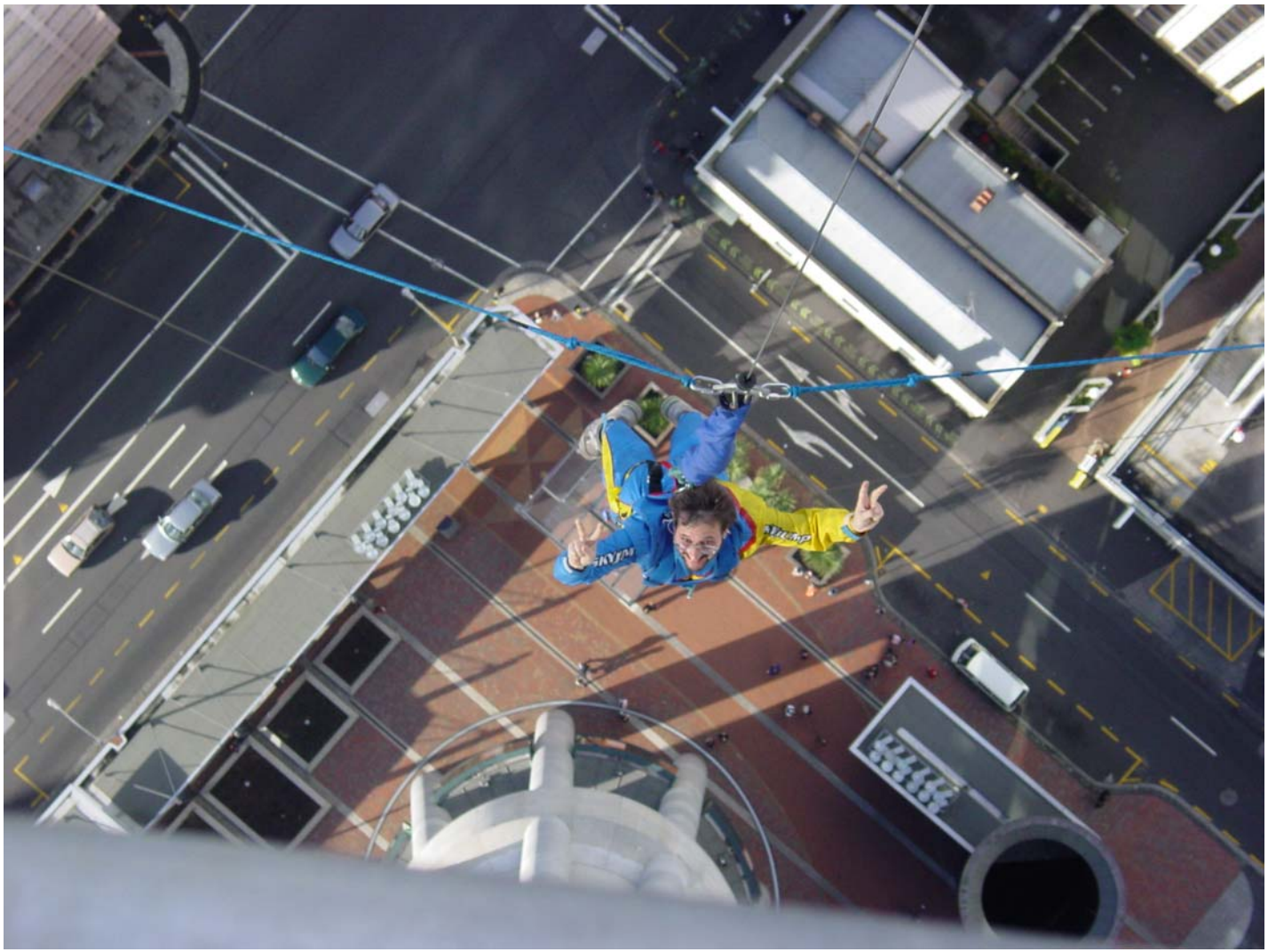
A Deep Dive into UDC-Land…



Putting It All Together With AE and UDC

- **Those of you who have seen my pre-merger "Server Utility" presentations** will find the following several slides to be somewhat familiar…

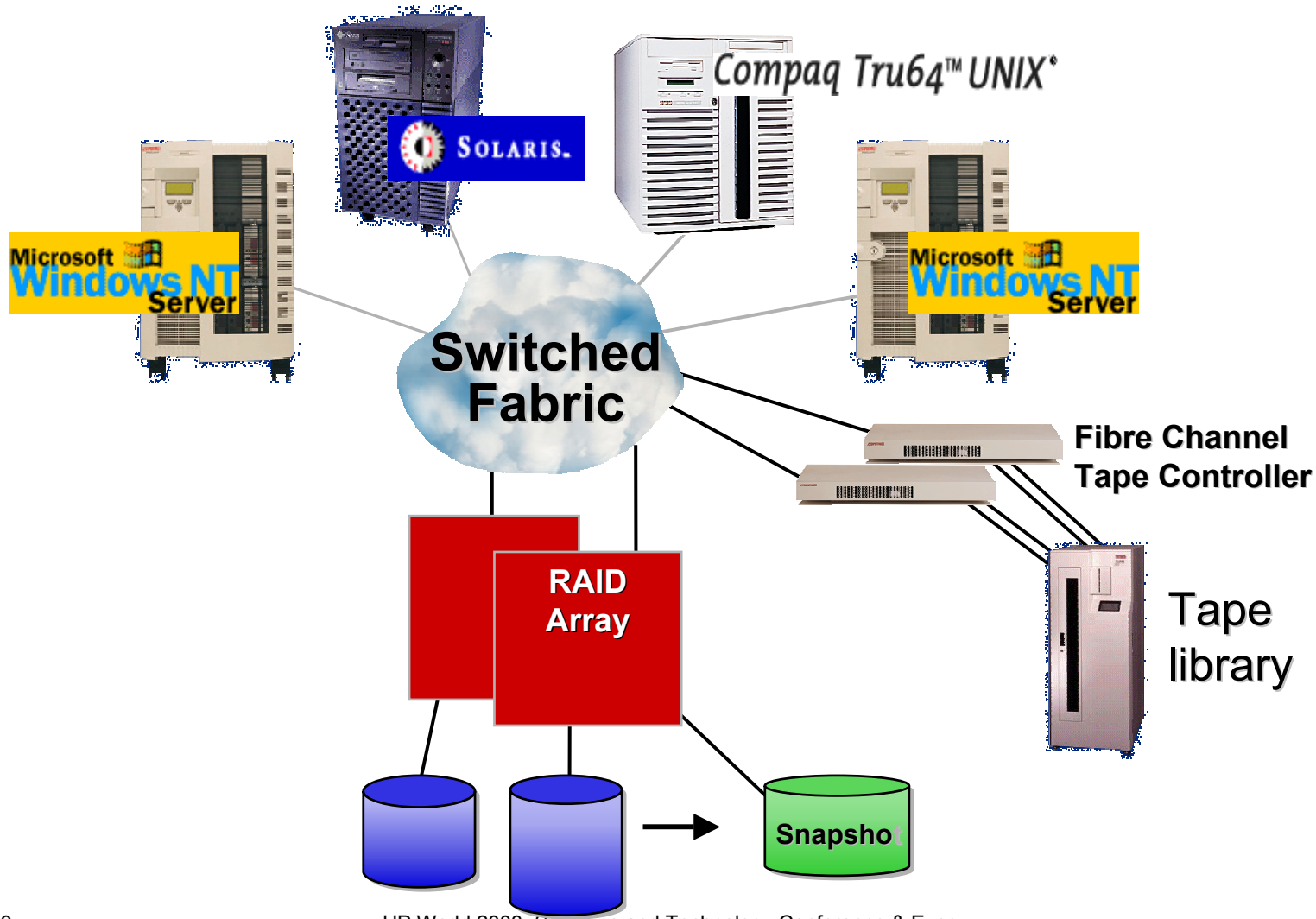
- **Then Things Start to Get Interesting…**
  - **This works, *today… in the lab and at customer sites***
    - **HP has a product**
    - Seen any **self-healing ELIZA** lately?

      any **Sun N1** goodies (other than advertisements?
  - Unlike Compaq, **HP is also virtualizing *everything***

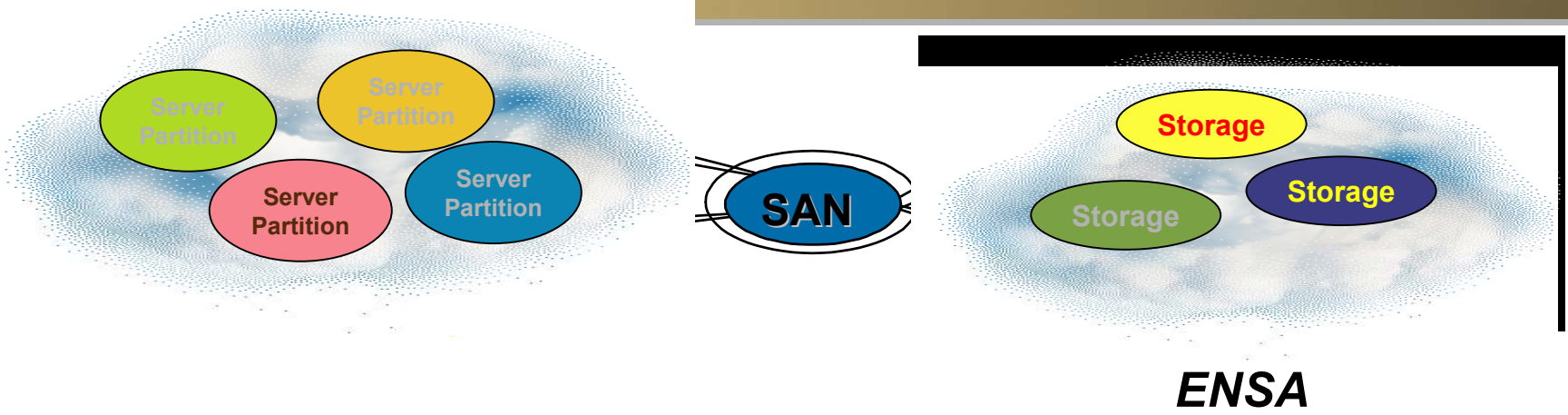
Servers: From Futility to Utility

- ***What goes around, comes around…***
  - **1952 - 1970 Mainframe**
  - **1970 - 1980 Minicomputers**
  - **1980 - 1990 Client Server**
  - **1990 - 2000 Clustering**
  - **2000 - ? Consolidation.. and server schizophrenia**
- HP's **RX for server schizophrenia**…
  - **Appliances -** simple, fixed function
  - **Ultra Scalable Systems -** all resources treated as one
- A "Son of SAN" **Server Utility strategy**

UDC Precursor: Compaq ENSA Storage Virtualization



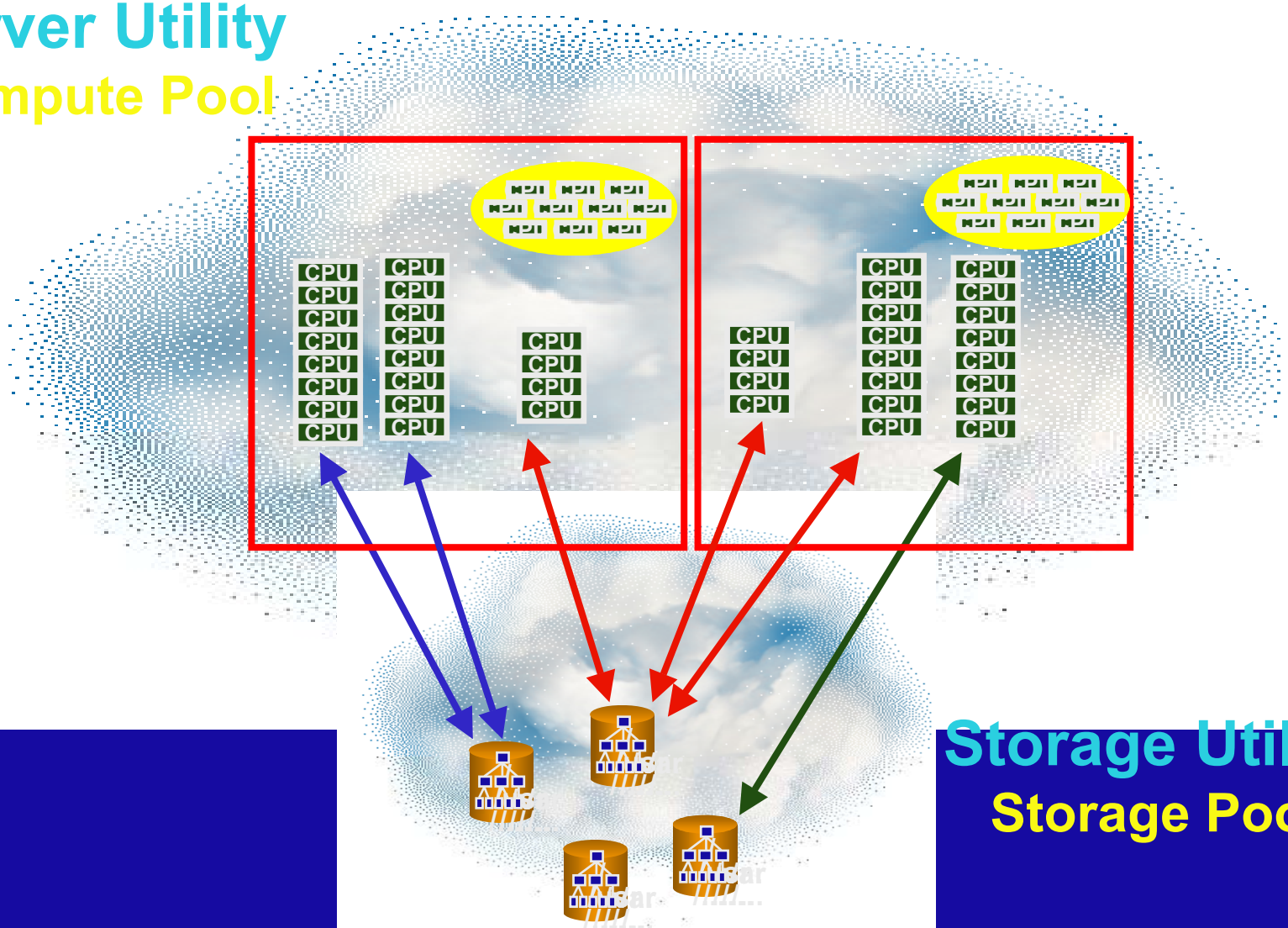
CPQ's Server Utility Strategy: ENSA Extended



ENSA

- **Son of Storage Area Networks…**
  - **Synergy with ENSA Storage Utility** model
  - **Flexible approach to** server resource management
  - System instances are allocated from a **common pool of distributed resources**
  - Resources are **dynamically reallocated to respond to changing needs**

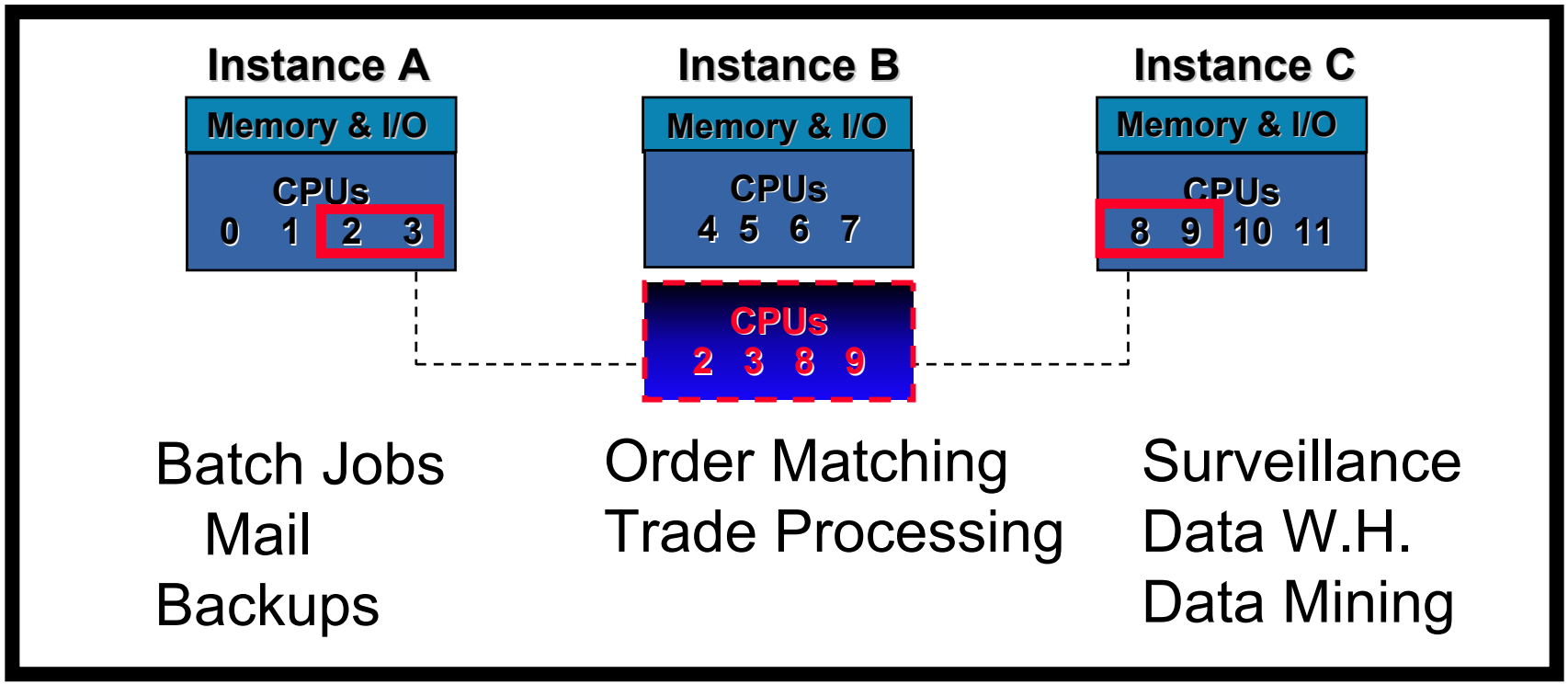
Combining Virtual Storage and Virtual Servers…



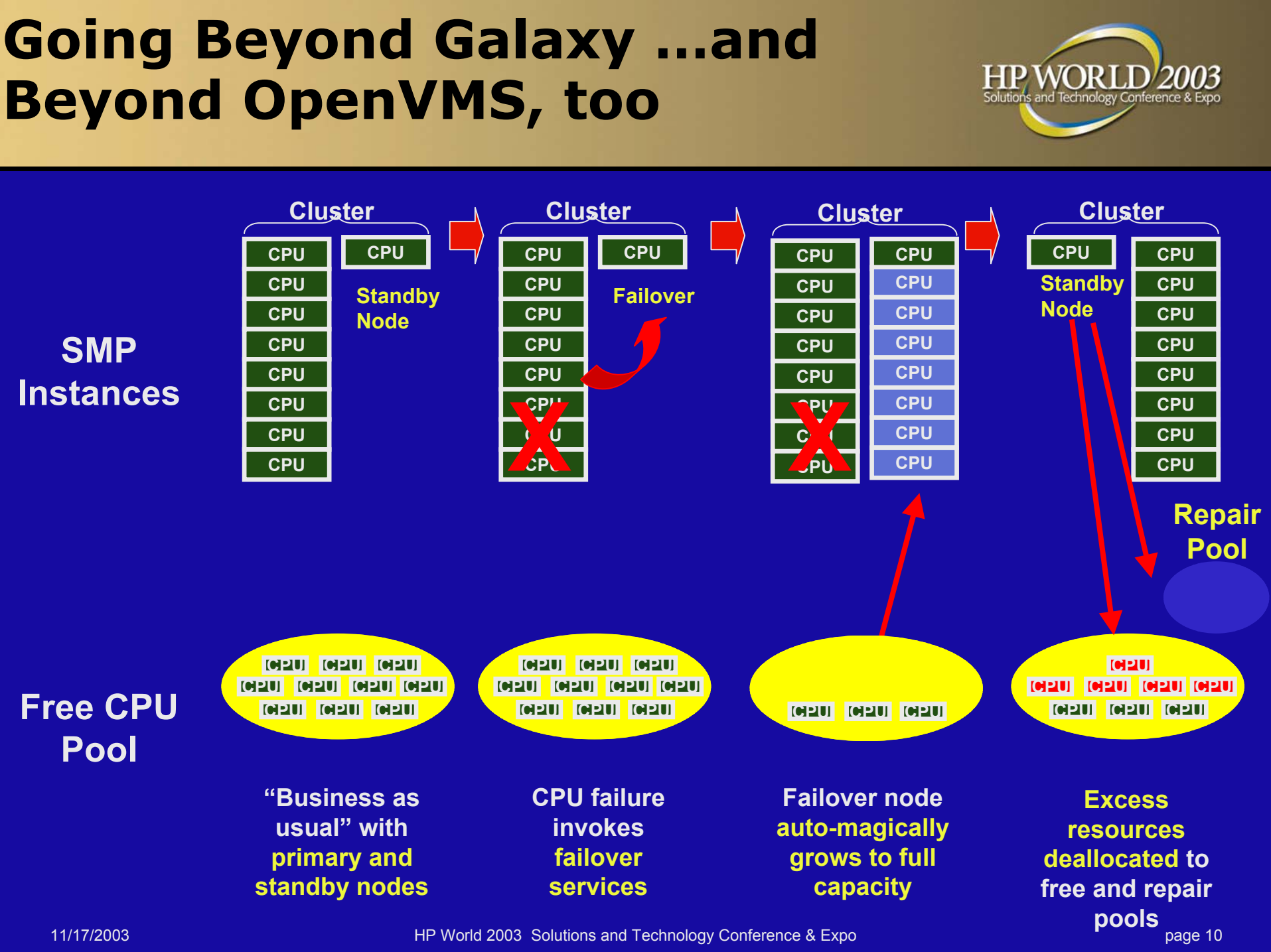
...And Managing Them With Galactic Techniques

OpenVMS Galaxy APMP at the Stock Exchange

"Move the capacity, not the workload..."



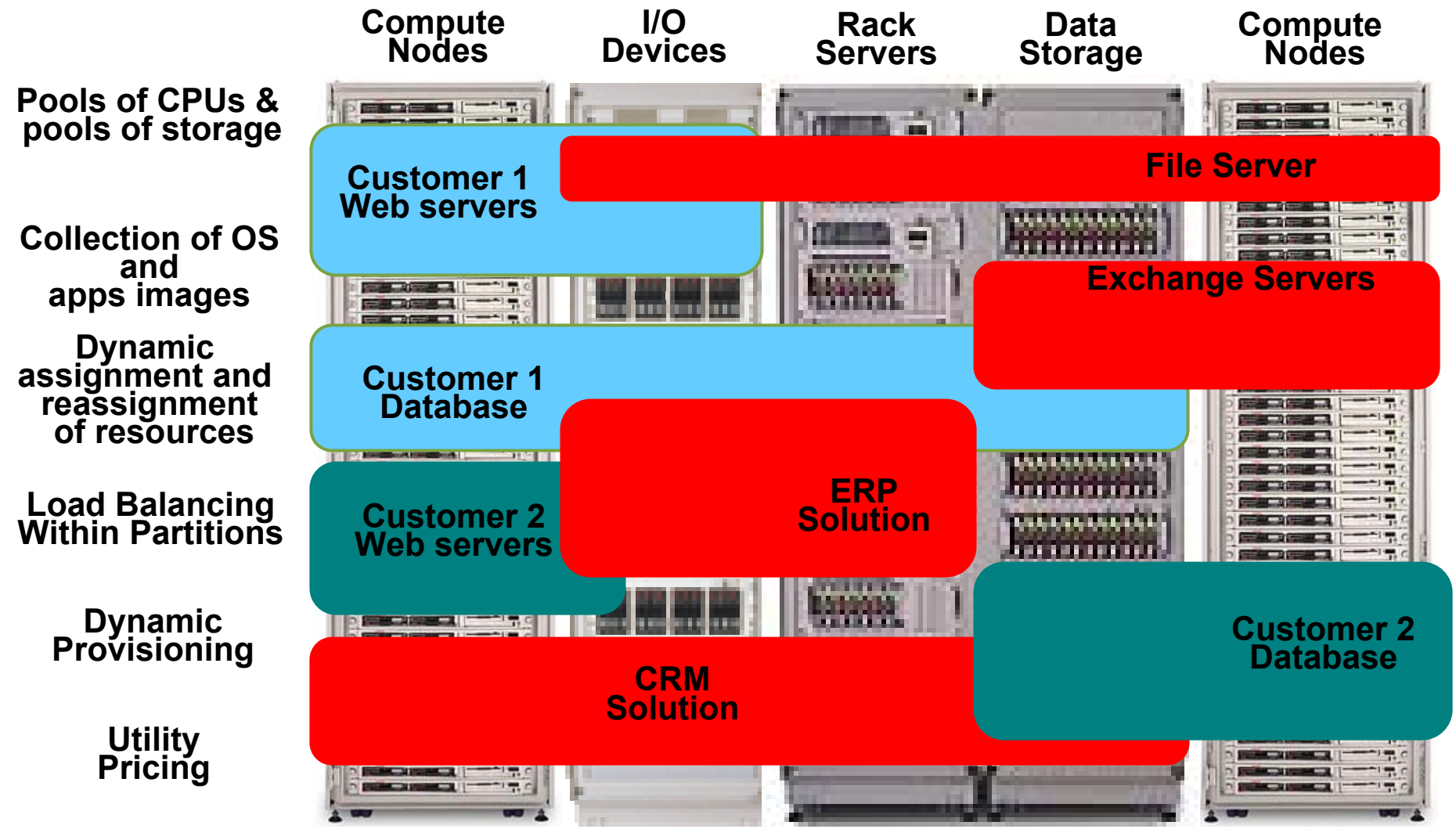
Going Beyond Galaxy …and Beyond OpenVMS, too



Server Utility Feature Summary

- Vastly **reduced management complexity** and cost
  - **Server consolidation** on steroids
  - Disparate, distributed **resources managed as a whole**
- **Ability to respond rapidly** to changing business needs
  - **Shift capacity (not workload)** to where it's needed
  - **React to the unexpected** via a just-in-time growth model
  - Quickly **increase capacity** or deploy new systems
- Nonstop **"boot-once"** operation
  - **Core services available** even during unplanned events.
  - **Continuous availability** at popular prices

Compaq's Proposed IPF-Inside Enterprise Server, circa 2000



Compaq: Virtualize Disks and CPUs. HP: Going *Much* Farther

- **Deal with all of the problems** of today's data centers
- **Extend Compaq's Adaptive Infrastructure** strategy
- **Rebrand as HP's Adaptive Enterprise** strategy
- **Deploy future IT centers as Utility Data Centers**
  - **Wire** your data center once
  - **Virtualize** all of your resources and assets
  - Let **management software** do all the heavy lifting
  - And **the network *will* be the system**

- ***IT as a utility was first envisioned by Ken Olsen nearly 20 years ago.***

Why UDC and Adaptive Enterprise?

Increased Volume of Change

Business challenges

- Improve business performance, quality and ROI, while reducing costs
- Minimize risk associated with change
- Drive new business models and direction
- Shorten time-to-market
- Enable mergers, acquisitions and divestitures

Ability to Adapt Quickly

IT imperatives

- Link business and IT
- Reduce costs, ensure stability and flexibility
- Reduce complexity
- Optimize assets today and tomorrow
- Extend value and reach of the enterprise
- Reduce headcount

The Downsides of Today's Data Centers

Very Expensive to Operate

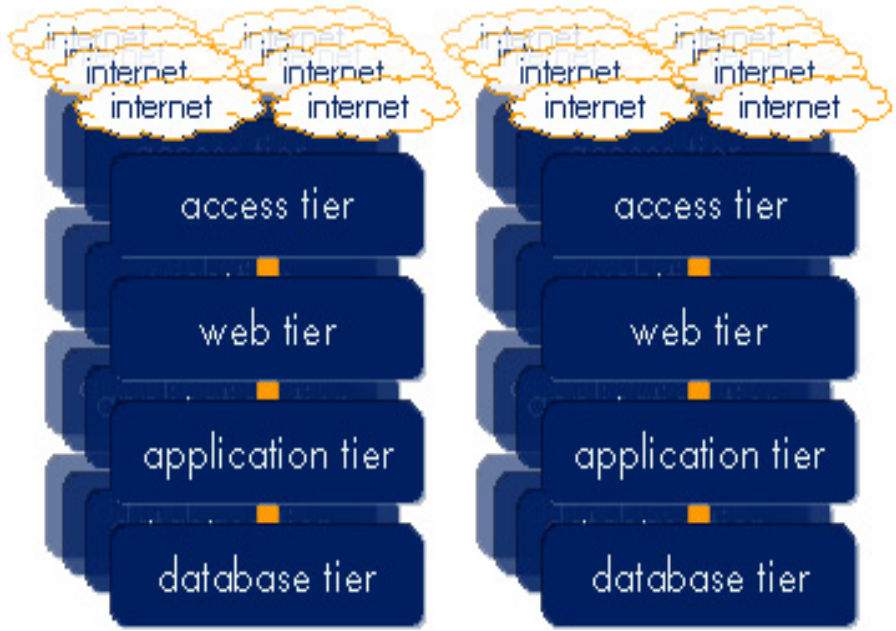
- **Manual, labor-intensive deployments for even minor changes to IT environments**
- **Inefficient asset utilization because of lack of data center-wide load balancing**
- **Development, support and use of home-grown mgmt applications is cumbersome**

Inflexible and Complex

- **Vendor provides inflexible architecture to each customer regardless of specific needs**
- **Highly complex architecture is required to accommodate each user's and app's needs**
- **Difficult to scale because of evolutionary growth or react rapidly to spikes in demand**

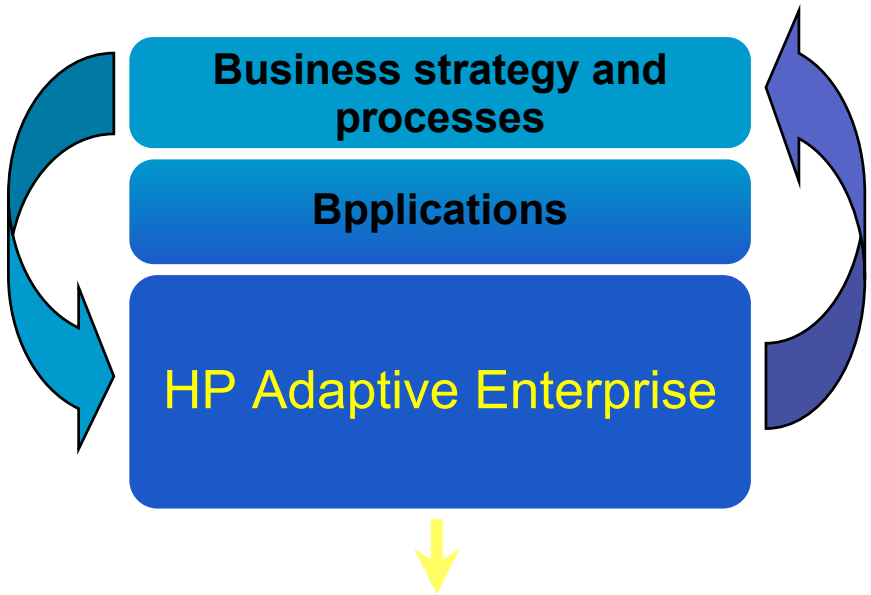
Error Prone and Unreliable

- Human intervention accompanies every change request and implementation



- **Introduction of new infrastructures is slow, costly, and disruptive**.
- **No data center-wide high availability threatens critical/irreplaceable data.**
- **No integrated mgmt view of services and operational environment**

HP Adaptive Enterprise in One Slide



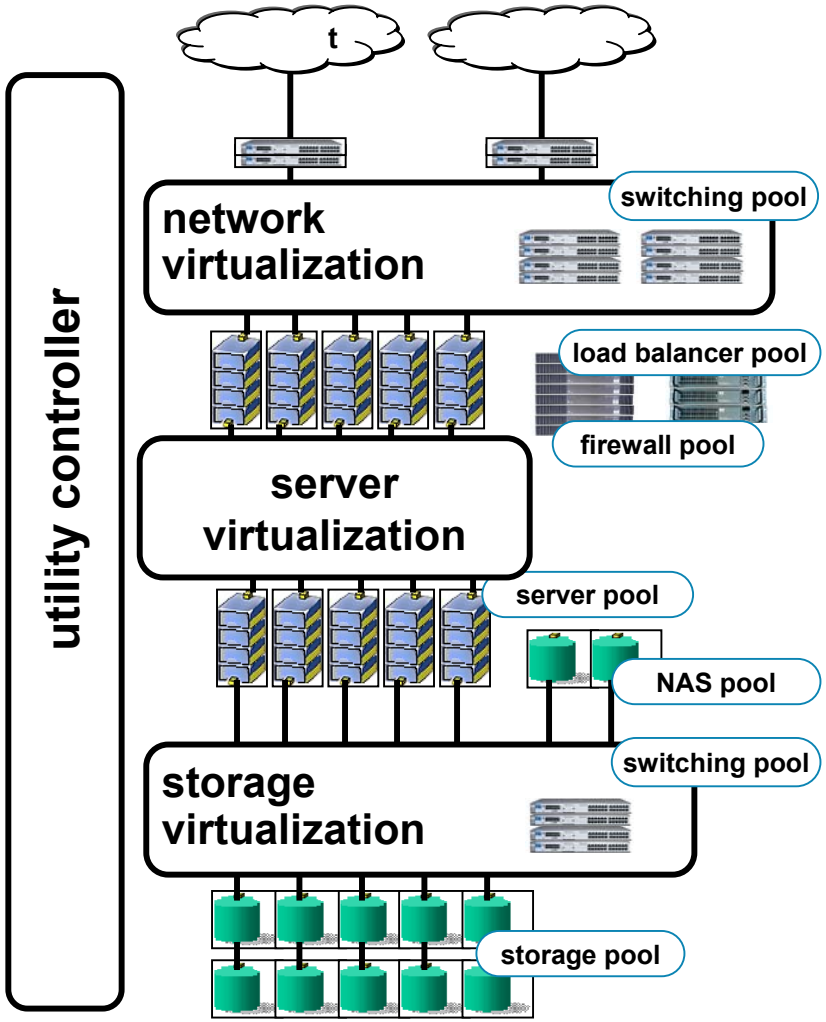
continuous and secure operations

automated and intelligent management

dynamic resource optimization

foundation for the future

What is HP's Utility Data Center? … a Better Way!



hp utility data center

- virtualized pools of resources for instant ignition
- failover protection and data replication to protect servers, storage and network
- wire-once fabric
- utility controller software for service definition and creation

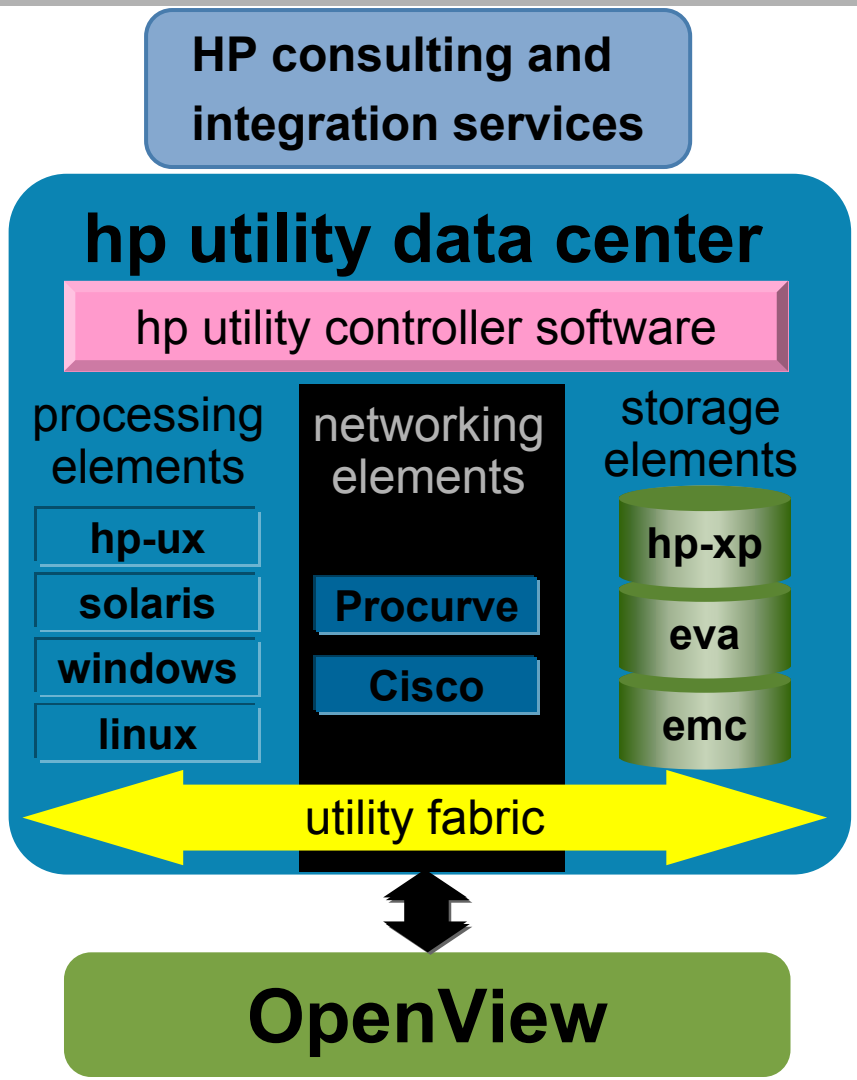
New applications and systems can be ignited within minutes

Server, storage and network utilization approaches 100%

Resources are 'virtualized' and optimize themselves to meet your service level objectives

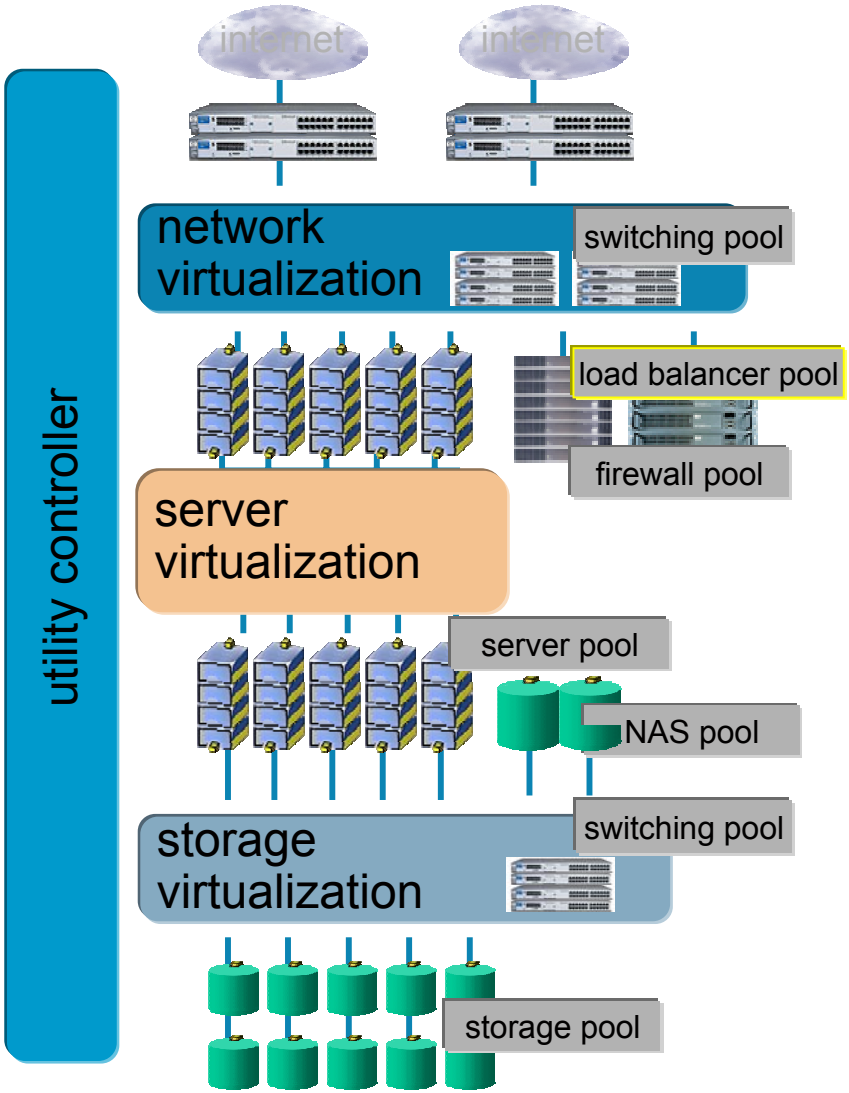
Administrative and operational overhead is minimized

HP Utility Data Center Components



- **Virtual Server Pools**
  - Heterogeneous server environments
  - HP servers optimized for UDC
  - Protect your current investments
- **Virtual Network Pools**
  - Standards-based VLANs
  - Flexible and robust network infrastructure
- **Virtual Storage Pools**
  - HP XP and EVA storage offer flexible 'network-based' virtualization
  - Integration with OpenView for storage management
  - EMC Symmetrix
- **Utility Controller Software**
  - Manages service templates
  - Integrates with HP software: resource, workload and failure mgt.

HP UDC: Improving Asset Utilization



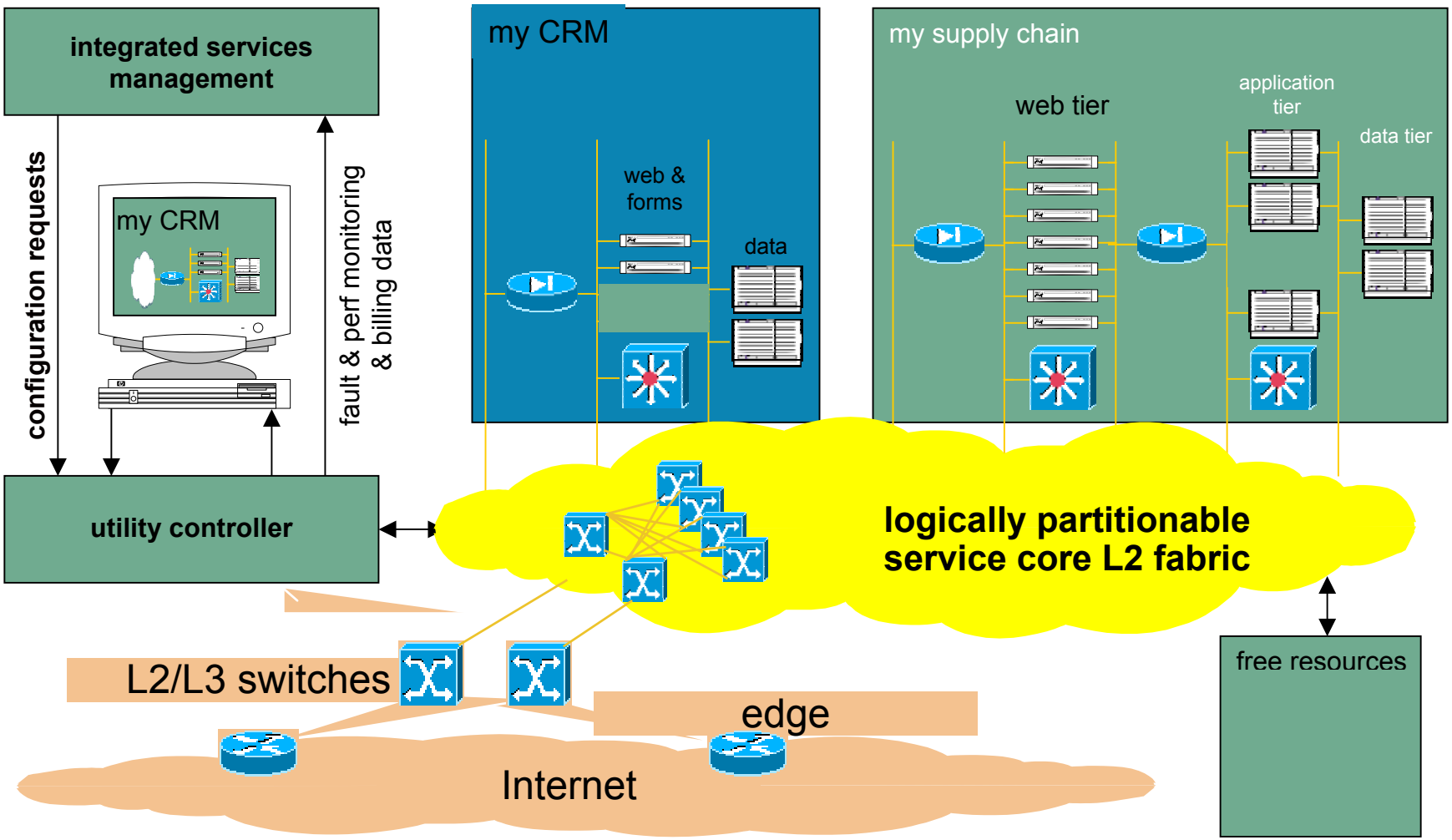
Adaptive management solution enabling virtual provisioning of application environments to optimize asset utility

- **Wire it up just once**
  - network, storage, and server components wired once
- **Virtualize asset pool**
  - All components can be allocated and reallocated
- **Easily reconfigure**
  - simple user interface allows administrators to architect and activate new systems using available resources

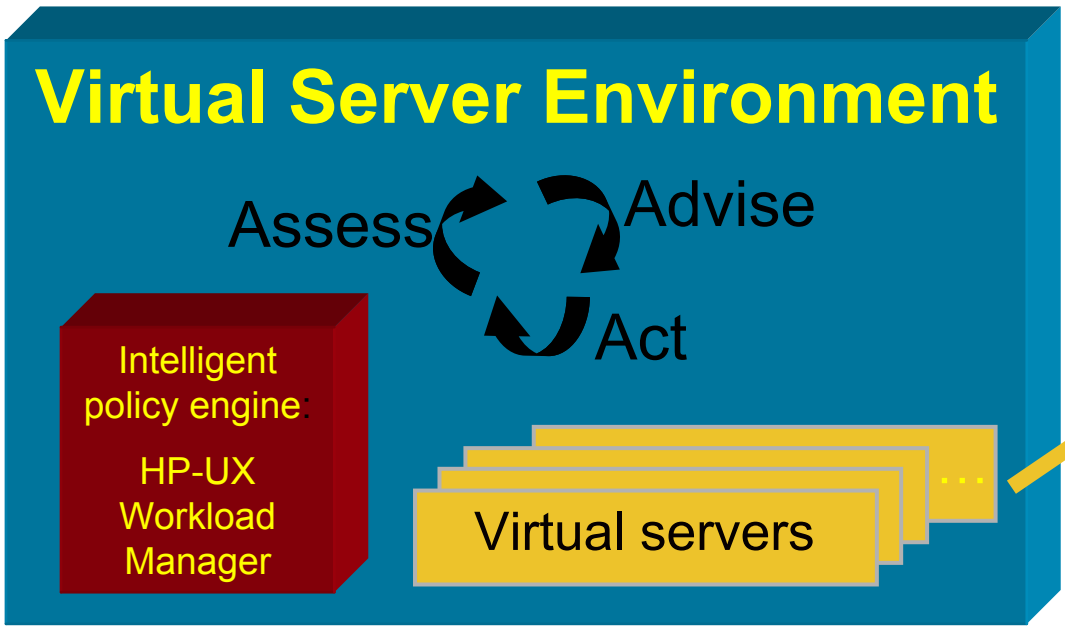
HP's Utility Data Center in Palo Alto, California, USA

HP UDC at the Palo Alto Research Labs. 12/02

HP Utility Data Center in Action



HP Virtual Server Environment for HP-UX



Dynamic resource optimization

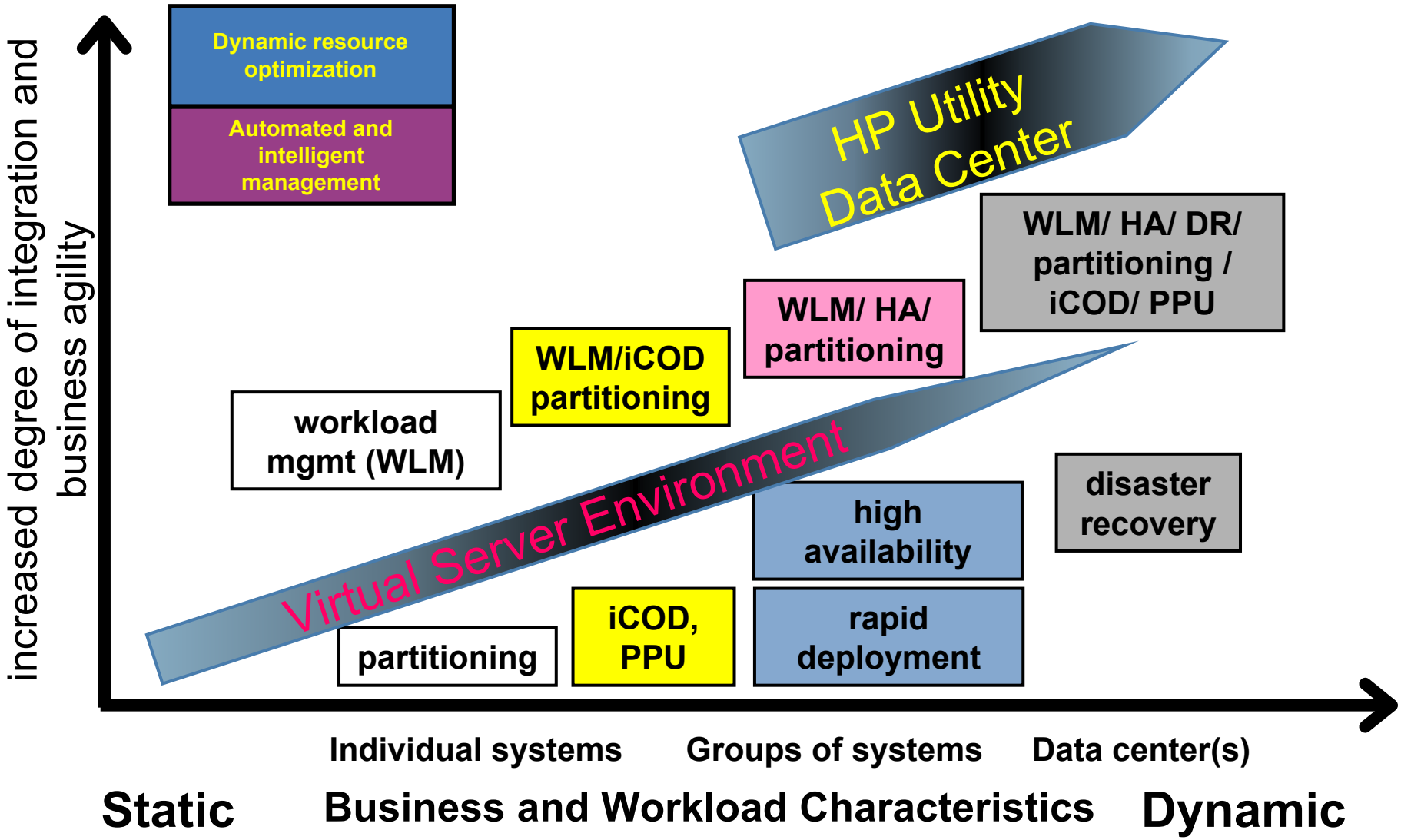
Automated and intelligent management

Server virtualization techniques:

Resource management
Partitioning
On demand
Clustering
Rapid deployment

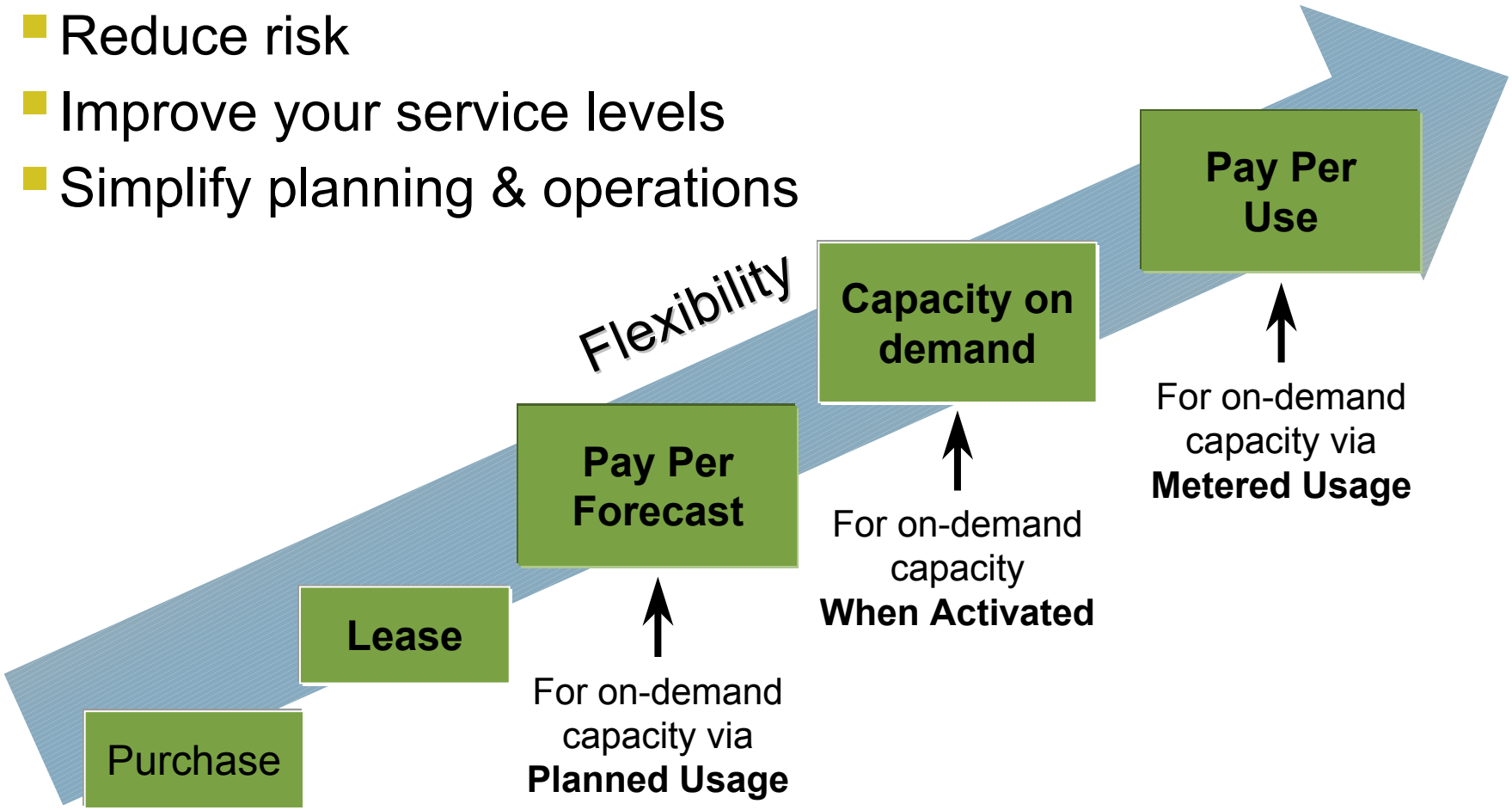
- **HP-UX Bragging Rights**
  - Only goal-based policy engine in the UNIX industry
  - Increased agility
  - Reduced complexity

HP Virtual Server Environment and HP-UX… Evolutionary Steps



Another Approach: On Demand Solutions Portfolio

- Align your costs to revenues
- Reduce risk
- Improve your service levels
- Simplify planning & operations



The Business Case for HP's UDC Strategy and Product Set

provisioning & operational **economies**	asset utilization **economies**	upgrade & migration **economies**	metering **economies**
reducing costs deployment 30% – 80% self adaptive 80% –100% security 20% – 30%	*improved asset utilization* higher server and storage utilization 5% – 40% capacity planning 5% – 10%	*reducing costs* upgrading & migration 20% – 40%	*more accurate charge-back and billing* usage metering 5% – 30%

A Satisfied HP UDC Reference Customer in EMEA

soon to be announced

- **Global manufacturing company based in Europe**
- **Customer objectives**
  - **TCO** cost reduction
    - 20% reduction in first year
  - **Flexible** infrastructure
    - Handle peaks and valleys in resource usage
- **HP solution**
  - **Four separate IT consolidation projects** with **UDC tying them all together**
  - **Won against IBM, Sun, EMC, DELL**, etc
- **Solution implementation awarded to HP in May 2002**

Another Satisfied HP UDC Reference Customer

soon to be announced

- Solution implementation awarded to HP in May 2002
  - **$15M USD deal** for first site
  - 3+ **additional sites**
- **Project status**
  - **First** of multiple worldwide sites
    - Consolidation **projects well under way**
    - **UDC up and running**
- Public announcement
  - **Real Soon Now**

SKHPC's Top Ten Fearless HP and IT Prognostications

- I'm not rich and famous like David Letterman (if I was, I wouldn't be writing about computers), but I DO like Dave's Top Ten Lists.
- So I decided to compile a Top Ten List replete with *SKHPC*'s latest and greatest predictions about things HP-related.
- Like Dave, I can't guarantee the accuracy of these futuristic predictions. But with a >90 percent accuracy rate over the past 15 years, I'm confident that my mid-2003 Top Ten List of Fearless Prognostications will prove to be very, very close to the mark.
- I don't use weasel words like "Probability Factors." After all, weather-guessers and certain Tier One IT analysts rely on Probability Factors, and I'd hate to duplicate their tactics. That said, I'll rely on Confidence Factors… and I'm pretty confident that the next ten pages will prove to be extremely accurate…

Prediction Number 10 (Already A Done Deal)

- **First VMS Industry Standard 64 SDK Release**
  - **OpenVMS on IPF, *aka* OpenVMS Industry Standard 64**
  - **OpenVMS on an industry-standard platform? *Be careful what you wish for, sometimes you get it!***
- **Targets include Key ISVs, Partners, Early Adopters**
- **Contents of OpenVMS V8.0 "Mako"**
  - Monitor Utility
  - DECnet Phase IV, TCP/IP
  - Development Tools
    - Cross Linker, Librarian
    - Compilers

      C, C++, BLISS, FORTRAN, IMACRO
- **Potential licensing changes may reduce entry price for VMS (variation on HP-UX model)… *stay tuned!***

Prediction Number 9

- Second SDK before end of year
- Target Audience: Key ISVs, Partners, Early Adopters
- Contents of OpenVMS V8.1 "Jaws"
  - Limited cluster functionality (4 nodes)
  - Native Compilers
    - C, C++, BLISS, FORTRAN, IMACRO, Pascal, BASIC, COBOL
  - Additional Layered Products
    - Networks,
    - Data Serving
    - Security
    - eBusiness Integration
    - Application Development

Prediction Number 8

- **Production VMS Industry Standard 64 in 2004**
- **Candidate Components for OpenVMS 8.2 "Topaz"**
  - **System & I/O Performance** Enhancements
  - **Cluster Interconnect** Enhancements
  - **Fibre/SAN enhanced** support including **Disaster Tolerance** Enhancements
  - Continued **Security Enhancements**
  - More **updates for e-Business and Integration**
  - **Alpha Compatibility** with OpenVMS Itanium release, including Clusters
  - More **UNIX Portability** features

Prediction Number 7

- Madison Launched 30 June (Another Done Deal)
  - 6MB cache, ~1.5GHz clock speed
  - 30-50 percent performance improvement
  - Madison daughtercard for 128-way Superdomes
  - Impressive performance should further legitimize Itanium, marginalize Sparc
  - ISV attraction is increasing rapidly
  - Don't expect to see HP compare Itanium and Alpha performance – comparisons will be with rival chips
  - Intel may do a declocked, low-power 62W chip version
  - Multiple cores on single chip in future versions

Prediction Number 6

- EV79 in prototype testing right now
  - EV79 will be available sooner than later
- Why?
  - EV79 is basically a CMOS9 shrink of EV78
  - Same EV68 core as EV78
- Same 1.75MB 7-way associative cache
  - Not optimized for IBM's CMOS9 process
  - Costs reduced significantly
  - Faster time to market
  - Reflects HP's expectations for future Itanium CPUs

Prediction Number 5

- **More reorganization and rightsizing at HP**
  - Initial reorg **only the beginning, more cutbacks ahead**
  - **Middle management and VP ranks cut** last month
- Current **~800 direct accounts cut to 200-300**
  - **Productive channel partners** will benefit
- **Direct salesforce** will be reduced
- Five **US sales regions reduced to two**
- **Another high-level reorg** anticipated in Sept-Oct
- Goal: Like Oracle, **HP will emphasize productivity**
  - **Revenue generators** will be rewarded
  - **Underperformers** will be asked to seek employment elsewhere
  - **Company-wide initiative,** specific products not singled out

Prediction Number 4

- **More competitive pressure**
  - **Esp. from IBM** (with POWER5) in enterprise
  - **IBM will attempt to migrate** Tru64 users to AIX
  - **IBM will leverage** Alpha EOL
    - **EV7x Marvel systems will be sold through >2006**
    - **Three years is average for a server, so why move?**
    - **VMS and Tru64 users will be supported past 2011**
  - More storage **pressure from EMC**
  - **Dell** will consolidate 4-way, move to 8-way space
  - **Services** (IBM and HP) remain a differentiator
  - **PC market share?** Not a make-or-break issue

Prediction Number 3

- Continued VMS/Itanium ISV Attraction
  - New ports announced almost daily
  - VMS/UNIX interoperability aids porting effort
  - HP is increasing focus on Itanium ports
- Former customers returning to VMS
  - Success of IPF port is the causative factor
  - Windows penetration of enterprise is slow
  - Clustering, RAS, Disaster Tolerance
- Progress will boost VMS acceptance

Prediction Number 2

- VMS/Itanium will proliferate
  - Gating factor: low-cost Itanium desktops
  - Not a near-term development
  - *SKHPC* estimates 4-5 years for low-cost systems
- VMS on Itanium Laptops?
  - Definitely, when the price is right (desktops sooner)
- VMS on non-HP Itanium systems?
  - Almost certainly
  - Any Itanium system that "plays by the rules" is a potential VMS host
- VMS port to another 64-bit architecture?
  - Not currently planned
  - But not beyond the realm of possibility

And *SKHPC*'s Number One Prediction is… Linux Rising

- **Linux… not just for iPAQS and Open Sourcerers Any More**
  - More emphasis: **HP's Linux Program Office is 2 years old**
  - Desktops **– driven by ease of use and apps availability**
  - **ProLiant servers – running plenty of Linux today**
  - **Enterprise server partitions – another home for Linux**
  - **HPTC – today's most rapidly growing Linux opportunity**
    - **Beowulf clusters, Grid computing and UDC**
    - **Cluster Blocks**
  - **Service and Support**
    - **IBM and HP, Red Hat today, others coming on line**
    - With stable service, **Linux gains credibility and acceptance**
    - **Linux certification programs** under development

IT Will Be a Two Horse Race…

Warning: Those who ignore HP may end up in the Sun Showroom!

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- The usual HP Web sites
- www.shannonknowshpc.com (includes *SKHPC* archives)
- www.canacu.org
- http://www.hp-interex.org/site/cms/
- www.openvms.org
- www.tru64.org
- www.enterpriseunix.org
- www.EnterpriseLinux.org
- www.LinuxHPC.org
- tshannon3@comcast.net (Terry Shannon's email)

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