Enterprise Architecture & Technology
Building A Service Oriented Infrastructure

Dr. Guy Bunker
Chief Scientist, Symantec Corporation
Agenda

- Driving Factors
- Complexity and the Data Center
- Moving to IT as a service
- Principles for architecture design
- Data and security convergence
- Risks and consequences
- Summary
Information Drives Our Businesses

- IT systems automate more of our business than ever
  - Automation of internal business process
  - Enabling new external business models
- The Internet offers unprecedented access to information
  - Credit reports, bank statements, health records
- More information than ever before
  - More information being generated
  - More information being accessed
- More regulations
  - Driving storage requirements
  - Driving access requirements

YOU ARE THE BUSINESS!
The Architecture Enables The Business
For The CIO, The Pressure’s On…

- Viruses
- Improve Utilization
- Compliance/Regulations
- Hackers/Phishers
- Increase Data Growth
- New Technologies
- New Opportunities
- Increase Data Growth
- Improve Service Levels
- Flat IT Budget

How often will you have to change your architecture? At what cost?
IT: The Challenge

Increasing demands for Quality of Service

Ability to deliver through traditional IT solutions

Higher Availability
Greater Performance
Improved Recoverability

The Widening Gap

More complex systems
Less Budget
One Goal: Master Complexity
## Infrastructure Software In The Data Center:
### Developing A Service Oriented Infrastructure

<table>
<thead>
<tr>
<th>Databases</th>
<th>Middleware</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORACLE</td>
<td>bea</td>
<td>ORACLE</td>
</tr>
<tr>
<td>DB2</td>
<td>IBM</td>
<td>Microsoft</td>
</tr>
<tr>
<td>Informix</td>
<td>SAP</td>
<td></td>
</tr>
<tr>
<td>Sybase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MySQL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Protection</th>
<th>Storage Management</th>
<th>Server Management</th>
<th>Application Performance</th>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup</td>
<td>File system</td>
<td>Clustering</td>
<td>Tuning advice</td>
<td>Firewall</td>
</tr>
<tr>
<td>Media management</td>
<td>Volume management</td>
<td>App. placement</td>
<td>Alerting</td>
<td>Anti-spam</td>
</tr>
<tr>
<td>Snapshot services</td>
<td>Copy services</td>
<td>Provisioning</td>
<td>Root cause analysis</td>
<td>Anti-malware</td>
</tr>
<tr>
<td>Archiving / Compliance</td>
<td>Multi-pathing</td>
<td>Configuration management</td>
<td>SLA reporting</td>
<td>IP Leakage</td>
</tr>
<tr>
<td></td>
<td>Resource mgmt.</td>
<td></td>
<td></td>
<td>Compliance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network</th>
<th>Storage</th>
<th>Servers</th>
<th>Virtual Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPE</td>
<td>HITACHI</td>
<td>HP</td>
<td>Xen</td>
</tr>
<tr>
<td>Juniper</td>
<td>IBM</td>
<td>EMC</td>
<td>VMware</td>
</tr>
<tr>
<td>Brocade</td>
<td></td>
<td>NetworkAppliance</td>
<td>Intel</td>
</tr>
</tbody>
</table>

**Symantec Confidential**

© 2006 Symantec Corporation
Infrastructure Software In The Data Center: 
Developing A Service Oriented Infrastructure
Infrastructure Software In The Data Center:
Developing A Service Oriented Infrastructure

Standardization & Virtualization:
The Only Way To Win.

Veritas NetBackup
Symantec Backup Exec, Enterprise Vault
Veritas Storage Foundation
Veritas Server Foundation
Veritas i3—APM
Symantec Security Solutions

Network
Storage
Servers
Virtual Machines

Symantec Confidential © 2006 Symantec Corporation
Architectural Maturity

- Dedicated Systems
- Shared Infrastructure
- Assisted Management
- Service Management
- Utility Computing

Business Value vs. Cost
Five Steps To Deliver IT As A Service

1. Discover
2. Automate
3. Standardize
4. Consolidate
5. Discover (again)

- Automated Management
- Virtual Commodity Infrastructure
- Predictable Service Levels
Architectural Maturity

<table>
<thead>
<tr>
<th>Dedicated Systems</th>
<th>Shared Infrastructure</th>
<th>Assisted Management</th>
<th>Service Management</th>
<th>Utility Computing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Interface</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No SLA’s</td>
<td>Arbitrary SLA’s</td>
<td>Basic Class Of Service Business Level Reporting</td>
<td>End-End Service Mgmt</td>
<td>Utility Services</td>
</tr>
<tr>
<td><strong>IT Organization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distributed Functions</td>
<td>Distributed Competence</td>
<td>Centers Of Competence</td>
<td>Simple Service Mgmt Discipline</td>
<td>Comprehensive Svc Mgmt Discipline</td>
</tr>
<tr>
<td><strong>IT Processes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bespoke processes</td>
<td>Basic Mgmt Workflows</td>
<td>Routine Task Automation</td>
<td>Comprehensive Automation</td>
<td>Fully Automated IT</td>
</tr>
<tr>
<td><strong>Software Capability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Standardized No Hardware Abstraction</td>
<td>Basic Storage Abstraction</td>
<td>Centralized Mgmt Tools</td>
<td>Std Software Tools Basic Auto Provisioning</td>
<td>Service Lifecycle Mgmt Actionable Infrastructure</td>
</tr>
<tr>
<td><strong>Hardware Capability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distributed, Proprietary</td>
<td>Shared Storage</td>
<td>Shared Server Pools</td>
<td>Hierarchical Modular Architecture</td>
<td>Commodity Hardware</td>
</tr>
</tbody>
</table>
### Architectural Maturity

<table>
<thead>
<tr>
<th>Business Interface</th>
<th>IT Organization</th>
<th>IT Processes</th>
<th>Software Business</th>
<th>Hardware Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>No SLA’s</td>
<td>Distributed Functions</td>
<td>Bespoke processes</td>
<td>Basic Storage Abstraction</td>
<td>Distributed Functions</td>
</tr>
<tr>
<td>Arbitrary SLA’s</td>
<td>Distributed Competencies Of Competencies</td>
<td>Standard Workflows</td>
<td>Centralized Mgmt Tools</td>
<td>Shared Storage</td>
</tr>
<tr>
<td>Basic Class Of Service Level Reporting</td>
<td>Centers Of Competencies</td>
<td>Routine Task Automation</td>
<td>Basic Auto Provisioning</td>
<td>Shared Server Pools</td>
</tr>
<tr>
<td>End-End Service Level Reporting</td>
<td>Comprehensive Storage Mgmt</td>
<td>Comprehensive Automation</td>
<td>Service Lifecycle Mgmt</td>
<td>Hierarchical Modular Architecture</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Commodity Hardware</td>
</tr>
</tbody>
</table>

- **Dedicated Systems**: No SLA’s, arbitrary SLA’s, distributed functions of competencies, bespoke processes, no hardware abstraction, arbitrary SLA’s.
- **Shared Infrastructure**: Distributed functions, distributed competencies, basic workflows, basic storage abstraction, central management tools, shared storage.
- **Assisted Management**: Basic class of service level reporting, routine task automation, service lifecycle management, actionable infrastructure, hierarchical modular architecture.
- **Service Management**: End-end service level reporting, comprehensive storage management, fully automated IT, end-end utility management.
- **Utility Computing**: End-end utility management, comprehensive software tools, basic auto provisioning, commodity hardware.
Key Principles

- Executive buy-in AND backing
- Agility: To Respond
- Flexibility: To Reuse
- Scalability
  - Storage, servers, network
  - People, offices, geographies
- Heterogeneity
  - This is not just about the OS
- Security
  - Build it in from the start
  - Build it in everywhere
- Keep it simple
  - OK… so as simple as possible will still be complicated…
  - No exceptions… exceptions cost time and money…
- Communication
  - Listen to the business
  - Changes have to be ‘sold’ to the stakeholders

Change... It Is Going To Happen... Accept It And Move On
What do the following have in common?

- They believe in convergence between data and security
  - At every point in the architecture
  - It is key to their corporate strategies

- Security is not built in at the last minute… it is the starting point

- You need to understand the risks
Where’s The Problem?

External
Hackers, Spies, Thieves

Internal
Thieves, Fraudsters
... And The Rest Of Us

Exclusion (Blocking)

Inclusion (Surveillance)
The Threat Landscape Shift

Old Landscape

- Threats are noisy & visible to everyone
- Threats are indiscriminate, hit everyone
- Threats are disruptive ➔ impact readily visible
- Remediation action is technical ("remove")
- Only a few named threats to focus on

New Landscape

- Threats are silent & unnoticed
- Threats are highly targeted, regionalized
- Threats steal data & damage brands ➔ impact unclear
- Remediation more complex, may need to investigate data leak
- Overwhelming amount of variants, nameless threats
Security Everywhere: Endpoint Compliance

- Start with the obvious
- Ensure that there are no holes in the basic infrastructure
- Deal with unmanaged systems
- Deal with the managed systems
- Next generation security: Behavioural Protection
SOA: Increasing or Decreasing Complexity?

- Haven’t you heard this before?
  - Improved reuse
  - Modular development
  - Object oriented
  - Data driven

- But…
  - Increased tangle of applications – no tools to monitor / manage ‘the whole’
  - Standards
  - Interoperability Agreements
  - Service Level Agreements
  - Downtime (planned or otherwise)

- Who’s in control of your information? Who’s in control of your business?

“By 2008, more than 60 per cent of enterprises will use SOA as a ‘guiding principle’ when creating mission-critical applications and processes”
- Gartner
The Risks
Summary

- Agility is the key to success
- Build a Service Oriented Infrastructure
- **Standardize**
  - Standardize – environments
  - Standardize – procedures
- **Understand the business**
- Continuously ask: Is our architecture and the services we offer the best for the business

**Innovate: Stay One Step Ahead**
A Quick Plug…

- Published by Wiley & Sons, December 2005
- A complete methodology for delivering utility computing
- A guide to selecting tools
- Case studies
- Available from Amazon.co.uk and Wiley.com