# 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


© 2006 Symantec Corporation

## 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**

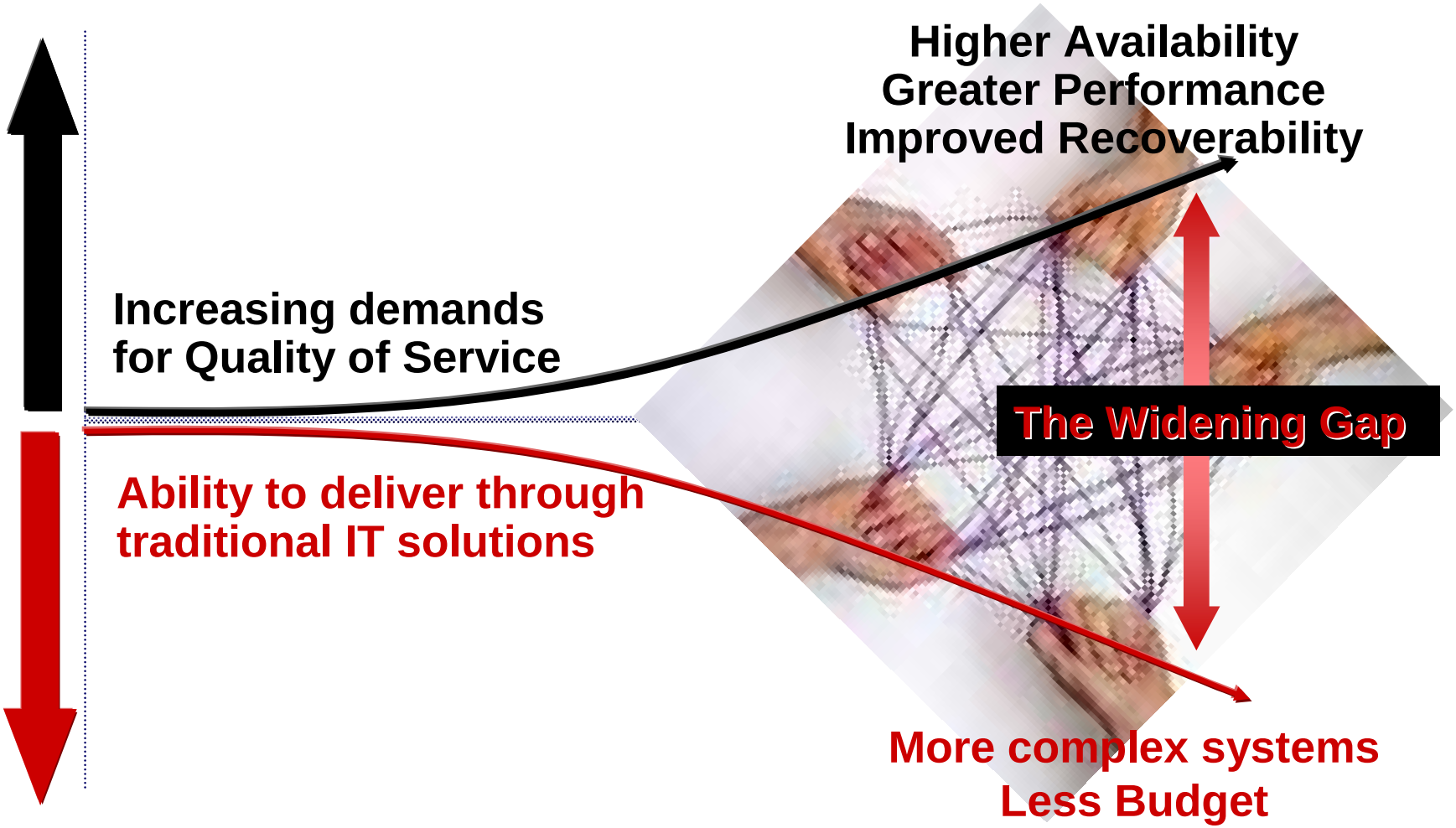

© 2006 Symantec Corporation

## For The CIO, The Pressure's On…

**How often will you have to change your architecture?**
**At what cost?**


© 2006 Symantec Corporation

# IT: The Challenge





© 2006 Symantec Corporation

# One Goal: Master Complexity

© 2006 Symantec Corporation

# Infrastructure Software In The Data Center:
## Developing A Service Oriented Infrastructure

**Databases**

ORACLE · Microsoft SQL Server 2005 · Informix Software · DB2 · Sybase · MySQL

**Middleware**

bea · IBM · SAP · ORACLE · Microsoft

**Applications**

SAP · ORACLE · Microsoft · Custom Applications

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

**Network**

Nortel Networks · Juniper Networks · Cisco Systems · Brocade · McDATA

**Storage**

hp invent · Hitachi · IBM · EMC² · NetworkAppliance

**Servers**

AIX 5L · solaris · Windows · hp invent

**Virtual Machines**

Xen · vmware · intel


© 2006 Symantec Corporation

# Infrastructure Software In The Data Center:
## Developing A Service Oriented Infrastructure

**Databases**

ORACLE · SQL Server 2005 · Informix Software · DB2 · Sybase · MySQL

**Middleware**

bea · IBM · SAP · ORACLE · Microsoft

**Applications**

SAP · ORACLE · Microsoft · Custom Applications

| Data Protection | | Storage Management | | Server Management | | Application Performance | | Security | |
|---|---|---|---|---|---|---|---|---|---|
| NetWorker | Data Protector | ECC | Sun SRM | DLM | ServiceGuard | Altiris | AppManager | Vantage | McAfee |
| Galaxy | EDM | AppIQ | ReiserFS | LVM | Sun Cluster | ClusterFrame | OEM | PathFinder | MessageLabs |
| ArcServe | NT Backup | Creekpath | SAN Navigator | SVM | MSCS | Polyserve | Patrol | Introscope | Zantaz |
| Media Mirror | OnTap | HiCommand | Aperi | ASM | HA-CMP | GeoSpan | Foglight | JProbe | MessageOne |
| DiskXtender | NetVault | TPM | ShadowImage | MDUX | TrueCluster | Qlusters | DBArtisan | Sitraka | BitDefender |
| EmailXtender | LiveVault | SAN Copy | InstantImage | SVC | IBM TPM / TIO | SteelEye | DGI | MOM | Postini |
| TSM | SyncSort | MirrorView | SnapView | LDM | BMC | Kickstart | Topaz | Performasure | IronMountain |
| SAM-FS | Retrospect | RepliStor | Shadow Copy | OCFS | HP OpenView | N1 Grid | CCMS | Tivoli | Microsoft |
| Data Migrator | Ultrabac | TrueCopy | FlashCopy | DFM | CA | HP UDC | PAC | Patrol | IronPort |
| RSS | Tapeware | DoubleTake | TimeFinder | UFS | Jumpstart | ADS, SMS | Optane | Corefirst | TrendMicro |
| NearStore | DLM | PPRC | Ext3 | ZFS | Opsware | Marimba | Silk | Appsight | Cisco |
| BrightStor | | SRDF | SANFS | JFS | Bladelogic | | TheGuard | | NetIQ |
| Mobile Backup | | MPIO | PowerPath | GPFS | Tivoli | | eHealth | | Altiris |

**Network**

NORTEL NETWORKS · Juniper · Cisco Systems · BROCADE · McDATA

**Storage**

hp invent · HITACHI · IBM · EMC² · NetworkAppliance

**Servers**

AIX 5L · solaris · Windows · hp invent

**Virtual Machines**

Xen · vmware · intel


© 2006 Symantec Corporation

# Infrastructure Software In The Data Center:
## Developing A Service Oriented Infrastructure

**Databases:** ORACLE, Microsoft SQL Server 2005, Informix Software, DB2, Sybase, MySQL

**Middleware:** bea, IBM, SAP, ORACLE, Microsoft

**Applications:** SAP, ORACLE, Microsoft, Custom Applications

| Data Protection | Storage Management | Server Management | Application Performance | Security |
|---|---|---|---|---|

# 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:** Nortel Networks, Juniper Networks, Cisco Systems, Brocade, McDATA

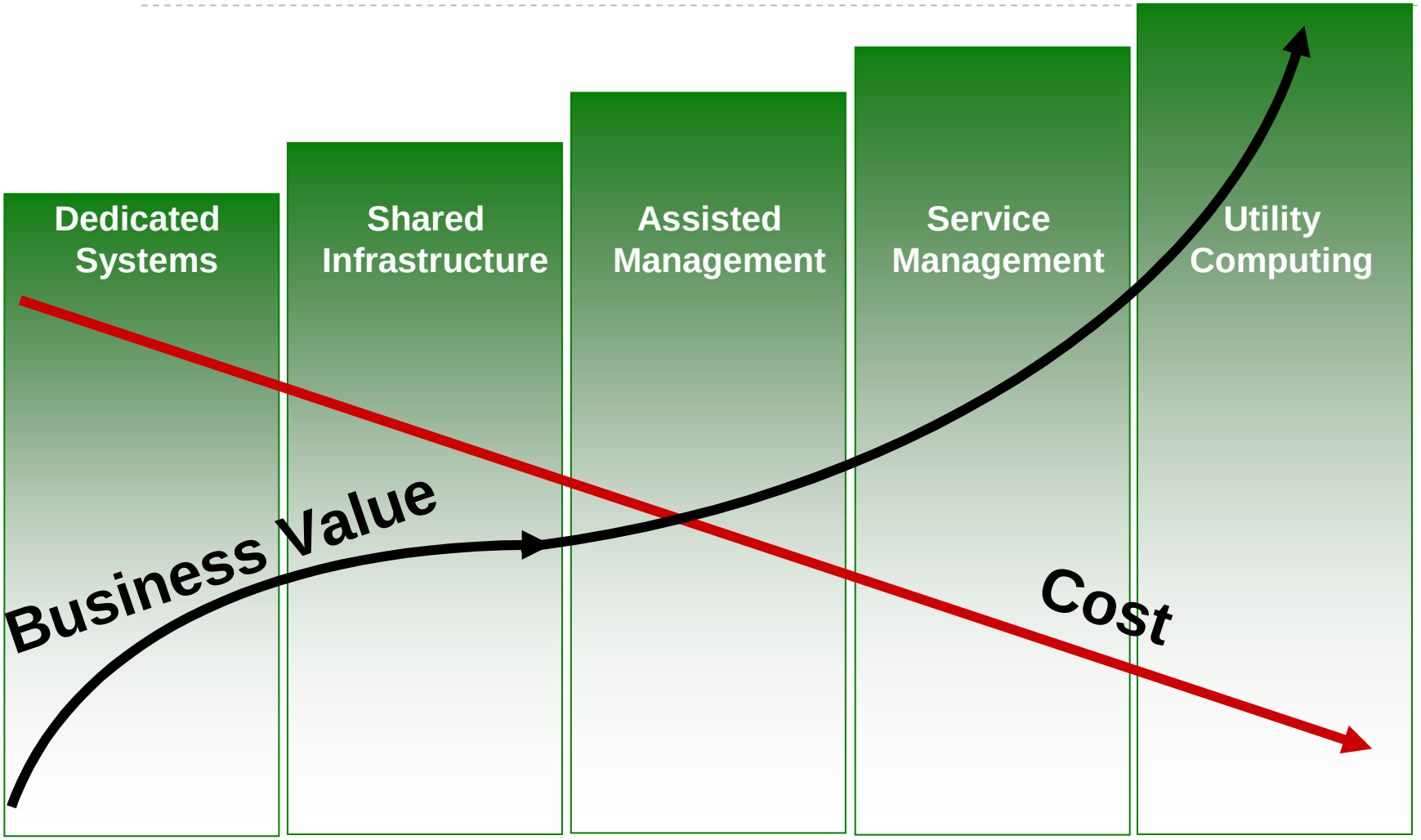
**Storage:** HP Invent, Hitachi, IBM, EMC², NetworkAppliance

**Servers:** AIX 5L, Solaris, Linux, Windows, HP Invent

**Virtual Machines:** Xen, vmware, intel


© 2006 Symantec Corporation

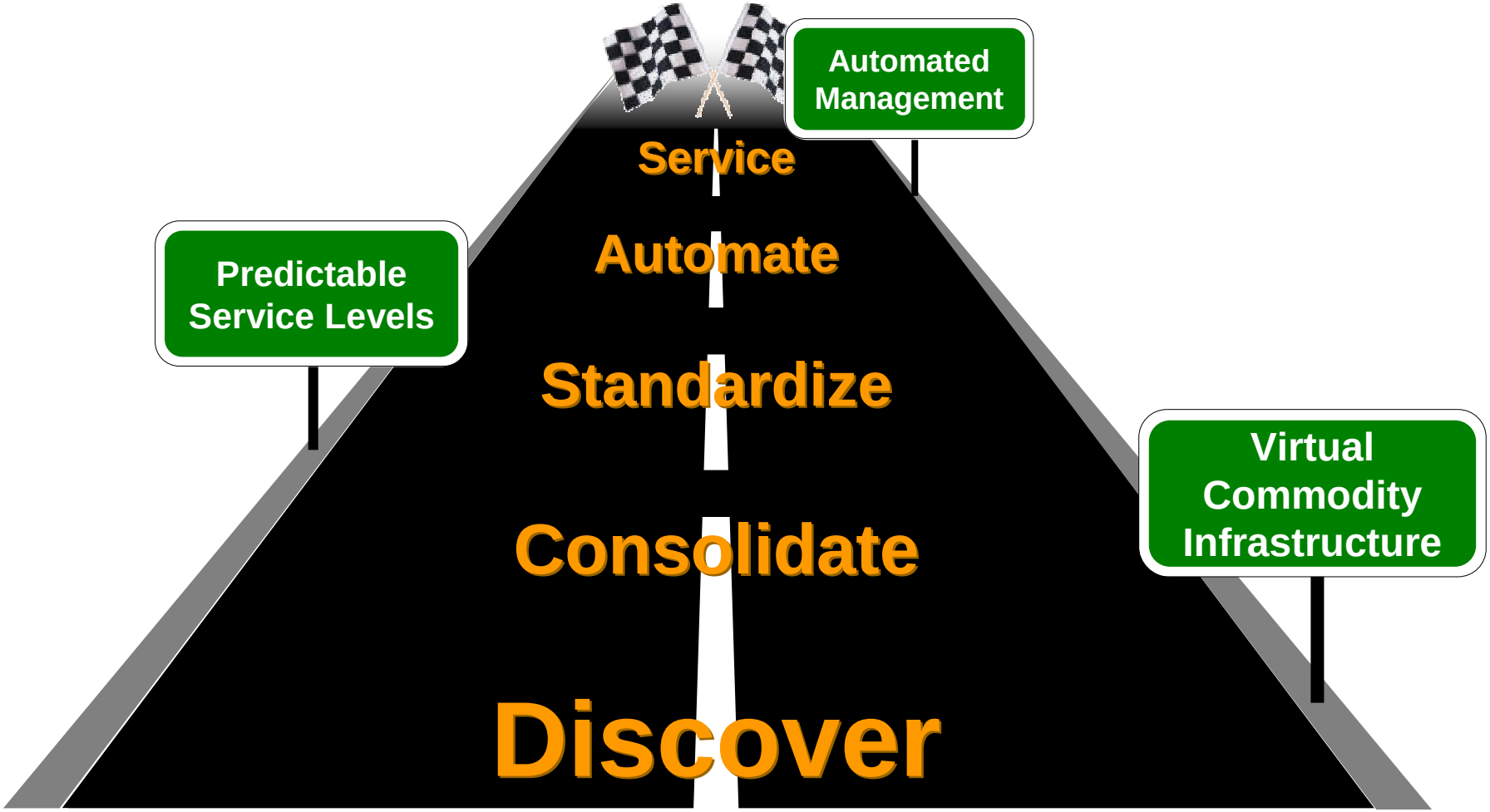
# Architectural Maturity





© 2006 Symantec Corporation

# Five Steps To Deliver IT As A Service





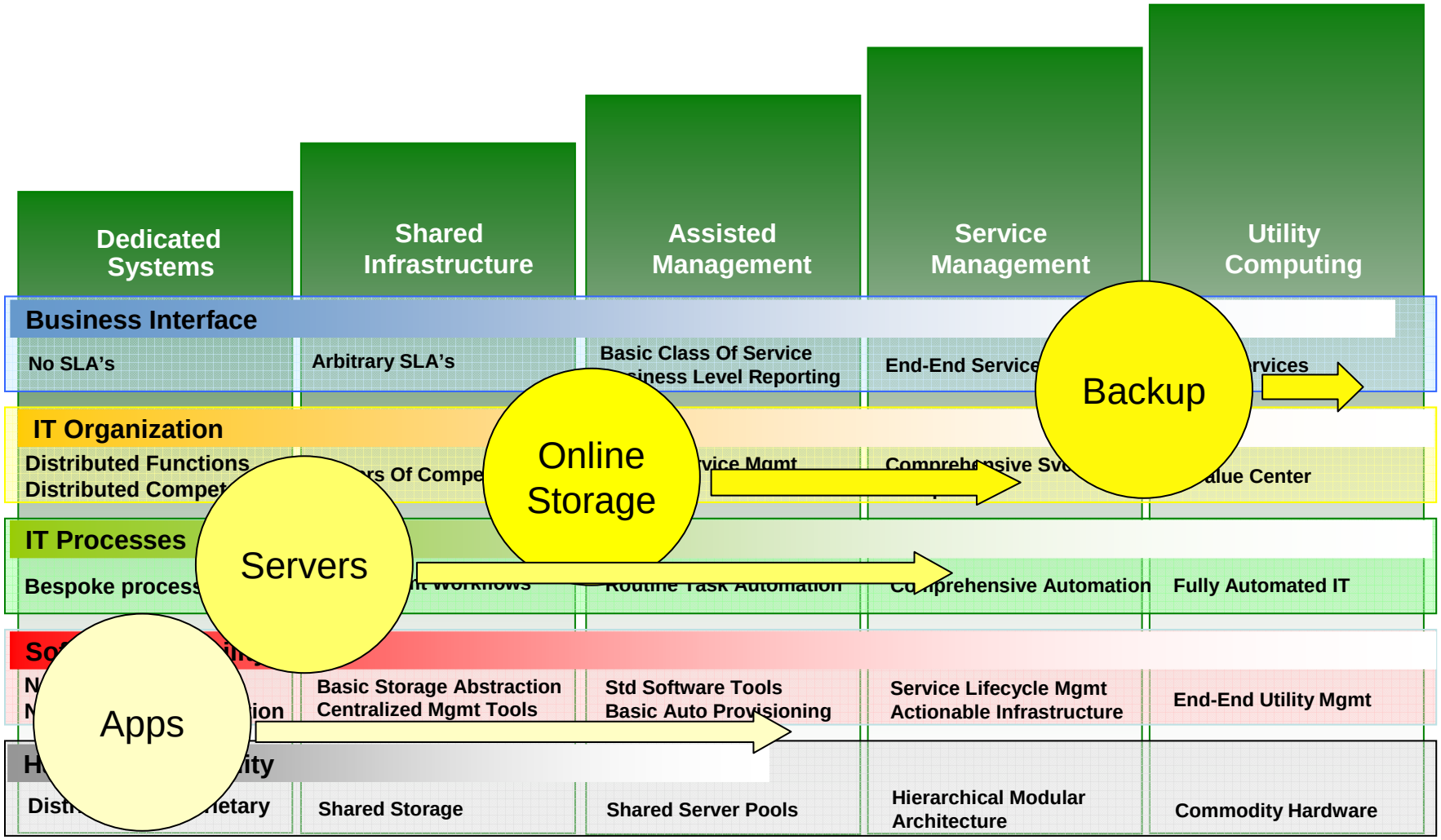
© 2006 Symantec Corporation

# Architectural Maturity

| | Dedicated Systems | Shared Infrastructure | Assisted Management | Service Management | Utility Computing |
|---|---|---|---|---|---|
| **Business Interface** | No SLA's | Arbitrary SLA's | Basic Class Of Service<br>Business Level Reporting | End-End Service Mgmt | Utility Services |
| **IT Organization** | Distributed Functions<br>Distributed Competence | Centers Of Competence | Simple Service Mgmt Discipline | Comprehensive Svc Mgmt Discipline | IT Value Center |
| **IT Processes** | Bespoke processes | Basic Mgmt Workflows | Routine Task Automation | Comprehensive Automation | Fully Automated IT |
| **Software Capability** | Non-Standardized<br>No Hardware Abstraction | Basic Storage Abstraction<br>Centralized Mgmt Tools | Std Software Tools<br>Basic Auto Provisioning | Service Lifecycle Mgmt<br>Actionable Infrastructure | End-End Utility Mgmt |
| **Hardware Capability** | Distributed, Proprietary | Shared Storage | Shared Server Pools | Hierarchical Modular Architecture | Commodity Hardware |


© 2006 Symantec Corporation

# Architectural Maturity





© 2006 Symantec Corporation

# 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**


© 2006 Symantec Corporation

## 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


© 2006 Symantec Corporation

## Where's The Problem?

### External
### Hackers, Spies, Thieves

**Exclusion (Blocking)**

### Internal
### Thieves, Fraudsters
### … And The Rest Of Us

**Inclusion (Surveillance)**


© 2006 Symantec Corporation

# The Threat Landscape Shift

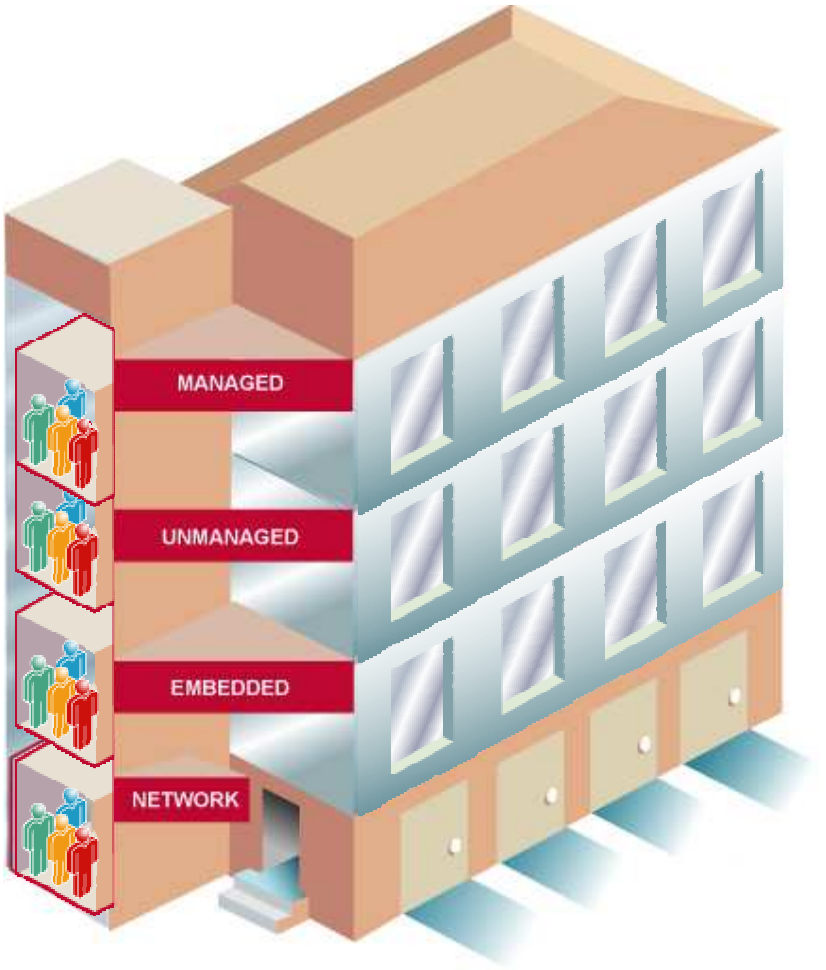
| Old Landscape | New Landscape |
| --- | --- |
| Threats are noisy & visible to everyone | Threats are silent & unnoticed |
| Threats are indiscriminate, hit everyone | Threats are highly targeted, regionalized |
| Threats are disruptive ➔ impact readily visible | Threats steal data & damage brands ➔ impact unclear |
| Remediation action is technical (“remove”) | Remediation more complex, may need to investigate data leak |
| Only a few named threats to focus on | Overwhelming amount of variants, nameless threats |


© 2006 Symantec Corporation

## 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





© 2006 Symantec Corporation

# SOA: Increasing or Decreasing Complexity?

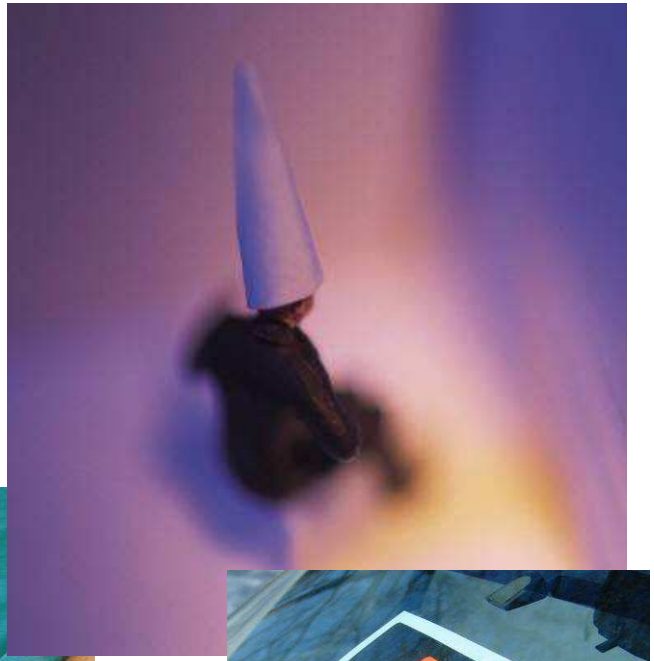
- Haven't you heard this before?
  - Improved reuse
  - Modular development
  - Object oriented
  - Data driven
- But…
  - Increased tangle of applications – no tools to monitor / manage 'the whole'
  - Standards
  - Interoperability Agreements
  - Service Level Agreements
  - Downtime (planned or otherwise)

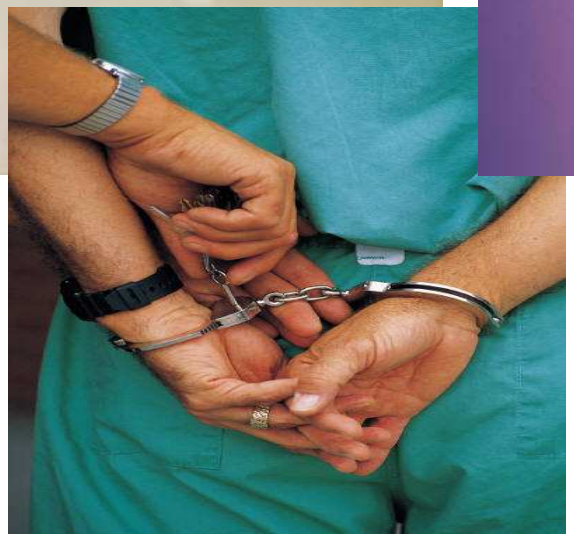
***"By 2008, more than 60 per cent of enterprises will use SOA as a 'guiding principle' when creating mission-critical applications and processes"***
**- Gartner**

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


© 2006 Symantec Corporation

# The Risks





© 2006 Symantec Corporation

## Summary

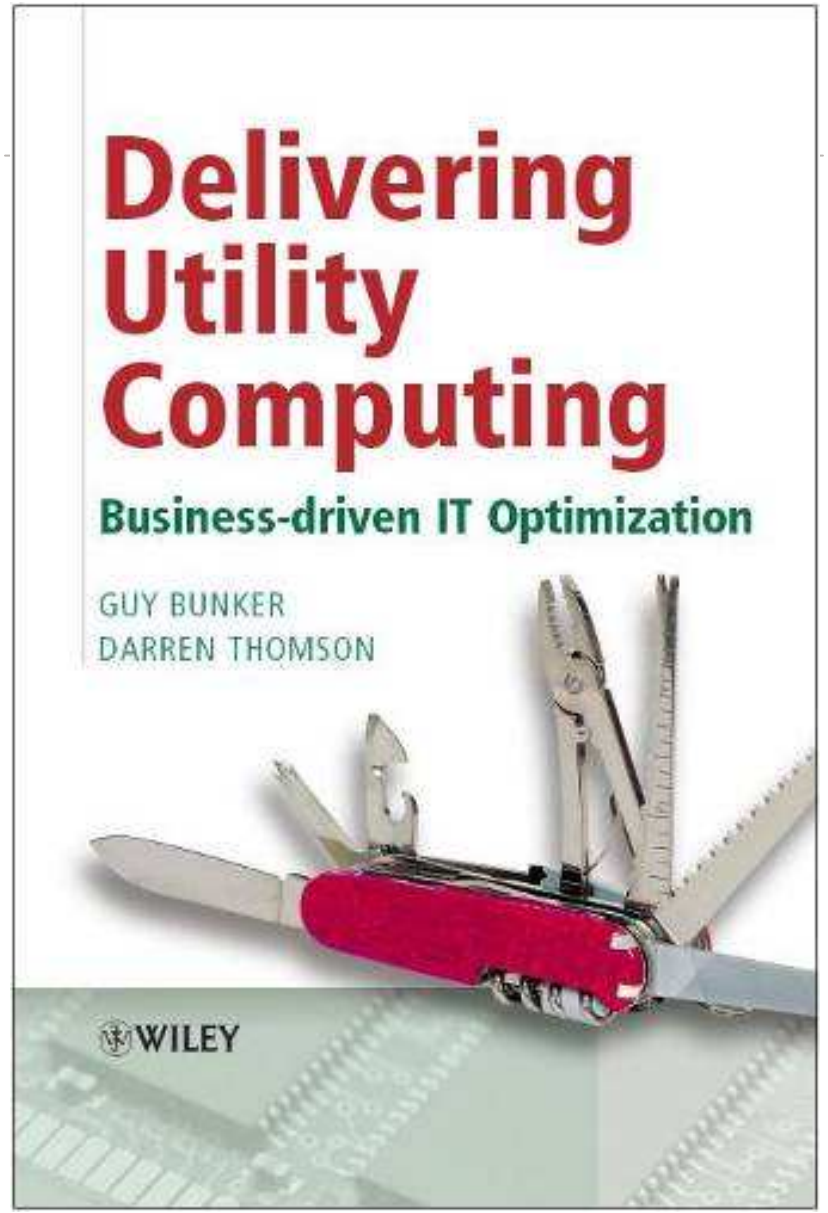
- **Agility is the key to success**
- Build a Service Oriented Infrastructure
- **Standardize**
- Standardize – environments
- Standardize – procedures
- **Understand the business**
- Continuously ask: Is our architecture and the services we offer the best for the business

# Innovate: Stay One Step Ahead


© 2006 Symantec Corporation

## 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





© 2006 Symantec Corporation

# Thank You