The Next Generation Data Center
Dynamic, Optimized, Automated, Virtualized, Green
What is driving the Data Center Transformation?

**Delivering Strategic Value**
- Supporting growth, productivity
- Rapidly deploying business applications
- Delivering information at the right time, right cost

**Green IT**
- Higher power, cooling costs
- Power availability
- Unplanned outages

**Operational Inefficiency**
- 30-40% IT utilization, IT “silos”
- End of Life technologies
- Management of Multiple Environment/Facilities
- Maintenance, TB/Servers per FTE

**Obsolescence**
- Unreliable legacy technologies
- Lack of legacy skills
- Out of Space due to Growth
- Not Meeting Requirements
- Cost of Space
- Location

**Compliance and Regulatory**
- Distance Between Data Centers
- Recovery Requirements
- High Availability Requirements
Why implementing a Next Generation Data Center?

**Respond to facilities crisis**
- Dramatic increase in power & cooling costs
- Reduced availability of affordable data center space
- Support “sustainability,” Green IT
- Virtualization increases dramatically the DC “density”

**Manage rising costs**
- Aging infrastructure and applications
- Staff growth driven by daily operations
- Staff time split between daily operations and projects

**Improve service levels**
- More responsive support of faster application development times
- Service-oriented architecture / Web 2.0 / Cloud computing

**Manage risk**
- Deliver availability, compliance, security services on smaller budget
### State of Infrastructure Today

<table>
<thead>
<tr>
<th>Server Sprawl</th>
<th>Power &amp; Cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>41 m physical servers by 2010 - 700% increase in 15 years</td>
<td>50c for every $1 spent on servers</td>
</tr>
<tr>
<td>Ave UT &lt;10% = $140 bn in excess server capacity</td>
<td>$29 bn in power and cooling industry-wide</td>
</tr>
</tbody>
</table>

### Summary quote:
“51% of CIOs want to transform the data center”

<table>
<thead>
<tr>
<th>Space Crunch</th>
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<tbody>
<tr>
<td>$1,000 /sqft</td>
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<tr>
<td>$2,400 / server</td>
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<tr>
<td>$40,000 / rack</td>
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<table>
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<tr>
<th>Operating Cost</th>
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<tbody>
<tr>
<td>$8 in maintenance for every $1 spent on new infrastructure</td>
</tr>
<tr>
<td>20-30 : 1 server-to-admin ratio</td>
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</tbody>
</table>
The 5 Next Generation Data Center Features

Dynamic  Optimized  Automated  Virtualized  Green
The 5 Next Generation Data Center Features

- **Agile Data Center**
  - Flexible and responsive to new business initiatives
  - Pooled enterprise information for strategic reuse

- **Service-oriented Data Center**
  - Business and IT aligned via service catalog
  - Business and IT communicate regularly
  - IT services superior to outsourcers
  - IT costs, time frames, SLAs all predictable
  - Documented best practices raise skills efficiency
The 5 Next Generation Data Center Features

- Optimized Data Center
  - Edge and core infrastructure and operations aligned
- Protected Data Center
  - Critical information protected
The 5 Next Generation Data Center Features

• Automated Data Center
  • Utilization-based chargeback
  • Predictive monitoring and management
  • Data mobility to support policy
• Virtualized Data Center
  • Virtualisation provides a logical view of physical resources
  • Virtualisation removes physical resource limits and improves resource utilisation
  • Virtualization enables services encapsulation, decoupling from infrastructure and improving mobility
  • Virtual Infrastructure includes:
    • Servers
    • Data
    • SAN Storage
    • Network
    • Desktop
• **Green Data Center**
  - Assess DC cabling/power/cooling efficiencies
  - Identify strategies to reduce energy consumption requirements
Next Generation Data Center
Building Blocks

- integrated management
- integrated security
- unified intelligent fabric
- virtualization-optimized application server blades
- virtualized infrastructure services
- storage optimized for VDC environments

modular facilities
flexible operations

Cost savings: optimum use of hardware resources
Operational savings: dramatically reduced operational effort
Business value: fast, flexible and responsive to new requirements
Enterprises moving to the virtual data center have a serious concern...

Can we “transform” to the new data center model without disrupting today’s business?
**Data Center Transformation Starting Points**

**Drivers:** Redundant data centers, M&A activity, real estate or facility issues, power & cooling costs, power, and cooling availability

**Challenges:** Projects often time bound, minimal planning, unknown complexity

**Drivers:** New technology’s promise of lower costs, improved SLAs, space, and power relief

**Challenges:** Operations, management complexity, recovery requirements, training and measurement

**Drivers:** Data accessible from anywhere, unplanned outage, security breach, regulatory compliance

**Challenges:** Difficult ROI, testing recoverability

**Drivers:** Cost recovery via operational efficiency, infrastructure aligned with business requirements, IT as a service, choose service levels via chargeback,

**Challenges:** Cultural resistance to change, no KPIs
What do we mean by executing “transformation?”

Large scale technology initiative with multiple, parallel workstreams at enterprise scale and scope.
EMC’s data center transformation framework

<table>
<thead>
<tr>
<th>Service Strategy</th>
<th>Service Design</th>
<th>Service Transition</th>
<th>Service Operations</th>
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</thead>
<tbody>
<tr>
<td>Discover</td>
<td>Analysis</td>
<td>Detailed Design</td>
<td>Pilot &amp; Test</td>
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<tr>
<td>Policy Driven Service Architecture</td>
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<td>Organizational Collaboration</td>
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<tr>
<td>Automated Process Architecture</td>
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<td>Software Toolset</td>
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<td>Virtualized Infrastructure Architecture</td>
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<td>People Development</td>
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<td>Benefits Realization</td>
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### Data center transformation methodology

#### Make IT Double

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<td>Release 0..N</td>
<td>Steady State</td>
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<td>Handover</td>
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<td>Policy Driven</td>
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<td>Service Architecture</td>
<td>Policy Development</td>
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<tr>
<td>Strategic Goals</td>
<td>Offer Offering</td>
<td>Service Introduction</td>
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<td>Identified</td>
<td>Development</td>
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<td>Service Assessment</td>
<td>Service Pilot</td>
<td>Service BAU</td>
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<td>Maturity Model</td>
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<td>Automated Process</td>
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<td>Operational Process</td>
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<td>Process Creation</td>
<td>Migration Candidate selection</td>
<td>Candidate scheduling</td>
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<td>Service Commissioning</td>
<td>P2V Migration</td>
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<td>Toolset Deployment</td>
<td>Decommissioning</td>
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<td>Infrastructure Requirements Analysis</td>
<td>Infrastructure Production Build-out</td>
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- Over 12,000 Business & Technical Consultants World Wide
- Conduct ~ 125 DC Migrations/Relocations per Year
- Conduct ~ 975 Move Events per Year
Comprehensive Services for your Information Infrastructure

- Business Consulting
  - Industry consulting and information management

- Content Management and Archiving

- Application Consulting
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- Infrastructure Consulting

- Storage Managed Services

- Global Education Services

Accelerate time-to-value and reduce risk throughout the enterprise

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