Server Consolidation Assessments with VMware CapacityPlanner

Rich Talaber
Agenda

- Evolution of the infrastructure
- Uncovering the opportunity
- Conducting the assessment
- The typical client
- Developing the strategy
- Managing objections

Need to be changed by Rich
We Started With Shared Environments

- Nothing new
- Single OS
- Sometimes partitions
- Mixed workload
- Predictable load
- Capacity planning discipline
- Performance tuning
- Design rigor
The Transition Begins

- In the late 80s, prices started to drop
- Environments no longer shared
- Development accelerated
- Shift from operational excellence to market speed
- Shift from rigor of design to management of:
  - Server names and WINS
  - IP addresses
  - Cabling
  - Subnets
  - WINS
  - Licenses
One Day, We Took a Breath

- We found hundreds, sometimes thousands of servers
- We found higher ratios of IT staff
- We had difficulty managing service levels
- We found unlicensed software
- We found security issues
- Costs out of control
- Servers not being utilized

But...it was the right thing to do!
What Lies Beneath?

- Approximately 40% of Windows servers are > 3 years old
  - Rack space
  - Power consumption
  - Weight and BTUs
- The average utilization
  - Processor utilization: 6%
  - Memory utilization: 50%
  - Disk busy: 1%
  - Disk capacity: 10%
  - NIC busy: 1%
- 20 to 50% more servers than expected
The Impact of Excess Capacity

- More to:
  - Secure
  - Patch
  - Monitor
  - Store, heat, cool and power
- Troubleshooting is more complex
Reason for Consolidation
The Reasons for Consolidation Help Shape the Assessment

- Money
- Physical constraints
  - Space
  - Weight
  - Power
- Service levels (infrastructure simplification)
- Migration from old to new
- Integrate acquired IT
Money

- Requires strong TCO and ROI analysis
- AOG does not automatically capture:
  - Date of purchase
  - Purchase price
  - Lease amount
  - Warranty information
- Determining what is actually possible
- Grouping
Physical Constraints
The Typical Client Has Opportunity for Rack Optimization

- 40% of equipment is > 3 years old
- Utilization
  - Processor = 7%
  - Memory = 50%
  - NIC < 1%
  - Disk throughput < 1%
- Multi-processors
  - 1 way = 21%
  - 2 way = 52%
  - 4 way = 16%
  - 8 way = 3%
Service Levels
Need to Shift from Tactical Operations to Strategic Thinking

- Number of physical machines
- Number of operating systems
- Standardization
- Processes
  - Change management
  - Service level agreements
  - Quality assurance
  - Charge back and options
Impediments to Consolidation

- Culture / politics
- Lack of accurate information
- Money
- Expertise
- Acceptance of technology
- Lack of process
- People’s time
Successful Assessments Include

- Accurate assessment of:
  - Customer needs
  - Customer willingness
  - Customer expectations
  - Capacity: All servers

- Plan that includes:
  - Process creation / improvement
  - Iterative capacity utilization improvement
  - Internal marketing
  - Supplemental expertise
  - Standardization
  - Maximum usage of existing infrastructure
Overall IT Assessment

- Standardization
- Versioning
- Service packs and patches
- Security
- Optimization
- Utilization
- Data center planning
- ... and more
Mixing Resource Requirements

BAD

50%
Mixing Resource Requirements

50%
Avoiding Peak Conflicts

50%

12AM 12PM 12AM

+  

12AM 12PM 12AM

=  

BAD

12AM 12PM 12AM

50%

12AM 12PM 12AM

+  

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BETTER

12AM 12PM 12AM
Grouping of Servers

- Will not cross boundaries by default
- Only two servers have the possibility of consolidation
- Consolidation ratio may be 15:14

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Combining Departments

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- Changing from physical ownership to capacity ownership
- VMware enables capacity management
- 11 servers have the possibility of consolidation
- Ratio may be 15:7
Combining Locations

- Combining locations increases ratios due to economy of scale
- 14 servers have the possibility of consolidation
- Ratio may be 15:4

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The Typical Client

- 40% of equipment is > 3 years old
- Utilization
  - Processor = 6%
  - Memory = 50%
  - NIC < 5%
  - Disk Throughput < 5%
- Multi-processors

<table>
<thead>
<tr>
<th>Processors</th>
<th>% of Inventory</th>
<th>Utilization</th>
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### Environment Only Boundary

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</table>

- We must retain the environmental boundary
  - Service levels
  - Security
  - Business continuity
- Highest ratio
  - 15:2
Dispose of Old Servers

- Since June, the average number of servers 700MHz or less is 28%
- The average rack size of a server with CPU <= 700 MHz is 7
- Client with 1000 servers
  - 280 with <= 700 MHz processors
  - 1960 rack units (approx. 50 Racks)
  - 446 Watts/Hour average = 125 KW/Hr
- Just switching to blades
  - 280 with 2.8Ghz processors
  - 6 rack units
  - 36 Blade Chassis @ 3000 Watts/Hour = 108 KW/Hr
  - Reduced cabling
  - Improved manageability
- Virtualizing increases the opportunity even more
Test and Development

- Great opportunity for virtualization
- Proves the technology is ready and prepares for next steps
- Consolidate servers that service infrastructure
  - Proves you willingness to consolidate yourself
  - Proves new technology
- Clients report that 25% to 50% of their environment is test / dev / BCP
- Consider concurrency
  - What percentage of your test / dev servers are actively being used at any time?
  - Could management software that schedules deployment of environments to a sandbox reduce requirements even further?
Like Applications

- Multiple physical servers to one single OS server
- Introducing
  - Workload management
  - Change management
  - Quality assurance
  - Chargeback
- SQL server consolidation on 64bit
- Still have control and service level issues
  - Workload management software
  - Virtualization
Mixed Workloads

- Virtualization
  - Retain some control
  - New production technology
  - Multiple OS
  - Sizing questions
- Mixed workloads on single OS
  - DLL Conflicts
Optimization

- Optimize before you consolidate
- Could increase your consolidation ratio significantly
- SQL example
  - 4 servers using 2 GB of RAM each
  - Optimize to use 1GB of RAM each
  - Double consolidation opportunity
- Comparative analysis
- Anomaly detection
- Trend deviation
The Typical Server

- (1.7) 1276 MHz processors
- 2.6 GB RAM on board / 1.5GB used
- % utilization approximately 7.2%
- Disk busy 5.6%

<table>
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<th>% of Servers</th>
<th>Processor %</th>
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<td>4.1</td>
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The Typical SQL Server

- (2.3)1400 MHz processors/1.8GB RAM
- % utilization approximately 7.3%
- Disk busy 5.7%
- Cache hit % = 99.7
- Large consolidation opportunity

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<tr>
<th>Processors</th>
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<thead>
<tr>
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<td>Between 2 and 20</td>
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<td>&gt;20</td>
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</table>
The Typical Exchange Server

- (2.2) 2188 MHz processors/1.7GB RAM
- % utilization approximately 10.6%
- Disk busy 15.1%
- Directory cache hit % = 55
- IS cache hit % = 83
- More memory needed

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<td>&gt;500</td>
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</table>
The Typical Citrix Server

- (2.1) 2065 MHz processors
- 3.2GB RAM installed/900MB used
- % utilization approximately 10.1%
- Disk busy 2.3%
- Active sessions average = 8.4
- Too much memory allocated

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VMware Server Consolidation Assessment Services

- A focused set of assessment services that enables:
  - Assessment of the current state of your infrastructure
  - Identification of server consolidation and virtualization opportunities
  - Scenario modeling and benchmark comparisons with industry data
  - Objective, validated, actionable server consolidation recommendations
- Based on VMware’s Virtual Infrastructure Methodology (VIM)
- Powered by VMware Capacity Planner: A hosted capacity planning and analysis tool for faster, more accurate, benchmarked IT assessments
- Analysis and reporting delivered by “VMware Service Bureau”
- Services available through Select VMware Partners
A Comprehensive Assessment Services Framework

VMware Server Consolidation Assessment Services

- Capacity Assessments
- Standard Virtualization Assessments
- Custom Virtualization Assessments

VMware Virtual Infrastructure Methodology (VIM)

- Infrastructure Assessment
- Application Assessment
- Organizational Assessment
- Compliance Assessment
- Financial Assessment

VMware Service Bureau

- Capacity Utilization Analysis
- Application/ Org. Groupings
- Application Analysis
- Virtualization Modeling/ Analysis

VMware Capacity Planner – Hosted IT Capacity Analysis and Planning Tool

- Agentless Discovery/ Inventory
- Performance/ Utilization metrics
- Industry Information Warehouse
- Scenario Modeling/ What-if Analysis
VMware Capacity Planner

- An IT capacity analysis and planning tool delivered as a hosted app service
- Leveraged within VMware Professional Services’ Server Consolidation Assessment Services to drive faster, more accurate and benchmarked assessments
- Built for agent-less implementation, it provides improved visibility of complex, heterogeneous IT environments
  - Discovers servers in just minutes and gathers detailed inventory data in just hours
  - Captures key performance data and analyzes server load profiles and capacity utilization
- Includes an Information Warehouse that houses valuable, aggregated industry data that’s leveraged for comparative analysis and benchmarking
- Primarily a decision support tool that helps:
  - Assess current capacity and identify opportunities for capacity optimization
  - Drive intelligent virtualization, consolidation and other infrastructure planning projects
VMware Capacity Planner

Capacity Planner Dashboard

- Assess
- Plan
- Decide
- Monitor

Web

Data Manager

- Discovery
- Inventory
- Performance Statistics
- Data Synchronization

Data Collector

Client Site

- Agent-less Discovery and Inventory
- Client IT Environment
- Manual or Scheduled Data Collection

Data Upload

Data Analyzer

- Aggregation
- Comparison
- Trending
- What-if?

Information Warehouse

Industry Benchmark Data (> 4 B records and growing!)

Manual / scheduled uploads

HTTPS