

VMware and EnterpriseOne:

A Feasibility Study

Session 23870 - David McIlmoyl

Agenda

- Introductions.
- Virtualization Overview.
- VMware Overview.
- EnterpriseOne Lab Configuration.
- Findings.
- Benefits and Drawbacks.
- Ideas on how to utilize VMWare effectively with E1.
- Conclusions.
- Questions.

Executive Summary

- TeamCain is an Oracle Certified Partner offering consulting services for EnterpriseOne and World software.
- We have experts in the areas of project management, software applications, development, technical infrastructure and CNC.
 - Our consultants average more than 16 years of EnterpriseOne and World experience.
- We are focused on the JDEdwards products and key complimentary products to build solutions for our customers.

Background Information

- Established in 1996
- 150+ customers worldwide
- Awards
 - JDE Canada Partner of the Year.
 - Bottomline Partner of the Year. (Americas)
 - RFSmart Global Partner of the Year.

Background Information

- Very positive track record.
- Very local customer base.
- Very good working relationship with Oracle.

***Earned by the values of
Quality, Integrity and Experience.***

Virtualization - Definition

- Virtualization is a technique for hiding the physical characteristics of computing resources to simplify the way in which other systems, applications, or end users interact with those resources. *
- Virtualization lets a single physical resource (such as a server, an operating system, an application, or storage device) appear as multiple logical resources; or making multiple physical resources (such as storage devices or servers) appear as a single logical resource. *

* Definition provided by about.com

Virtualization – Products

- VMware / EMC
 - ESX Server
 - GSX Server
 - VMware Workstation
- Microsoft
 - Virtual Server 2005 R2
 - Virtual PC 2007
 - Virtual PC for Mac

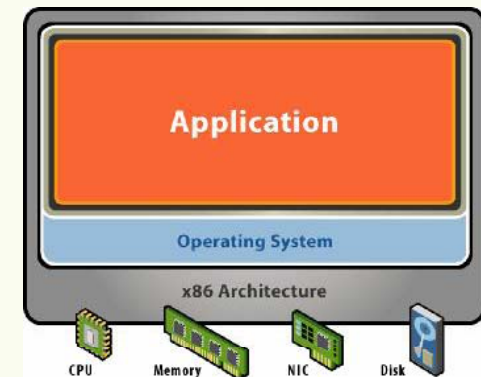
VMware ESX Overview

Traditional Model

- Single operating system
- Single server usually only hosts all or part of a single functional application.
- Operating system / utilities / hosted software is tightly coupled to underlying hardware.

Disadvantages

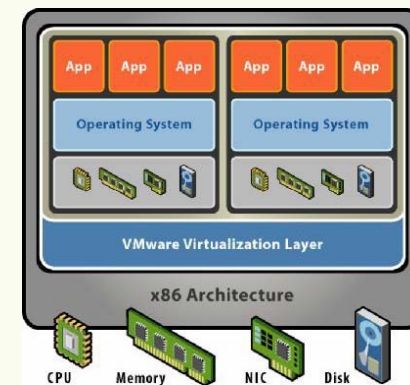
- Poorly utilized hardware resources.
- Difficult to make hardware changes without reinstallation of operating system or software programs.
- Hardware and software maintenance often requires a service outage for hosted applications.



VMware ESX Overview

New Model

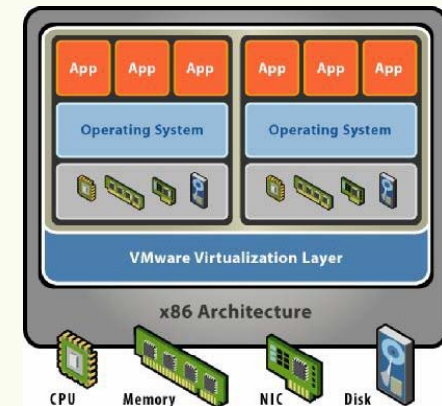
- VMware layer between hardware and operating systems acting as a “middleware”.
- Host multiple operating systems, multiple applications.
- Each virtual machine can be thought of as an independent partition.
- All hardware components presented to each hosted partition is virtual.
- Each hosted partition is completely separate from one another.



VMware ESX Overview

New Model (continued)

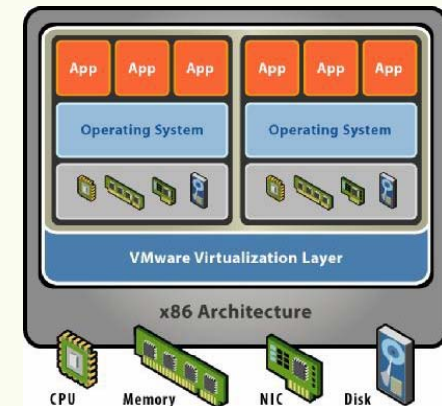
- VMware allows for the creation of virtual servers made of virtual resources.
 - Virtual CPU's
 - Virtual Memory
 - Virtual Disks
 - Virtual NIC's / Switches / Port Groups / VLAN's.
- Dynamic or pre-defined reallocation of the virtual resources as needed.
- RAM over-commitment.
 - Using Swap file below virtual machine level, VMware can send memory pages to disk as needed to ensure virtual machines don't run out memory resources on the virtual machines.
- Transparent memory page sharing.
 - VMware can share identical memory pages for different virtual machines, minimizing the overall memory usage on the underlying physical servers.
- Physical to Virtual tool.
 - P2V is used to take physical machines and create virtual machines.



VMware ESX Overview

Advantages

- Better utilization of hardware resources.
 - Host multiple applications on a single box for better usage levels.
 - Server consolidation.
 - Memory page sharing.
- Much easier to perform hardware upgrades / changes due to virtualization layer. (i.e. Hardware independent partitions)
 - Common BIOS, CPU Chipsets, Disk Controllers, NIC's, Video and other serial devices presented to the virtual machine and O/S, regardless of underlying hardware in the physical servers.
- Isolation
 - Each virtual machine is independent from one another.
 - Ensures no single failing VM / application can crash all VM's / applications.
- Encapsulation of each system into a single file.
 - Easy to move between VMware Servers.
 - Easy for backup / restore / disaster recovery.
 - Easy to create templates for building new servers.
- Significant cost savings.
 - IT maintenance.
 - Hardware Infrastructure. (Cost for additional servers, server room infrastructure, etc.)
 - Power consumption.



EnterpriseOne Lab Configuration

- Environment is built using virtual servers on a single x86 physical server.
 - DELL PowerEdge 2850
 - 2 x 2.8 GHz CPU (Intel dual core)
 - 8 GB DDR2 RAM
 - Perc4 – 128MB SCSI Controller
 - 73 GB x 6 = 438 GB Hard Disk Space / 15K rpm SCSI-3 Hard Disks. (RAID 5 configuration with 365 GB of available storage.)
 - 2 x 1 Gbps Intel Network Interface Cards
 - Dual Power Supplies
 - VMware ESX Server Version 2.5.3 – 2 CPU Edition.
 - Virtual SMP module.
 - Virtual Console / MUI (Management User Interface – Web).

EnterpriseOne Lab Configuration

- EnterpriseOne 8.12 / Tools Release 8.96_C1
- 5 environments
 - PD812, PY812, TS812, DV812, JD812
- 4 pathcodes
 - PD812, PY812, DV812, JD812
- Virtual Servers
 - Windows 2003 Intel Deployment Server
 - 2 virtual CPU's, 2 GB RAM, 100 GB disk storage, 1 virtual gigabit nic.
 - Windows 2003 Intel Enterprise Server running SQL Server 2000
 - 2 virtual CPU's, 3 GB RAM, 150 GB disk storage, 4 virtual gigabit nic.
 - Windows 2003 JAS Server running Websphere Application Server 5.0.2.6/5.0.2.12.
 - 2 virtual CPU's, 3 GB RAM, 60 GB disk storage, 2 virtual gigabit nics.
 - Windows 2003 Primary Controller.
 - 1 virtual CPU, 1 GB RAM, 20 GB disk storage, 1 virtual gigabit nics.

EnterpriseOne Lab Configuration

JD EDWARDS ONEWORLD DATABASE ENVIRONMENTS

Revision: New
Effective: 11 Apr 2007

PRISTINE ENVIRONMENT PS812 / JPS812 (JAS Port 83)	DEVELOPMENT ENVIRONMENT DV812 / JDV812 (JAS Port 82)	TEST ENVIRONMENT TS812 / JTS812 (JAS Port 82)	PROTOTYPE(CRP*) ENVIRONMENT PY812 / JPY812 (JAS Port 81)	PRODUCTION ENVIRONMENT PDB812 / JPD812 (JAS Port 80)	DEPLOYMENT ENVIRONMENT DEP812 (No JAS Port)	PLANNER ENVIRONMENT JDEPLAN (No JAS Port)
PRISTINE DATA FILES DS: Business Data - PS812 DBMS: JDE_PS812	TEST DATA FILES DS: Business Data - TEST DBMS: JDE_DEVELOPMENT		CRP DATA FILES DS: Business Data - CRP DBMS: JDE_CRP	PRODUCTION DATA FILES DS: Business Data - PROD DBMS: JDE_PROD	DEPLOYMENT / PLANNER DATA FILES DS: Business Data Local DBMS: JDE_Local	
PRISTINE CONTROL FILES DS: Control Tables - PS812 DBMS: JDE_PS812	TEST CONTROL FILES DS: Control Tables - Test DBMS: JDE_DEVELOPMENT		CRP CONTROL FILES DS: Control Tables - CRP DBMS: JDE_CRP	PRODUCTION CONTROL FILES DS: Control Tables - Prod DBMS: JDE_PROD	DEPLOYMENT / PLANNER CONTROL FILES DS: Control Tables Local DBMS: JDE_Local	
PRISTINE CENTRAL OBJECTS DS: Central Objects - PS812 DBMS: JDE_PS812	DEV CENTRAL OBJECTS DS: Central Objects - DV812 DBMS: JDE_DV812	PROTOTYPE CENTRAL OBJECTS DS: Central Objects - PY812 DBMS: JDE_PY812		PRODUCTION CENTRAL OBJECTS DS: Central Objects - PDB812 DBMS: JDE_PDB812	DEPLOYMENT / PLANNER CENTRAL OBJECTS DS: Central Objects Local DBMS: JDE_Local	
PRISTINE VERSIONS DS: Versions - PS812 DBMS: JDE_PS812	DEVELOPMENT VERSIONS DS: Versions - DV812 DBMS: JDE_DV812	PROTOTYPE VERSIONS DS: Versions - PY812 DBMS: JDE_PY812		PRODUCTION VERSIONS DS: Versions - PDB812 DBMS: JDE_PDB812	DEPLOYMENT / PLANNER VERSIONS DS: Versions Local DBMS: JDE_Local	
DATA DICTIONARY DS: Data Dictionary - 812 DBMS: JDE812						DATA DICTIONARY DS: Data Dictionary Local DBMS: JDE_Local
OBJECT LIBRARIAN DS: Object Librarian - 812 DBMS: JDE812						OBJECT LIBRARIAN DS: Object Librarian Local DBMS: JDE_Local
SYSTEM DS: System - 812 DBMS: JDE812						SYSTEM DS: System Local DBMS: JDE_Local
PRISTINE ENVIRONMENT ACCESS: IT PURPOSE: This environment is used for troubleshooting application issues with JD Edwards. It contains no modifications or ESU's in order to determine if a problem exists at the base (unmodified) level of applications. DATA: The data and control files contain demo information supplied by JD Edwards.	DEVELOPMENT ENVIRONMENT ACCESS: IT PURPOSE: This environment is used for the development and testing of modifications and custom objects. In addition, vendor supplied ESU's (Electronic Software Updates) are first applied and tested here. Data: The Development environment uses the TEST data and control files. These in turn, are refreshed from the Productions files as needed.	TEST ENVIRONMENT ACCESS: IT, End Users, Consultants PURPOSE: This environment is used by end users to test all modifications, custom objects and ESU's that originated in the Development environment. It is also where system setup, module configurations, and business model changes are first tested. DATA: The TEST data and control files are refreshed from the Production files as required.	PROTOTYPE (CRP*) ENVIRONMENT ACCESS: IT, End Users, Consultants PURPOSE: Except for the current change (from Production) being tested, this environment is a mirror image of the Production Environment. All changes are fully tested and validated here before being moved into production. DATA: The Prototype(CRP) data and control files are refreshed from the Production files as needed or prior to any end user testing.	PRODUCTION ENVIRONMENT ACCESS: IT, End Users, Consultants PURPOSE: The Production Environment is the "Live" environment. This is where the company runs the actual business and stores the data. Any changes to this environment <u>must</u> be completely tested and validated successfully using the Development, TEST and Prototype(CRP) environments before being applied here. DATA: The data for the Production environment is generated daily from the business operations.	DEPLOYMENT ENVIRONMENT ACCESS: IT PURPOSE: The Deployment Environment is the environment where the company performs deployment modification activities. Those activities include package assembly, building and deploying. This environment and pathcode only exists on the Deployment Server. DATA: The data for the Deployment environment is sample JDE data.	PLANNER ENVIRONMENT ACCESS: IT PURPOSE: The Planner Environment is the environment where various technical tasks are performed. Those tasks include introducing ESU's, baselines and updates, tools releases and for performing initial installations and upgrades of the software. This environment and pathcode only exists on the Deployment Server. DATA: The data for the Deployment environment is sample JDE data.

*CRP - Conference Room Pilot

Findings

- ESX Server
 - Significant learning curve to setup product **properly** for E1/ERP.
 - 2 VMware courses.
 - 6 manuals from VMware.
 - Web site reading.
 - Total reading: Approximately 1630 pages of information plus web site information.
 - Extremely simple installation.
 - Required approximately 30 minutes to install and have running and available for the configuration of VM's.
 - Very simple setup program to lay down initial code for ESX 2.5.
 - Very few code updates required.
 - Only a small number of patches to get to current patch level.

Findings

- ESX Server (continued)
 - VMwares ESX product runs on “bare-metal” .
 - It is tightly coupled with a installation of Redhat Linux.
 - Extremely stable codeset.
 - Opinion based on our limited in-lab testing, not extensive multi-site testing.
 - No real crashes or stability issues encountered during testing that could be directly attributed to the ESX product.
Note: Had to apply one patch from VMware and a BIOS update from DELL to resolve a few issues encountered.
 - Overhead due to ESX product versus “traditional” physical servers.
 - Approximately 0-10% overhead depending on the particular characteristics of the server and its primary job function.
 - Support for VMware
 - Very good based on our limited needs during the lab testing.

Findings

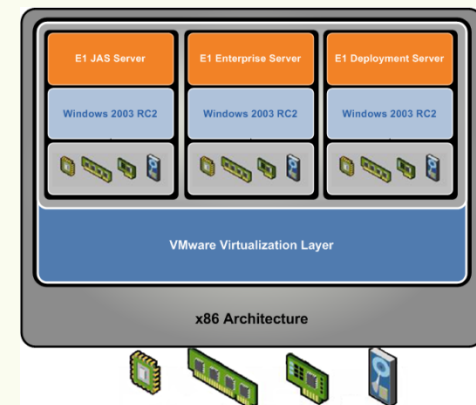
- Virtual Machines (VMs) running on ESX server.
 - No issues with installation of operating systems and required supporting software for E1, including patches later applied to the O/S and supporting software for E1.
 - No “unique” issues encountered installing EnterpriseOne 8.12 as well as patches such as the tools release update and ESU’s.
 - No “unique” issues encountered running EnterpriseOne 8.12 on the VM’s.
 - No issues with Permanent to Virtual (P2V) cloning of select E1 servers into VM’s.

Benefits and Drawbacks

- Benefits
 - Definite cost savings for certain sized organizations.
 - Server hardware / Windows licenses / data center infrastructure / power consumption.
 - Simplifies IT maintenance / functions.
 - Initial server setups.
 - Hardware and software maintenance.
 - Server migrations to new hardware.
 - Any level of disaster recovery design.
 - Possible to *improve* performance in certain E1 scenarios versus a traditional physical server design.
 - Intelligent E1 CNC and VMware VM design that compliments each other.
 - Transparent memory page sharing.
 - RAM over commitment.
 - VMotion / High Availability (HA)
 - Properly designed VMware solution allows for the movement of *running* virtual machines between underlying ESX servers in the farm.
 - Movement can be on demand (scheduled maintenance) or for HA. (dynamically as needed.)

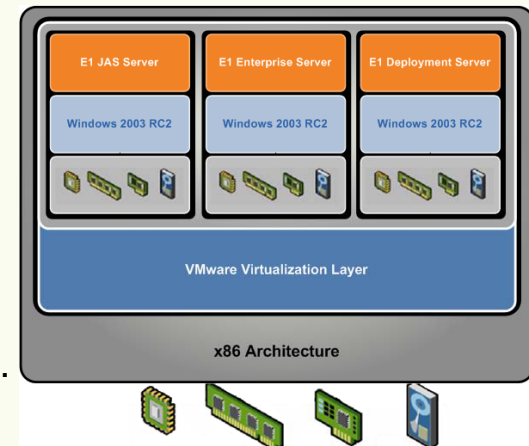
Benefits and Drawbacks

- Optimizing E1 CNC and VMware design.
 - Memory
 - Set appropriate memory maximums for each server so they don't consume more RAM than they realistically need in a normal business environment. (capping)
 - Overcommitted physical RAM across VM's to allow them to steal unused RAM from other servers if needed. Uses a Least Recently Used (LRU) algorithm to determine this. (in our case, this is typically the Deployment Server)
 - VM swap as an insurance policy against a crash if system wide requirements exceed physical memory on the server.
 - Transparent page sharing between all server since they are on one physical machine and all running Windows 2003 server.



Benefits and Drawbacks

- Optimizing E1 CNC and VMware design.
 - CPU
 - Physical – 2 Intel CPU's, Dual Core.
 - Virtual – 4 virtual CPU's available for use.
 - 2 virtual CPU's to the Enterprise Server, and 2 separate virtual CPU's to the JAS Server.
 - No competing for CPU resources with each other.
 - VMware calls this feature Processor Affinity.
 - 4 virtual CPU's assigned to the Deployment Server.
 - Uses all virtual CPU's available to the other servers.
 - Provided ¼ of the "shares" for CPU use that the Enterprise Server and JAS Server have on their virtual CPU pairs. This means it gets less time slices of CPU power when there is contention.



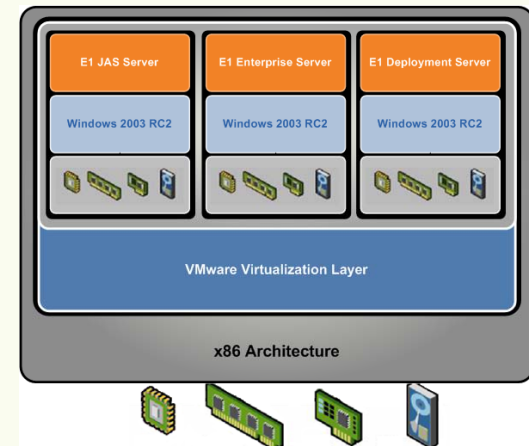
Note: "Shares" are used in VMware ESX Server for weighting and allocation for CPU, Disk and Memory hardware resources.

Benefits and Drawbacks

- Optimizing E1 CNC and VMware design.
 - Network Interface Cards (NICs)
 - Physical – 2 Gigabit Network Cards.
 - Virtual
 - Can create virtual NIC's, virtual switches to connect to those NICs, as well as VLANs on the virtual networks.
 - Virtual NIC's and switches do NOT have to be directly connected to physical NIC's.
 - Physical NIC's can be teamed into "bonds" to increase aggregate network bandwidth to the VM's. (Note: Physical switches must support 802.3ad link aggregation support for out-ip traffic balancing)
 - Outbound network traffic maximums can be set on a per virtual server basis. (Vmware calls this network traffic shaping)

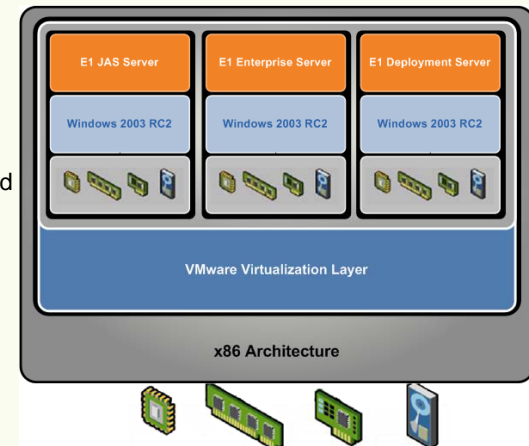
- Built a virtual switch / network segment for only the E1 servers to use. (no real NIC's = zero collisions and bus speed access between VM's... ☺)
 - 4 Gigabit virtual NIC's for the Enterprise Server.
 - 2 Gigabit virtual NIC's for the Web Server on this segment.
 - 1 Gigabit virtual NIC for the Deployment Server on this segment.

- Built a virtual switch / network segment for connection to the physical NIC's.
 - 2 Gigabit virtual NIC's connected to the 2 bonded physical NIC's on our second virtual switch / network segment.
 - Setup ESX to use IP address balancing on this segment. (better traffic distribution and performance, slightly higher CPU overhead)
 - Option: By setting the JAS server to not route traffic across it's NIC's on each network segment, you could use this for basic protection against attacks of your E1 system or connection overloading.



Benefits and Drawbacks

- Optimizing E1 CNC and VMware design.
 - Disk
 - Physical
 - 73 GB x 6 = 438 GB Hard Disk Space / 15K rpm SCSI – 3 Hard Disks. (RAID 5 configuration with 365 GB of available storage.)
 - Virtual
 - Deployment Server – 100 GB – from RAID 5 volume.
 - Enterprise Server – 150 GB – from RAID 5 volume.
 - JAS Server – 60 GB – from RAID 5 volume.
 - Note: Additional disk space allocated for ESX installation, VM images and the Windows AD Primary Controller server.
- What we did that was interesting.
 - Nothing. (unfortunately!)
 - Not enough disk space / disk arms to get creative.
- What we could have done.
 - Adjusted “share” weightings for disk bandwidth across VM's.
- What would I do if there were an IT Santa Claus?
 - Ask for a SAN or a NAS solution with lots of disks.
 - Deployment Server - RAID 1 for O/S and software.
 - Enterprise Server - RAID 1 for O/S, RAID 0+1 volumes for each of Enterprise Server DBMS data files and transaction logs, RAID 5 for pathcodes.
 - JAS Server = RAID 1 for O/S, RAID 5 for applications.



Benefits and Drawbacks

- Drawbacks
 - Support for virtualization by software vendors.
 - Most software vendors will only troubleshoot issues on a physical server solution.
 - Additional technology layer to understand.
 - Must have a VMware trained employee or contract out for a resource.
 - Server Consolidation.
 - If the underlying server has a hardware failure, it can affect all virtual machines running on that server.

Benefits and Drawbacks

ORACLE | PeopleSoft.
Customer Connection™

- PeopleSoft Home
- Implement, Optimize + Upgrade
- Updates + Fixes
- Support
 - Troubleshooting
 - Online Support
 - Knowledge Garden Support
 - Report a Problem
 - Total Ownership Experience
 - Documentation
 - Roadmaps + Schedules
 - User Groups
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Search Solution

Solution Summary

Solution ID: 201012423 Solution Type: Standard

Solution Library: E1 Technical/Tools

Did this solve your Problem?

Summary: E1: PLAT: What is EnterpriseOne's support policy for virtual server environments

Details: Solution 201012423

E1TECHPLAT
E1: PLAT: What is EnterpriseOne's support policy for "virtual" server environments?

ISSUE:

What is EnterpriseOne's support policy for "virtual" server environments - whether it's VMWare or Microsoft's Virtual Server software. Do you have any specific plans to test/certify EnterpriseOne for use in a Virtual Server environment?

SOLUTION:

We don't certify EnterpriseOne against operating platforms running on a virtual server environment. We do not have plans to extend our testing matrix to cover all the possibilities allowed by virtual servers.

We do not differentiate between virtual servers and traditional servers. Virtual servers must follow the same hardware and operating system platforms as detailed in the Minimum Technical Requirements (MTRs). The virtual server vendor must assure that the behavior of the virtual server is the same as a traditional server.

If customers run into problems with EnterpriseOne operating on a virtual server and support cannot duplicate it on a traditional server, the customer must go to the virtual server vendor for support.

Metrics
Usage Count: 19
Solved Count: 15
Next Review Date: 12/31/2013
Date Created: 04/19/2006 9:17
Date Modified: 12/16/2006 9:00

Ideas

- DESIGN
 - Steal resources for Deployment Server VM as needed since it typically isn't used during the business day for anything except packages and check out / check in of BSFN's, NER's and TBLE's.
 - Setup multiple logic servers and database servers.
 - Production database and logic server(s).
 - Special logic servers for Production. (Year End job server)
 - Non Production database and logic server.
 - Utilize "shares", traffic shaping and VLANS to optimize performance where it makes sense for E1.
- MAINTENANCE / DISASTER RECOVERY
 - Take images of systems regularly for quick system recovery if needed during the day.
 - Take images for backups / offsite storage for daily DRP planning.
 - Use images for DRP testing and server rebuilds at offsite locations.
 - Duplicate VM's using images to upgrade software, then replace original system with duplicate.

Conclusions

- Very good technology to compliment E1.
- Significant cost savings and maintenance / DRP simplification for some companies.
- Works well with E1 in our lab tests, given proper design considerations are taken.

- Support for Production systems is a concern.
- Hardware redundancy and reliability is of utmost concern given the consolidation factor.

QUESTIONS

&

DISCUSSION

Thank you for attending

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