Looking Beyond Virtualization Germination

Chris Wolf, Senior Analyst, Burton Group

November 5, 2008

Agenda

- Virtualization then and now
- Unfinished business
- Future Developments
- Recommendations

Virtualization Then and Now

Then

- Force feeding virtualization to unwilling participants
- Moving from dev/test to production
- Playing it safe with performance-intensive apps
- Enjoying the HA benefits of virtualization
- Few hypervisor choices

Virtualization Then and Now

Now

- Virtualization is the default deployment method for new applications
- Virtualization in production is mainstream
- Exchange, SQL, Oracle, DB2, SAP, XenApp frequently virtualized
- Looking to redefine how we look at HA
- “Good enough” choices are emerging

Unfinished Business

- Software Licensing and Support
- High availability
- Security
- Interoperability
- Management
- Virtual Desktops

Software Licensing and Support

- Steady improvements in software licensing
- Support – What does *we support virtualization* really mean?
- License tracking by physical resources is complex
  - Associating VM to physical hardware
  - VM movement (Live Migration/VMotion, DRS) can change licensing terms – VM goes from a 2 way to a 4 way physical host

Ideal Licensing Characteristics

- Choice of physical server or virtual instance-based licensing
- No direct ties to physical hardware
- No restrictions on VM mobility
- No penalties for maintaining offline VMs for DR purposes
- Option for CPU-based licensing to bind to virtual CPUs

High Availability

- With VM as the point of failover, all applications can be highly available
- VM failover requires a full VM restart
- We can do better
  - Think beyond legacy failover architectures
  - Application aware fault tolerance
    - Via orchestrator
    - Embedded in VM tools
    - Third party (Symantec, SteelEye)

Security

- Legacy security models are incompatible with the dynamic data center
  - Intrusion detection and prevention
  - Zone segmentation
  - Security appliance placement
- VMsafe provides a look at the future
  - Security appliances glued to physical hosts
  - Policies drive security enforcement

Hypervisor Maturity

- Competition heating up
  - VMware, Microsoft, Citrix, Sun, Red Hat, Novell, Virtual Iron, Parallels, Oracle
- What's "good enough?"
  - Acceptable management and performance
  - High availability
- Pricing differentiators
- Heterogeneous?

Hypervisor Maturity: Key Differentiators

- Vendor support
- High availability – variations in failover intelligence
- Hardware-assisted virtualization
- Data protection and recovery
- Live migration and memory overcommit
- Virtualization.info Buyer's Guide
  - http://www.virtualization.info/buyersguide/

Microsoft's Server Virtualization Validation Program

- Validated: Cisco, Citrix, Novell, VMware
- Source: http://windowsservercatalog.com/svvp (click "Products" link)
- *Application Server License Mobility* http://download.microsoft.com/download/3/d/4/3d42bdc2-6725-4b29-b75a-a5b04179958b/Application_Server_License_Mobility_VL_Brief.doc

Hardware-assisted Virtualization

- Hardware-assisted Memory Virtualization
  - AMD RVI, Intel EPT
  - Significant performance improvement in multi-threaded enterprise applications
- AMD Extended Migration / Intel Flex Migration
  - Allows different CPU generations to reside in the same physical cluster
  - Fine print: Run processor features at the lowest common denominator

Single Root I/O Virtualization (SR-IOV)

- Virtualization intelligence added to PCI devices
- Gives VMs passthrough access to PCI devices
- First implementation: 10GbE NICs
- Requires a device driver in the VM guest
- Impact on mobility?

Interoperability

- CIM management profiles
  - System Virtualization Profile, Virtual System Profile
  - CIM uptake – VMware, Citrix, Microsoft, Novell
- Open Virtualization Format (OVF)
  - Common VM import/metadata standard
  - Key cloud enabler
  - Barriers: virtual disk formats, device drivers

Compliance

Compliance

- Challenge to audit/enforce in virtualized environments due to hardware abstraction and workload mobility
- Tools now evolving to assist in compliance audits
  - ManageSoft, CiRBA, ManageIQ, Embotics, ConfigureSoft, VMware, CA
- Are orchestration policies fully aware of compliance-related restrictions?
- Major inhibitor to cloud-based computing

Virtual Desktops

- Moving toward mainstream adoption
- Redefining IT support and desktop management
- Changing the desktop paradigm
  - Remote virtual desktops
  - Desktop hypervisors
  - Application streaming
  - Application caching

Virtual Desktop Differentiators

- Storage (single vs. multi-instance)
- OS and application management
- User self service
- 3D graphics
  - Fine print: Yes our thin client supports 3D graphics, but we just don't have a device driver for your hypervisor

Future Developments

- Storage and data protection
  - Deduplication
  - Serverless backups
  - Single-pass, multiple recovery options
  - Closer integration between array-level features and data protection software
- Security
  - VMsafe appliances shipping in 2009
  - VM tokening, tracking, authorization

Future Developments

- Networking
  - Distributed virtual switch
  - Access layer moving to virtual infrastructure
- Power management
  - In the hypervisor (Hyper-V)
  - Dynamic Power Management (VMware)

Recommendations

- Architect to avoid lock-in
- Integration must occur up the stack (orchestration must start at the top)
- Rethink existing solutions and architectures
- Beware differences between *features* and *marketing checkboxes*