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Red Hat VDI

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AGENDA

- Open Source and the Evolution of Virtualization
- Desktop VDI Value Components
- Real VDI TCO
- The Future of the Desktop and the savings

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What is a virtual desktop?

Similar to a virtual server, a virtual desktop is an operating system instance separated from its physical environment. This encapsulates the operating system to give full portability throughout the enterprise. Access to the desktop is provided via an end-device such as a physical personal computer or thin client.

Operating system runs in a hypervisor thus all CPU instructions and disk I/O is executed on a Red Hat Server running KVM

Entire user environment is “streamed” to the end-user

Graphical desktop is “drawn” over the network to the end-device

Mouse movements and keyboard strokes are translated from the end device to the virtual session

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Q & A

Is a virtual desktop the same as Microsoft Terminal Services or Citrix?

NO

Virtual Desktops run a unique copy of the operating system and deliver an isolated environment to the end-user. Terminal Services and Citrix share an operating system with the users with no isolation

What is the impact of the end-client device in a virtual desktop environment?

All computations and network and disk I/O operations occur on the server which makes the end-client computing power irrelevant. However, the graphics capabilities of the end-device directly control the user experience.

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Red Hat Virtual Desktop Solution

- A hosted desktop virtualization solution in which entire desktop images run inside virtual machines on a server.
- Users access their desktops from a thin client or PC with a browser using either Red Hat's SPICE protocol or RDP.
- A virtual desktop is the user's entire work environment i.e. the entire display pixel for pixel, cursor, keyboard, audio, plus all applications, data and storage.
- Each desktop is dedicated to a user. Provides complete isolation from other users' desktops.
- Bottom Line:
 - Significant reduction of TCO
 - Unsurpassed desktop manageability
 - Superior user experience, same as a physical PC

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Differentiation

- **Superior end-user experience**
 - ◆ Indistinguishable from a physical PC on a LAN
- **Quad monitor support**
 - ◆ Others only offer single monitor support
- **USB 1.1 and 2.0 support**
 - ◆ Thumb drives, blackberry, cameras
- **Designed originally for Virtual Desktop environments**
 - ◆ Other vendors offer a repackaged server solution
- **First fully-integrated end-to-end desktop solution**
 - ◆ No 3rd party components
- **Open Source Linux-based**
 - ◆ Leverages existing scheduler, memory mgnt, device mgnt, I/O security
 - ◆ Others use a proprietary operating system based upon Linux

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RHEV Manager for Desktops

Red Hat Enterprise
Virtualization
Manager for Desktops

Administrator
Console

API and Scripting

Windows
PowerShell



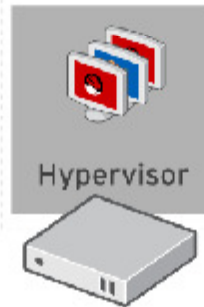
Active Directory



Red Hat Enterprise
Virtualization Hypervisor

End-user existing
desktop hardware
or thin client

Virtual
Desktops



Hosts



Browser



Spice Client

Publish template



Third party
provisioning



Install media



Virtual
Appliance



Red Hat
Satellite



Storage

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Background

KVM (Kernel Virtual Machine) Hypervisor

3rd Generation Hypervisor Invented by Qumranet in 2006- Released to the Open Source Community

- .Integrated into the Linux Kernel
- .Leverages Hardware Acceleration (AMD-V or Intel VT)

.Advantages over traditional hypervisors

- .Small footprint less the 25,000 lines of code which reduces hypervisor overhead
- .Leverages Proven Linux Scheduler and handles each virtual machine as a process
- .Uses native Linux drivers optimized for specific hardware platforms

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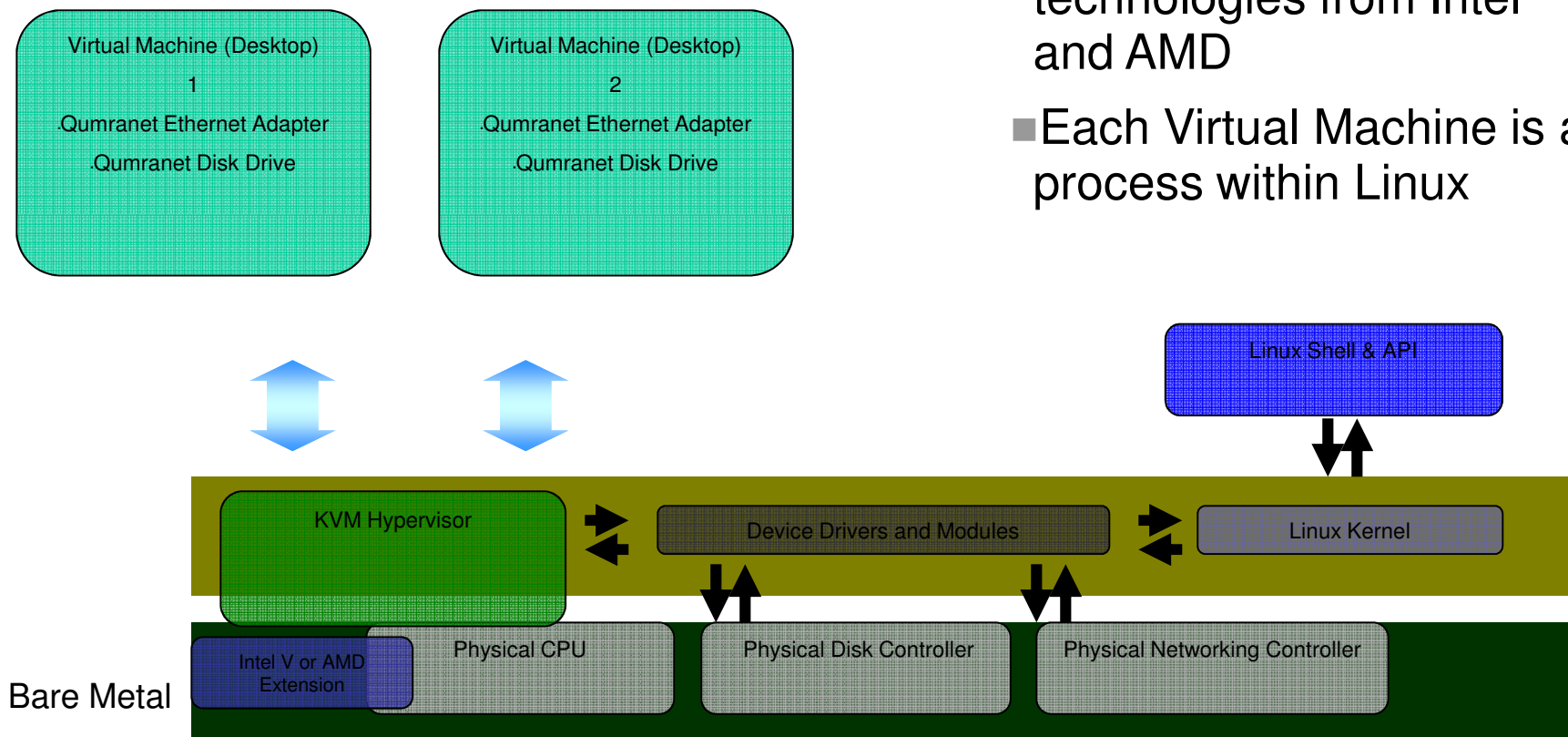
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Background

KVM turns a base Red Hat Server into a full hypervisor – No special kernel needed

- KVM utilizes hardware-assist virtualization technologies from Intel and AMD
- Each Virtual Machine is a process within Linux



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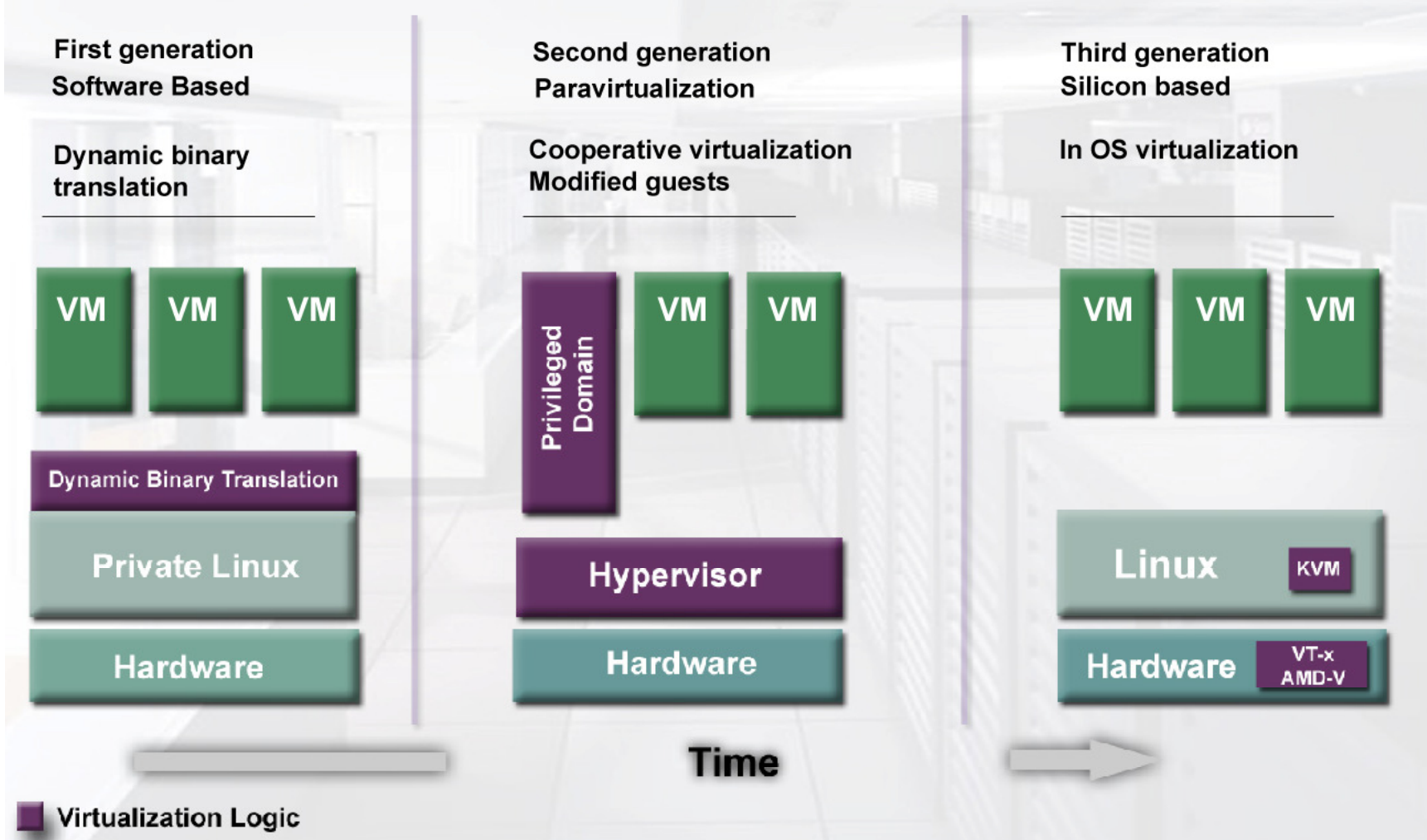


Background

**VMware – Pure Binary Translation
(Later Added Intel and AMD Hardware Acceleration)**

XEN – Uses DOM0 Domain for IO Traffic

KVM – Extends Native Linux as a true Hypervisor



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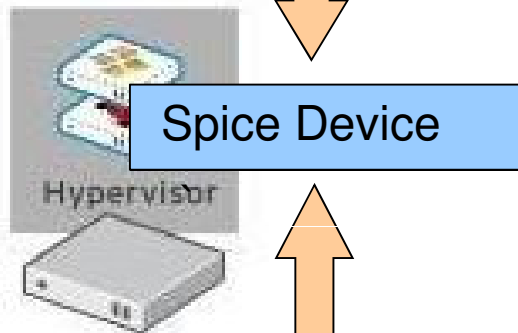


Spice – Rendering Protocol

Guest



Host



***Thin Client/Desktop
Windows/Linux based***

- **User experience indistinguishable from physical PC**
 - 30+ frames per second video
 - Supports flash and other graphics
 - Bi-directional audio and video for (for video -conferencing/phone)
 - Multi-monitor support (4+ monitors)
 - USB 1.1 and 2.0 support
- **Adaptive remote rendering solution**
 - Utilizes GPU of the server and/or client
 - Offloads graphics processing/rendering to client (if powerful)
- **Improves desktop density on the server**
 - Minimizes server side rendering (adaptive behavior)



Why deploy a virtual desktop? -- The ROI

The major reason for deploying a virtual desktop is the reduction of capital and maintenance expenditures when compared to a physical personal computer. Virtual Desktops from any competitor deliver the following:

HARD Costs

Reduction in Capital Expenditures

Average physical desktop cost is \$700.00. Virtual Desktops allow a customer to reuse their existing personal computers as dumb terminals or use thin clients. Thin clients range from \$300 to \$500 in capital costs and have up-to seven-eight years of life.

Reduction in power. Thin Clients typically use 15W – 20W vs. 150W for a physical PC

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Virtual Desktops

Hard Dollar Savings – Identify the “Event”

Desktop Refresh

Red Hat’s RHEV-D Solution can save customers significant amounts of money during an “event.” The event is when customers are going through a hardware refresh cycle:

Extend the life of current Personal Computer 1 -2 years

Replace \$700 Personal Computers with \$300 Thin Clients

When does this event occur?

Most customers deploy desktops in a staggered refresh fashion usually every three to four years. Three year refresh is common in environments where desktops are leased, four-year occurs mostly in environments where the assets are owned.

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Hard Dollar Savings – Continued

Power Savings “Green Initiative”

Using Thin Clients, the reduction of power is nearly 40%. A typical Personal Computer with a 150W Power Supply will cost at a minimum, \$56.00 a year to operate vs. \$14.00 for a thin client.

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Virtual Desktops

Soft Dollar Savings

Reduce Deskside Visits

With the entire desktop virtualized, the need for desktop deskside visits is eliminated. Using a FTE (Full Time Employee) Rate of \$75.00, this reduces deskside visits by 4 hours a year by \$300.00 /

Reduce Desktop Conversion Time

When customers transition from one desktop platform to another, either the desktop is re-imaged or the entire environment is reloaded. Encapsulating a desktop within a virtual machines eliminates this time consuming tasks. Even with enterprise deployment tools, this arduous task still takes 6 hours or \$450.00 of FTE time.

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Area	Typical Savings	Rationale
Desk-side PC support	90%	Desk-side support, other than for hardware failures, is eliminated
Security and user administration	75%	Administration is policy-based and authorized users can be allowed to administer their own entitlements (rule-based, delegated admin)
Power & cooling	60%	Blade and Thin Client solution gives maximum power efficiency

Help desk	50%	Simplified environment reduces complexity and support calls Moves, adds and changes typically do not require IT support
Network engineering and support	50%	All traffic is over HTTPS No need for complex firewall configuration and administration
Software distribution staff	50%	Packaging happens once for servers and desktops Software distribution is gradually replaced with software publishing
Desktop engineering	75%	The need for complex desktop engineering is eliminated though the combination of wrapping applications and moving to a central model
Security engineering	50%	Security administration eased through the introduction of a simplified infrastructure

(Source: Gartner Research)

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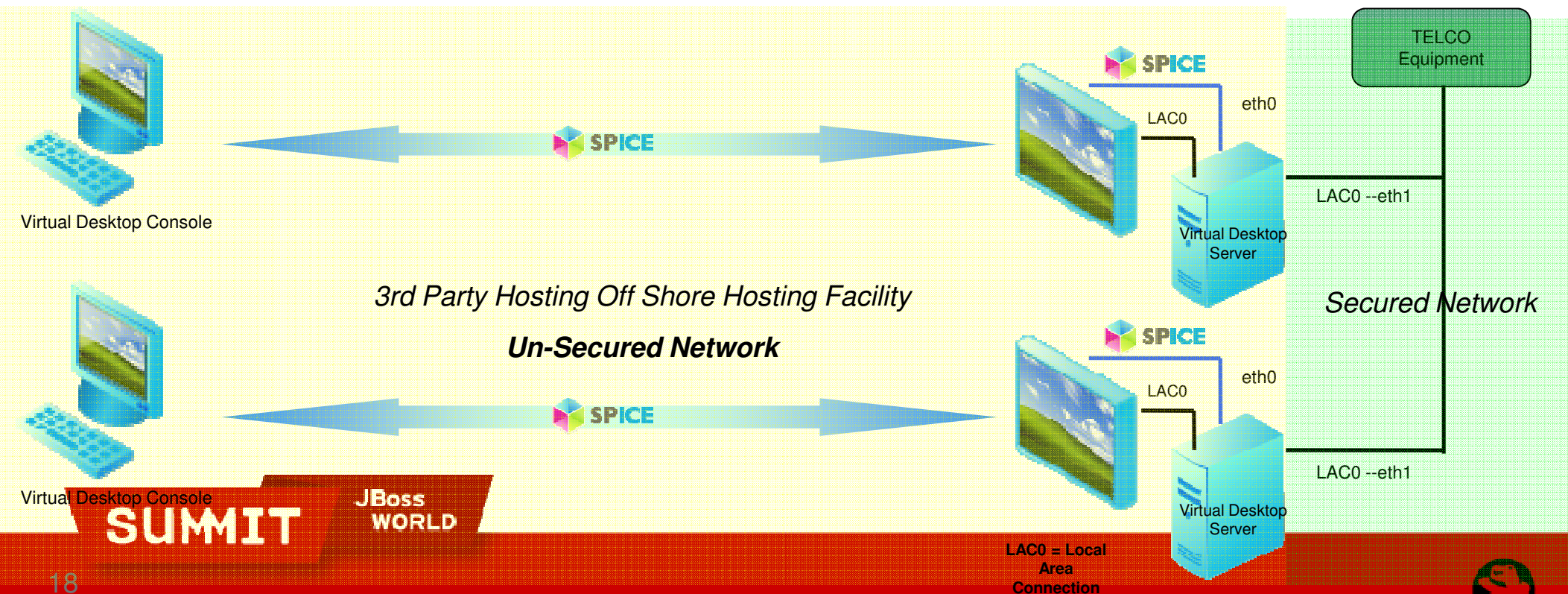
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Red Hat SPICE – Securing your data

- Separate, physical network isolation for user console access
 - Encrypted Data Stream
 - Pass-Through USB (*if desired*)
 - Bi-Directional Audio and Support for Web Cams
- SPICE
 - 32-bit color
 - HD Resolution
 - 1,2 and 4 monitor support
 - 30 fps full-motion video capable



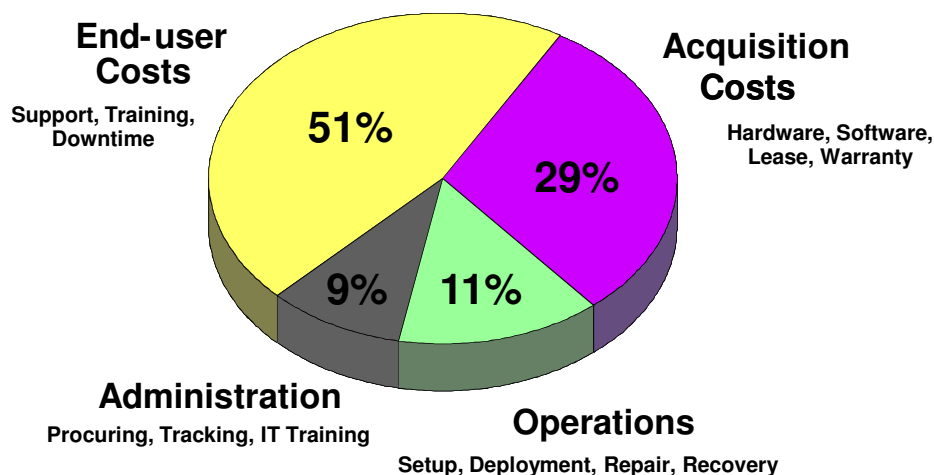
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Virtual Desktop Infrastructure

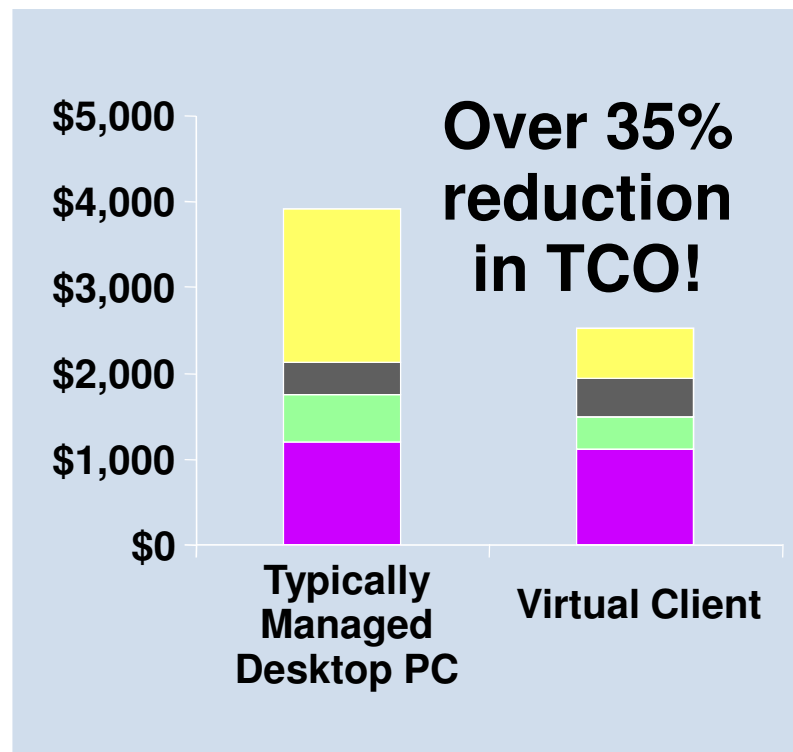
Total Cost of PC Ownership



VDI reduces end-user costs by 65% vs. typically managed PC environment

VDI reduces operations costs by 30% vs. typically managed PC environment

Ex. Virtual Desktops can reduce Setup & Deployment by 50% (4 hours per PC to less than 2 hours per thin client)



Virtual Client can lower TCO by reducing cost of operations and end-user support.

(Source: Gartner Research)

\$4000 TCO per desktop (\$1000 avg acquisition cost)
\$7600 TCO per laptop (\$1900 avg acquisition cost)

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