



W07 – Virtualizing the Desktop

Jesper Krogh

jesper_krogh@dell.com

Speaker intro

- Jesper Krogh
 - Senior Solution architect at Dell
 - Responsible for Microsoft offerings and solutions within Denmark
 - Specialities within: Active Directory, Exchange and the client platform
 - 15 years of consultancy experience
- Dell Services
 - 30000 consultants worldwide
 - Focusing upon infrastructure services
 - Enterprise architecture, Datacenter and End-user computing

Agenda

- VDI Levelset
- VDI vs Sessions?
- RDS Roles used to enable VDI scenarios
- Setup steps & considerations
- Putting it all together
- Tips & Tricks
- 3rd Party Value & the MS VDI stack
- Licensing
- Setting the scene (the numbers behind)

Microsoft VDI Solutions Stack

 Windows 7
+VECD

Microsoft®
Application
Virtualization

Microsoft®
Desktop Optimization Pack
for Software Assurance

Partner Solutions

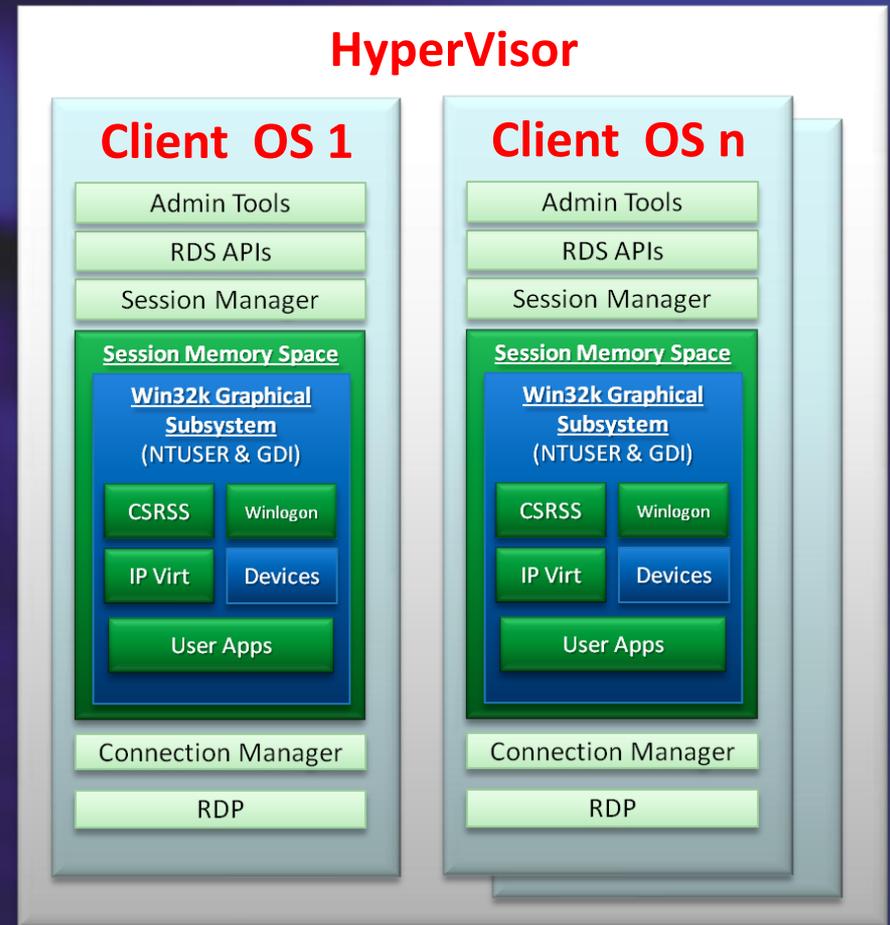
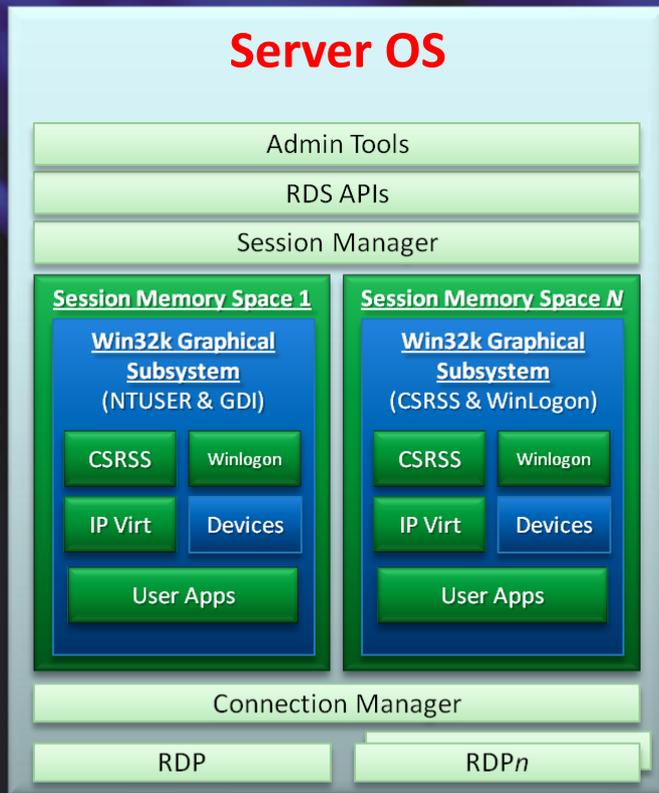
 Windows Server® 2008 R2
Remote Desktop Services

 Windows Server® 2008 R2
Hyper-V™


Microsoft®
System Center

Microsoft: typically departmental / simple scenarios
Partners: typically enterprise wide / complex scenarios

Sessions Virtualization VS Centralized Desktop Virtualization



Centralized Desktops: RDS vs. VDI

	RDS (Session-Based)	VDI (VM-Based)
Technology Maturity	Proven	Emerging
Scalability	Higher ratio of users/server	Lower ratio users/server
Isolation/Security	<ul style="list-style-type: none">● Session-based isolation● Shared OS across users● Must run as standard user	<ul style="list-style-type: none">● VM-based isolation● Dedicated OS per user● Can run as admin
Remote User Experience	Protocol-dependent	Protocol-dependent
User Flexibility	User is running as a user	User can have full rights
Application Compatibility	Windows Server OS	Windows Client desktop

- User requirements should dictate mode chosen
- Remoting protocol is common factor for both models
- Expect to have mix of both models

RDS Roles Explained

RD Session Host

- Provides Multi-Session Virtualization (f.k.a terminal server)
- Sessions for both remote desktops & RemoteApp

RD Virtualization Host

- Orchestrates Hyper-V hosted client VMs
- Enables VDI Scenarios
- Connection broker drives RD Virtualization Requests

RD Connection Broker

- Combines Session Directory, Publishing & Connection Broker in single service
- Aggregates RemoteApp hosts, Personal VDI VMs & Shared VDI VM
- Redirects user to right resource at right time, informs RD Virtualization Host

RD Web Access

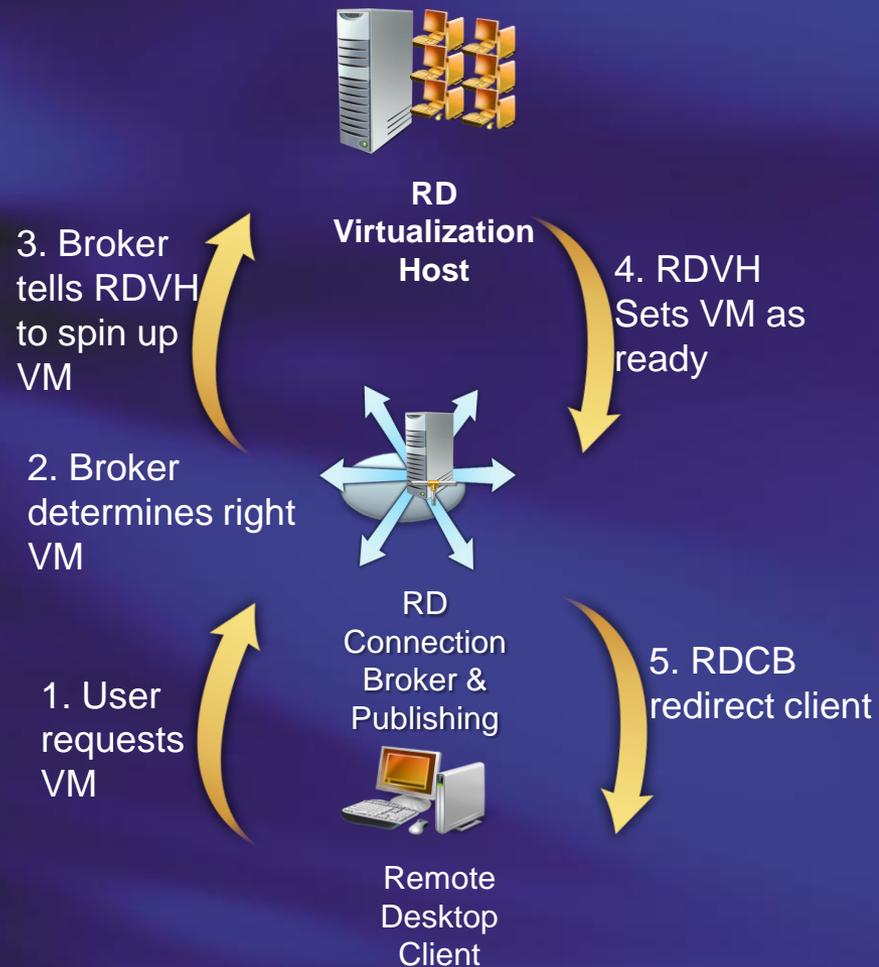
- Provides publishing not connectivity.
- Two modes points at either multiple RemoteApp hosts OR connection broker
- Aggregates multiple RemoteApp hosts in either mode

RD Gateway

- Provides HTTPS based access
- Enables accessing corporate resources from internet
- Can provide endpoint & redirection based security service

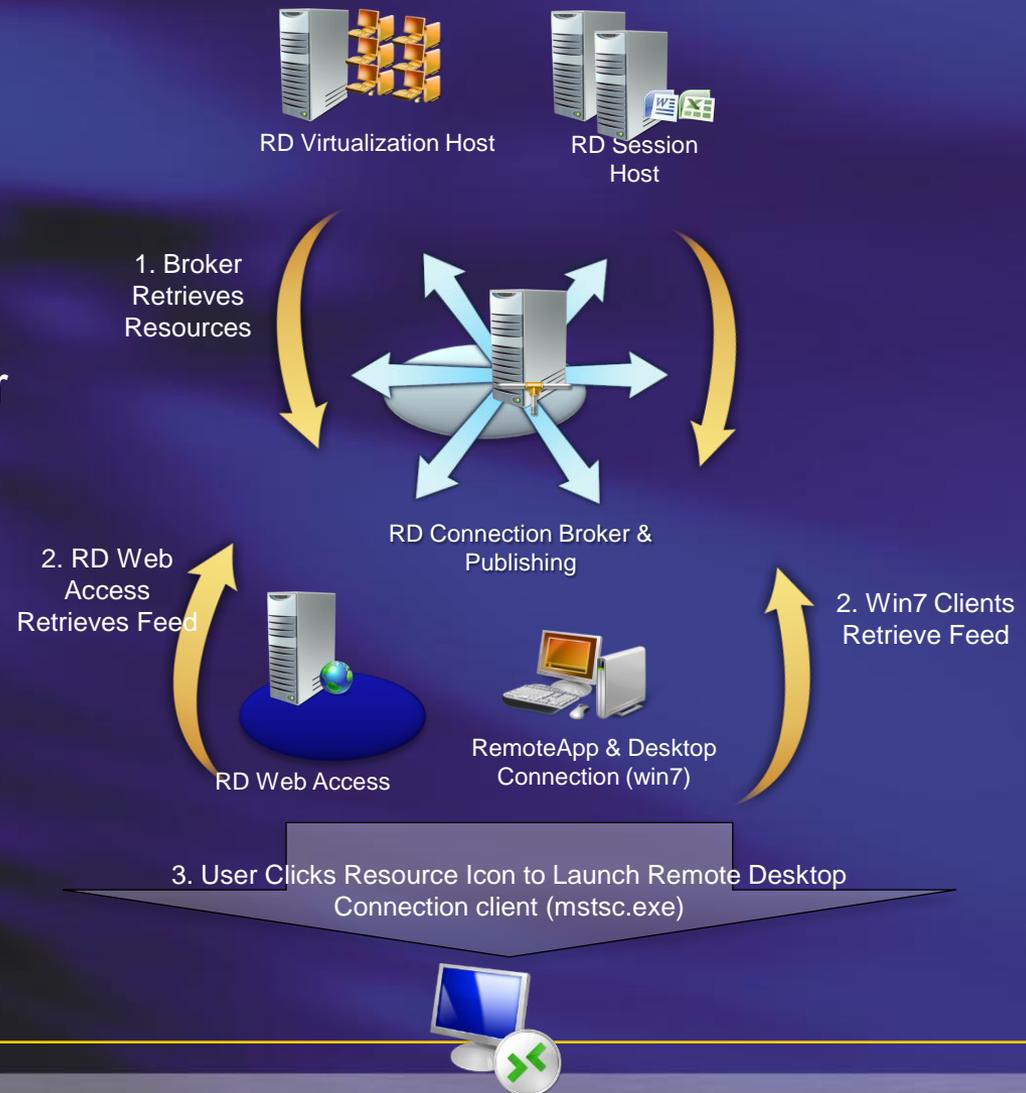
RD Virtualization Host

- Responsible for Orchestrating VDI VMs
 - Startup
 - Shutdown
 - Freeze/Unfreeze
 - Rollback
- Install Remote Desktop Virtualization Host Role service (Installs the Vmhostagent Service (tsvmhasvc.dll))
- Receives command from Connection broker to start VMs
- Collects Information on VMs and sends to Connection Broker (Session information and VM-state (i.e. is it running or hibernated))



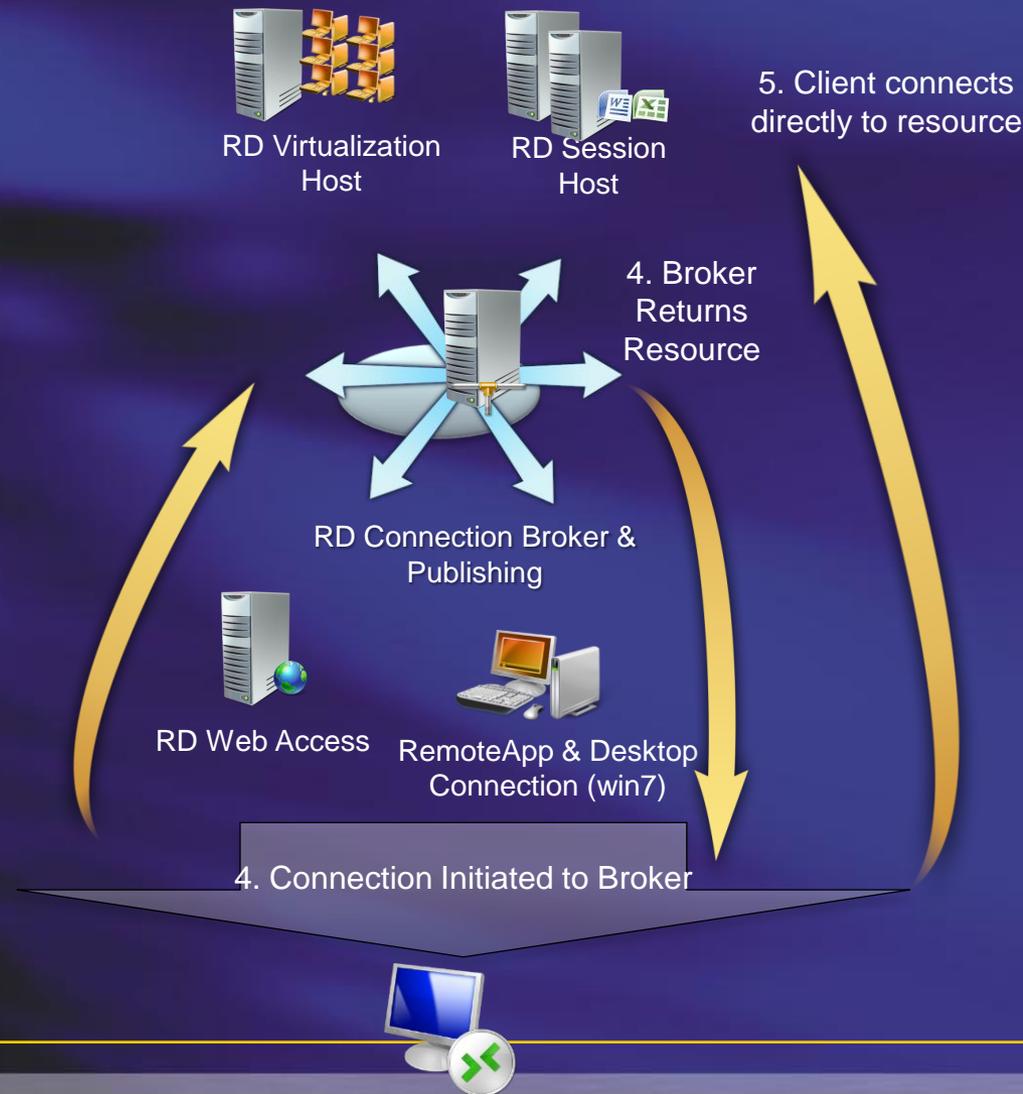
RD Connection Broker

- Multiple Capabilities
 - Connection Broker
 - Publishing Service
 - Redirector
- Connection broker & redirector can be separate



RD Connection Broker

- Multiple Capabilities
 - Connection Broker
 - Publishing Service
 - Redirector
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Connection Broker Role Service

- Installs 2 services
 - Connection Broker : tssdis
 - Centralized Publishing (Officially RemoteApp and Desktop Management Service) : tscpubrpc
- Connection broker
 - Processes all RDS and RDV connections
 - Stores all session information without this, users can't get back to disconnected sessions.
 - Calls into Centralized Publishing to connect to your personal VM

Centralized Publishing Service

- Aggregates RemoteApp programs from RD servers
- Maintains list of VM Pools and queries AD for the Personal VM assignments
- RD web access calls into this service to get the list of RemoteApps and Desktops for the user.
- Looks up the users assigned personal VM for Connection broker.
- By default listens on Port 5504

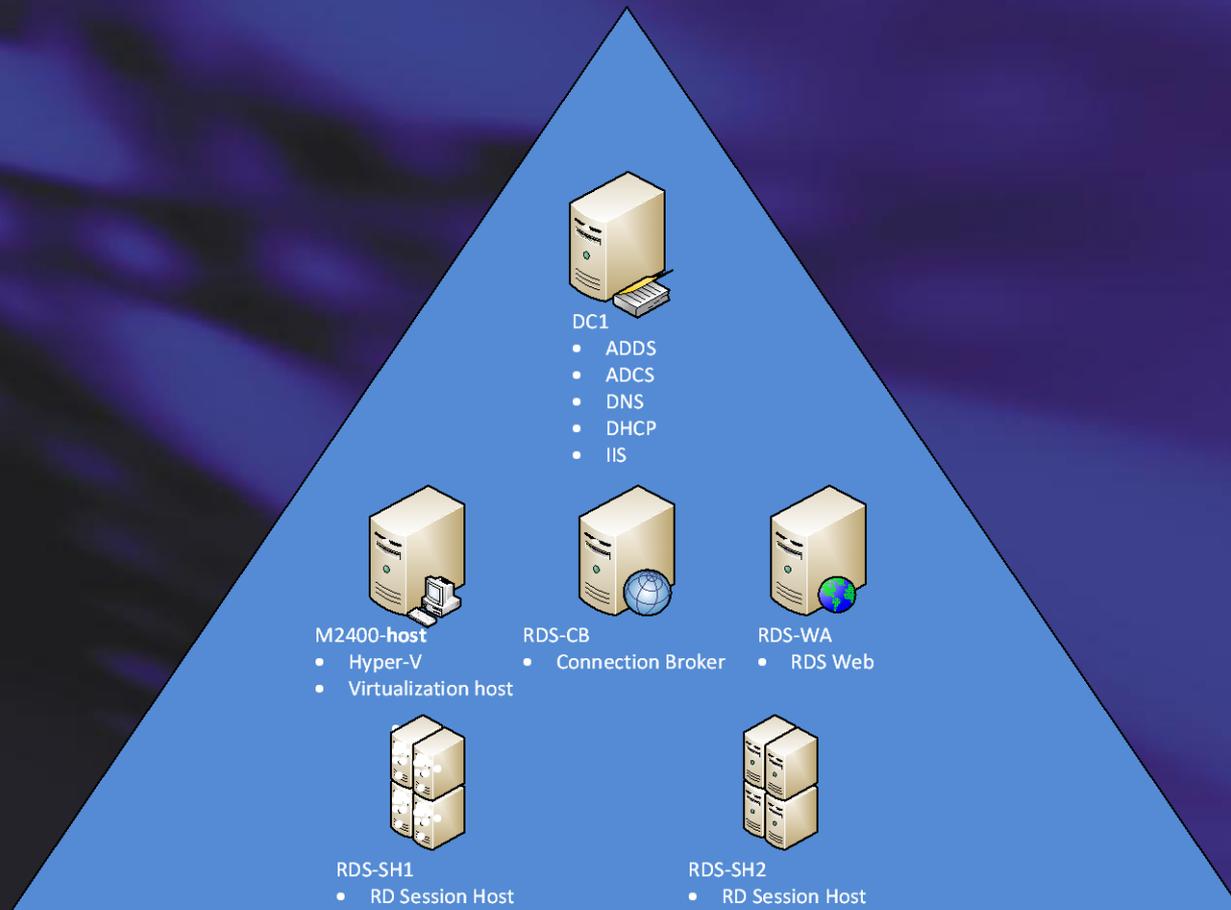
Redirector component

- Redirector is a Session Host in 'drain / dedicated redirector mode'
 - Forwards the RDP client connection request to the connection broker and returns the list of IP addresses received from the broker.
 - Only 1 redirector is needed for both Personal virtual desktops and VM pools.
 - Users never 'TS' into the redirector, but they do need to be in the 'Remote Desktop Users' security group.
 - Drain mode mean users on this server or users will not be able to connect as desktop or RemoteApp
 - For administrative access, start mstsc with the /admin switch to connect.

Demo environment

- Host hardware
 - Dell Precision M2400
 - Intel Centrino 2 – T9400 (Dual core)
 - 8 GB Ram
 - 128 GB SSD HDD

Demo setup



Krogh.eu

Demo

RD WEB ACCESS

Setup

- 0 – importance of SSL certificates
- 1 – Preparing Hyper-V & RD Virtualization Host
- 2 – Preparing Client OS Vms
- 3 – Configuring Redirector & Broker
- 4 – Configuring Web Access
- 5 – Setup Pools

Step 0 – Importance of Certificates

- RDP signing enables many cool features
 - Single sign-on (for Web Accessed RemoteApp)
 - Trusted behaviors
 - RemoteApp & Desktop Connections
 - Etc
- Make sure you have an SSL certificate you can use
 - Cert used by RD Web Accessor
 - Trusted root cert for enterprise / know 3rd party authority
- Deploy cert to all client machines
 - Not needed if cert issues from known 3rd party authority
 - Deploy with GP for managed clients
 - Will need to be manually installed on a non-trusted clients

Step 1 – Preparing Hyper-V / Virtualization Host

- Install Hyper-V role
- Install Remote Desktop Virtualization Host sub role

Sizing your Hyper-V Server?

- Q. How many VDI VMs can I get on my Hyper-V server
- A. It depends (just like sessions)!
 - Depends on applications
 - Depends on data used
 - Depends on demand cycle of user
 - Depends on OS – use Windows 7

Test, Test, Test – with ***real*** users

Step 2 - Preparing Client OS VMs

- Support XP SP3, Vista and Windows 7 clients
- If using XP SP3 or Vista, in the Hyper-V management tool install Hyper-V enlightenment (Integration Services)
- This is the most commonly misconfigured part of the VDI solution and involves 5 manual steps.

VM Guest Configuration

- Enable Remote Desktop Services (Group Policy)
- Add user groups to Remote Desktop Users Group
- Enable Remote RPC (Group Policy)
 - Or set HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Terminal Server\AllowRemoteRPC from 0 to 1.
- Allow Remote Service Management through firewall (Group Policy)
- Modify RDP Permissions (manual or script)
 - Add the VM Host machine account to the RDP Listener permissions. This must be done by a VB script or a PowerShell script as the UI is not available on client SKUs
 - The RDVH Server computer account needs the WINSTATION_QUERY, WINSTATION_LOGOFF, and WINSTATION_DISCONNECT permissions on each virtual machine in the virtual desktop pool
 - Can only be done after domain join

Modify RDP-TCP Perms - WMIc

- `·wmic /node:localhost RDPERMISSIONS where TerminalName="RDP-Tcp" CALL AddAccount "<domain>\<rdvh_server>$",1`
- `·wmic /node:localhost RDACCOUNT where "(TerminalName='RDP-Tcp' or TerminalName='Console') and AccountName='<domain>\\<rdvh_server>$'" CALL ModifyPermissions 0,1`
- `·wmic /node:localhost RDACCOUNT where "(TerminalName='RDP-Tcp' or TerminalName='Console') and AccountName='<domain>\\<rdvh_server>$'" CALL ModifyPermissions 2,1`
- `·wmic /node:localhost RDACCOUNT where "(TerminalName='RDP-Tcp' or TerminalName='Console') and AccountName='<domain>\\<rdvh_server>$'" CALL ModifyPermissions 9,1`
- `·Net stop termservice`
- `·Net start termservice`

Demo

CONFIGURING CLIENT

– USE GPO WHERE POSSIBLE **(PLEASE)**

Step 3 - Configure Connection Broker & Redirector

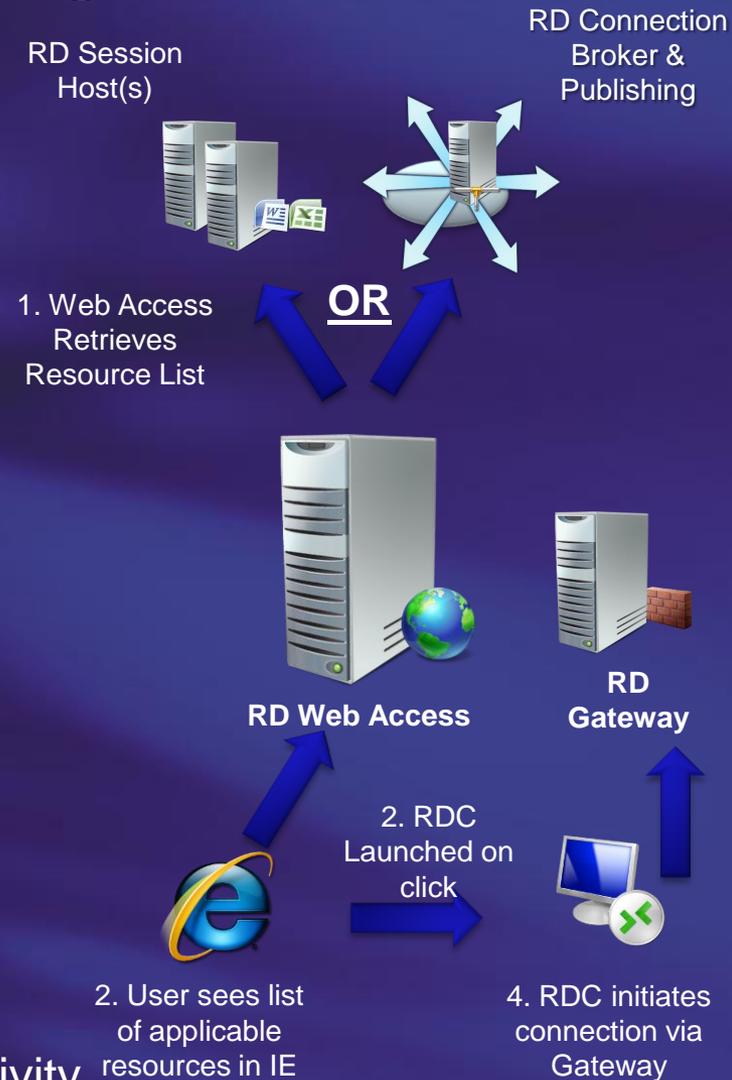
- Untangling the broker & redirector
- Connection Broker is RD Server Role Responsible for
- Redirector is RD Session Host configured as a dedicated redirector.
- add RDWA Server(s) to the TS Web Access Computers group on the connection broker

Step 4 - Configuring Web Access

- Two modes of operation
- Must use Connection Broker mode

Step 5 - Configuring Web Access

- Two modes of operation
- Point mode
 - Good for session based RemoteApp & Desktops
- Centralized Publishing Mode
 - Single view of both VDI and session based resources
- Must use Centralized Publishing Mode for VDI.



NOTE: RD Web Access DOES NOT provide connectivity

Redirector Configuration

- Installed by Installing Remote Desktop Services Role
- This puts the RDSH in drain mode so RemoteApp programs should not be setup on this server or users will not be able to connect.
- The only manual configuration is to add the authorized users to the “Remote Desktop Users” security group.
- On the redirector to manually configure the role:
 - Open Remote Desktop Session Host Configuration snapin
 - Set the Server purpose to Virtual machine redirection

Demo

RD WEB ACCESS IN PUBLISHING MODE

Step 5: Personal or Pooled Virtual Desktops?



Personal Virtual Desktops

Personal Virtual Desktops

- One OS image per user
- Administrator access, desktop customizable
- User state typically part of the image

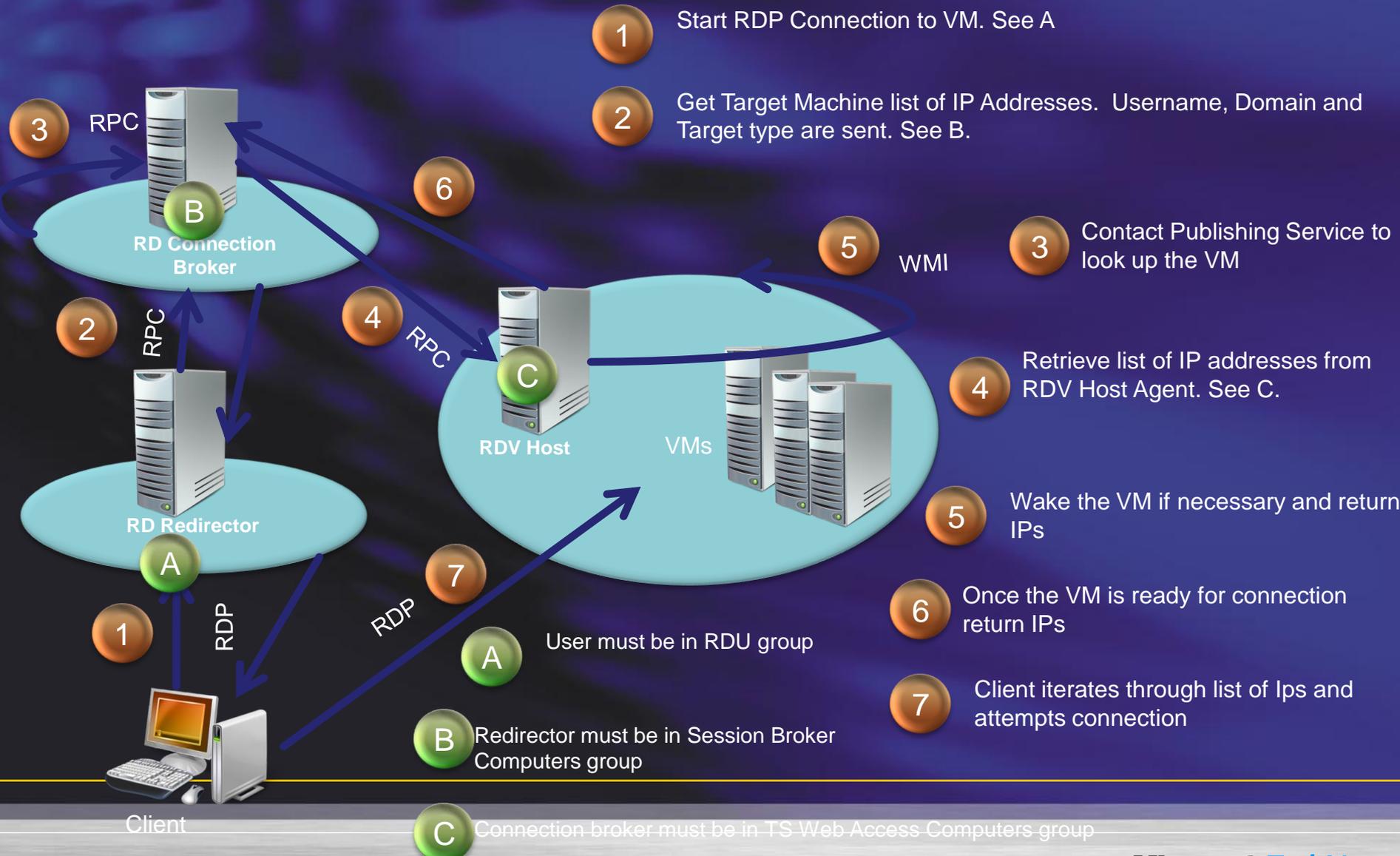


Pooled Virtual Desktops

Pooled Virtual Desktops

- Shared OS images, identically configured
- No administrator access
- User state temporary (discarded at session end)

Connection Sequence



Demo

CONFIGURE POOLS

Tips and Tricks: Common Issues

- Common Issues
 - RD Web Access machine account not in the TS Web Access Computers security group
 - Certificates and Kerberos delegation issues
 - DCOM and WMI security groups no longer have TS Web Access Computers security group listed with Remote Access
 - TCP port 5504 not open in the firewall
 - WMI Port not open
 - Server can't connect to AD (Not in a domain, no network access or trust relationship issue)

Tips & Tricks: Connection Broker

- If clustering Connection broker. The VM Host and Connection broker can't be installed on the same machine.
- For Thin Client support, check “Enable redirection for earlier RDC versions” and add the IP address of the redirector.
- Top 2 issues seen in deployments
 - Configuration of Guest VM was incorrect. A symptom of this is the user sees a message about “Waking Machine” for a long time.
 - Users complaining they couldn't connect to a personal domain desktop, but no desktop was assigned.

MS or 3rd Party Broker?

Low-Complexity Environment

Microsoft VDI with
Remote Desktop
Connection Broker

- ✓ Single site/location
- ✓ Static image placement
- ✓ Single virtual desktop pool
- ✓ Single, non-clustered broker
- ✓ LAN-only connectivity
- ✓ USB support limited to PnP devices

Enterprise-ready Environment

Microsoft VDI with
3rd Party Connection
Broker

- ✓ Multiple sites/locations
- ✓ Dynamic image placement
- ✓ Multiple virtual desktop pools
- ✓ Multiple brokers in failover configuration
- ✓ LAN & WAN connectivity
- ✓ Generic USB support

Introducing the new Microsoft VDI Suites

The Microsoft VDI Suites were developed to simplify licensing of VDI Infrastructure

Now Available!

Windows Virtual Enterprise Centralized Desktop (Windows VECD)

Microsoft®
Virtual Desktop Infrastructure
Standard Suite

\$21/device/year

Hyper-V, MDOP, SCVMM, and VDI - restricted rights to SCOM, SCCM and RDS

OR

Microsoft®
Virtual Desktop Infrastructure
Premium Suite

\$53/device/year

All components of Standard Suite, plus unrestricted RDS rights and App-V for RDS

3rd Party Products add value to the Microsoft VDI Suite

Simple Licensing

- Two simple SKUs for Microsoft VDI
- Simple device based annual subscription model

Excellent Value

- Both SKUs are significantly cheaper than the competition
- Enterprise grade features at a low price point in conjunction with partners

Comprehensive Technology

- Application virtualization, integrated management included in base SKU
- Choice of VDI and session based desktops in premium SKU

Still Need to Purchase Virtual Enterprise Centralized Desktop **Microsoft TechNet**
Desktop VECD to host Windows Client OS in VDI

IS VDI the solution to all problems???

SETTING THE SCENE

Windows Optimized Desktop

Client, server, security, and management infrastructure

Management Infrastructure



Deployment – Application management – PC monitoring – Security management



Server Infrastructure



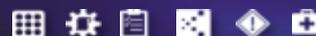
Active directory – Group policy – Networking – Server-based client virtualization



Client Infrastructure



Microsoft Desktop Optimization Pack for Software Assurance



Windows Optimized Desktop Scenarios

Task worker

 Windows Server 2008 R2

 Windows Server 2008 R2
Remote Desktop Services

 Windows Fundamentals
for Legacy PCs



AppLocker



Group Policy and AGPM
Active Directory
Users and Groups



Windows Server
Remote Desktop
Services

Task



End User Benefits

- ▶ Task Focused UI
- ▶ Enable free-seating

IT Benefits

- ▶ Centralized Management
- ▶ Security; Low cost
- ▶ Extending the life of the old hardware

Windows Optimized Desktop Scenarios

Contract worker



Microsoft®
Desktop Optimization Pack
for Software Assurance

Microsoft®
Hyper-V Server 2008 R2



Microsoft Application
Virtualization
(aka App-V)

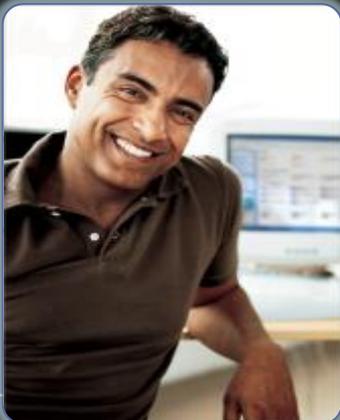


Group Policy and AGPM
Folder Redirection



Windows 7
Virtual Desktop
Infrastructure (VDI)

Contract



Unmanaged PC

End User Benefits

- ▶ Access to right apps and data

IT Benefits

- ▶ Centralized Management
- ▶ Security and compliance

Windows Optimized Desktop Scenarios

Access from home

 **Windows 7**
Enterprise

Microsoft®
Desktop Optimization Pack
for Software Assurance

Microsoft®
Hyper-V Server 2008 R2

 Microsoft®
System Center



**Group Policy and
AGPM**
Folder Redirection
**AD Users and
Groups**



**Windows Server
Remote Desktop
Services Web
Portal**



**Windows 7
Virtual Desktop
Infrastructure
(VDI)**

Access From Home



Home PC



End User Benefits

- ▶ Home/emergency access
- ▶ Right apps and data

IT Benefits

- ▶ Centralized Management
- ▶ Security and compliance

Windows Optimized Desktop Scenarios

Mobile worker



Microsoft Application
Virtualization
(aka App-V)



Group Policy and AGPM
Folder Redirection
Offline Files



Windows 7
Direct Access

Mobile



BitLocker
Drive
Encryption

BitLocker
To Go



End User Benefits

- ▶ Anywhere connections
- ▶ Flexible Configurations
- ▶ Rich user experience

IT Benefits

- ▶ Data security compliance
- ▶ Easy user migration
- ▶ Policy-based Management

Windows Optimized Desktop Scenarios

Office worker

 **Windows 7**
Enterprise

Microsoft®
Desktop Optimization Pack
for Software Assurance

 **Windows Server 2008 R2**

 Microsoft®
System Center

Office



**Microsoft Application
Virtualization
(aka App-V)**



**Group Policy
and AGPM
Folder Redirection
Offline Files**



**Windows 7
Enterprise Search
Scopes**

Windows Server BranchCache



End User Benefits

- Find necessary information quickly
- Flexible configurations
- Rich user experience

IT Benefits

- Simplify software delivery and desktop access
- Ease of moving user to a different PC

Optimizing the Enterprise desktop

Rich Desktop Scenarios

Mobile



Replaceable PC

flexibility, easy to migrate users

BitLocker +
BitLocker To
Go



Application Virtualization

Folder
Redirection

Task



Extending PC life

security, low cost, carbon-neutral



Terminal Services
(Desktop)

Office



Hot-desking

flexibly, compliance, free seating

Application
Virtualization



Folder Redirection

BranchCache
Enterprise Search

VDI Scenarios

Home -on non company PC



Working from home

security , emergency access



Windows Server® 2008
Terminal Services Gateway



Contract



Hosted Image

security, right apps and data



VDI



- Match technologies with your business needs of your people

Choose the different desktop virtualization technologies effectively

Managed Desktops

Task



Office



Mobile



Managing Unmanaged Desktops

Workfrom home



Contractor/ Offshore



User State Virtualization



Microsoft Application Virtualization



Shared Remote Desktops (RDS)



Personalized Remote Desktops (VDI)



How well do you manage ?

DESKTOP CONFIGURATION



Image Management



Patch Management



HW/SW Inventory



Roles/Profiles/Personas



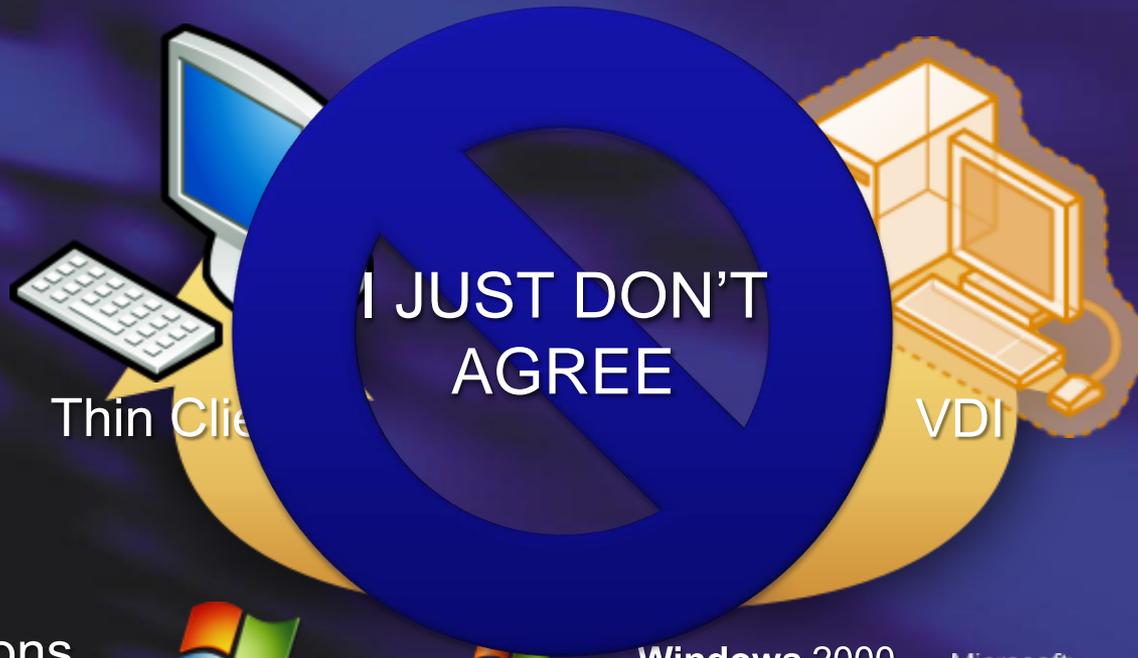
OS or App Deployment



Application Lifecycle



The market is looking at two ways to solve this “new” problem



4+ Generations
of OS



Windows 2000
Professional

Microsoft
Windows 95

4+ Generations
of HW



How has the thin client market grown ...

2008 Worldwide Shipments

Thin Clients – 3 Million units (1% WW)

PCs – 248 million units

Source : Gartner, 2008 PC Market Size WW
June 2009

Thin client remain 1% of the market

1999 Worldwide Shipments

Thin Clients – 700,000 units (0.6% WW)

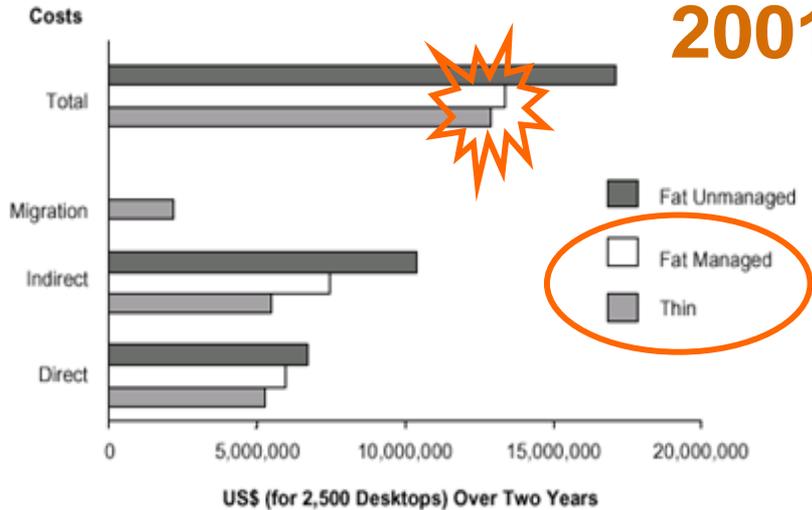
PCs – 113 million units

Source : IDC 1999 Enterprise Thin Client Year in Review -
Jan 2000 Update IDC, 9/7/01

8 Years of Analyst's TCO Data

TCO Comparison: Thin vs. Fat

2001

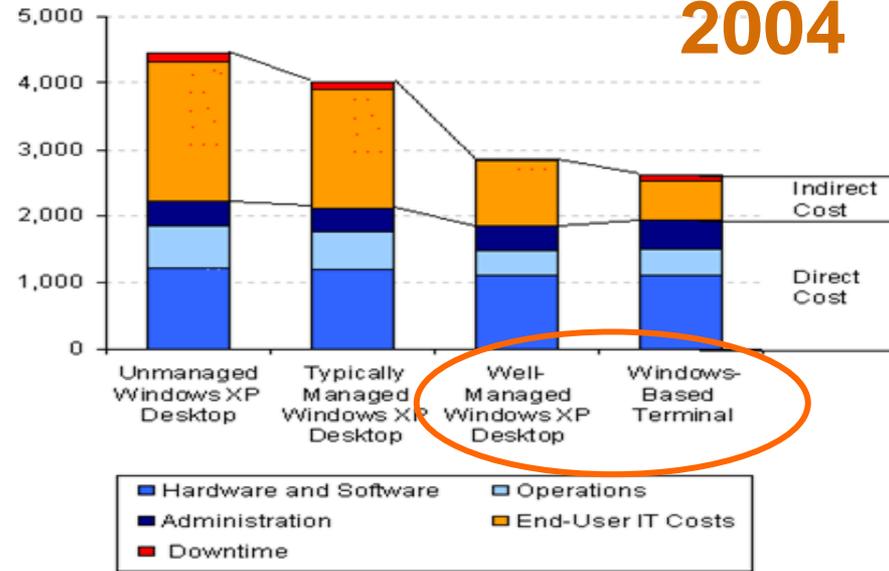


Note: Loosely managed and well-managed PCs (Windows 2000) compared with Windows terminals.

Source: Gartner Research

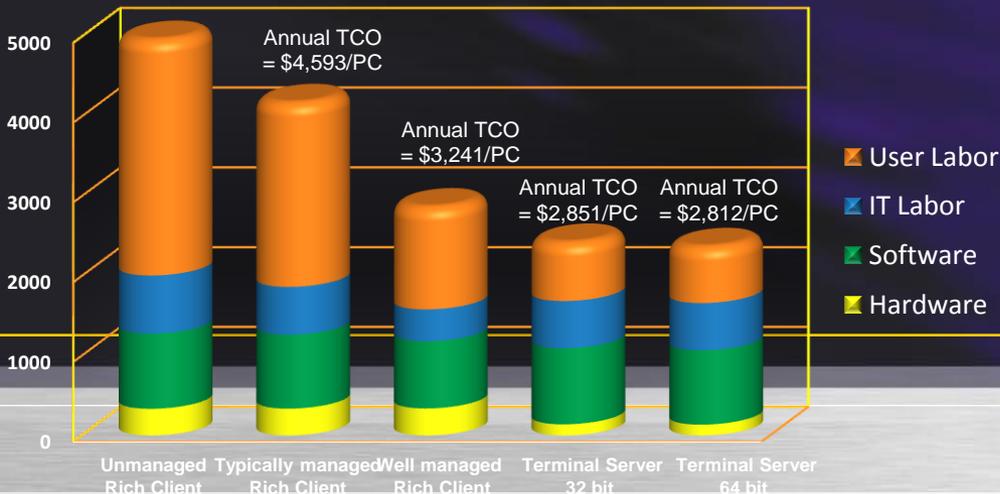
TCO (Dollars)

2004



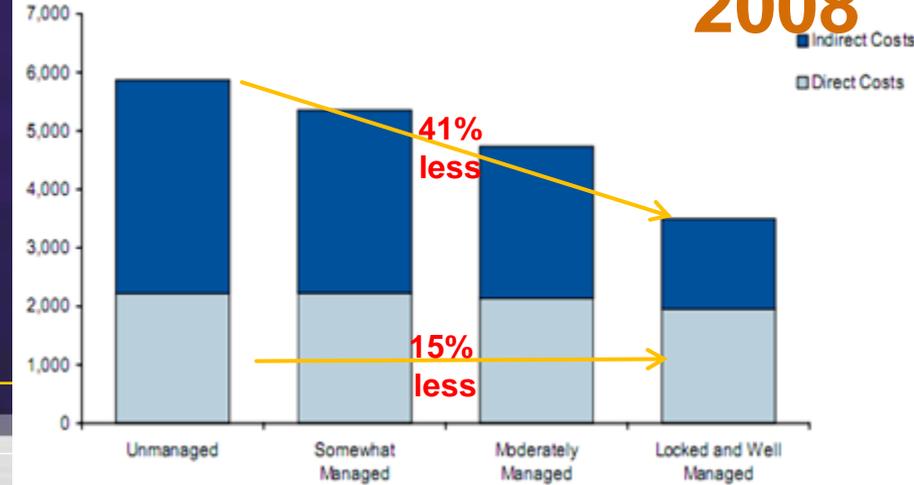
Annual TCO = \$5,386/PC

2006



Dollars

2008



Summary: Centralized Desktop Options



Session Virtualization (fka TS)

- Low cost image management
- Easiest admin management
- Least resources required
- Good compatibility for legacy apps



Personal Virtual Desktop

- High cost image management
- Administrator access (user can install programs)
- High Resource cost
- Better Compatibility for legacy apps



Pooled Virtual Desktop

- Medium cost image management.
- Easier admin management than Personal VM Desktops
- Less Resources than personal
- Better compatibility for legacy apps

Mix & match your options - based on end user needs

Next session at Xx.xx

- Sessionslokale 1
 - Session title
- Sessionslokale 2
 - Session title
- Sessionslokale 3
 - Session title
- Sessionslokale 4
 - Session title

Campus Days
14.-16. januar 2010



Questions

jesper_krogh@dell.com

Campus Days
14.-16. januar 2010



THANK YOU!