

Virtual Desktop Infrastructure (VDI)

Centralise the Desktop

Cam Merrett

Demonstrator



Agenda

- Who we are
- What is VDI?
- Real-world financial case studies
- Next steps

Who We Are

- TecDem Ltd.
 - Established 2004
 - Technology demonstrations and information delivery
- Pulsar Ltd.
 - Established 2005
 - To deliver virtualisation, virtual desktop (VDI), and cloud computing solutions
 - “VDI in safe hands”
 - **Market leaders for VDI solutions**

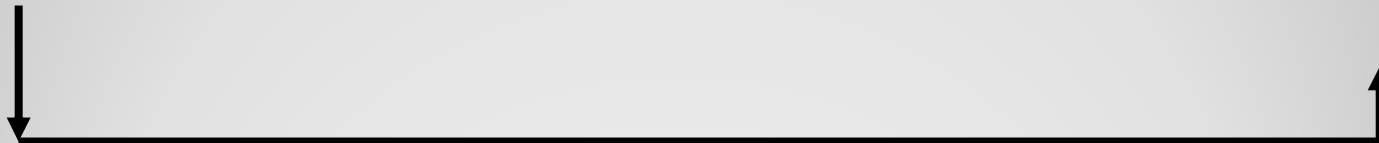


What is VDI?



Virtual Desktop Infrastructure

Virtualisation
Connection Brokers
PC/Thin Client/Lockdown PC
Remote office options
ROI



What is VDI?

ESX - Bare metal virtualisation



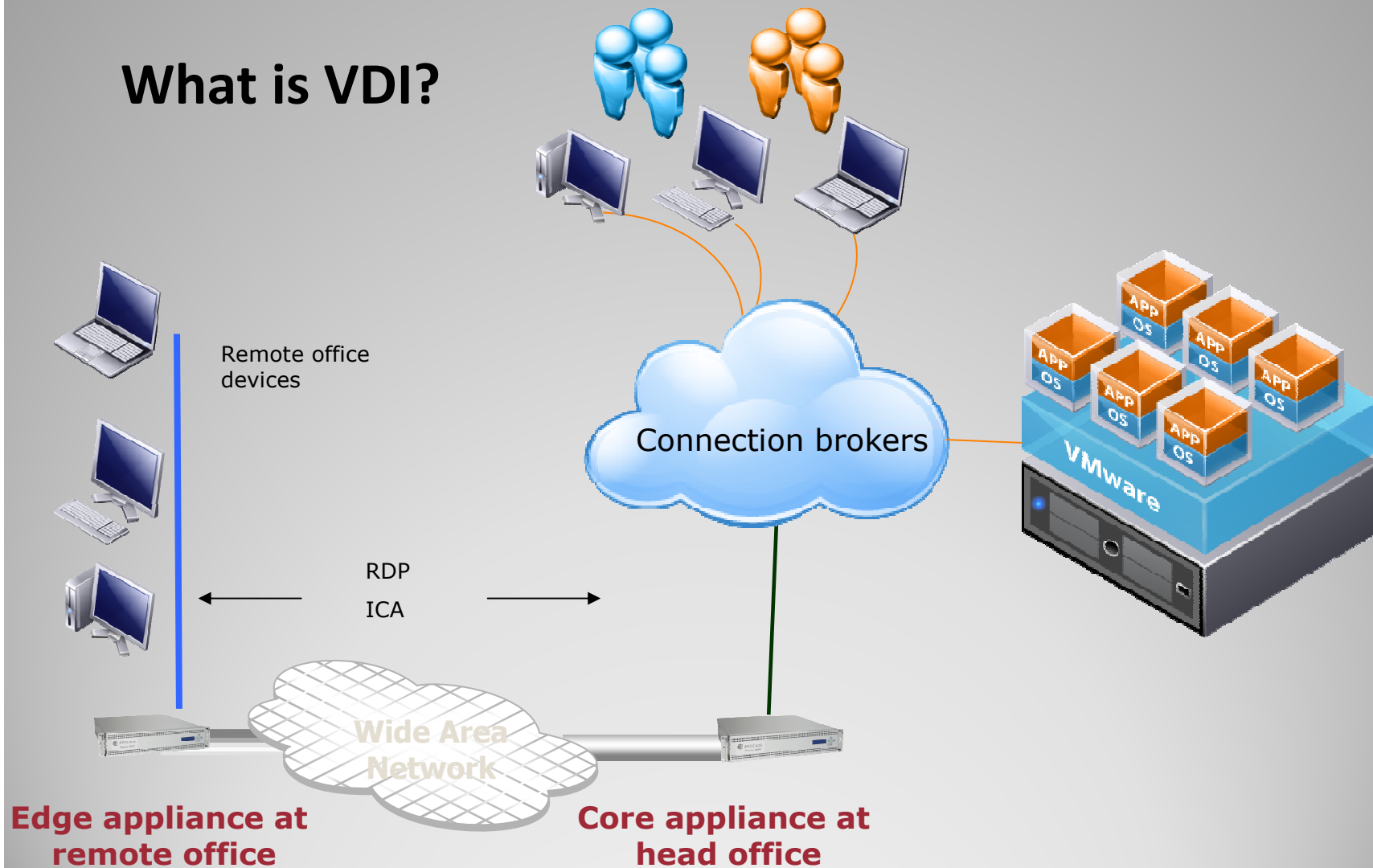
Hyper-V from
Microsoft

Xen Server from Citrix

Parallels

Except for VMware all
solutions are
Para-Virtualisation
meaning there is no
memory sharing!

What is VDI?



Pulsar Ltd

User name:

Password:

Log On

Applications

Main

Select view: Icons ▾



XP Desktop

Hint: Click Reconnect to resume any paused published resources. ✕

Problem Connecting?



My Computer



My Network Places



Recycle Bin



Internet Explorer



MS Excel



MS PowerPoint



MS Word



SampleMusic



SampleVideo



- pdvspherevc.pulsardesktop.co.uk
 - Pulsar
 - Dual Core Cluster
 - pdex02.pulsardesk
 - pdex03.pulsardesk
 - aris
 - demo
 - desktops
 - oracle
 - production
 - tecdem
 - test and dev
 - vollers
 - vApp Demo
 - cag-client
 - expovdiskplate
 - expoxp0015
 - farm1-dc
 - farm1-wi
 - farm2-dc
 - farm2-wi
 - farm3-dc
 - farm3-wi
 - mastervdisk
 - pdadminwin72-2
 - replica-3fd0b68d-37
 - source-1c-b21f4fb0-0
 - xp4provsvr
 - XPdemo33311
 - XPdemo33312
 - XPdemo33313
 - xptplatappsense

pdex02.pulsardesktop.co.uk VMware ESXi, 4.0.0, 175625

- Summary
- Virtual Machines
- Performance
- Configuration
- Tasks & Events
- Alarms
- Permissions
- Maps
- Storage Views
- Hardware Status

General

Manufacturer: IBM
 Model: IBM x3950-[88743RG]-
 CPU Cores: 8 CPUs x 3.002 GHz
 Processor Type: Intel(R) Xeon(TM) CPU 3.00GHz
 License: vSphere 4 Enterprise Plus Licensed for 4 physical CPU...
 Processor Sockets: 4
 Cores per Socket: 2
 Logical Processors: 16
 Hyperthreading: Active
 Number of NICs: 5
 State: Connected
 Virtual Machines and Templates: 81
 VMotion Enabled: yes
 VMware EVC Mode: Disabled

Fault Tolerance Enabled: no
 Active Tasks:
 Host Profile:
 Profile Compliance: N/A

Resources

CPU usage: **9287 MHz** Capacity: 8 x 3.002 GHz
 Memory usage: **21549.00 MB** Capacity: 32763.60 MB

Datstore	Status	Capacity	Free
vmfs_templates	Normal	136.00 GB	59.2
ds4700_vmfs01	Normal	399.75 GB	145.5
ds4700_vmfs02	Warning	399.75 GB	66.0
ds4700_vmfs03	Normal	399.75 GB	134.0
ds4700_vmfs04	Normal	399.75 GB	148.0

Network	Type	Status
jpmc	Standard switch network	OK
vdv	Standard switch network	OK

- ### Commands
- New Virtual Machine
 - Enter Maintenance Mode
 - Reboot
 - Shutdown
 - Enter Standby Mode

Recent Tasks

Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time	Completed Time
Initiated guest OS shut...	XPdemo3338	Completed		PULSARDESK...	pdvspherevc.p...	02/11/2009 14:11:57	02/11/2009 14:11:57	02/11/2009 14:11:58
Power On virtual mach...	XPdemo33311	Completed		PULSARDESK...	pdvspherevc.p...	02/11/2009 14:09:48	02/11/2009 14:09:48	02/11/2009 14:09:51



Pulsar Desktop

- Locations
 - Pulsar
 - Connection Brokers
 - Terminal Servers
 - Desktops
 - Mikes Non-VC Group
 - Planner
 - Sage Published App
 - vSphere Admin
 - XP Demo
 - Other Servers
 - Clients
 - Resources
 - Packaged Applications
 - Performance Optimization
 - Virtual IP
 - File & Registry Redirection
 - Workload Evaluators

vWorkspace Management Console
Pulsar Desktop

- Locations
- Clients
- Resources
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Pulsar Desktop\Locations\Pulsar\Desktops
XP Demo

Summary Computers Managed Applications

12 Computers, 1 Selected

Actions Refresh (10s) Find:

Computer Name	Type	IP Address	Client Device	Client IP Address	Enabled
VMware VirtualCenter Server					
Expo09005	VMware VirtualCenter Server	10.10.30.101			Yes
Expo09006	VMware VirtualCenter Server				Yes
Expo09007	VMware VirtualCenter Server	10.10.30.88			Yes
Expo09008	VMware VirtualCenter Server	10.10.30.85			Yes
Expo09009	VMware VirtualCenter Server	10.10.30.112			Yes
Expo09010	VMware VirtualCenter Server	10.10.30.81			Yes
Expo09011	VMware VirtualCenter Server	10.10.30.107			Yes
IBM001	VMware VirtualCenter Server	10.10.30.113			Yes
IBM002	VMware VirtualCenter Server	10.10.30.103			Yes
IBM003	VMware VirtualCenter Server	10.10.30.105			Yes

Summary Tasks Log

Computer [Expo09005] 0 Tasks, 0 Selected

Actions Refresh

No task entries.



- Pulsar Desktop
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 - ySpher
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 - Workload Evaluator

Pulsar Desktop\Locations\Pulsar\Desktops
XP Demo

Summary Computers Managed Applications

Add Computers

Welcome to the Add Computers Wizard

This wizard will assist you in creating computers by specifying the following parameters:

- ▶ Number of Computers to Create
- ▶ Clone Method
- ▶ Template
- ▶ Folder
- ▶ Resource Pools/Datastores
- ▶ Naming Conventions
- ▶ Sysprep Customizations
- ▶ Configure Computers
- ▶ Options

Click Next to continue...

< Back Next > Cancel

Enabled

- Yes
- Yes
- Yes
- Yes
- Yes
- Yes
- Yes
- Yes
- Yes
- Yes



- Pulsar Desktop
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Pulsar Desktop\Locations\Pulsar\Desktops
XP Demo

Summary Computers Managed Applications

Add Computers

XP Demo

- Welcome
- Number of Computers to Create**
- Clone Method
- Template
- Folder
- Resource Pools/Datastores
- Naming Conventions
- Sysprep Customizations
- Configure Computers
- Options
- Finish

Number of Computers to Create
Specify the number of computers to create in this group.

Enter the number of computers to create:

< Back Next > Cancel

- Enabled
- Yes
- Yes
- Yes
- Yes
- Yes
- Yes
- Yes
- Yes
- Yes



- Pulsar Desktop
 - Locations
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Pulsar Desktop\Locations\Pulsar\Desktops
XP Demo

Summary Computers Managed Applications

Add Computers

XP Demo

Welcome

Number of Computers to Create

Clone Method

Template

Folder

Resource Pools/Datastores

Naming Conventions

Sysprep Customizations

Configure Computers

Options

Finish

Template

Select the template to be used for new computers.

Select the template from which the computers in the group will be created.

Template	Size	Network Storage Server	Server Type
Pulsar			
2003tplat	10.0 GB		
stdvdiskplat	768 MB		
xptplat10g	10.0 GB		
xptplatstd	4.39 GB		
xptplatnaked	8.00 GB		

Click Import to refresh the templates from the VirtualCenter Server.

Import

< Back Next > Cancel

Enabled

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

- pdvSpherevc.pulsardesktop.co.uk
 - Pulsar
 - Dual Core Cluster
 - pdex02.pulsardesk
 - pdex03.pulsardesk
 - aris
 - demo
 - desktops
 - oracle
 - production
 - tecdem
 - test and dev
 - vollers
 - vApp Demo
 - cag-client
 - expovdiskplate
 - expoxp0015
 - farm1-dc
 - farm1-wi
 - farm2-dc
 - farm2-wi
 - farm3-dc
 - farm3-wi
 - mastervdisk
 - pdadminwin72-2
 - replica-3fd0b68d-37
 - source-1c-b21f4fb0-c
 - xp4provsvr
 - XPdemo33311
 - XPdemo33312
 - XPdemo33313
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 Cores per Socket: 2
 Logical Processors: 16
 Hyperthreading: Active
 Number of NICs: 5
 State: Connected
 Virtual Machines and Templates: 82
 VMotion Enabled: yes
 VMware EVC Mode: Disabled

Fault Tolerance Enabled: no
 Active Tasks:
 Host Profile:
 Profile Compliance: N/A

Resources

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Network	Type	Sta
jpmc	Standard switch network	✓
vdi	Standard switch network	✓

- ### Commands
- New Virtual Machine
 - Enter Maintenance Mode
 - Reboot
 - Shutdown
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Recent Tasks

Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Ti...	Start Time	Completed Time
Clone virtual machine	xptplatestd	16%	Copying Vir...	PULSARDESK...	pdvSpherevc.p...	02/11/2009 14:21:39	02/11/2009 14:21:39	
Power On virtual mach...	Expo09006	Completed		PULSARDESK...	pdvSpherevc.p...	02/11/2009 14:17:26	02/11/2009 14:17:26	02/11/2009 14:17:34
Initiated guest OS shut...	XPdemo3338	Completed		PULSARDESK...	pdvSpherevc.p...	02/11/2009 14:11:57	02/11/2009 14:11:57	02/11/2009 14:11:58

vWorkspace Management Console

File Actions Help

- [-] Pulsar Desktop
 - [-] Locations
 - [-] Pulsar
 - [-] Connection Brokers
 - [-] Terminal Servers
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 - [-] Packaged Applications
 - [-] Performance Optimization
 - [-] Virtual IP
 - [-] File & Registry Redirection
 - [-] Workload Evaluators

Pulsar Desktop\Locations\Pulsar\Desktops
XP Demo

Summary Computers Managed Applications

13 Computers, 2 Selected

Actions Refresh (10s) Find:

Computer Name	Type	IP Address	Client Device	Client IP Address	Enabled
VMware VirtualCenter Server					
Expo09005	VMware VirtualCenter Server	10.10.30.101			Yes
Expo09006	VMware VirtualCenter Server	10.10.30.117			Yes
Expo09010	VMware VirtualCenter Server				Yes
IBM001	VMware VirtualCenter Server	10.10.30.113			Yes
IBM002	VMware VirtualCenter Server	10.10.30.103			Yes
IBM003	VMware VirtualCenter Server	10.10.30.105			Yes
IBM004	VMware VirtualCenter Server	10.10.30.111			Yes
IBM005	VMware VirtualCenter Server	10.10.30.104			Yes
IBM006	VMware VirtualCenter Server				Yes
IBM007	VMware VirtualCenter Server				Yes

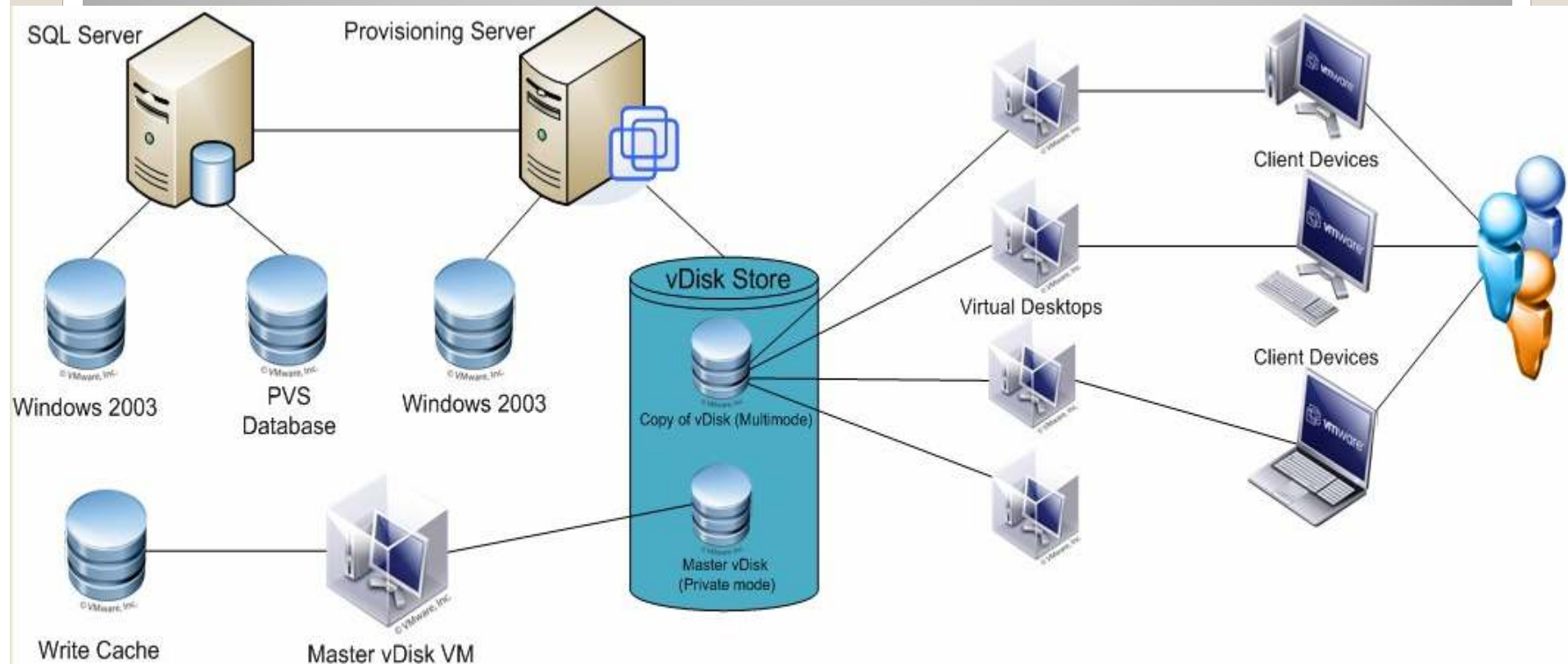
Summary Tasks Log

2 Computers Selected 6 Tasks, 1 Selected

Actions Refresh

Posted	Computer	Task Item	Task Status	Start Time	Completed Time	Mk
2009-11-02 14:23:02	Expo09010	Delete Desktop	In Progress 15%	2009-11-02 14:23:03	2009-11-02 14:23:18	
2009-11-02 14:23:02	IBM001	Delete Desktop	In Progress	2009-11-02 14:23:23	<Not Completed>	St
2009-11-02 10:35:51	IBM001	Initialize Computer	Succeeded	2009-11-02 10:43:36	2009-11-02 10:43:50	SL
2009-11-02 10:27:04	IBM001	Create	Succeeded	2009-11-02 10:34:09	2009-11-02 10:35:51	Cl
2009-10-29 13:37:23	Expo09010	Initialize Computer	Succeeded	2009-10-29 13:46:24	2009-10-29 13:46:39	SL
2009-10-29 13:35:35	Expo09010	Create	Succeeded	2009-10-29 13:35:36	2009-10-29 13:37:23	Cl

- Provisioning Server – Virtual Machine streaming from Citrix



A Master vDisk VM is configured to boot from the 'Master vDisk', this is used to customise or update the vDisk. When the updates have been completed the 'Master vDisk VM' is shutdown and the vDisk is copied within the vDisk store. The vDisk mode is changed to 'Multi Mode' which allows multiple 'Read Only' connections. Any new VM's are configured to boot from this vDisk.

Leading Connection Brokers

- Citrix
- Ericom
- Leostream
- Quest
- Sun
- VMware
- Microsoft

XenDesktop

vWorkspace

Sun Ray

View Manager

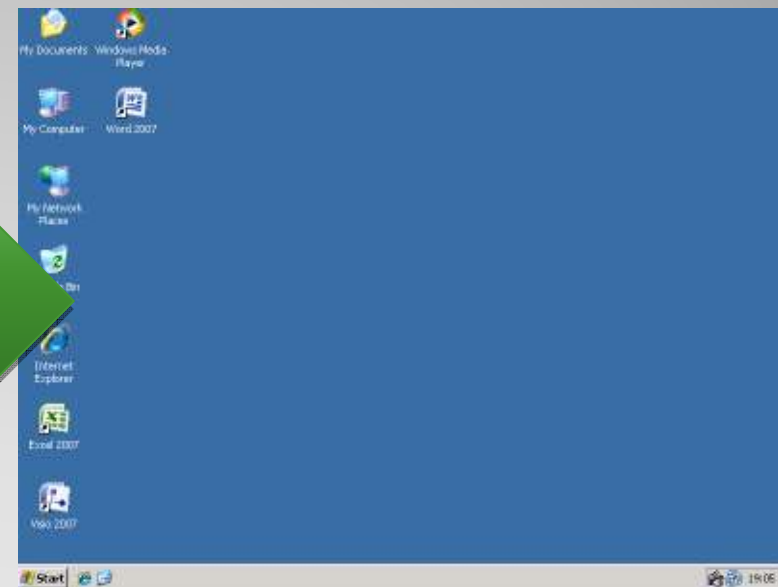
Remote Desktop Services

VDIpc™ – Lock down PC

First screen when PC turned on



User is now connected to VDI session

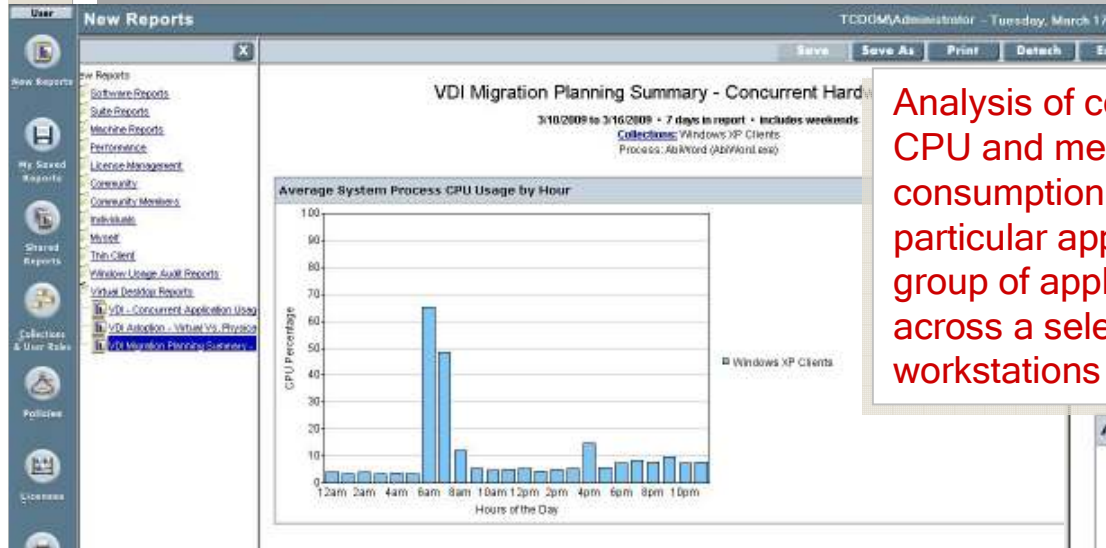


- When the user logs off the VDI session the physical PC is automatically powered off
- If VDIpc™ is idle for a period of time the physical PC is powered off. When the user powers on the physical PC again and logs in, they will be returned to their VDI session with no data loss and any opened applications still running

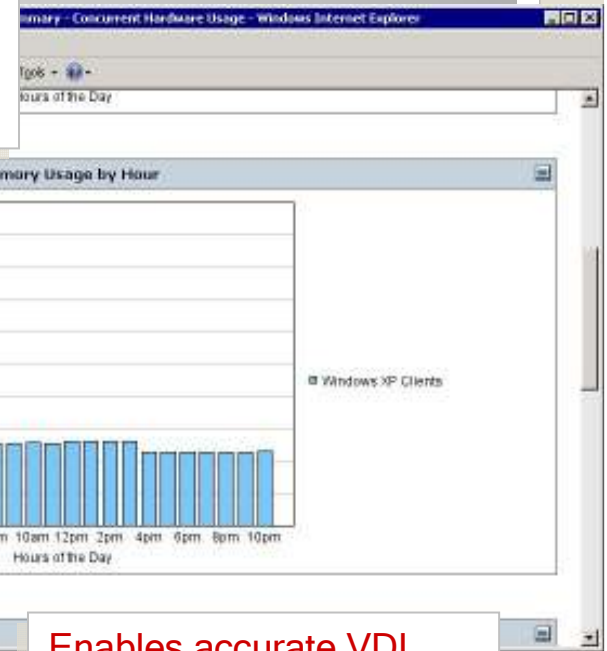
VDIpc™

PULSAR
DESKTOP CLOUD

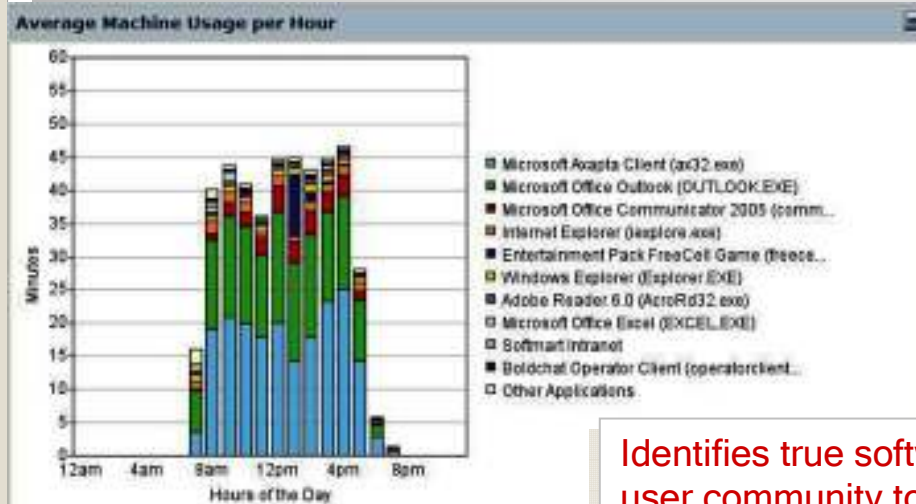
Virtual Desktop Planning



Analysis of concurrent CPU and memory consumption for a particular application (or group of applications) across a selection of workstations



Enables accurate VDI server hardware sizing ahead of migration of applications and users to VDI



Identifies true software user community to ensure VDI license agreements are correctly structured

Benefits

Cost per user model (500 users, 4 years)

Desktop costs

- Purchase price £399
- Maintenance £140
- Half day to install £105
 - £35 per hour
- Admin – 15 hours £525
- Power usage £240

- Total **£1,409**
- Per annum **£352.25**

VDI Costs

- Thin client £240
- Maintenance £0
- One hour to install £35
 - £35 per hour
- Admin – hour £35
- Power usage £20
- VDI / 500 users £530

- Total **£860**
- Per annum **£215**



Real-World Financial Examples

VMware VDI

Based upon the info provided for the 1000 user desktops being planned for virtualization, the projected outcome of this VMware VDI solution over the 3-year analysis period is as follows:

- > Virtualize the desktop infrastructure for 1000 desktops, reducing capital costs by £399,317 and operating costs by £420,937 over the next three years, £171.91 per desktop in savings on average.
- > Achieve an ROI of 40.1% from an investment of £304,547 in virtual desktop infrastructure solution, and projected savings of \$515,707.
- > An NPV savings of £154,503 and a projected payback period of 17 months.

Cumulative 3 Year TCO Comparison	Current (As Is)	With VMware VDI (Projected)	Difference (£ and % savings)
VMware VDI Benefits			
Desktop Capital Expenditure	£399,317.00	£0.00	£399,317; 100%
Desktop Operating Expenses	£793,592.19	£372,655.28	£420,937; 53%
Investment Required			
Capital Investment for Implementing VMware VDI	£0.00	£304,546.86	£-304,547; 100%
Total TCO (3 year)	£1,192,909.19	£677,202.14	£515,707; 43%
TCO average per year per desktop (1 year)	£397.64	£225.73	£171.91; 43%
Expected Benefits from VMware VDI			
	Year 1	Year 2	Year 3
Desktop Capital Expenditure Avoidance	£126,667.00	£133,000.00	£139,600.00
Desktop Operating Expenses	£128,160.00	£139,950.72	£152,800.00
Total Benefits	£254,827.00	£272,950.72	£292,400.00
Expected Investment in VMware Solution			
	Initial / Year 1	Year 2	Year 3
Capital Investment for Implementing VMware VDI	£304,546.86	£140,429.69	£140,429.69
Return on Investment (ROI)	40.1%	Note: Net Present Value (NPV) measures the net benefit of a project in terms of the sum of the present values of the expected cash flows.	
NPV Savings (3 year, discount rate = 9.5%)	£154,502.87	The sum that results when the discounted value of the expected costs are subtracted from the discounted value of the expected benefits.	

Summary

- VDI is a way to centralise desktops
- Benefits include
 - Typical 40% ROI over 4 years
 - Business agility
 - Reduced management time/money
 - Data security
 - Business continuity
 - Double-digit power/CO₂ savings
 - Flexibility to move to an OpEx model

Next Steps

- Copy of these slides
- How to approach VDI document
- White paper on consolidation ratios
- Pulsar offerings
 - **VDIpc™** for locking down PC's
 - **tryVDI™** - No cost 10-day free trial
 - **ROIcalc™** – Financial calculator tool
 - **PDW™** – Project Definition Workshop
 - **QuickStart™** Proof of Concept options

