Licensing Windows for Virtual Desktops

This document is intended to explain licensing Windows virtual desktops and how to calculate the number of licenses required for common usage scenarios.

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Overview

Today, organizations are looking to reduce desktop TCO, while improving flexibility and streamlining management. Desktop Virtualization solutions such as VDI can help organizations improve management and flexibility of their desktops. But due to the complex nature of virtual desktops, licensing can prove to be challenging, and hence organizations need to understand how to properly license Windows in this model. This document is intended as a resource to help organizations understand how to properly license Windows for Virtual Desktop scenarios.

TOPICS

- Desktop Virtualization
- Typical Use cases for Windows Virtual Desktops
- Limitations of Traditional Windows Licensing for virtual desktops
- Windows VDA (virtual Desktop access) licensing
- Windows VDA Pricing
- Examples of scenarios for Windows Virtual Desktop Licenses

AUDIENCE

This document is intended for individuals and organizations that have or intend on deploying virtual desktops, and want to be compliant with virtual desktop licensing. The primary goal is to enable correct licensing when implementing Windows in a virtual desktop computing solution

Desktop Virtualization

Desktop virtualization is a set of technologies focused on optimizing desktop operations that help IT tune the desktop environment to better fit the different end-users needs by separating desktop resources from each other. Microsoft provides a comprehensive set of desktop virtualization solutions to help in optimizing the desktop infrastructure.

With desktop virtualization technologies, typical desktop components can be separated from each other and operate independently, providing benefits to support and management costs as well as allowing IT to react more quickly to changing business requirements. The following is a brief description of each desktop virtualization concepts:

USER STATE VIRTUALIZATION

User state virtualization increases business flexibility by having the user's personal profile and data available dynamically on any authorized PC. User state virtualization also helps IT reduce the impact of failure and PC theft by backing up personal profiles and data to the data center. The following technologies that are available out of the box with Windows 7 help virtualize the user state:

- Roaming User Profiles are a namespace of user specific folders isolated for user and application data

Folder Redirection and Offline folders is a client side technology that provides an ability to change the target location of predetermined folders found within the user profile and is seamless to the user.

APPLICATION VIRTUALIZATION

IT departments need to reduce application management costs and improve application deployment velocity. End users need to have their business applications available on any authorized PC. To achieve these goals, Microsoft Application Virtualization (App-V) decouples applications from the operating system (OS) and helps to eliminate application-to-application incompatibility, because applications are no longer installed on the local client machine. In addition, application streaming expedites the application delivery process so that IT no longer needs to install applications locally on every machine.

- Microsoft App-V enables the transformation of applications into centrally managed virtual services to reduce the cost of application deployment, eliminate application conflicts and reboots, simplify your base image footprint to expedite PC provisioning, and increase user productivity
- RemoteApp programs are programs that are accessed remotely through Remote Desktop Services and appear as if they are running on the end user's local computer. These are hosted apps, and are accessed through an RDP client such as a web browser.

OS VIRTUALIZATION

OS virtualization separates the operating system workloads from the underlying hardware. OS virtualization can be divided into two broad categories:

- **Client-hosted desktop virtualization:** Microsoft Enterprise Desktop Virtualization (MED-V) provides deployment and management of virtual Windows desktops to increase business flexibility—for example, to help enterprises upgrade to Windows 7, without having to worry about application compatibility with legacy Windows XP applications. MED-V builds on top of virtual PC technology to run two operating systems on one device, adding virtual image delivery, policy-based provisioning, and centralized management.
- **Server-hosted desktops:**
  - Microsoft Virtual Desktop Infrastructure (VDI) technology enables users to access their personalized Windows desktops that are hosted on servers. VDI is another deployment model for Windows desktops, and is ais an emerging technology that is suitable and cost-effective for corporations with specific use scenarios, such as organizations that would like to give remote users access to their corporate desktops without investing in expensive laptops can leverage VDI technology.
  - Microsoft Windows Server® Remote Desktop Services is a mature, server-based computing architecture that runs user applications on a single Windows Server operating system with multiple sessions on one server, enabling each user to remotely access a full desktop or single application from the user's local device via a remote protocol such as Microsoft Remote Desktop Protocol (RDP).

Typical Use Cases for Virtual Desktops

Virtual desktops introduce new and interesting use cases for organizations. These scenarios go beyond the typical licensing of the operating system to one specific physical piece of hardware.

Virtual Desktop Infrastructure (VDI)
Virtual Desktop Infrastructure (VDI) is an alternative desktop deployment model for Windows desktops. Each user gets access to a personal desktop in the datacenter from any connected device. The access device could include a traditional desktop environment with Windows or a thin client.

Virtual Machine on Contractor or Employee Owned PCs
Provide managed corporate based desktop image on a non-managed and non-corporate owed Windows PCs. This users enables users that aren't permanent employees or employees that work from home to work on the same optimized and managed desktop as user within the corporate infrastructure.

Virtual Machine on Portable Media
Corporate based virtual machine images can be provided on media such as USB drives and DVD. This enables easy distribution of corporate based desktops to remote workers, but doesn't require the connection to the corporate environment like a VDI solution as the virtual machine can run locally without connectivity.

Remote Boot a Virtual Machine from network storage
This scenario involves creating, and storing a Windows image on a storage device (network server), which may be run over an internal network locally in a physical or virtual operating system environment.

Blade PC
Typically, the blade pc environment offers one user connecting with remote desktop to a dedicated and licensed hardware device. However, in some blade pc models, multiple users access the same physical device with a single copy of Windows, which requires additional licensing.

OS Streaming
Centralized copies of an operating system can be streamed to devices for local execution.

A Closer Look at Virtual Desktop Infrastructure (VDI)

VDI is another way to deploy Windows desktops for your users. Microsoft offers comprehensive and cost effective technology that can help customers deploy virtual desktops in the datacenter. The Microsoft VDI Suites allow customers to manage their physical and virtual desktops from a single console, while providing great flexibility for server-hosted desktops and applications.

Customers of Microsoft VDI get the following benefits:

1. **Integrated Management:** With the Microsoft VDI suites, customers can manage physical, virtual and session based desktops.
2. **Enhanced security and compliance:** With desktops, applications and data being locked behind the datacenter, organizations can now provide personalized desktops to unmanaged devices, such as contractor PCs.
3. **Anywhere access from connected devices:** Personalized desktops, applications and data follow the user across any connected device
4. **Increased business continuity:** In case of a device failure, workers can get access to their desktops from any other connected device, thereby minimizing impact to productivity.

VDI can especially provide tremendous benefits for customers that want to optimize desktop deployments for the following use cases:

1. **Contractor devices/ third-party devices:** Provide managed and secured desktops to unmanaged PCs.
2. **Remote Offices with excellent connectivity:** Centrally manage and easily deploy desktops to multiple remote and branch offices, thereby reducing IT efforts at those locations.
3. **Task workers:** Offer Choice of either session-based or virtual desktops to task workers, onsite or offshore.
4. **Regulatory compliance:** VDI desktops are locked behind the datacenter, thereby inherently complying with strict regulations in industries such as financial services, government and healthcare.

Limitations of Traditional Windows Licensing Models for Virtual Desktops:

The current Microsoft offerings for desktop licensing include Original Equipment Manufacturer (OEM), Full Packaged Product (FPP), Volume License, and Software Assurance (SA) options. Although these licensing models offer different benefits they were all designed to be licensed to a specific hardware device. The following section will provide an overview of the different license models and describe the limitations that pertain to deploying client operating systems virtually in the datacenter.

Original Equipment Manufacturer (OEM) Licenses:
The OEM license is intended to be preinstalled on hardware before the end user purchases the product. OEM licenses are distributed by authorized computer manufacturers. OEM licenses can also be acquired by buying essential computer components (memory, motherboard, hard drive, etc.) from authorized system builders.

Since OEM licenses are bound to hardware, and cannot be transferred, they are priced the lowest due to the fact that they offer limited flexibility, and a lifespan that is dependent on the hardware on which they are assigned to.

Full Packaged Product (FPP) Licenses:
A Full Packaged Product or Retail license refers to boxed, licensed software sold through distributors to resellers. Customers generally acquire FPPs through local retail stores and software retailers. Typically each FPP includes on license, along with media and documentation, and is designed for low-volume needs.

FPP licenses were designed to enable customers to install Windows on retail machines, and were not designed for large scale VDI deployments. However, FPP licenses can be used in a VDI scenario only if:

1. The physical server on which the virtual desktop is installed is assigned only to one user, and is not shared with other VDI desktops. Microsoft does not recommend this configuration for VDI, as it would lead to increased costs of your virtual environment.
2. In a standard VDI environment where multiple users need access to VMs running on the same server, the access device that is being used to remote into the VDI desktop is a PC that is licensed with the same version of Windows as the FPP VM. However, customers using Windows devices to access virtual desktops can alternatively acquire Software Assurance coverage on those devices with VL upgrade at a much lower cost, and hence avail of virtual desktop benefits on those devices without the need to purchase FPP, while getting all of the other benefits of Microsoft Software Assurance at the same time.

The following restrictions on FPP licensing apply to VDI scenarios:

1. Each FPP license permits use of only a single VM per user. Hence, each VM needs its own licensed copy of Windows for VDI. For users that need access to multiple VMs, this may prove expensive.
2. Multiple simultaneous users cannot share VMs, as each VM licensed with an FPP copy of Windows needs to be assigned to one user at a time.
3. The FPP licensed VM can only exist on a single computer at any given point of time. If you have to move the VM to another server, it has to be completely moved off the original machine.

Since the access device needs to be licensed with the same version of Windows as the FPP VM, this effectively leads to two desktops with the same OS version, thereby not offering any distinct productivity gains or cost savings as compared to just running the FPP on the PC.

Volume Licensing: Volume Licensing programs serve the needs of organizations that acquire five or more licenses, but do not need multiple copies of the media and the documentation and do not want to keep track of numerous individual license agreements. Volume Licensing offers the potential for substantial savings, ease of deployment, flexible acquisition, varied payment options, and other benefits, such as ongoing maintenance.

Windows 7 Professional, Windows Vista Business or windows XP Professional obtained through VL upgrade, when purchased on top of a qualifying operating system license, has all the limitations of an FPP license, as well as the added limitation of not being allowed to move off the device on which the OS is first installed. What this means is, the VM cannot be dynamically moved across servers, thereby not allowing business continuity and load balancing scenarios, negating the advantages of VDI.

Hence, a new licensing model is necessary to enable customers to license Windows for Virtual environments that provide the necessary licensing and pricing flexibility for virtual desktop environments like VDI.

Introduction to Virtual Desktop Licensing

VIRTUAL DESKTOP LICENSING OFFERINGS:

Virtual desktop architectures like VDI are extremely complex, and require significant infrastructure for servers and storage. With the wide variety of technology and deployments models available for these emerging technologies, Microsoft decided to standardize on the access device as the unit for measurement for virtual licenses. Not only does this simplify the virtual desktop licensing model, but it provides customers with a cost effective way to manage desktop licenses irrespective of datacenter growth or architecture.

Microsoft provides two different licensing vehicles for the access devices for virtual desktops, that come into effect on
July 1st, 2010:

1. Windows Client Software Assurance (SA)
Software Assurance is an upgrade to Volume License, offering a broad range of benefits to help manage costs, get the most out of new technologies and improve employee productivity. Some of the benefits include support, consulting services, training, technical resources, and virtual desktop licensing.

As of July 1st, 2010, software Assurance rights will be expanded to include virtual desktop access rights. Organizations that are already licensed for Software Assurance on the devices that will connect to or run virtual desktops do not need to acquire additional licensing for the virtual desktop operating system. However, additional licensing may be required for connectivity to a centralized solution like the Microsoft VDI Suite or other 3rd party licensing to enable access.

2. Virtual Desktop Access (VDA)
The second licensing vehicle for virtual desktops is Virtual Desktop Access (VDA), which is a new license that will come into effect on July 1st, 2010. Customers that want to use devices such as thin clients that do not qualify for Windows client SA would need to license those devices with a new license called Windows Virtual Desktop Access (Windows VDA) to be able to access a Windows VDI desktop. Windows VDA is also applicable to 3rd party devices, such as contractor or employee-owned PCs.

Windows VDA (Virtual Desktop Access) is a device based subscription that is available at 100/year/device, and is available through all major Microsoft volume licensing programs.

Windows VDA extends the benefits of Software Assurance to devices such as thin clients for virtual desktops. This license is required in addition to the server and management infrastructure for VDI, such as the Microsoft VDI Suite or other 3rd party licensing to enable access.

WINDOWS VDA BENEFITS

PCs covered under Windows Client SA and thin clients licensed with Windows VDA both get the same set of benefits for accessing virtual desktops. In general the benefits address the major concerns when moving the desktop to the datacenter, but many are forward thinking around how VDI can enable greater business flexibility. Benefits unique to the Windows VDA license include:

- Install Windows 7/Windows Vista/Windows XP virtual machines on any combination of hardware and storage
- Unlimited movement between servers and storage
- Access corporate desktop images from non-corporate owned Windows-based PCs
- The primary user of a Windows VDA device has extended roaming rights, which means that he/she can access their VDI desktop from any device outside of the corporate environment, such as a home PC or an internet kiosk
- Includes Software Assurance (SA) benefits such as 24x7 call support, training vouchers, access to Enterprise versions of Windows, etc.
- Eligibility for other Software Assurance products, such as MDOP and Windows Fundamentals for Legacy PCs
- Single Windows VDA license allows concurrent access for up to 4 VMs
- Reassignment rights to another device after 90 days, or in the case of end-point failure
- Dynamic desktop licensing enabled through KMS/MAK activation
- Unlimited backups of both running and stored VMs

All of these benefits can enable very powerful solutions to address the business flexibility required today in the IT infrastructure. In the next section you will learn how these benefits translate in to specific scenarios that capitalize on the Windows VDA licensing features and benefits.

WINDOWS VDA AVAILABILITY

Windows VDA is available in most Volume License agreements. The following table presents the license solution (Software Assurance or VDA) required to license virtual desktops with different Volume License Agreements:

Table 1: *Virtual Desktop Licensing Availability*

Volume License Agreement	Software Assurance	VDA
Open	Yes	Yes
Open Value or Open Value Subscription	Yes	Yes
Select or Select Plus	Yes	Yes
Enterprise or Enterprise Subscription	Yes	Yes
Campus and School	Yes	No

If an organization is not licensed for Software Assurance and is looking at purchasing VDA licensing, they can either buy VDA licenses for their solution or upgrade their current license agreement to include Software Assurance for their solution.

HOW TO ACQUIRE SOFTWARE ASSURANCE?

Organizations interested in purchasing SA for their PCs should contact their Microsoft Representative, Microsoft Partner, or Microsoft Large Account Reseller (LAR).

HOW TO ADD VDA LICENSING?

Windows VDA is available as an additional product on most organization’s agreements. To execute Windows VDA for non-SA covered devices in an EA the organization would expand the qualified desktop definition to now include thin clients through an amendment. Organizations should work with their Microsoft representative to add Windows VDA licensing into an existing EA agreement.

IMPORTANT USE RIGHTS FOR VIRTUAL DESKTOP LICENSING

Term of License

Windows VDA is a subscription only model, as it offers the desktop-as-a-service similar to other software-as-a-service offerings. However, there is no Service Provider License Agreement (SPLA) available for virtual desktop licensing. Windows VDA is coterminous with your license agreement, meaning that the subscription that is entered into cannot be terminated early. If a customer is currently already licensed on a subscription based license agreement like Enterprise Agreement Subscription the virtual desktop licensing can be purchase mid-life and will terminate with the parent agreement.

Windows VDA is non-perpetual, which means you may not access your virtual desktops through the licensed device if the corresponding Windows Software Assurance coverage or the windows VDA term expires.

Assigning Windows VDA to a device:

Before the user can access their virtual desktop, they must assign their Windows VDA license to a device. Devices can be defined as thin client, employee owned machine, corporate owned machine not covered by Software Assurance, a hardware partition or blade computer. Reassignment of the Windows VDA license to another device is possible only after 90 days of the last assignment of that license. The exception is that you may reassign your license sooner if you retire the licensed device due to permanent hardware failure.

Extended Roaming Rights in Windows VDA

The single primary user of the corresponding Windows VDA licensed device may access their virtual desktop from any other device that is not owned or affiliated with their organization. This adds great flexibility to the Windows VDA license, enabling the single primary user to roam on devices such as home PCs, hotel kiosks, internet café's etc. However, this use right is only valid for the primary user of a licensed windows VDA device at work. If the Windows VDA device does not have a primary user (such as a shared terminal on a shop floor), then this use right does not apply.

Note: roaming rights are only applicable to devices not owned or affiliated with the organization. If a user is roaming within their corporate network, then all devices that will be used to access virtual desktops within the corporate network will need to be licensed either through Windows client SA, or with a separate Windows VDA license.

WINDOWS VDA PRICING

As mentioned previously, Windows VDA is both a subscription and device based license. Windows VDA is available at $100 per year (MSRP), which includes the benefits and use rights mentioned in this document.

Organizations that plan to use Windows PCs already covered with Windows Client SA to access their virtual desktops do not need any additional licensing costs beyond the cost of their SA agreements.

The total number of licenses required will be equal to the total number of devices not qualified for software assurance (such as thin clients, 3rd party contractor PCs) that will be used to access the virtual desktops.

Examples of Licensing Scenarios

As you have previously learned there are many benefits and available scenarios that Windows Virtual Desktop licensing provides to an organization. When calculation the costs of those solutions it is imperative to understand the different scenarios that are commonly found in a typical organization. The following examples will provide real-world scenarios and the licensing requirements to achieve a compliant solution.

CORPORATE OWNED COMPUTERS

An organization has 100 devices that need access to the VDI environment. However, only 80 users and only 50 VMs are used at any one time. Since 100 different devices will be accessing the VDI environment the following would be required:

- Devices are PCs covered with SA: No additional licensing
- Devices are thin clients not covered with SA: 100 Windows VDA licenses

CORPORATE OWNED COMPUTERS WITH SHIFT BASED WORKERS

An organization has 100 devices that need access to the VDI environment. However, they have 300 shift based users and up to 150 VMs are used at any one time. Since 100 different devices will be accessing the VDI environment the following would be required:

- Devices are PCs covered with SA: No additional licensing
- Devices are thin clients not covered with SA: 100 Windows VDA licenses

MIXED DESKTOP HARDWARE

An organization has 100 PCs with SA and 100 thin-clients that need access to the VDI environment. However, they have only 100 users and accessing 100 VMs are at any one time. Since 200 different devices will be accessing the VDI environment the following combinations of licenses is required:

The PCs with SA do not require additional licensing. The 100 thin clients need 100 Windows VDA licenses.

OCCASIONAL HOME USER

An organization with 100 employees who are the primary users of 100 thin clients covered under Windows VDA at work. These employees occasionally work from home and access the corporate VMs via VDI from their home machine (employee-owned).

- If the employees are a primary user of a VDA licensed device at work, no additional VDA licenses are required.
- If the employees are not a primary user of a VDA licensed devices at work, 100 Windows VDA licenses are required.

100% HOME USERS

An organization has 100 employees who work from home and will access corporate VMs via VDI from their employee owned device at home. Since 100 different devices will be accessing the VDI environment the following would be required:

- 100 Windows VDA licenses

ROAMING USER

An organization has 300 thin clients that need access to the VDI environment. However, only 100 users and only 50 VMs are used at any one time. Since 300 different devices will be accessing the VDI environment the following would be required:

- 300 Windows VDA licenses

CONTRACTOR-OWNED PCS

An organization has 100 contractors that are working for 6 months, and then are replaced by 100 different contractors for the next 6 months. Each contractor will have one contractor-owned computer to access the organizations corporate virtual machine via VDI.

- 100 Windows VDA licenses are required.