

# From Terminal Server to Windows Virtual Desktop

## a 20 Year Journey

1998

### Windows NT 4.0 Terminal Server

Microsoft releases Windows NT 4.0 Terminal Server edition with built-in multi-user expansion module (MultiWin) licensed from Citrix



1999

### Windows 2000 Server Family

**Windows 2000 Server Family based on NT is released with multi-user capabilities integrated into the kernel and Terminal Services available as a standard feature**

- Printer and clipboard redirection and remote session monitoring is introduced.
- Terminal Services licensing is introduced: Windows 2000 client devices are free, all others require a Terminal Services Client Access License (TS-CAL).
- RDP (Remote Desktop Protocol) is refined with bitmap caching and API is created.

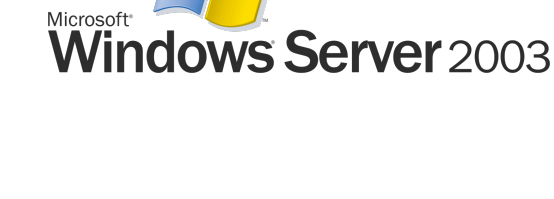


2001

### Windows Server 2003 & Windows XP

**Windows Server 2003 and Windows XP are launched with improved Terminal Server capabilities**

- Terminal Server licensing is no longer free for non-Windows 2000 client devices.
- Windows XP is a desktop operating system based on NT and supports single user session RDP connections.
- Windows Server 2003 with Terminal Services role supports multiple concurrent users like NT 4.0 and Server 2000.
- Many RDP improvements are introduced including local drives and audio redirection, admin tools, group policies, WMI provider, and much more.



2003–2007

### Terminal Server based desktop sessions grow in popularity

**Terminal Server based desktop sessions grow in popularity**

- On-premises deployments run Windows Server 2003 and virtual desktops are served via Terminal Services to both local and remote users.
- Hosting providers leverage Windows Server 2003 to host virtual desktop sessions for customers in data centers.
- Licensing is provided via the Microsoft SPLA program for the Server operating system and Terminal Services Subscriber Access Licenses (TS-SAL).

2007

### Desktop OS streaming with VECD

**Microsoft modifies its desktop OS licensing terms with VECD (Vista Enterprise Centralized Desktop)**

- Allows Windows desktop OS virtual machines (Vista and XP) to be streamed to a local device (e.g. PC or thin client).
- For hosting service providers there is a catch. Hardware cannot be shared among customers under the new licensing terms. Each customer organization must have its own dedicated hardware.
- Customers must purchase VECD licenses and maintain an agreement directly with Microsoft. Service Providers cannot resell VECD licenses.
- Licensing terms make single-user VDI desktops very expensive as they cannot benefit from service providers' economies of scale.



2008

### Windows Server 2008

**Windows Server 2008 is released and Terminal Services is renamed to Remote Desktop Services (RDS)**

- RDS becomes more robust with great deployment flexibility and scalability.
- There are now RDS roles that can be deployed in a highly available, redundant manner to create large deployments with users automatically load-balanced across multiple RD Session Hosts.



2009

### VDI Goes Mainstream

**VMware introduces VMware View 4.0, a VDI product that allows one-to-one user to desktop assignment**

- To address performance challenges and user isolation concerns, this new technology allows each user to have their own dedicated desktop virtual machine.
- Windows XP and Vista are supported operating systems with VMware View.
- Although the technology and use-cases are strong, Microsoft's licensing restrictions on multi-tenant hosting environments for desktops make it very expensive due to dedicated hardware requirements.



2010

### VECD is replaced with Virtual Desktop Access (VDA) license

**Microsoft retires VECD and replaces it with a new license program for streaming desktops**

- Customers with Software Assurance (SA) can stream desktops from a data center at no additional charge.
- Those without Software Assurance can purchase a per-device VDA (virtual desktop access) license.
- Dedicated hardware limitation is still in place, making hosting of dedicated virtual desktops an expensive proposition.
- Customers must still purchase the VDA license and have an agreement directly with Microsoft, not the Service Provider.

2012

### Windows Server 2012

Microsoft releases Windows Server 2012 with significant improvements to RDS scalability and a new management interface via the Server Manager rather than individual administrative tools for each RDS role as in previous versions of Windows Server.



2014–2016

### Azure RemoteApp

Microsoft launches and eventually discontinues a platform-as-a-service (PaaS) product called Azure RemoteApp (ARA) to host RDS RemoteApps in Azure.



2016

### Windows 10 Enterprise in CSP

**Microsoft launches Windows 10 Enterprise subscription via CSP program**

- Qualified Multi-tenant Hosters (QMTH) program participants can now host and stream Windows 10 Enterprise desktops (e.g. Windows 7 and 10) without being subject to the dedicated hardware requirement for each customer.
- CSP resellers can now purchase Windows 10 Enterprise subscription licenses through the CSP program and resell these licenses to customers as part of their services – maintaining the billing relationship with the customer, unlike with VECD and VDA.
- Customers with existing Windows 10 Enterprise with active Software Assurance or Windows 10 Enterprise E3/E5 via CSP can run desktops VMs in Azure and with qualified multi-tenant hosters (QMTH).



2017

### Remote Desktop Modern Infrastructure (RDmi)

**Microsoft announces Remote Desktop Modern Infrastructure (RDmi) product at Inspire 2017**

- RDmi represents significant evolution of the RDS product. RDS infrastructure roles (e.g. gateway, connection broker, etc.) are moved from domain-joined VMs to standalone Webapps.
- RDmi promises to be a scalable, non-ADDS dependent set of Webapps that will finally enable service providers to cost effectively deliver virtual desktops from a multi-tenant control plane.



2018

### Windows Virtual Desktop (WVD) COMING SOON

**Microsoft announces Windows Virtual Desktop (WVD) at Ignite 2018**

- RDmi project evolves into WVD.
- WVD is an Azure hosted, Microsoft managed control plane replacing all RDS infrastructure roles that traditionally run on Windows servers.
- New operating system called Windows 10 Enterprise multi-session promises to bring parity to the end-user desktop experience across all physical and virtual Windows 10 devices.
- Microsoft acquires FSLogix, a user profile management technology that removes many challenges related to Windows profiles in virtual desktop environments.



2019

### WVD Public Preview and General Availability

**Microsoft opens WVD preview to the public and releases Windows 10 Enterprise multi-session**

- Licensing virtual desktops is now super simple – all that's needed is a Windows 10 Enterprise subscription under any licensing program. This license includes the use of WVD management service hosted in Azure and managed by Microsoft at no charge.
- Windows 10 Enterprise VMs are used to serve virtual desktops. Pooled and personal desktops are supported.
- Desktop VMs run in customer's Azure subscription and consume storage, compute and networking resources.
- WVD is an Azure-only service and so is the Windows 10 Enterprise multi-session operating system. On-premises deployments of virtual desktops still require the use Windows Server operating system (e.g. 2016 and 2019) with RDS licensing.
- Newly released Windows Server 2019 no longer supports Office 365 ProPlus – the most popular set of applications running in virtual desktops. Microsoft is clearly signaling to the market that future virtual desktop deployments will be using WVD and running in Azure.

