



Dell Wyse Datacenter for Government

A White Paper detailing the features and functionality of a Dell virtualized desktop solution within a Future Ready Government environment.



Dell Wyse Thin Clients

Dell develops and maintains solutions for desktop virtualization that are validated through over 100,000 hours of testing. These solutions are based on open architectures and are scalable for any number of users.

Dell Wyse Datacenter for Gov

We have developed the Dell Wyse Datacenter for Government 3.0 (aka DWD-Gov) solution that ensures full, dual-factor identification, incorporates the best security solutions in the industry, and offers a refined management interface. Through our research and development processes, we update DWD-Gov regularly with improvements such as load-balancing, multi-level security interfaces, and improved graphics capabilities. When Army customers request modifications to our endpoint options, DWD-Gov has the flexibility to accommodate those changes so that we can provide those to the customer swiftly.



Thin clients and zero clients are selected for use depending upon the operating system desired, the connection broker being used, and the type of workload a user is expected to perform utilizing the zero/thin client.



The timeline and resources for the development and maintenance of custom thin client configurations for large (≥ 500 users) or small (≤ 500 users) will be largely dependent on the degree of customization of our standard configuration. The development and maintenance process is discussed below, followed by a discussion of the engineering efforts required for implementation and migration.

- Thin and zero clients are the best way to secure VDI at the client side via smallest possible attack surface and ability to lock down hardware.
- Thin / zero clients are the fastest, simplest and most cost-effective way to deliver VDI to users.
- Dell leads the thin client industry offering the most comprehensive portfolio of thin and zero clients for every use case.
- Purpose-built thin and zero client configurations to address all VDI use cases from task workers to power users.
- Dell offers the most OSs (Wyse ThinOS, Linux, and Windows Embedded) that range from easier to manage and more secure to more flexible and greater peripheral support.
- Only Dell provides VDI enhancement software and cloud based and on-premise management to keep users and IT at their productive best. Gain peace of mind with the world's most secure thin clients with zero attack surface – virus-resistant Wyse ThinOS
- Increase uptime and lower TCO with 8-year client refresh cycles
- Monitor and control thin and zero clients with Dell Cloud Client Manager (Cloud) or Wyse Device Manager (On-Premise).

Operating Systems:

Linux

- Supports unified communications platforms such as Lync (Skype for Business) and VXME
- Supports local Linux applications
- Good peripheral support
- Flexible management options via Wyse WDM & INI File management
- Based on Open Source
- Supports both ARM and x86

ThinOS

- Unified Communications– Skype for Business (Lync)
- Bluetooth Support
- Inherently Virus Immune and extremely secure
- Little-to-no management overhead
- Easy-to-deploy & works out of the box
- Instant ON with rich multimedia
- Limited peripheral support
- No local application support
- Supports ARM and x86
- Will Support VMware Blast Extreme in 2017



Windows Embedded

- Supports unified communications platforms such as Lync (Skype for Business)
- Flexible management options via Wyse WDM & WCM
- Based on Microsoft Windows OS
- Supports x86 architecture only
- Secure from the desktop to the data center
- Wyse thin clients are far more secure than PCs with an extremely small attack surface
- Can be locked down as single purpose endpoints
- Support a wide range of user authentication methods
- Apps and content are protected in the data center
- Great to use Wyse thin clients deliver a fast, rich, familiar Windows® user experience:
 - Windows® user interface for VDI, local internet, and local apps
 - Connectivity to a broad range of Windows® applications and peripherals
 - Power to drive rich, fluid graphics locally or via VDI protocols: Microsoft® RemoteFX, Citrix® HDX Highly scalable and easy to manage Management software that scales as you grow from just a few to tens of thousands of thin clients
- Wyse Device Manager – easy, remote management and monitoring; no need to ever visit endpoints
 - Cloud Client Manager – off-premises management and support of thin clients and select mobile devices
 - Wyse Configuration Manager – automatic, server-less configuration management
 - Manage with your existing Microsoft® System Center Configuration Manager 2012 SP1
 - Wyse thin clients - Wyse offers a variety of hardware form factors with dual or quad core options compatible with Windows Embedded 7, Windows Embedded 8 Standard and Win10 IoT. Catering for your budget, application, and performance needs.



Zero Clients:

Wyse 5030 (formerly known as the P25). Compact, strong, and flexible, the Wyse 5030 PCoIP zero client for VMware delivers outstanding performance. Its dedicated hardware PCoIP engine delivers the highest level of display performance available for advanced applications, including CAD, 3D solids modeling, video editing and more. Extremely compact and energy efficient, the Wyse 5030 PCoIP zero client is a fully functional

VMware Horizon end point that delivers a true PC-like experience with support for dual displays. The Wyse 5030 offers the full benefits of an efficient and secure centralized computing environment, like multiple display support, multimedia playback, HD audio and four USB peripheral ports. The Wyse 5030 PCoIP zero client for VMware draws under 8 watts of power, – creating cooler, quieter working environments





Wyse 7030 (formerly known as the P45) PCoIP zero client delivers workstation-level performance for VMware® Horizon, VMware Horizon® DaaS®, and Amazon WorkSpaces. Its dedicated hardware PCoIP engine delivers the highest level of display performance available for advanced applications, including CAD, 3D solids modeling and video editing with support for up to 4 digital displays



Wyse 5050 All-in-One (AIO) PCoIP Zero Client for VMware. Secure and Simple to Install and Use – Effortless deployment with a simple one-cord design and out-of-box automatic setup. The Wyse 5050 AIO PCoIP zero client can be managed with the Teradici Mgmt Console or WDM 5.7. Wyse zero clients are extremely secure with zero attack surface for viruses and malware

Best-in-class Design: 23.6" LED monitor with class-leading resolution allows you to maximize your productivity without cluttering your workspace. Sleek design and built-in power supply create an incredibly small footprint. 6 USB ports, 4 of which are on the side of the chassis for convenient access. Rotating and detachable base allows you to position the 5050 however you'd like.

Robust Functionality and Performance: PCoIP engines deliver an exceptional level of display performance for advanced applications, including CAD/CAM, 3D solids modeling, video editing and more. The Wyse 5000 series PCoIP zero clients provide rich multimedia, high-resolution 3D graphics, HD media, and full USB peripheral interoperability locally over a LAN – or remotely over a WAN. Highly energy efficient, the Wyse 5050 AIO PCoIP zero client is a fully functional

VMware endpoint that delivers a true PC-like experience.

Thin Clients



Wyse 7040 The most powerful thin client from Dell, the Wyse 7040 is a high-powered, ultra-secure thin client. Equipped with 6th generation Intel® compatible with both data center hosted and client-side virtual desktop environments, including AFRI's SecureView. The Wyse 7040 is compliant with all relevant U.S. Federal security certifications including OPAL compliant hard-drive options, VPAT/Section 508, NIST BIOS, Energy-Star and EPEAT. Wyse enhanced Windows Embedded

Standard 7P OS provides additional security features such as BitLocker.

The Wyse 7040 offers a high level of connectivity including dual NICs, 6 x USB3.0 ports and an optional second network port, with either copper or fiber SFP interface. USB and wired network interfaces can be configured at a highly granular level, allowing individual customer requirements to be met. The Wyse 7040 devices are highly manageable through vPRO features and Wyse Device Manager (WDM), Microsoft System Center Configuration Manager (SCCM) and Dell Command Configure (DCC). Supported by existing Dell best-in-



class management tools such as WDM and DCC means that IT has access to rich management functionality for the Wyse 7040, including OS and BIOS imaging and BIOS configuration and password changes.

Dell Wyse 7040 thin client Specifications:

Operating system: Windows Embedded Standard 7P (Windows 10 IoT Enterprise Ready and upgradable to TPM 2.0 from 1.2)

CPU: 6th Generation Intel® Core™ i5 - 6500TE processor, 6th Generation Intel® Core™ i7-6700TE processor

Memory: 4GB, 8GB, or 16GB RAM DDR4

Storage: 128GB (Flash Media) / 256GB (Flash Media) / 500GB (hybrid) HD (both OPAL compliant)

I/O peripheral support: 6 x USB 3.0 ports, Display Port, HDMI Port, Ethernet, SFP (Fiber or Copper)

Networking: 100 Mb / 1Gb Ethernet, 100 Mb / 1Gb SFP (Copper or Fiber SFP Module)

Resolution: 1 monitor at UHD 4K (3840 x 2160) or 3 monitors at 2560 x 1600 resolution

Audio: Composite audio jack: 1/8-inch mini, 16-bit stereo / internal mono speaker, audio out jack

Dimensions: 7.16 in (182mm) x 7.01 in (178.2mm) x 1.41 in (36mm)

Weight: 3.12lbs (1.41 kg)

Mountings: Optional VESA mounting bracket for mounting to flat surfaces, such as walls

Security: Trusted Platform Module (TPM) 1.2 Upgradeable to 2.0, VPAT / Section 508 certified, NIST BIOS, Kensington Lock, OPAL Compliant hard-drive options

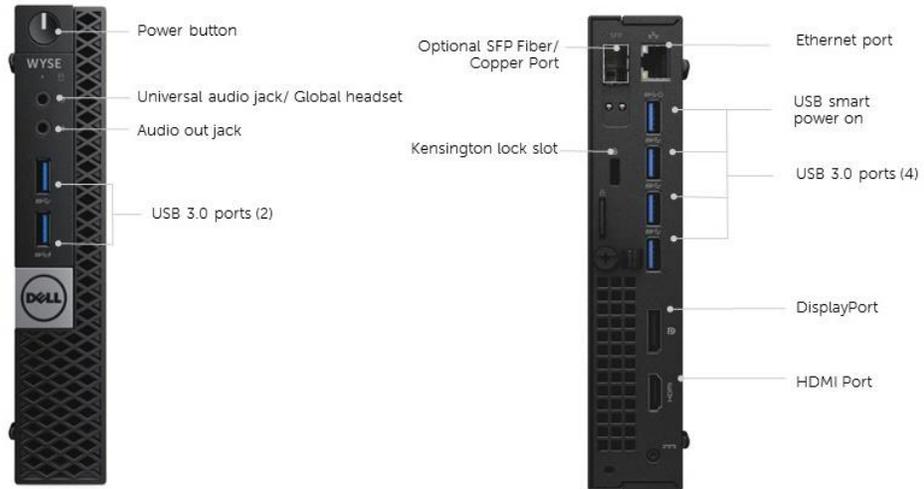
Power: Worldwide auto-sensing 100-240 VAC, 50/60 Hz 65W, 19V DC Energy Star V.5.2 Phase V external and EuP compliant power adapter

Temperature range: Operating (vertical position): 41° to 95° F (5° to 35° C)

Humidity: 20% to 80% condensing. 10% to 95% non-condensing

Warranty: Three-year limited hardware warranty with ProSupport (optional)

Support and deployment: Complete services portfolio including Deployment Services, ProSupport and Accidental Damage service.



Wyse 7000 Series Mobile Thin Client

Server OS	SUSE Linux, WES7, WES7P
Processor	Dual core AMD G-T56N 1.6GHz
Memory	7452-X50M: 2GB Flash / 2GB RAM DDR3 7490-X90M7, X90M7P: 16GB Flash / 2GB RAM DDR3 7402-X00M: 120GB SSD/ 2GB RAM DDR3
I/O Peripheral Support	1 x DisplayPort 1 x VGA port 1 x USB 2.0 ports 2 x USB 3.0 ports Media card reader
Networking	10/100/1000 Base-T Gigabit Ethernet 802.11 a/b/g/n internal wireless
Display	14" 1366x768 LED backlight
Audio	Output: 1/8-inch mini jack, full 16 bit stereo Input: 1/8-inch mini jack, 8 bit microphone
Dimensions	29 x 342 x 239 mm (1.14 x 13.45 x 9.42 in)
Shipping Weight	1.72 kg (3.8 lb)

Wyse 5000 Series Dual Core AMD Specifications

Server OS	Wyse ThinOS, ThinOS w/PCoIP, SUSE Linux, WES7, WE8S
Processor	AMD G-Series T48E Dual Core 1.4GHz
Memory	5010 Zero Client for Citrix: 8GB Flash / 2GB RAM DDR3 5010 Cloud Desktop: 0GB Flash / 2GB RAM DDR3 5010 Thin Client (ThinOS): 8GB Flash / 2GB RAM DDR3 5010 Thin Client (Linux): 8GB Flash / 2GB RAM DDR3 5010 Thin Client (WES): 16GB Flash / 4GB RAM DDR3
I/O Peripheral Support	1 x DisplayPort 1 x DVI-I port, DVI to VGA (DB-15) adapter included 4 x USB 2.0 ports
Networking	10/100/1000 Base-T Gigabit Ethernet Optional 802.11 a/b/g/n internal wireless Optional Fiber SFP
Display	DisplayPort: up to 2560 x 1600 @ 60Hz; color depth: 32 bpp DVI-I: up to 1920 x 1200 @ 60Hz; color depth: 32 bpp Dual: up to 1920 x 1200 @ 60Hz; color depth: 32 bpp
Audio	Output: 1/8-inch mini jack, full 16 bit stereo Input: 1/8-inch mini jack, 8 bit microphone
Dimensions	170 x 40 x 185 mm (6.7 x 1.6 x 7.3 in)
Shipping Weight	0.93 kg (2.05 lb)



Wyse 5000 Series Quad Core Specifications

Server OS	SUSE Linux, WES7, WES7P, WE8S, Windows 10 IoT Enterprise
Processor	Quad core AMD G-Series SoC 1.5GHz
Memory	5020 Cloud Desktop: 0GB Flash / 2GB RAM DDR3 5020 Thin Client (Linux): 8GB Flash / 2GB RAM DDR3 5020 Thin Client (WES7): 16GB Flash / 4GB RAM DDR3 5020 Thin Client (WE8S/Win10IoT): 32GB Flash / 4GB RAM DDR3
I/O Peripheral Support	1 x DisplayPort 1 x DVI-I port, DVI to VGA (DB-15) adapter included 4 x USB 2.0 ports 2 x USB 3.0 ports
Networking	10/100/1000 Base-T Gigabit Ethernet Optional 802.11 a/b/g/n internal wireless
Display	DisplayPort: up to 2560 x 1600 @ 60Hz; color depth 32 bpp DVI-I: up to 1920 x 1200 @ 60Hz; color depth: 32 bpp Dual: up to 1920 x 1200 @ 60Hz; color depth: 32 bpp
Audio	Output: 1/8-inch mini jack, full 16 bit stereo Input: 1/8-inch mini jack, 8 bit microphone
Dimensions	170 x 40 x 185 mm (6.7 x 1.6 x 7.3 in)
Shipping Weight	0.93 kg (2.05 lb)

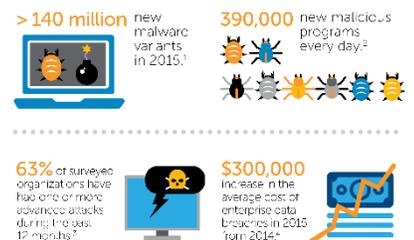
DDP|Threat Defense (TD) provides advanced protection for WES Wyse thin clients. Revolutionary AV replacement based on artificial intelligence (AI) and mathematical models, allowing for proactive/preventive protection (not traditional, reactive, signature-based detection), Web security and content filtering, stops even zero-day threats before they can execute and unparalleled efficacy of over 99%

Dell's Dynamic Reference Architecture

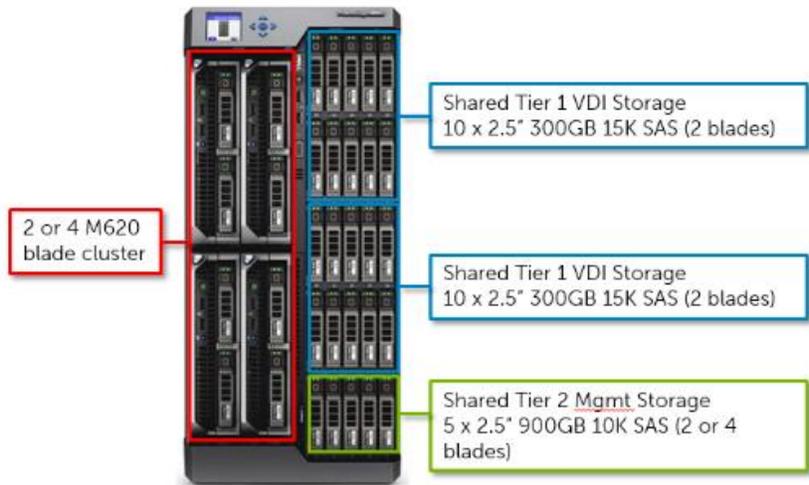
Dell has developed two reference architectures: one designed to accommodate the needs of less-sophisticated deployments or smaller (less than 500 users) organizations, and one designed to accommodate the needs of more complex deployments, or larger (more than 500 users) organizations. For this White Paper we refer to them, respectively, as DWD Simplified and DWD Enterprise.



The amount of malware in the world is increasing, and it can have devastating effects on your organization. Prevention — not reaction — is the best defense.



Features	DWD Simplified (Less Than 500 Users)	DWD Enterprise (More Than 500 Users)
Advanced Image Management	No	Yes
High Availability Option (HA)	Basic (Failover)	Enterprise grade
Dynamic Motion	No	Optional
Application Streaming	No	Optional
Application Virtualization	No	Yes
Shared Storage	Optional	Yes
Persistent and Non Persistent Desktops	Yes	Yes
Integrated Profile Persistence	Basic	Basic
Converged Architecture	Yes (Dell Appliance for Wyse – Citrix only)	Yes (Dell XC, VSAN, etc)



DWD Simplified (VRTX)

DWD Simplified offers the fastest implementation time utilizing the fewest resources. At its core, the beauty of the DWD Simplified for Government solution is the flexibility. We provide a Simplified Appliance utilizing VRTX that can scale from a handful of users to over 500 users as a rack or under-the-desk appliance.

VRTX takes about four hours to set up by one person and can be administered remotely or on site. An organization can provide for high availability simply by adding an additional, redundant server. All such

systems include three years of Dell’s highest level of client support, reducing pressure to on organizations to have large or sophisticated IT staffs to oversee the solution. It is ideal for geographically separated units, small agencies with under 500 users, and customers who do not have a robust IT staff.

DWD Enterprise



A typical DWD Enterprise thin client deployment requires additional components beyond those required for a typical DWD Simplified deployment. The DWD Enterprise Integrated Solution stack (ISS) can scale up to 50,000 users. For ease of development and deployment, we have designed a bundled offering that allows customers to buy a fully-configured, cabled, and software-loaded rack ready to roll into a data center. For custom deployments, the solution can be modified to suit the needs of each individual organization. The following is an overview of key differentiators.

Provisioning Servers. These management servers control the dynamic provisioning and de-allocation of virtual desktops. Typically, a minimum of two provisioning servers are required for high-availability.

Delivery Controllers. These servers manage and broker the end-user connections to the virtual desktops. Typically, a minimum of two delivery controllers/connection brokers is required for high-availability.

Virtual Desktop Hosts. These are the servers that run the virtual desktop workload, and the number of these depends on their capacity and the sizing guidelines of the thin client solution.

Load Balancers. A minimum of two load balancers are typically placed in front of the delivery controllers to evenly distribute the desktop workload.

Shared Storage SAN. Shared storage is required to create a centralized storage resource pool for the running virtual desktops, so that in the event of a server failure, a different VM host can pick up the desktop state from the SAN and run the desktops.

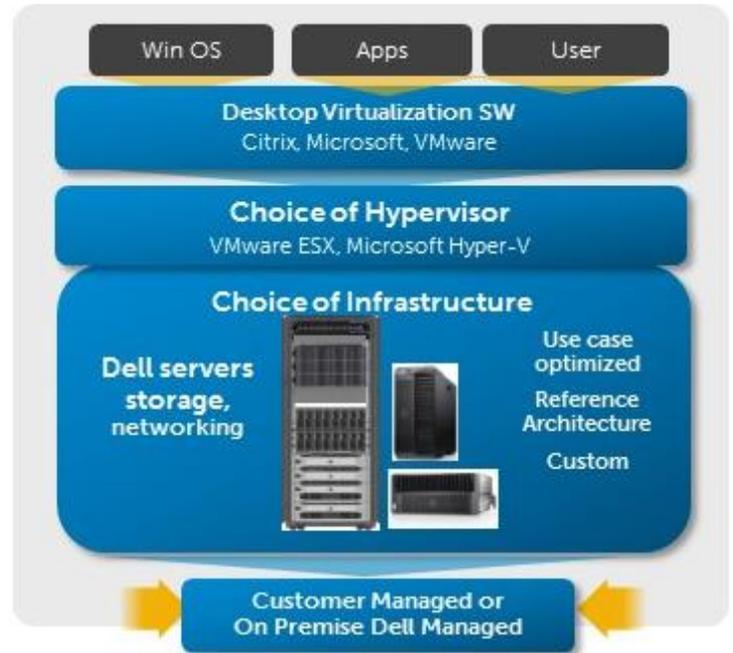
High-Speed Interconnects. Typically, for performance reasons, high-speed interconnects are used among these components.

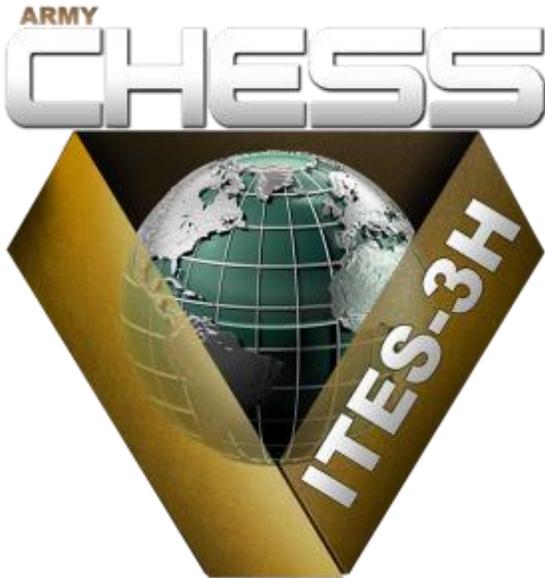
Implementation & Migration

The engineering efforts required to implement a zero/thin client solution and migrate clients will vary depending on the size and complexity of the implementation. The level of engineering and project management effort is driven in large part by the need to pull data from existing client devices to the data center.

If data migration is a requirement, our managed deployment teams work with the customer to create requirements for the migration, including security considerations and disposition of legacy equipment. The requirements are built into a project plan and associated schedule that include the resource requirements for completing the implementation and migration on time.

If data migration is not a requirement, our managed deployment team deploys thin or zero clients and recovers old systems with ease. Given the lack of complexity, the resources required will be a function of schedule: more resources reduce the project timeline. If desired, our Asset Recovery Services (ARS) team can destroy and certify the destruction of hard drives, while recycling other components without compromising security.





Zero/Thin Client's Impact over the Life of ITES-3H

Our understanding of the impact of thin client solutions is considerable as we are the World's leading thin client providers. We know that power, space, and cooling needs are all positively impacted by moving to zero/thin client solutions. The reductions in each of these areas in turn, lead to an increased return on investment via operating expense savings. The Government is facing constrained IT budgets and resources. IT departments are being called upon to be increasingly effective and efficient with fewer, and oftentimes outdated, resources. It is virtually unfeasible to staff and train to constantly changing and expanding IT requirements while maintaining effectiveness and efficiency. Moving to zero/thin client solutions help alleviate these challenges since changes, patches and updates can be easily implemented at the enterprise level. For example, a change to the Gold Master virtual desktop image can be implemented in the data center since no images reside locally on personal computers. Thus any one change can be automatically propagated to all users as soon as they active a session.

Implementing a zero/thin client solution is feasible for both small and large organizations alike. In all cases, thin client migration enhances security, reduces endpoint break/fix calls, and provides greater IT control over applications and data. We are also flexible in that a non-standard, customized configuration can be created. We can provide TEMPEST units and have a partner who can provide a ruggedized tablet PCoIP-based zero client. Flexibility and configurability can be supported by Dell Wyse and our partner eco-system.

Dell's zero/thin client offerings will evolve and grow over the life of the ITES-3H contract, further increasing their adoption. We will continue to make advances in end points to include tablets, additional thin/zero clients. A comprehensive and technical explanation can be found in our [Dell Wyse Datacenter for Government - Reference Architecture](#).

In order to continue to advance the zero/thin client evolution, we continue to work closely with key industry partners such as Teradici, VMware, Citrix, AMD, Intel and NVIDIA.

Contact your Dell Fed representative or visit www.dell.com/fed to discover how Dell can help you get more from your CCC solution.

