Windows 10 Pro

Das bislang sicherste Windows

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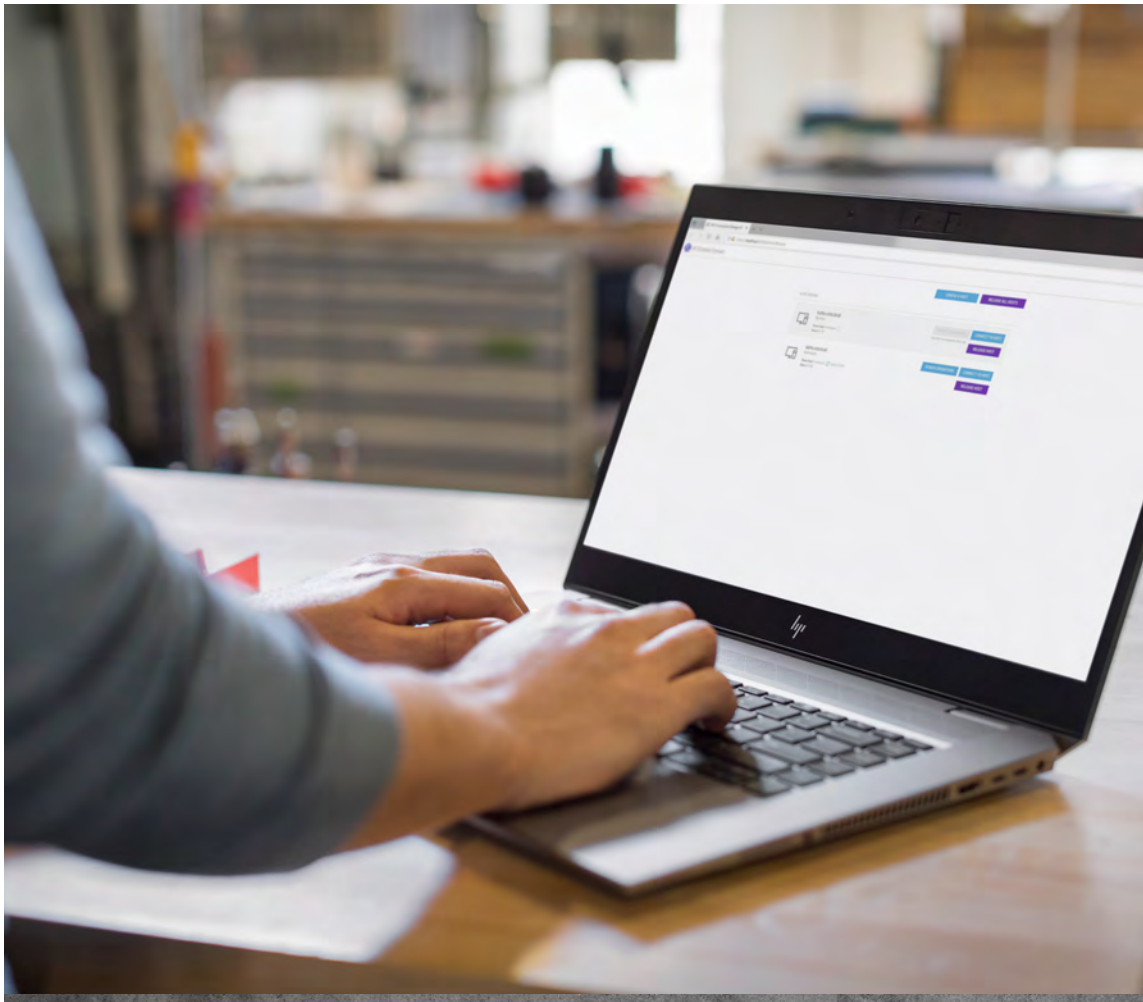


HP ZCENTRAL OVERVIEW

What is HP ZCentral and how is it different?

HP ZCentral is a new remote computing solution designed to address common pain points with local workstation deployments. It is an alternative to servers, virtualization (or VDI) and cloud service providers. HP ZCentral offers users remote access to dedicated (or bare metal) workstations instead of virtual machines. HP's full portfolio of desktop workstations can be rack mounted in compute rooms or data closets, while providing a best in class remote experience to end users via ZCentral Remote Boost*. IT can manage end user connections to pools of workstations with the all new HP ZCentral Connect**. The key advantages over servers, virtualization and the cloud are better performance, lower cost and simpler setup and maintenance; all from a single vendor.

This paper will share the pain points of local workstation compute, how they are relieved with HP ZCentral centralized workstations, and the architectural considerations for a successful ZCentral deployment.

CONTENTS & NAVIGATION

Who needs HP ZCentral and why?

As a worldwide leader in the workstation market, HP regularly meets with companies and organizations using workstations to design and engineer products, buildings and cities; create animations, visual FX, and TV programs; or analyze and simulate complex market trends and geospatial data. In all these cases a combination of high performance and high reliability compute is required. In other words, a workstation. It is worth noting that a dedicated workstation in front of each user is often the best solution from a performance and cost point of view. However, there are growing trends that make it difficult to keep the high-powered workstation at the desk. HP ZCentral is the outcome of working with industry leading customers to address these trends.

Faster Data Sync and Greater Physical Security

Many companies have teams working on very **large project files.** When the teams are not located in the same building, it can take a long time to synchronize changes to those project files between central storage and each workstation in each office.

ZCentral co-locates the workstations with an enterprise's storage technology, allowing for much faster data access and synchronization. HP ZCentral Remote Boost software instantly transfers screen images (e.g. pixels) instead of model data back to the user's device, so interactivity is maintained even as data sizes grow. In these cases, a remote workstation solution like ZCentral can improve the experience compared to a desktop workstation at the desk.

Other organizations are concerned about having **confidential data** stored on devices out in offices or factory floors. By centralizing the workstations in a more access-controlled environment, they can significantly increase the robustness of their security.

Flexibility & Mobility

Tower workstations can be optimized for an extreme power user's professional workflow, but they are not optimized for mobility. This means power users can only do their work from one specific chair in one specific building. While this is ideal in some situations, it can be limiting in others. ZCentral allows IT to optimize the workstation for the software it needs to run, while also sourcing the best end user device for modern, mobile workstyles. Power users can work at any desk, table or couch; in the office or at home.

Simplified Client Device Strategy

HP ZCentral allows companies wanting to simplify sourcing, deployment and support of client devices by giving all workers the same device, like HP EliteBooks or ZBooks, regardless of the jobs they have. Companies trying to minimize the client device maintenance costs and maximize security can standardize on HP Thin Clients with HP ThinPro. Power users can connect to ZCentral workstations from their standard client devices when the task requires more compute performance or specialty applications. IT can manage all the workstations in one location.

Oversubscribe Workstation and Professional Applications

We all work with budgets, and when users require expensive applications and powerful workstations to run them, it can add up. But what about when power users only need the professional apps some of the time and use basic office applications the rest of the time? HP ZCentral allows IT to setup pools of high-end workstations that can be remotely "check out" as needed. IT can deploy optimally configured workstations based on actual use, rather than dedicating an application license and workstation to every person.

Work environment

With ZCentral the powerful workstation moves out of the office environment, taking its heat, noise and power draw into the server room. Editors, designers or scientists can then use a notebook or thin client for a quieter office with a significantly lower environmental footprint.

HP ZCentral vs. Virtualized Servers

There are two approaches to centralized workstations. The differences come primarily in the back-end compute and the software layer. HP ZCentral is a dedicated remote workstation solution.

Servers & Virtualization (VDI, eVDI, Cloud workstations)

- Servers host multiple virtual machines (VM) via virtualization software (Hypervisor).
- Servers can have multiple graphics cards that are passed directly through to individual VMs, or GPUs can be virtualized to give each VM a slice of a GPU.
- Remoting software sends the images from the desktop screen over the network to the end user at a different location, using a different device.
- Broker software allows IT to manage the connections between users and VMs.
- A public cloud workstation has the same components as above except a company rents time on the server hardware and data center where the servers resides rather than owning and managing them.

Dedicated Remote Workstations (Bare metal) – HP ZCentral

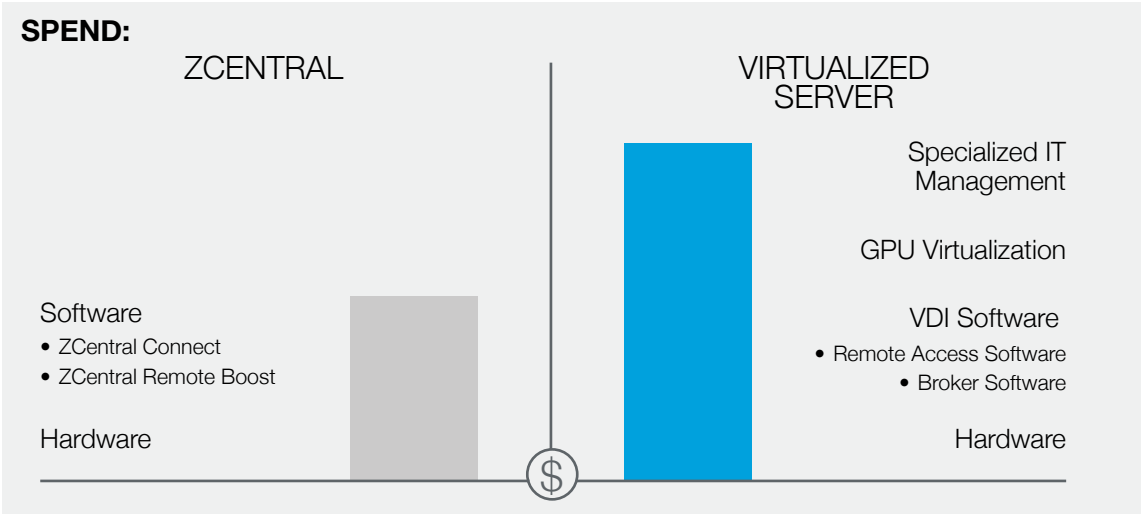
- Workstations are configured for the specific jobs to be done, then rack mounted in a central location like a compute room, data closet, or data center. You do not connect a monitor, keyboard or mouse to the workstation. The workstation is not sliced up into smaller virtual machines (VMs), however it can be added to a pool of machines that are shared.
- Remoting software sends the images from the desktop screen over the network to the end user at a different location, using a different device.
- Broker software allows IT to manage the connections between users and the ZCentral Workstations.

Comparing approaches

Servers and virtualization do centralize the compute and provide remote access, but they also introduce a lot of complexity and cost, while lowering the performance of the applications driving the solution in the first place. Virtualization is more expensive because of the added virtualization software licenses, the more expensive server hardware configs (even when divided by number of users), the additional GPU virtualization costs, and any additional costs to setup and manage the complexity. VDI or virtualization remoting software is developed primarily for the general office user and may not provide the same interactive experience for power users, compared to remoting software purpose built for workstation users like HP ZCentral Remote Boost.

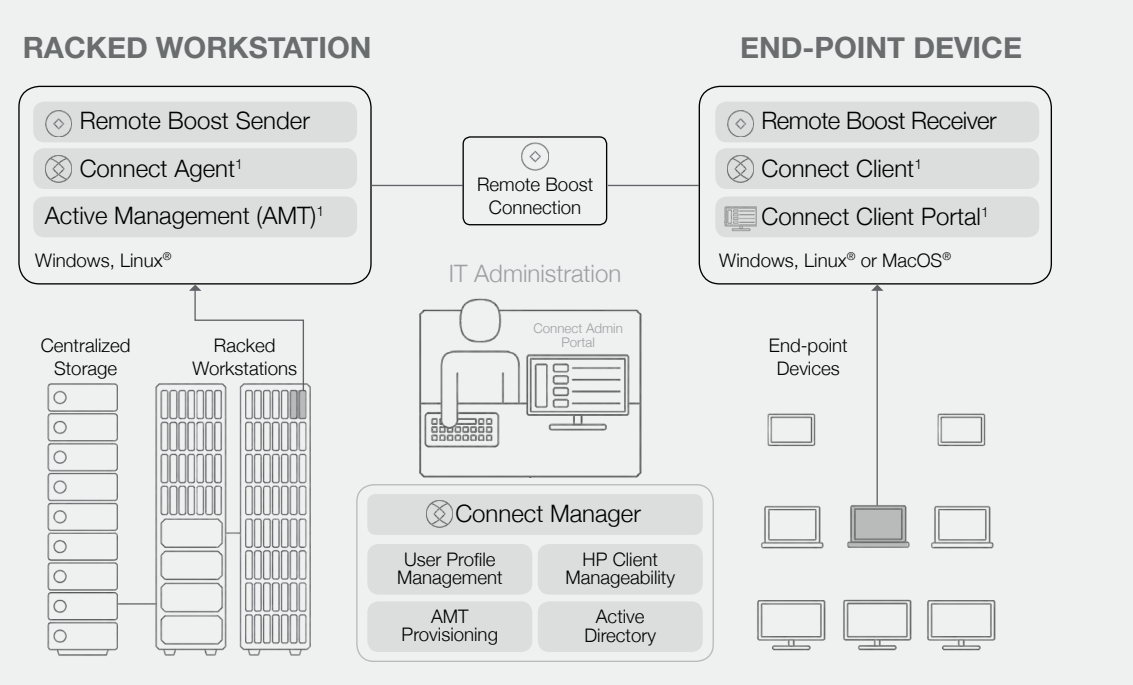
HP's ZCentral dedicated remote workstation approach is much easier to setup and use since it takes hardware that your company is already familiar with and simply places it in a different location, then adds remote access and connection management software. ZCentral can provide richer hardware configs per user at a lower cost. Workstations have higher CPU frequency with optimal CPU core counts. VDI requires CPUs with extremely high core counts so there are enough cores to share with each VM, and the overhead cores needed to run the virtualization software. It is more expensive to get high frequency CPUs with the high core counts required by VDI. With ZCentral, the ISV applications and workflows guide the CPU choice, rather than virtualization requirements.

The remoting software, HP ZCentral Remote Boost, is included with HP Z Workstations, and is developed specifically for workstation power user use cases. ZCentral Connect allows IT to share pools of workstations to a broader set of users, so even though any given connection takes up a full workstation, that workstation is not dedicated to just one user.



SOLUTION OVERVIEW

The image below shows key components in the HP ZCentral solution. These components will be discussed in the sections below along with other important items that solution architects need to consider.
The recommendations below by the ZCentral team should be viewed as a guideline and testing with user specific workloads is advised before deployment to end-users.



[1] RACKED WORKSTATION AND END-POINT DEVICE ARE CONNECTED TO CONNECT MANAGER.

ZCentral Remote Boost

Perhaps the most important factor in a successful centralized workstation solution is the end user experience. The ZCentral team has built over a decade of remote workstation customer experience feedback into the new ZCentral Remote Boost. The ZCentral engineers are constantly pushing the boundaries of frame rate, image quality and responsiveness. Building on the performance and features of HP Remote Graphics Software (RGS), Remote Boost paired with ZCentral Connect provides a full, end to end software solution geared toward the most demanding users.

Here is a sample of the experiences provided with ZCentral Remote Boost:

- **Match resolution and display layout.** End users can connect from desks with dual displays, mobiles with a single display or even video walls with many displays. ZCentral Remote Boost can automatically reconfigure the racked workstation to show the right number of displays at the right resolution so it feels like you are natively working on whatever your device and display setup is. With NVIDIA® Quadro® graphics the display information is injected by ZCentral Remote Boost. Other graphics solutions will require EDID emulators.
- **Work across multiple operating systems.** Users can be setting at a MacBook, but remotely running Windows applications natively on the racked workstation. Or work on a windows PC and connect to a Linux workstation. Switching between systems and operating systems is as easy as minimizing windows on the desktop. Or, if power users need more than one machine, you can keep one local and centralize the other to free up desk space.
- **Collaboration for creation.** Sharing desktops in meetings is second nature, but the performance of standard tools isn't acceptable for interactive, graphically intensive applications used by creators. With ZCentral Remote Boost you can screen share with multiple remote people, and it is like they are looking right over your shoulder, regardless of the app or content. It is ideal for video, 3D model manipulation and design reviews. No need to export files to presentation friendly formats. Directly share the view and control of your content creating software for faster collaboration, reviews and business decisions. You can even grant mouse control to remote

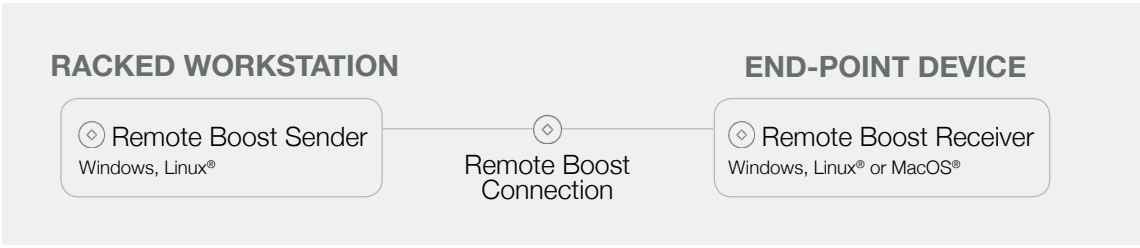
users to grab and rotate 3D models, zoom in on parts, or scroll through video timelines. IT has control on how Collaborators join a remote session. The default behavior creates a pop up for the primary user to accept or decline the request to join.

- **Security, USB and Copy Paste.** HP has a security first approach to remote access. IT can lock down or enable powerful features like remote USB and copy paste. Remote USB allows users to plug USB devices into the client device and have them function as if they were plugged into the centralized workstation. This is valuable for creators who use things like 3D space mice, or financial traders with their specialty keyboards. You can also copy and paste content between the sender and receiver machines or plug in USB drives to move files between local and remote. Of course, IT can disable these features if they so choose.

See HP ZCentral Remote Boost User Guide for more details on configuring these features.

What you need:

ZCentral Remote Boost has two main software components, the Sender and the Receiver. The Sender is a service that runs on the centralized workstations, often racked in a compute closet. It is responsible for analyzing the display images on the workstation and sending them over the network to the client device. The Receiver is an application that runs on the end user's client device. It is responsible for receiving the display images from the sender and displaying them on the end user's computer, as well as capturing the keyboard and mouse inputs and redirecting them back to the workstation. When the two talk to each other over the network you have a Remote Boost session.



Sender

The sender can run on HP Z Desktop Workstations, or other devices that run Windows or Linux®. You can also run the Remote Boost Sender on virtual machines, bare metal servers or even public cloud instances running supported operating systems. For best performance you will want multiple cores and a NVIDIA® Quadro® Graphics card. A NVIDIA® Quadro® Graphics card is not required. See HP ZCentral Remote Boost User Guide for current list of supported operating systems and more.

Remote Boost sender runs license free on HP Z Workstations, including ZBooks. You can run HP ZCentral Remote Boost sender on other hardware, including Non-HP hardware, but you must purchase a license for each system that is not a Z Workstation.

Receiver

The receiver can run on any Windows, Linux® or macOS® device. It does not require a license on any device and can be downloaded for free. See HP ZCentral Remote Boost User Guide for current list of supported operating systems and more.

The Network

HP ZCentral Remote Boost requires the sender and receiver devices to be visible to each other on the network. For secure remote connections this can include setting up a VPN (Virtual Private Network).

Latency considerations

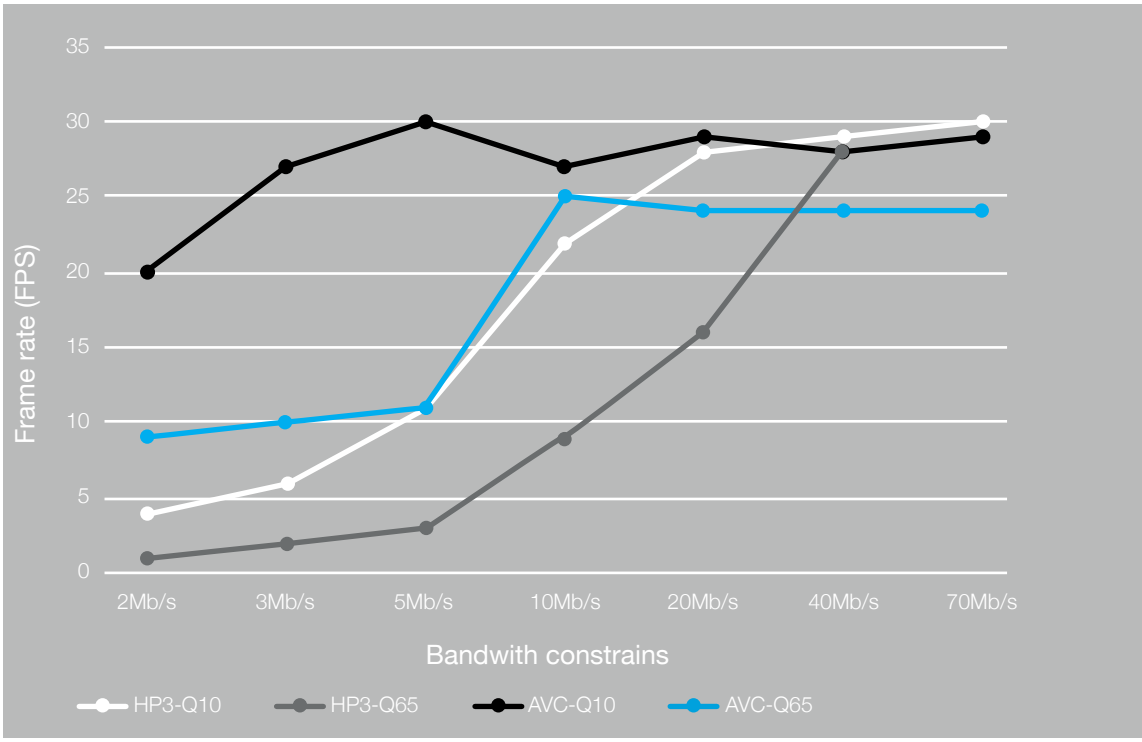
Latency is a function of geographical distance, Network Address Translation (NAT) filtering and hops. Since a data packet can only travel as fast as the speed of light, the further the packet must travel, the greater the delay. Hops, or the number of devices the data must pass through between the sender and receiver, can be especially significant in data transmission across large ocean or continental distances. Network latency can be easily measure with the "ping" function (if enabled on the network) between two endpoints of interest.

Network delay	Example geographies	Responsiveness user experience	Subjective impact	Behaviors
<20ms	Europe, Japan	Excellent	No visible difference from local system	Like local workstation
20ms to 60ms	North America	Good	End user not likely to notice affects	May be slight lag in windows drags. Video may become “jumpy”.
60ms to 100ms	Trans-Atlantic	Good	End user is aware that the system is remote	Streaming audio can lose sync. Window drags lag cursor.
100ms to 200ms	Trans-Pacific	Acceptable	May be objectionable for some use cases	HP ZCentral team recommends pilot testing for specific applications
>200ms		May be unacceptable depending on application	May be unacceptable depending on application	May be unacceptable depending on application

Bandwidth considerations

HP ZCentral Remote Boost includes configuration settings to provide the best remote experience over a variety of network conditions, ranging from no latency, high bandwidth LAN connections to high latency, low bandwidth WAN connections. You can control the amount of bandwidth used by varying the image quality (“Q value”), capping the frame rate, or changing the codec (HP3 or AVC) used with Remote Boost. Because of this flexibility, and the variety of applications being accessed, there is no single answer to how much bandwidth is needed, or how much latency is acceptable. The ZCentral team recommends testing your specific use case on your network.

HP Remote Boost allows users to pick a low bandwidth codec (AVC), which can improve frame rate on low bandwidth connections. The chart below shows the frame rate achieved with HP3 and AVC codecs under different bandwidth constraints and quality settings.



Packet Loss and ZCentral Remote Boost

“Packet loss” occurs when data on the network (organized in “packets”) fails to reach its destination, causing the packets to be resent. This often has the biggest impact on perceived latency or lag for remote experiences. For enterprise networks, packet loss is most commonly due to network congestion, which causes the packets to “time-out” (expire) before they reach their intended destination. In this case, to ensure the integrity of the data transmission, the packet must be continuously retransmitted until it reaches its destination. ZCentral Remote Boost has a feature called HP Velocity which can avoid the buildup of repeat packets in the network to maintain an interactive remote experience.

While packet loss rates for enterprise networks are very low, and rarely exceed 0.5% (99.5% or more of the packets go through without retransmission), the sheer volume of data on the network can still present problems especially for long-distance connections where latency is already a factor. Frequent packet loss can result in slow overall data transfer, effectively appearing as reduced network bandwidth.

ZCentral Connect

ZCentral Connect is a powerful new tool that allows organizations to maximize the use of their workstations, match users to pools of workstations and simplify how users connect to central workstations. It is a broker for HP ZCentral Remote Boost connections.

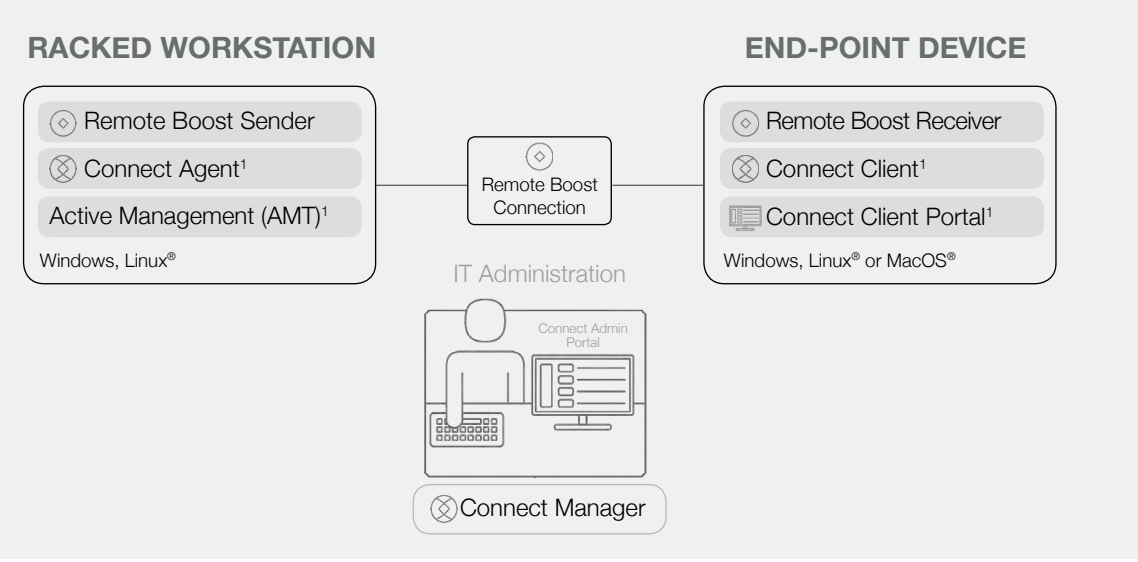
Admin experiences

- Remote power control & global enable/disable remote power control for end users
- Assign machines to pools, or dedicate machines to specific users
- Forcefully end sessions

End user experiences you can deliver

- Remotely power on/off workstations. Remote hard reboot.
- Connect with a simple click
- Multiple, simultaneous connections
- Authenticated via Active Directory
- Choose which machine or pool of machines to connect to

ZCentral Connect has several components and integrations. The diagram below illustrations how they all work together.

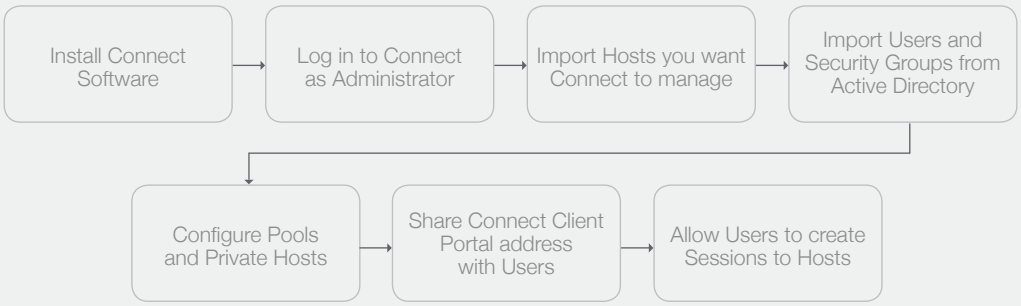


[1] RACKED WORKSTATION AND END-POINT DEVICE ARE CONNECTED TO CONNECT MANAGER.

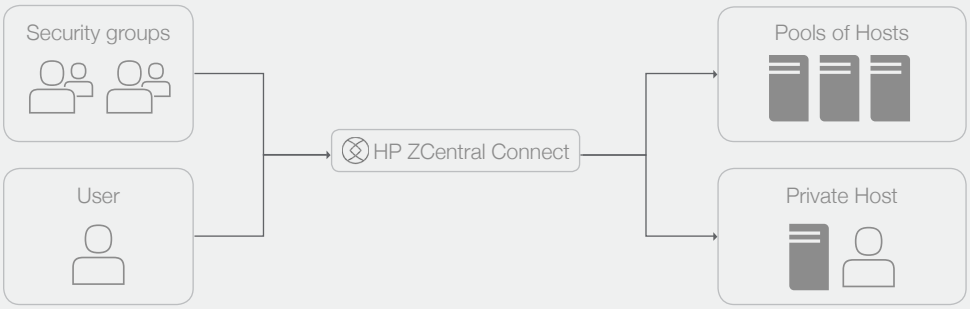
HP ZCentral Connect COMPONENTS

- HP ZCentral Connect Manager – Windows service that hosts web endpoints for both administrators and users
- HP ZCentral Connect Client Portal – Web portal for end users to launch connections
- HP ZCentral Connect Admin Portal – Web portal for administrators to configure, monitor, and manage connections
- HP ZCentral Connect Agent – Monitors connection status of Remote Boost Sender on the centralized workstation
- HP ZCentral Connect Client – Listens for commands from Connect Client Portal to launch Remote Boost Receiver on end-user's machine

STEPS TO DEPLOYING ZCENTRAL CONNECT



How ZCentral Connect sees users and workstations



What are Pools and Private Hosts

- Pools are logical groups of Workstations. Admins can group by geographic location (San Francisco, Vancouver) or by configured use (CAD, CAE/Simulation, Video, Data Science, etc.)
- Private Hosts are an individual workstation assigned to a specific user

What are Security Groups

- Logical organization of user accounts defined in the Active Directory
- Specific roles, workflow and resource requirements
- Used to assign permissions to Pools (ex. Team of Solid Modeling engineers)

Active Directory integration

Active directory (AD) integration is required for ZCentral Connect. Domain hosts, security groups, and users are imported into the ZCentral Connect database and user access to private hosts or machines within a pool is done by associating users to private hosts or security groups to pools.

AMT enablement and provisioning

To enable power operations through the ZCentral Connect Manager it must first be integrated with Intel® AMT and each host (workstation) needs to be provisioned. By default, AMT is disabled on all Z Workstations out of the factory. It can be enabled and provisioned by the ZCentral administrator or enabled by HP custom services at the factory. More information on AMT provisioning can be found in HP's whitepaper on AMT provisioning for enterprise environments (Coming soon).

Racked Workstations

HP's ZCentral solution allows HP's industry leading workstations to be remoted to the user when and where they need it. HP Workstations are optimized for the ZCentral environment and HP recommends, fully tests, and has rack kits for all HP Z2, Z4, Z6, and Z8 Workstations. For rack mounting details see **Rack Mounting and the HP Workstation** for more details.

HP ZCentral Remote Boost is included on HP Workstations at no additional cost thus providing the most complete and compelling remoting experience on the market.

HP ZCentral Remote Boost and Connect are sold for use with other vendor's workstation hardware and virtual environments, although not all ZCentral features are supported by these non-HP solutions.

End-point Devices

Today, HP ZCentral supports a wide range of Windows, Linux®, and macOS® endpoints. Furthermore, accessories such as docks and Z Displays can enhance the user's remoting experience.

When considering appropriate endpoint devices and configurations several factors need to be considered. For example, many users require more than one display for their workflows. HP Remote Boost can easily drive more than one display, but each additional display will take more network bandwidth and will require more CPU horsepower to decode the remoted images. Increasing the image quality or requiring a higher frame rate can require more capable endpoints. While HP expects most endpoints to just work, testing is always advised to verify the endpoints have the capabilities necessary to deliver the expected user experience.

Other considerations

KVMs

A KVM (Keyboard, video, and mouse) switch is a physical device that provides remote control of a computer. If IT needs to remotely access a racked workstation before it is booted to the operating System (OS), it is recommended to use a KVM because HP ZCentral Remote Boost does not provide remote access before the OS has loaded.

KVMs typically come in either standard or IP form. Standard KVMs are popular to use when the Z Workstations are accessible, otherwise the ZCentral team recommends an IP KVM. IP KVMs support all the capabilities of standard KVMs but they can be accessed via the network when accessing the systems is difficult. KVMs (both standard and IP) often use CAT V cabling as the cabling between the KVM and an adapter to the graphics port of the system. The resolution the KVMs provide may not take advantage of the full graphics resolution the system can provide. However, the main use case of the KVM is to access system in a pre-boot environment where graphics resolution is usually not a big concern.

KVM and Remote Boost resolution matching

Remote Boost can change the racked workstations screens to match the screens and resolutions of the device the receiver is running on, giving a seamless, full screen remote experience. It is possible that KVMs could interfere with this feature so special consideration should be made.

When NVIDIA® Quadro® graphics are used HP ZCentral Remote Boost will first attempt to use the graphics output port(s) that currently have an EDID. If the EDID on a port doesn't support a resolution requested by Remote Boost, Remote Boost will be unable to utilize the port and disable it. Remote Boost will then attempt to load an EDID onto an empty graphics output port to match the display configuration of the local device.

Limited resolution can occur if Remote Boost is not using the resolution matching feature or when the workstation does not have an NVIDIA® Quadro® GPU. Remote Boost will not modify any display settings on the Sender and will only use the graphics output port(s) that have EDIDs and are currently enabled in the OS. If the KVM provides a persistent EDID and is active or EDID emulators are installed, the ports will be used with the resolutions limited by the available EDIDs. More information about resolution matching can be found in the **ZCentral KVM Experience Whitepaper (Coming soon).**

Other Rack Components

When setting up a ZCentral solution there are other considerations that may be useful.

- Rack Monitor Consoles – Rack monitor consoles typically take up no more than 1U of space and are convenient as a monitor, keyboard, and mouse solution for the rack.
- Power Distribution Unit - A power distribution unit can be a convenient way to control power to your systems. PDU's come in various forms but a common form is a power strip that connects into a KVM giving an administrator the ability to apply or remove power to specific units in the rack.
- Cabling – cables can become difficult to manage with any rack solution housing multiple systems. Cabling solutions that manage, separate, and organize cables should be considered to ensure a more stable environment, especially during trouble shooting, and can prevent cable damage as systems are slid in and out.

Rack Solution Physical Considerations

Several factors should be considered when racking electronic equipment. You are now fitting a significant amount of power/heat into a small area. You should consider:

- How much power your equipment will need?
- How much cooling will be needed to keep the equipment within appropriate operating limits?
- How much floor space will be needed?
- How much weight the solution will put on the location where the rack sits?

Example: If your solution was to use HP Z2 Mini you can potentially put up to 56 Z2 Mini's in a 42U rack.

Power – Approx. 15.7K Watts

Space – A standard 42U rack has an approx. floor footprint of 35" x 24".

Weight – A standard 42 rack may weigh as much as 400 lb (182 kg), plus the weight of each system at 5.5 lb. (2.5 kg), times the total number of systems – 56. This gives a rack weight of approx. 700Lbs (318 kg) in a 35" x 24" space. You should ensure your flooring can support this much weight in this small of a space.

IT MANAGEMENT

HP ZCentral builds upon the HP Client Manageability offering to deliver a comprehensive set of manageability features that meets the needs of administrators who must manage client devices without being physically in front of the device. The table below outlines a few key attributes of the manageability solution.

Remote Power On/Off	Remotely power on, perform a hard reboot or graceful shutdown racked workstation from HP ZCentral Connect admin portal
Connection Status	Admins can see who is connected to each machine and manually end remote sessions from HP ZCentral Connect admin portal
Remote Support	IT can see what end users see with HP ZCentral Remote Boost
Pre-boot Access	Remotely view and control pre-boot functions with 3rd party KVM, HP's BIOS Configuration Utility, and the Open Source AMT tool MeshCommander
Ensure Performance	Tune performance of system config to the workflow it is meant for with built in HP Performance Advisor
BIOS & Driver Updates	Deploy updates to BIOS, drivers, and other HP platform specific software with HP Client Catalog and HP Driver Packs
Deploy Images, Set Policies	Deploy images and set policies using HP BIOS Config Utility, Microsoft SCCM with HP Manageability Integration Kit or Red Hat® KickStart
End to End Solution Support	One contact for entire solution support

HP ZCentral Connect admin portal provides health and status information as it relates to the ZCentral connection capabilities. Admins can quickly check whether platforms are in a state to receive a remote connection request or have an active connection in progress. When needed, admins can remotely connect to a platform for remote support or they can remotely power the machines on or off.

HP ZCentral builds on **HP's client manageability solution** allowing customers to use the same set of tools and processes they use to manage all other client devices. As IT professionals plan, deploy, and support their ZCentral solution they can use HP's full suite of client manageability solutions. Some of the available tools are as follows:

- **HP Image Assistant (HPIA)** is a tool from HP that helps IT System Administrators improve the quality and security of their PC Windows image by diagnosing the image, identifying problems with outdated drivers, and recommending solutions. HPIA can help the IT administrator build a driver pack or golden image using the most current drivers available.

- **HP BIOS Configuration Utility (BCU)** is a tool from HP that manages BIOS settings on HP supported commercial systems and replicates BIOS settings across multiple client computers. For example, IT admins can optimize the power management of your Z platforms, change the boot order, or manage the BIOS password.

- **HP Driver Packs** contain the Microsoft Windows drivers in .INF based installation format. This INF installation method can be used standalone or with bare-metal operating system deployment tools that require .INF based drivers. Administrators can also create their own driver packs or determine that newer drivers are available using HPIA.

- **HP Catalog** is a plug-in for Microsoft System Center products that automates the acquisition and deployment of HP SoftPaqs to HP commercial PCs and Z Workstations. It can be used with the software update feature

of Microsoft SCCM and Update Publisher or System Center Essentials to provide automated drivers and patch updates to HP-managed clients.

- **HP Manageability Integration Kit (MIK)** is a plug-in for Microsoft System Center products that helps customers improve deployment of Microsoft Windows-based Client OS images to HP PCs. The HP MIK is installed on the same server as Microsoft System Center Configuration Manager and can be accessed through the System Center console on the server. HP MIK's key benefits include:
  - Reduce the number of steps needed to create, deploy, and manage images, BIOS, and system security.
  - Secure BIOS settings, set authentication and credentials requirements, enable Device Guard, and manage Trusted Platform Module (TPM) firmware updates.

- **HP System Software Manager (HP SSM)** is a utility that allows an IT administrator to deploy HP platforms specific and system ROM updates from a single file store to multiple desktops, workstations, and notebook computers. With HP SSM administrators can run reports to compare HP platform specific updates awaiting deployment against machines in the network to identify PCs in need of update. Customized update packages can be created and deployed.

- **HP Client Management Script Library (HP CMSL)** for IT administrator that prefer scripting or for those not using HP MIK with SCCM, HP provides a collection of PowerShell functions for managing HP BIOS, and streamlining the download and organization of HP platform specific updates for HP client PC models in your environment.

- **HP Performance Advisor (HPPA)** is a Window's based utility that will tune platforms based on a primary application, such as Catia, Autodesk Maya or Avid Media Composer. It is also used to analyze system performance and can recommend changes if it recognizes a system are mis-configured. See **HP Performance Advisor** for more details.

- **HP Proactive Management** is a multi-device, multi-OS service that helps admins to boost productivity and optimize uptime. It's cloud-based dashboard and predictive analytics are used to track hardware and software inventory while monitoring device health. See **HP Proactive Management** or your HP sales representative for more details.

HP ZCentral Connect must be integrated with Microsoft's Active Directory (AD). The racked Z Workstations must have AMT enabled and provisioned for certain manageability features like remote power control. Lastly the user's experience must be carefully considered and architected. Information on these topics can be found under ZCentral Connect in this document.

Considerations when setting up the end-user environment

When setting up pools of workstations that can be shared between different users at different times it is important to consider how the end-user environment will be presented on each machine. For example:

- Does the user need a consistent experience across multiple workstations that is always the same?
- Does the user need to personalize their remote experience or do all users in the pool have the same experience?
- Do the users need access to local or network files?

Consider how to apply some of the concepts below to meet the user experience requirements.

User Profile Management

A user profile contains the information that helps set up the environment the user will work within after logging into a computer. In Windows, administrators can setup Local profiles, Roaming profiles, Mandatory profiles, and Temporary profiles. The profile type depends on how the questions above are answered. For further information the ZCentral team discusses various scenarios and solutions to help guide you in the HP white paper **"User Profiles and Folder Redirection in a Centralized Workstation Environment".**

Access to user data (Cloud storage, Folder redirection)

ZCentral users will often need data that is not stored directly on the racked Z Workstation. Instead the data will come from centralized storage locations. The reasons for this are many, such as data redundancy, data resiliency, multi-user access, multi-platform access, etc. The use cases should guide you on the solution you choose, however, a very common solution is Windows Folder Redirection. You can deploy Folder Redirection for your end users using a combination of Active Directory Services and Group Policy Management. Folder redirection can also reduce user profile management overhead when a user first logs into a ZCentral workstation. The ZCentral team has provided more details about how to setup Folder Redirection in the HP White Paper **"User Profiles and Folder Redirection in a Centralized Workstation Environment".**

Write filtering

A Write Filter can provide a consistent ZCentral user experience after each reboot of a system. A write filter will capture any changes made to the operating environment to a temporary overlay, which is cleared after the reboot. This feature brings the operating system back to a known configuration and will eliminate issues of end user misconfiguration and installation of unauthorized software. To learn more about write filtering there are links at the end of this solution guide.

Preparing end-users in your organization

As mentioned earlier, one of the most important factors in a successful deployment is end user acceptance of the experience. It is important to set appropriate expectations with end users and thoroughly test the full solution before deploying across the organization. The network connection will make a difference so become familiar with all network conditions you will be working with. Small adjustments within ZCentral software settings or your network could make a big difference.

Be sure to communicate what your end users will gain from ZCentral. For example:

- Access their work from any desk, meeting room or even from home
- Thinner, lighter personal computers and more desk space
- Faster project file load times for large, shared projects
- Ability to use their own devices if a BYOD strategy is implemented
- Quickly switch between different machines and/or work on multiple machines at the same time
- Do design reviews faster by collaborating directly in the professional CAD software rather than exporting to sharable formats.
- Quickly access a different machine if they experience issues with one.

Users who have had a poor experience trying other general purpose remoting solutions like RDP, TeamViewer or VDI with Citrix or VMware may need hands on demos early in the project. This can quickly and easily be done by installing HP ZCentral Remote Boost sender on an existing Z workstation in the office and connecting to it from another computer in the office. Be sure to use a machine with relevant professional applications and project files on it so they can truly test it out.

If questions arise, don't hesitate to reach out to HP ZCentral support for help tweaking settings for your particular use case. Once the remote experience is what you need, then you can start testing with a broader group of end users.

ADDITIONAL DOCUMENTS AND REFERENCES

The following HP documents have additional information and details related to ZCentral.

- **HP ZCentral web portal**
- **HP ZCentral Connect 2020 Agent Deployment Guide**
- **HP ZCentral Connect 2020 User Guide**
- **HP ZCentral Remote Boost User Guide**
- Optimizing HP ZCentral Remote Boost for your environment and workloads (Coming soon)
- HP's guidelines for remote provisioning AMT in an Enterprise Environment (Coming soon)
- **Remote Management Options**
- **Rack Mounting and the HP Workstation**
- **User Profiles and Folder Redirection in a Centralized Workstation Environment**
- **HP client manageability solutions**
- **HP Performance Advisor**
- **HP Proactive Management** and **Proactive Management Developer's portal**
- **HP DaaS** and **HP DaaS Proactive Management**
- How to build a NAS using a HP Z8 G4 platform (Coming soon)

The following 3rd party documents may also be of use:

- **Intel® AMT SCS Guide**
- **Microsoft Active Directory Overview**
- **Microsoft Active Directory How to**
- **Microsoft FSLogix Information**
- **Microsoft FSLogix How to**
- **Microsoft Write Filter Overview**
- **Red Hat® Kickstart**

WHERE TO GET ADDITIONAL HELP

Contact your local sales representative for more information on how HP can help you successfully plan and deploy your ZCentral solution.

*HP ZCentral Remote Boost does not come preinstalled on Z Workstations but can be downloaded and run on all Z desktop and laptops without an additional license purchase. When you purchase a Z device, you get an embedded license. With non-Z sender devices, it is a perpetual or floating license. ZCentral Remote Boost requires a Windows (10 or 7 SP2), RHEL (6, 7 or 8), UBUNTU 18.04 LTS, or HP ThinPro operating system. macOS® (10.13 or newer) operating system is only supported on the receiver side. Requires network access. The software is available for download at https://www8.hp.com/us/en/workstations/zcentral-remote-boost.html.

**HP ZCentral Connect software is a one-time software license purchase, more information can be found at https://www8.hp.com/us/en/workstations/zcentral.html. Not available until early 2020. Requires HP ZCentral Remote Boost, Windows 10, Windows Server 2016 or newer operating system, Microsoft Active Directory and Intel® Active Management Technology for select features.

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