A whitepaper on the rapid rise in a modern AEC mobile workforce and the growing demands for remote workstation graphics to mobile devices.
WHERE are you most creative?

At the site of your next architectural project?

At your client’s office, discussing design options?

Or perhaps on a long hike, isolated from the bustling office?

Wherever it may be, creative spaces continue to empower the human imagination.

Creative spaces spark solutions, and remote graphics allow us to work virtually anywhere.

40% of millennials believe their employer’s digital capabilities are sufficient

66.6% of AEC firms store data in the cloud already

CGI image courtesy of Uniform.Studio
Powered by AMD graphics.
Remote Desktop?

Many of today's AEC software applications support remote workstation graphics. This allows the user to stream powerful workstation graphics to the user's desired mobile device, with users' mouse clicks and keyboard data securely streamed back to the workstation.

By delivering AEC software via AMD Remote Workstation Graphics, it is possible to need fewer software licenses for mobile devices, and maximize the usage of office software when not in the office environment.

In computing, the term remote desktop refers to a software or operating system feature that allows a personal computer's desktop environment to be run remotely on one system (usually a PC, but the concept applies equally to a server), while being displayed on a separate client device.³
The Challenge

Today’s architects and engineers are more mobile than ever before, ushering in several IT admin challenges, including security and the rising costs of a modern digital office. With the boom in workforce mobility and the continued rise in clients’ expectations for you to be regularly onsite with the correct design tools, AMD Remote Workstation was developed to ensure you have the power of your workstation virtually anywhere. AMD Remote Workstation is designed to bridge creative spaces with productive platforms: a way to harness powerful desk-side workstations from almost anywhere without compromising performance and without additional end-user license fees.
The Solution

AMD Remote Workstation allows you to stream your critical AEC tools from your AMD professional graphics powered workstation to your mobile device.

AMD Remote Workstation is a suite of innovative AMD technologies designed to provide rich graphics acceleration and a reliable CAD experience when accessing your workstation using select leading remote visualization tools. From accelerating frame-by-frame capture directly from the base workstation graphics card’s onboard memory, to supporting high speed fixed-function frame encode capability, to exhaustively verifying compatibility with leading AEC applications, AMD Remote Workstation delivers a premium graphics experience anywhere.

Furthermore, in a remote access environment, AMD Remote Workstation’s virtual display technology can be used to natively emulate and render to a display – all taking place transparently to the design application. This allows design applications to be used in the same way as in traditional environments, even without output being rendered on a physical display at the desk. Finally, AMD performed extensive professional design application testing with AMD Remote Workstation to help ensure a dependable remote work experience.

Working in conjunction with industry standard tools like Citrix® Virtual Apps and Desktops and Microsoft® Remote Desktop Connection, AMD Remote Workstation provides an accessible path to a responsive, reliable, and high-fidelity remote user experience.
No Additional Cost

The AMD Remote Workstation tools are built into every one of the unified Radeon™ Pro Software Enterprise drivers. AMD does not charge an end-user license fee for this technology and provides all the software components you need to work remotely once you have acquired, installed and set-up Citrix® Virtual Apps and Desktops or Microsoft® Remote Desktop Connection. Citrix Virtual Apps and Desktops and/or Microsoft Remove Desktop connection are not provided and must be acquired separately.

Deployment Made Easy

The unified Radeon™ Pro Software Enterprise graphics driver already comes with everything required to accelerate remote access. This allows the same desk-side workstation that is used in-person to be accessed remotely without modification. No need to change drivers, hot plug the display, or power-cycle the machine. Simply connect from your properly equipped client device and make those design changes on the go.

The complete at-the-desk workflow is preserved as well. No need to migrate large files, change in-software viewport settings, or reduce project file texture detail when working remotely. The end-users workflow is kept intact and not disrupted.

Additionally you can work with an AMD partner and your IT team to help deploy across your existing hardware.
Flexibility, Built on Simplicity

Local AMD Graphics Powered System, using Radeon Pro WX 4100 graphics or greater.

Local AEC software graphics delivered by Citrix® XenDesktop® 7.16+ agent or Microsoft® Remote Desktop Connection.

Only pixels are delivered. Never physical project data.

Seamlessly delivered to your smartphone, tablet, PC or Mac by connecting to remote desktop machine using Citrix® Workspace (Formerly Citrix® Receiver) or Microsoft® Remote Desktop app.

Design anywhere. From onsite to client offices. Virtually anywhere you have a connection.
Low Latency

The value of a remote work solution often hinges on latency considerations, quantified as the time delta between providing mouse or keyboard input and observing client-side graphical output. The reliance on a low-latency user experience is further amplified in architectural real-time and visualization workflows. Applications like Autodesk® Revit® are contingent on real-time model manipulations and accurate viewport interactions using advanced shading features. Here client-to-server latency can make or break application usability.

To optimize for latency-sensitive environments, AMD Remote Workstation allows the remote visualization application to access rendered frames directly from the base workstation’s AMD GPU framebuffer. Compared to conventional remoting tools that traverse many software layers to obtain a copy of the desktop image, AMD Remote Workstation can capture that same frame straight from video memory. This frame is then fed into the GPU’s dedicated fixed-function multimedia engine capable of encoding a 1080p frame in milliseconds.

Software Built on Stability

AMD Remote Workstation was designed from the ground up with stability in mind. According to a third-party assessment in 2018, QA Consultants determined that “AMD has the most stable graphics driver in the industry.” AMD Remote Workstation is delivered via this same rigorously tested AMD’s graphics driver, and subsequent iterations, are, allowing users to expect a predictable experience virtually anytime or anywhere. This driver is also a regular recipient of ISV certifications across a host of AEC-focused applications.

Learn more about certifications at AMD.com/CERTIFIED
Workforces are Mobile

Today’s modern studio understands that a geographical location should not stop a project from being delivered. In a recent study we’ve seen how two thirds of AEC firms currently store data in the cloud. This is a trend we expect to continue to rise. Typically, this cloud usage consists of file-based transfers and related infrastructure. This reliance on cloud solutions shows how many architects have already embraced remote access technology. The next step in enhancing work-from-anywhere capability is to enable the same architects and engineers to edit, design and create while away from the office.

performance parity of a local desktop experience delivered by AMD Remote Workstation

98%

CGI image courtesy of Glass Canvas. Powered by AMD graphics.
43.3% of global workforce who will be mobile by 2023

51% of execs said outdated office tech impeded ability to retain employees

33% of companies rely on increased business travel

72.3% by 2020 mobile workers will account for nearly three quarters of US workforce
Supported GPUs

Radeon™ Pro WX 4100 Graphics
Super small form, punchy performance.
Ideal for entry level CAD work.

Radeon™ Pro WX 5100 Graphics
Thin, and packed with power.
Ideal for mainstream 3D work.

Radeon™ Pro WX 7100 Graphics
Ready for VR workflows.
Ideal for advanced CAD and entry VR.

Radeon™ Pro WX 8200 Graphics
Flexible, Fast and Quiet.
Ideal for real-time rendering.

Radeon™ Pro WX 9100 Graphics
Ultimate Performance.
Ideal for advanced visualization and VR.

Learn more about these graphic cards at [AMD.com/AEC](https://www.amd.com/aec)
How to Configure

1. Ensure your local system is running an AMD Radeon Pro WX 4100 graphics or above.

2. Install Radeon™ Pro Software for Enterprise on the target Microsoft Windows based workstation. The driver must be installed locally or via Remote Desktop Connection.

3. Install Citrix® XenDesktop® 7.16 VDA or higher on the system. Select Virtual Delivery Agent for Windows Desktop OS. (FIG 01)

4. Connect to the remote desktop machine using the relevant Citrix® Receiver, Citrix® Workspace app or Microsoft® Remote Desktop app.

   Citrix® Receivers are available for Linux, Android, iOS, Mac, Chrome, and Windows. For more info visit Citrix.com.

   The Microsoft® Remote Desktop app is available for free from the Microsoft Store, Google Play and the Mac App store. For more info visit Support.microsoft.com.

5. You are now ready to use your AEC software as you would normally, except you are now free to create wherever you want, whenever you want. Virtually anywhere.

As of August 2018 Citrix® Receiver was replaced with Citrix® Workspace app, and is backwards compatible.

Tip: Machine Type

Ensure as part of the configuration that the machine type is setup as a “Remote PC Desktop”
Tip: Mouse Cursor

After the Remote desktop connection has been established, if the user observes mouse cursor misalignment or undesired scaling, the steps below should be followed:

a. When remotely connected, Right-Click on the desktop and open AMD Radeon™ Pro Settings.
b. Click on the Display tab.
c. Change the Scaling Mode to Full Panel (FIG 02)

Should you need assistance, contact your local IT administrator, or an AMD representative.

GPU

or graphics card is critical to reliable software performance, but can sometimes be overlooked.

AMD’s professional graphics allow you to explore designs with the best viewport experience possible, allowing you to concentrate on creating beautiful designs. The full range is built to match the increasing graphical demands placed on them, whether used in physical workstations or virtual desktop solutions, allowing you to work virtually anywhere. AMD Radeon™ Pro graphics are for the visionaries of the AEC world.
# Remote Workstation Support for Common AEC Software

<table>
<thead>
<tr>
<th>PRIMARY SOFTWARE USED</th>
<th>CPU OR GPU INTENSIVE</th>
<th>PROCESSOR FREQUENCY</th>
<th>GRAPHICS DEMAND</th>
<th>SYSTEM RAM</th>
<th>VIEWPORT TECHNOLOGY</th>
<th>CERTIFIED FOR RADEON™ PRO</th>
<th>CITRIX® READY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productive Apps (Office, Excel +)</td>
<td>CPU</td>
<td>3+ GHz.</td>
<td>Low. 2+ GB VRAM.</td>
<td>8+ GB</td>
<td>DirectX® 9.0</td>
<td>No ISV Process</td>
<td>✓</td>
</tr>
<tr>
<td>Adobe Creative Cloud (PhotoShop +)</td>
<td>Balance</td>
<td>3+ GHz.</td>
<td>High. 8+ GB VRAM</td>
<td>16+ GB</td>
<td>OpenGL® 2.0</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Autodesk® AutoCAD®</td>
<td>CPU</td>
<td>3+ GHz.</td>
<td>Low. 2+ GB VRAM.</td>
<td>16+ GB</td>
<td>DirectX® 11</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Autodesk® Revit®</td>
<td>CPU</td>
<td>3+ GHz.</td>
<td>Medium. 4+ GB VRAM</td>
<td>16+ GB</td>
<td>Shader Model 3.0</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Autodesk® 3ds Max®</td>
<td>Balance</td>
<td>3+ GHz.</td>
<td>High. 8+ GB VRAM</td>
<td>32+ GB</td>
<td>DirectX® 11, Shader Model 5</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Bentley® MicroStation®</td>
<td>CPU</td>
<td>3+ GHz.</td>
<td>Medium. 2+ GB VRAM</td>
<td>16 GB</td>
<td>Direct3D® 11</td>
<td>(Part of DirectX®)</td>
<td>✓</td>
</tr>
<tr>
<td>Epic Twinmotion</td>
<td>GPU</td>
<td>3+ GHz.</td>
<td>High. 8+ GB VRAM</td>
<td>32+ GB</td>
<td>DirectX® 11</td>
<td>No ISV Process</td>
<td>✗</td>
</tr>
<tr>
<td>Enscape™</td>
<td>GPU</td>
<td>3+ GHz.</td>
<td>High. 8+ GB VRAM</td>
<td>32+ GB</td>
<td>OpenGL® 4.3</td>
<td>No ISV Process</td>
<td>✗</td>
</tr>
<tr>
<td>McNeel Rhino</td>
<td>Balance</td>
<td>3+ GHz.</td>
<td>High. 8+ GB VRAM</td>
<td>16+ GB</td>
<td>OpenGL® 4.2</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nemetschek Allplan®</td>
<td>Balance</td>
<td>3+ GHz.</td>
<td>High. 8+ GB VRAM</td>
<td>16+ GB</td>
<td>OpenGL® 4.1</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nemetschek Bluebeam®</td>
<td>CPU</td>
<td>3+ GHz.</td>
<td>High. 8+ GB VRAM</td>
<td>16+ GB</td>
<td>OpenGL® 4.2</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nemetschek Vectorworks®</td>
<td>Balance</td>
<td>3+ GHz.</td>
<td>High. 4+ GB VRAM</td>
<td>16+ GB</td>
<td>OpenGL® 4.2</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Trimble® SketchUp Pro</td>
<td>CPU</td>
<td>3+ GHz.</td>
<td>Medium. 2+ GB VRAM</td>
<td>16+ GB</td>
<td>OpenGL® 2.1</td>
<td>No ISV Process</td>
<td>✗</td>
</tr>
</tbody>
</table>

**LATEST INFO:** The above table is based on internal testing, customer reports and recommendations, providing a guide only. Whilst every care has been taken, please refer to the individual software documentation for the most up to date information on Remote Workstation Graphics support and hardware considerations. Individual models will vary in hardware resource usage and performance demands.

**VIEWPORT TECHNOLOGY:** The entire range of AMD Radeon™ Pro GPUs support all of the various display technologies listed in the table, ensuring advanced features can be used within the software viewports combined with High DPI support for larger screen resolutions.
Conclusion

AMD Remote Workstation allows your AEC workforce to be ready for that next design challenge wherever they are. Built with stability and performance at the forefront, the AMD Remote Workstation experience, built into your existing AMD Enterprise graphics driver, allows for an easy to deploy, reliable, and cost-effective way to create from anywhere using workstations you already have.

WHERE will you create today?

To learn more visit AMD.com/RemoteWorkstation or contact your local AMD technical support team to get started.
END NOTES
4 Compatible with AMD Radeon™ Pro WX 4100 GPUs and up. Remote Workstation functionality requires AMD Radeon Pro Software for Enterprise driver 18.Q4 or newer plus purchase and installation of Citrix Virtual Apps & Desktops or Microsoft Remote Desktop Services. RPS-50
5 HEVC (H.265), H.264, and VP9 acceleration are subject to and not operable without inclusion/installation of compatible HEVC players. GD-81
6 https://qaconsultants.com/stabilityaudit/
7 Radeon™ Pro Software for Enterprise 19.Q2 with AMD Remote Workstation delivers comparable performance on SPECviewperf® 13 3dsmax-06 when compared local (non-remoted) performance. Testing conducted by AMD labs as of April 22nd, 2019 on a test system comprising of Intel® Core i5 8400 CPU, MSI Z370-A PRO motherboard, ADATA XPG Z1 16 GB DDR4 RAM, Samsung 860 EVO 250GB SSD, Windows® 10 Pro October 2018 Update with a Radeon™ Pro WX 4100 graphics card using Radeon™ Pro Software for Enterprise 19.Q2. The test was conducted using running benchmark the application SPECviewperf® 13 benchmark for its “3dsmax-06” viewset subtest: Radeon Pro Software Adrenalin 2019 Edition for Enterprise 19.Q2 with Radeon™ Pro Remote Workstation: 50.22, 19.Q2 run locally: 51.36 resulting in only up to a 2% drop. The results are the average of 3 iterations. The AMD Remote Workstation solution was implemented using the Citrix® XenDesktop® 7.18 application on an HP ZBook 17 G5 Client. Performance Differential: 51.36-50.22 = ~2.0% performance drop with the AMD Remote Workstation solution on Radeon™ Pro Software for Enterprise 19.Q2 versus running locally. Additional information about the SPEC benchmarks can be found at spec.org/gwpg. RPS-53
8 http://bit.ly/43globalworkforce

The information contained herein is for informational purposes only and may contain technical inaccuracies, omissions, and typographical errors. The information contained herein is subject to change and may be rendered inaccurate for many reasons, including but not limited to product and roadmap changes, component and motherboard version changes, new model and/or product releases, product differences between differing manufacturers, software changes, BIOS flashes, firmware upgrades, or the like. While every precaution has been taken in the preparation of this document AMD is under no obligation to update or otherwise correct this information. However, AMD reserves the right to revise this information and to make changes from time to time to the content hereof without obligation of AMD to notify any person of such revisions or changes.

AMD MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS HEREOF AND ASSUMES NO LIABILITY OF ANY KIND INCLUDING BUT NOT LIMITED TO ASSUMING NO RESPONSIBILITY FOR ANY INACCURACIES, ERRORS, OR OMISSIONS THAT MAY APPEAR IN THIS INFORMATION.

AMD SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR ANY PARTICULAR PURPOSE. IN NO EVENT WILL AMD BE LIABLE TO ANY PERSON FOR ANY DIRECT, INDIRECT, SPECIAL, OR OTHER CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF ANY INFORMATION CONTAINED HEREIN, EVEN IF AMD IS EXPRESSLY ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NO LICENSE, INCLUDING IMPLIED OR ARISING BY ESTOPPEL, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. TERMS AND LIMITATIONS APPLICABLE TO THE PURCHASE OR USE OF AMD’S PRODUCTS ARE AS SET FORTH IN A SIGNED AGREEMENT BETWEEN THE PARTIES OR IN AMD’S STANDARD TERMS AND CONDITIONS OF SALE.