

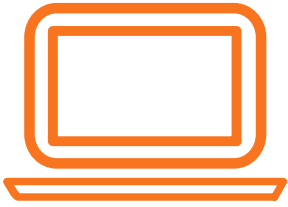


DESKTOP-AS-A-SERVICE (DaaS):
**Implement a secure,
digital, work-from-
anywhere solution for
your workforce**

WHITEPAPER

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DESKTOP AS A SERVICE



Desktop as a Service, or DaaS, is a technology used when a computer's operating system, programs, storage, and memory are utilized in the cloud or inside of a data center, versus being utilized inside of the computer itself. An Internet connection is used to access those resources and programs from the cloud. There are many variations of DaaS that will be explained in this Whitepaper, and are based on budget, security, and technology.

DaaS is sometimes referred to as Hosted Desktop or Virtual Desktop.



CRITERIA FOR SELECTING A SPECIFIC DAAS SOLUTION

Budget

DaaS can be customized to meet budget requirements. There are many available options, as well as built-in scalability, to deliver a solid user experience at various price points.

Security

Every organization has different needs for security. DaaS can be customized to meet specific compliance criteria, and also has various implementation options for network and application security.

Technology Demands

Some users require robust computing resources, such as large amounts of RAM, to process data or run resource-intensive programs. Other users need only basic compute to run simple programs. DaaS can be customized to meet all of your organizational and user needs.

OVERVIEW OF WHITEPAPER

As the need for working from anywhere grows, it's more important than ever that businesses understand the various options they have to offer a secure, remotely accessible IT environment to their employees. Understanding the options will allow companies to choose which one works best for them, and will provide confidence in the decision-making process.

Many companies already use cloud-based services, such as Office 365, G Suite, Salesforce, and other software-as-a-service applications. Employees access those services by typing in a URL from any device, and with the proper credentials, can log in and access their services.

Other applications and workflows aren't as easy to access remotely, or from any device. Those are the situations this whitepaper is written for, and it will provide readers with the knowledge required to begin considering a DaaS environment.

Using the combination of existing cloud-based services and one of the solutions presented in this whitepaper, companies no longer need to worry about downtime or lost productivity due to an employee's location or availability of their company-provided device.

BENEFITS OF MOVING FROM TRADITIONAL DESKTOPS AND LAPTOPS TO DAAS

Before we review the various options for DaaS, it's important to understand the general advantages to moving away from traditional devices:

- Using DaaS, employees can work from anywhere with no change to their workflow processes.
- User desktops can be accessed from any device: A laptop, desktop, phone, or tablet.
- BYOD (bring your own device) policies can become less detailed and stringent, as DaaS is secure from any device the user connects with.
- Since all processing is completed on servers in the cloud, rather than on a user device, organizations can use less expensive or older user devices.
- With DaaS, the specific compute needs of a user can easily change without purchasing a new device. If additional RAM or storage space is needed, it can be added quickly and inexpensively, with minimal user interruption or downtime.
- All user and application data is stored on servers, rather than on user devices. This creates a much more secure environment, as data isn't available if the device is lost/stolen, or if the device is compromised with a virus or malware (provided that the environment in the cloud is secured appropriately).



- Thorough backups and subsequent restores, if needed, are easier to administer and perform, as all data is in known locations.
- Centralized management is used for operating systems, software versions, antivirus, etc. There is no longer a need for user-level updates, as all updates occur at the cloud level. Additionally, any software that is new will automatically appear as part of the user's desktop, eliminating the need for local installation on the individual user devices.
- Even though DaaS is a monthly expense, most organizations experience significant savings in a combination of areas:
 - Device procurement, since higher-end user devices are not required
 - Improved efficiency of users, since programs run on optimized and uniform desktops, versus a patchwork of varied local devices
 - Reduced IT service calls = reduced support costs
 - Improved security, as well as time spent administering it
 - DaaS is a subscription per user, so it can ebb and flow with employee count

VARIATIONS OF DAAS

DaaS can be implemented in several different ways. Each option has different advantages based on budget, security and technology sophistication. The options in this whitepaper are presented in increasing order based on those criteria.

Option 1: DaaS using Remote Desktop Protocol (referred to as RDP)

What is RDP?

RDP (Remote Desktop Protocol) is a network communications protocol, developed by Microsoft. There are 2 variations of RDP:

1. It can be utilized to enable users to connect to a remote Windows computer.

Use Cases for accessing a remote Windows computer:

- Travel: If you travel or go on vacation, you may need to access your Windows office computer from a remote location, using a computer available at a hotel or someone else's home. This is easily accomplished using RDP.
- Work from home: You can easily access your Windows computer at work using any of your home devices.

2. It can be used to access virtual desktops.

In this type of RDP implementation, user devices (laptops, tablets, mobile phones) connect to servers in the cloud where they access their programs, storage and compute resources. The server presents the same virtual desktop to all users.

Use Cases for RDP using virtual desktops:

- This type of RDP is commonly used in everyday IT environments. Instead of relying on a computer's local resources, users connect to a server where their device receives its programs, storage, RAM, and operating system that they need.
- Using RDP, users can connect to their existing desktop sessions on the Windows server from any device, anywhere. They can interact with their programs, files, and network resources, leaving their workflow unchanged.
- It is ideal for environments that have groups of users who run the same software.

RDP is the first option for DaaS on the scale of budget versus technical solution. It is inexpensive, and while it isn't appropriate in complex environments, it does have benefits for its niche. It is easy to administer remotely, and organizations realize immediate efficiencies over maintaining individual user workstations.

RDP can be used from Windows, Linux, Mac, and other operating systems. However, the endpoint must always be a Windows device.

Drawbacks of RDP

- There are not many personalization options for RDP, so it is best suited for organizations with similar user profiles.
- One user that consumes too many memory resources (RAM), can create a decreased experience for all other users. An example of this would be if a user has too many browser tabs open, each of which consume RAM. This creates a situation called "resource contention," and can be problematic.
- Depending on the age of your printers, add on programs may be needed for reliable printing services.
- Using mobile devices with RDP can be challenging.
- If any programs that use heavy graphics or video are needed, RDP does not perform well.
- More feature-rich and scalable solutions are available, making RDP a less modern solution that does require more maintenance and day-to-day interaction than other options.

Option 2: DaaS using VDI (Virtual Desktop Infrastructure)

VDI is next on the scale of budget versus technical solution. It is much like RDP, however provides some clear advantages for environments that require more sophistication than RDP can provide. Solutions using VDI are customizable and scalable for the future.

Much like other DaaS offerings, users can access their environment from any device, anywhere. The clear benefits of VDI are as follows:

- Each user can have a customized experience, with a combination of programs and apps designed just for them.
- Users can each have the compute (RAM and storage) tailored specifically for them and the programs they run.
- Allows precise permissions to be assigned, managed, and monitored. This is valuable for healthcare applications where HIPAA compliance is required, or in educational environments where only specific curriculum content should be accessed per user. It is also ideal for shift workers, where it is necessary for staff to share a computer but need varying access to programs and resources.
- VDI is the easiest of all DaaS offerings when it comes to remote management, administration, troubleshooting and new user deployment. It is extremely flexible and easy to maintain.
- VDI offers the best experience for mobile workforces. Tablets and smartphones can easily be integrated into the environment without additional tools.
- While the monthly subscription fee for VDI is higher than RDP, in the long run it increases cost efficiency by reducing labor, energy and time for maintenance and day to day management.
- VDI requires less bandwidth to perform well, so is ideal when employees need to work remotely for long periods of time.
- VDI is available using several platforms, including VMware and Citrix. Citrix has some features that VMware does not, which include:
 - It is more scalable for programs that have high end graphic requirements
 - It is certified by Microsoft to support Teams
 - Video applications provide a more robust user experience, as resources are pushed to the local device when video is needed.

- Security is greatly enhanced in VDI deployments:
 - VDI is a way for organizations to get back the "old school security fortress" around their infrastructure, as it is able to be fully monitored and managed.
 - Endpoints, such as user devices, are easier to manage, as the VDI session is all that should be loaded on them.
 - There are standard application loads per user, so software cannot be downloaded that is not placed on the virtual desktop by IT.
 - Software versions and patching are fully controlled by IT, versus users receiving onscreen prompts to update.
 - Browser isolation can be deployed, which isolates endpoints from active web content, ensuring that any breaches that occur on the Internet stay contained in that browser session.
 - User data is contained and secure in the server environment, versus on a user device.
 - There is no content on a user device that could be comprised via a cyber threat or if the device is physically stolen or missing.

Option 3: DaaS with GPU (Graphics Processing Unit)

This option for DaaS is the highest on the scale of budget versus technology solution.

- It rolls up all the benefits of other DaaS solutions, and adds an enhanced graphics experience.
- While DaaS with GPU can be used to enhance an RDP environment, it is most commonly deployed with VDI. The reason is simple: VDI environments are more sophisticated than RDP, which creates a natural need for enhanced graphics.
- A robust environment is provided for nearly any software, including 3D modeling, video production, and simulations. This environment surpasses the ability of any local device, and allows extensive amounts of compute and stunning graphic rendering.

SECURITY SPECIFIC TO DAAS

While all variations of DaaS offer more security inherently by design than traditional devices, additional security measures are required to ensure remotely accessed environments are built securely and stay secure for the long term. The importance of proper security cannot be minimized. In many cases, data travels across the public Internet and special care must be taken to appropriately secure this data.

Recommended security for all DaaS deployments:

- Encryption technology that enables safe connectivity into the DaaS environment
- 2 factor authentication (2FA), that confirms the proper end user is logging into the system
- Aggressive password policies and user training to support the policy
- Documented security policies for users, such as frequency of password changes
- Antivirus
- Optimized firewall settings
- Properly sized routers and switches

The above recommendations should be built into the budget for any DaaS initiative.

NETWORK DETAILS

When using DaaS, the available network bandwidth greatly impacts the quality of the user experience. Different applications and display resolutions require different network configurations, therefore it is important to make sure the network is configured properly and with sufficient amounts of bandwidth.

It is best to determine the bandwidth that will be needed on a per user basis. Variables that determine each user's needs include:

- Their workload
- The resolution they run on their monitors
- The number of monitors they use

In addition to determining and adding up each user's needs, you also need to take into consideration the requirements of the entire IT infrastructure. Remember to consider other applications that consume bandwidth such as:

- Video conferencing
- VoIP phones
- Streaming services
- Large files that are accessed or saved to a share which exists outside of the DaaS environment

VENDOR CONSIDERATIONS

Most organizations don't have someone on staff with expertise in DaaS or network design, so a Managed Service Provider (an MSP) is consulted.

Regardless of the DaaS solution, it's important to choose the right MSP partner to help you gain even more expertise, implement the solution, and also manage it long term. Some things to consider:

- Is the MSP experienced in DaaS design and do they understand your use-case for it? They should be willing to explore and explain all DaaS options and recommend the best solution.
- Be cautious of an MSP that makes you feel “in a rush” to get started, or is trying to capitalize on any change in the industry or popular trend. DaaS is a large undertaking and something that needs to be thoughtfully considered, planned for, and budgeted.
- Be cautious of an MSP that is "selling" to you versus helping you create a customized solution, and not taking the time to understand your business and its nuances, etc.
- Does the MSP offer services for all phases of life for DaaS, including planning, implementation, management, and ongoing support of the environment? If they don't, you should consider consulting with a different MSP, as it will be up to you to make the solutions of various vendors work together. This is time consuming and often ineffective.
- Does the MSP understand cyber security, your compliance criteria, and how to implement both inside of a cloud environment?
- Your chosen MSP should have network expertise, as any reliable DaaS solution is heavily reliant upon network infrastructure.
- One of the only drawbacks of DaaS is that it depends heavily on 2 components to operate, and it is critical that you understand your MSP's ability to manage both variables:
 1. Availability of the servers that DaaS runs on
The servers that your solution resides on may be new, but they may be inside of an outdated or inappropriate data center. There are many levels of data centers available in the market, and they increase in price based on their up-time capabilities. Many times, MSP's and service providers choose one of the least expensive data center options so their service offering can earn more margin. Less money equals less redundancy and increased outages. Make sure your MSP houses your DaaS solution in a Tier III or Tier IV certified data center (It is common for customers to ask to see the data center's certification).
 2. Availability of the network services the DaaS solution travels across
Your MSP should be concerned with redundant Internet access, both for your organization and their DaaS offering. Educate yourself on the number of Internet providers that their solution is deployed over, as well as make sure they architect sufficient Internet into your DaaS solution.

OBTAINING EXPERTISE

When talking to an experienced MSP, you should be ready with some high-level information, so the MSP can then dig deeper into your environment and determine which DaaS solution would work best for your company:

- What operating system runs on your users' computers (Windows is typical)?
- What operating system do your servers run? If you don't know, that's OK, instead you should have server-level login credentials ready so the MSP can take a look.
 - The MSP will eventually need login information or an export of your server environment, so they can ascertain all of the resources and programs used in your environment.
- What programs and applications do your users run?
 - Are there groups of users who run the same set of programs and applications?
- Do you have users who run resource intense programs such as design, graphics, or mapping programs? Those individuals will likely need specialized resources, and should be identified at the onset of the project.
- Where do you want your users to be able to work? The office, home, while traveling, a combination of settings, etc.
- Do you have compliance requirements that your organization has to meet such as PCI, HIPAA, etc.
- Do you have budget constraints that the MSP should know about at the beginning of the project design?
 - Note that if you don't feel comfortable talking to your MSP about budget, you may have the wrong MSP. DaaS is an important initiative for any size organization; planning and implementation require transparency and trust.

CONCLUSION

This Whitepaper covered many details and nuances of DaaS, but it is by no means comprehensive. Every organization has varying needs and requirements, and DaaS design is not a "one size fits all" solution.

OneIT has designed, deployed, managed, and provided ongoing support for DaaS environments for over 10-years. We understand the complexities of not only the solution, but also of the end users who may be resistant or unsure of change.

The current health crisis has forced organizations to immediately consider remote working solutions that may have originally been planned for the future. The technology is available and constantly progressing - let OneIT help you design a customized solution that helps you think long-term and choose the future now.

CLIENT TESTIMONIALS

"Once the first two cases of COVID-19 were discovered in Michigan I was asked to put a plan in place for any concerned staff to have the option to work remotely. Four days later this expanded to announcing the closure of our physical offices, asking staff to pack up and head home. Although this whole situation is a little surreal, making the change to full remote working was absolutely seamless thanks to the IT infrastructure OneIT already had in place for both our cloud and on-prem environment. OneIT has been great throughout the process, making sure appropriate changes were made to accommodate our staff, and that I had all the information I needed to comfort our Executive Director. We attended a webinar of IT Directors held by our industry's national organization to discuss preparedness for the coronavirus, and found we were far ahead of every other organization. The following day our Executive Director was on a webinar panel of Executives for the same group, and we were clearly received as the national example for preparedness. I value our partnership with OneIT and appreciate their expertise and responsiveness."

- CIO, Michigan government agency

"We sincerely appreciate OneIT for putting together the disaster response effort for our I.T. infrastructure in response to the Coronavirus pandemic, OneIT has a solid group that we appreciate"

- CEO, Law firm with offices in 6 states

"I just wanted to take a moment to let you know how appreciative we are of the team that you have assembled at OneIT, especially the technicians. I'm always so impressed with how friendly, down-to-earth and helpful they all are. So thank you so much for seeking out and hiring great people! I'm looking forward to continued collaboration."

- Director of Operations, large non-profit advocacy organization

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