How to Determine if WVD is the Right Choice for Virtual Desktops

Your organization has recognized that a Virtual Desktop is the solution of choice. Fantastic, we agree! VDI is all the rage today and Microsoft has WVD, so do you simply go that route and roll it out? Seems cheap and easy, why not?

Before you can answer the question of "Is Microsoft's WVD right for our organization?" you should step back and ask yourself the following: "As an organization what are we trying to achieve, what does our IT strategy look like and how do virtual desktops fit into that strategy?" As technologists we often go straight to solutioning, or worse a specific technology we have been desperate to deploy into production. The focus shifts to the technology and we lose sight of **what the business wanted to achieve in the first place.**

So, how do you get to the right answers?

First, spend as much time as possible with end users, this will give you real insight into what the business needs to achieve and how they work to achieve their objectives. By deciding to deploy virtual desktops you already have an idea of what you are trying to achieve – a better end user experience, or maybe you are being tasked with a dramatic IT budget cut, or perhaps you must deliver a remote access solution for staff or offshore workers. Each of these scenarios could lead you to select a different solution. Get the right combination and you have the formula for the most successful VDI deployment. Making the wrong decision will have far-reaching consequences for your organization and could be a time-consuming, humbling, and costly migration.

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What are my options?

Public Cloud: Run your desktop in a public cloud – Microsoft's cloud, based on their brand recognition and the company that delivers the Windows OS is a likely candidate you may look at. WVD stands for Windows Virtual Desktop and it is Microsoft's virtual desktop offering that runs in their Azure cloud platform.

> ***According to Microsoft*** *"Windows Virtual Desktop is a comprehensive desktop and app virtualization service running in the cloud. It's the only virtual desktop infrastructure (VDI) that delivers simplified management, multi-session Windows*

10, optimizations for Microsoft 365 Apps for enterprise, and support for Remote Desktop Services (RDS) environments. Deploy and scale your Windows desktops and apps on Azure in minutes, and get built-in security and compliance features."
- azure.microsoft.

Desktop as a Service (DaaS): Is an approach to delivering VDI in which the infrastructure and hosting are outsourced and handled by a third party, typically this approach would also provide an agreed level of management for the deployment - usually including everything up to the hypervisor but potentially even including the desktop and applications – this is where you get the flexibility to choose what level of help you need and get this from a single vendor.

A DaaS provider also typically handles storing, securing, and backing up a user's data, as well as upgrades for the DaaS infrastructure. WVD is different in this aspect as there is no option for Microsoft to manage anything that you deploy. You are responsible for OS updates, and application support – it's truly self-service. If you want someone to manage this for you, it is possible, but you will typically pay someone handsomely to do it. Managed Service Providers (MSP) are delivering a DaaS but engage with the expectation of replacing your staff and outsourcing the entirety of your VDI deployment. They manage everything but this also has an increased cost.

Deploy on-premises (on-prem): This is fairly straight forward, and most people will be very familiar with this as it is how IT has been typically deployed and managed. Servers are deployed in your data center or sometimes in the communications closet tucked away at the back of the office. Your IT team manages the infrastructure, the desktop, and the applications that run inside it.

It's very easy to get swept up in the marketing of public cloud and go all in with a cloud solution, it sounds so easy. Enough customers have now experienced this and have the scars to show for it. Our goal with this white paper is to give you the questions you should ask BEFORE you make a decision regarding your VDI infrastructure. Learn from our experience working with hundreds of VDI customers. We strive to provide the information as factually as possible (we are human, and we do believe in our solution so forgive any bias we missed.) We have had too many customers tell us, we wish we had known x,y,z before we tried to run VDI in the cloud or if only we had known how to calculate the true cost.

Now let's look at some of the issues you should consider before making a decision.

How often do my employees access their desktops?

A VDI desktop has to be available when the end user needs it, this means at the very least it's going to run for ~10 hours a day. What if your users need access 24x7? One of the most expensive components to run in a public cloud is a virtual machine (VM) for 24 x 7. How long do you want your VM to run? The default for WVD is 220 hours – that

is roughly 10 hours a day for a five-day working week – I'm sure your employees would love being limited to only having access to a desktop 10 hours a day, 5 days a week, but that isn't how business runs these days. Start calculating the productivity cost this is going to have on your organization! A 31-day month has 744 hours – that's more than 3x the cost of the default scenario.

If you are not going to pay to run your desktops 24 x 7 then you may have to hope there is capacity to run your desktop.

What happens if my end users suddenly need access to a desktop 24x7?

The cost of running your WVD desktop will more than double, also consider the way you manage your environment needs to change – there is more to consider when running a 24x7 environment – how do you upgrade desktops, deploy new applications, take backups, all of these need a different way of thinking. The benefit of a DaaS offering is that it is available to you 24x7 and the DaaS provider has overcome all of these challenges and will manage the environment for you in the right way. The same with deploying the solution yourself, you have ultimate control over when it's available.

Assume for a minute you are able to get over the cost hurdle, there are many more hurdles you need to get over:

Will I be able to deliver a consistent end user experience?

Microsoft WVD isn't a single delivery mechanism; it actually encompasses two delivery methods:

- **Windows 10 Virtual Desktops – VDI.** Each user has access to their own desktop, and this can be either a stateless or persistent desktop.
- **A Shared desktop** – Is an instance of Windows Server made to look like Windows 10. Historically known as Terminal Services, a Windows Server is used to control and manage processes and applications on behalf of a user. Multiple end users access the same server.

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When evaluating a WVD based solution, it's key to understand what Desktop delivery model is being delivered and you need to be confident you are comparing the same delivery method when comparing DaaS and on-prem solutions. Why? The solutions are not equal. Delivering a shared desktop is cheaper but has many limitations including: the inability to run applications simultaneously without drastically impacting end user performance, or whether applications can even run in 'terminal server' mode. End users can be severely impacted in terms of their experience when they are unable to install their own applications, can't update device drivers, and are at the mercy of other users on the same system 'playing fairly.'

How do you ensure optimal desktop performance?

If you are deploying WVD you need to be comfortable with ALL your data being in the cloud! End user experience, as we discussed, is key for a successful VDI deployment. You don't want your users having to wait a long time for applications running inside the desktop to have to go back to a file share in your organization to pull data – this round trip time will not only slow everything down for the end user it will dramatically increase the bandwidth cost. DaaS providers understand this and will have strategies to help move the data to their data centers to ensure a good end user experience or help you put in WAN optimization technologies to minimize the overhead of running in two data centers. Deploy on-prem and you don't have to think about this, everything is already in the same data center!

Do you have the security architects on your team to ensure you are properly protected when placing your desktop infrastructure in a public cloud?

Cloud security is a dark art these days – you pay a lot for security consultants to help architect a solution and then you have to ensure you have the right network configuration, that only your users/desktops/applications have access to your data, and stop the rest of the world getting access. How many times have you heard of data being downloaded from unsecured object stores in public clouds? As you add more and more security layers the cost and complexity of a cloud based deployment goes up – you pay for what you use.

DaaS providers are running your desktops in their contained infrastructure – they vet each customer and don't allow people who are not supposed to be there into your environment. They can put high-end security devices on the edge to protect all of the customers, and on top of that have the appropriate skills to protect your desktops and data. Deploy this on-prem and you have the comfort that you are the only one in your datacenter and you can deploy the level of security appropriate to your organization. If you are on-prem and you leave a file shared unprotected it's not ideal, but you don't have the whole world instantly downloading your data.

How do I properly size my VDI?

Sizing each of these 'desktop' delivery methods for an organization is a complex and deep topic. We won't get into too much detail in this paper; however, we would be remiss if we skipped the discussion point altogether. Consider what it takes to deliver the standard – 2vCPU and 4GB of RAM desktop. This is the bare minimum starting point for Windows 10, anything less and it's unlikely your end users will be satisfied. If you have users that have heavy office productivity applications or need specific requirements then you will be looking at provisioning 8, 16, or even 32GB of RAM. Finally consider the storage performance your solution requires – you pay for IOPS in a cloud solution – the more you need the more it costs. DaaS and on-prem solutions

differ here in that they typically default to SSDs today and you get full access to the 10's of thousands of IOPS they can provide. We discuss this cost more later on.

When provisioning your own on-prem solution or consuming desktops from a DaaS provider, you have the opportunity to review your existing desktop estate and work with your chosen solution provider to ensure the new service is going to meet your needs. When you buy WVD everything is self-service unless you allocate significantly more funds to consulting and deployment.

How do I work out the cost of a desktop?

If the art of sizing a desktop wasn't hard enough, pricing a desktop in a public cloud provider takes you to a completely new level.

What size desktop do you need to deploy – unsurprisingly the larger the desktop the more it costs to run. Incredibly there are ~310 different VM specs to choose from, not all of them suitable for VDI, but they range in price from 2 cents per hour to nearly $50 per hour. It's more complicated than that though – Do you need a B2S with 2vCPU and 4 GB RAM for $0.0416 / hour or an A2 v2 with 2vCPU and 4GB RAM for $0.091?

Where do you want to run your desktop? Electricity and building costs vary massively around the world and this is reflected in your WVD pricing. In the USA this is a relatively small difference. The B2S desktop we mentioned earlier ranges from $0.0416 to $0.0496 per hour, over a full month that's actually $5.88. So now consider the balance of running desktops close to end users vs the increased cost of having that privilege. Want to run a desktop in Switzerland? It's nearly 2x the cost of running it in the USA. When a DaaS provider spins up the service for you they take this into consideration so again you don't need to calculate all of the individual scenarios. The cost you pay for far-flung users will be balanced into your per user per month cost.

Windows 10 is I/O heavy. Most laptops today can give a user 10s of thousands of IOPs, and Windows makes use of as much of this as you can give it. Moving to the cloud and providing the same level of I/O performance can get incredibly expensive. The default is 500 IOPs, need 5,000 IOPs that's an additional $122.80 per user per month! Skimp on IOPs at the risk of many disgruntled end users hating your slow and laggy VDI deployment.

This gets you a VM, but there are more components to a virtual desktop deployment that you have to add into your cost: storage, performance, bandwidth and support to name a few – the WVD cost calculator takes you through all of this – but you are expected to know what you don't know – you find yourself back in the situation of needing experts all around you just to deploy a desktop. There will be things you forget, and they are easy enough to add, but, in the blink of an eye, a seemingly cost-effective move to the cloud becomes a financial quagmire.

When deploying your own solution on-prem or working with a DaaS provider there are no unknowns. Deploying your own solution, you have a quantified capital investment that you typically depreciate over 3 or even 5 years. It's an expensive capital outlay

upfront but a known and quantifiable cost. Or, if you already have the equipment at hand, it's a minimal outlay to reuse or repurpose hardware and deploying a simple VDI solution like Hive Fabric (shameless plug.) When consuming a DaaS service you have a fixed per desktop per month cost that doesn't fluctuate based on usage or bandwidth requirements – you know exactly what you are going to pay and when you are going to pay it.

Great insight but how much does a WVD desktop actually cost?

The Azure WVD calculator is available online. We used it to get an idea of what it really costs to run an environment for 250 users on the East Coast USA, ensuring the desktop was available to the user whenever they needed it and each Windows 10 desktop was provisioned with 2vCPU, 4GB RAM and 10GB of user data and 1000 IOPs. Azure Active Directory was added with a small amount of bandwidth – overall the bare minimum for a lightweight user. The cost? $58.88 per user per month. For comparison we have seen DaaS providers deliver a comparable desktop running on Hive Fabric for 50% of this cost often with more resource and the added benefit of it being provisioned and managed for you. If you have existing infrastructure and can deploy on-prem then this can be the most cost-effective solution – especially if you already have the process and team to manage it – get the simple environment you need by paying for Hive Fabric.

What else do I need to consider when deploying a WVD desktop?

Yes, unfortunately there is still more to implement when moving to Azure WVD. Azure Active Directory is required for WVD. This is a separate service within Azure and has a monthly cost based on the number of users. In addition, you also need an Azure Virtual Network to connect back to your organization if you will still have additional resources on-prem, rates for this vary based on the amount of bandwidth transferred. Even then this is the bare minimum, what about backup, DR, and security - all these services are available with varying levels of additional cost, configuration, and ongoing management.

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There are many more questions to consider and one that comes to mind is **who supports your environment on an ongoing basis?**

In conclusion Microsoft Azure WVD will be right for some organizations, likely those that are small, don't have a lot of applications or desktops, have employees that work 9-5 pm, require minimal IT support. Another good use case would be organizations that have a short term demand for a Windows 10 desktop or dramatically change the number of desktops they need on a weekly basis. WVD can be spun up and down for a matter of hours – this provides flexibility that just isn't available from deploying the solution on-prem or purchasing from a DaaS provider.

WVD as a model is a brilliant concept in theory, pay for only what you use – allow the servers to be used by others while you don't need them. In reality, there are some serious risks. You can gain all the benefits of the concept while maintaining control over your data and have a team of dedicated experts that you can hold responsible should any issues arise with many of the Desktop as a Service (DaaS) providers. Mechanistically it's exactly the same as WVD, however, it has some clear additional benefits.

Ultimately – the question you need to ask yourself, Is the risk worth the reward?

You don't want to be in front of your CFO explaining why you are 200% over what was initially budgeted or worse on the front page of the Wall Street Journal under the headline "Ransomware took down your entire company" because you couldn't secure your VDI deployment.

About HiveIO

HiveIO develops Hive Fabric, a tightly integrated all-in-one virtualization platform for VDI – providing an unparalleled end user experience. HiveIO has helped hundreds of organizations reduce the complexities of VDI management, by leveraging swarm theory to intelligently utilize resources, scale their infrastructure, and simplify its management.

HiveIO is the power behind many MSPs. We can help you find the one that is right for your organization or we can help you deploy on-prem. We hope this white paper has helped to provide guidance on what to consider when deploying VDI. We would love to hear about your decision, reach out to us or drop us a comment: info@hiveio.com.

HiveIO's Community Edition can be downloaded for free at www.hiveio.com. It provides all the technologies you need to deploy VDI as a single packaged install for up to 5 users, and allows you to experience the power of Hive Fabric in minutes.