CUBESYS

VIRTUAL DESKTOP

A Roadmap To Adoption

WWW.CUBESYS.COM.AU

2025

INTRODUCTION

When you think of the future, it's hard not to imagine a world where we all work remotely. Virtual desktops have become increasingly popular as companies realise that remote employees need access and security just like their onsite counterparts. Businesses are adapting, cutting costs and providing better security with Virtual Desktops like Azure Virtual Desktop (AVD) and Windows 365 (W365). I bet you're thinking, "If they're only good for those who work from home, what about my other remote workers?" Don't worry, Virtual Desktops have you covered! They provide an easy way to give your entire team enterprise-grade protection no matter what device or location they may use at any given moment in time. And that's not all; with the power of the Azure cloud's high-end graphics, developers and scientific modelling are now common workloads for Virtual Desktops. Better yet, they are very cost effective, as you only pay when you use them.

Sounds great, but is it right for you and how do you get started?

Over the last 13 years, cubesys has been supporting organisations like yours to adopt modern workplace solutions that we fully customise to suit your needs. In that time, we deployed Virtual Desktops and remote applications to over 120 organisations and we have answered the following questions:

1. Where do I start?
2. Which Virtual Desktop solution do I choose?
3. How much does it cost?
4. What technology do I need?
5. How long does it take?
6. How do I track operational costs?

That's where the Virtual Desktop Economic Plan for Success Sessions come in!

In this e-book, we lay out our approach and tools which allow us to gather EVERYTHING you need to choose the right solution for your business, build a solid business case, see the technical roadmap, and calculate the timing to adopt a virtual desktop environment for your business.

AND the amazing part? We only need 3 days to get everything you need.

Happy reading!

CHAPTERS

WHAT IS A VIRTUAL DESKTOP?

A virtual desktop is a fully-fledged operating system that runs on remote servers. This enables you to securely access work applications and data from wherever and whenever! Just like being in the office.

While multifactor protected log-ons and conditional access secure the desktop access, users get the benefit of working from anywhere with a Wi-Fi connection. What's more, the Virtual Desktop is actually inside the corporate network, so the security you use today is already in place, the user experience is the same and access to all corporate applications is available. It's like having all the benefits of your office desk without being teathered to your cubicle!

01

WHAT IS A VIRTUAL DESKTOP AND WHICH ONE DO YOU NEED?

WHICH VIRTUAL DESKTOP IS BEST FOR YOU?

AZURE VIRTUAL DESKTOP (AVD) OR WINDOWS 365 (W365)?

Windows 365 service and Azure Virtual Desktop (AVD) are both "desktop as a service" solutions from Microsoft but there are several important differences between them. Our awesome friends at Nerdio have developed this graphic that helps you understand which one is best for you!

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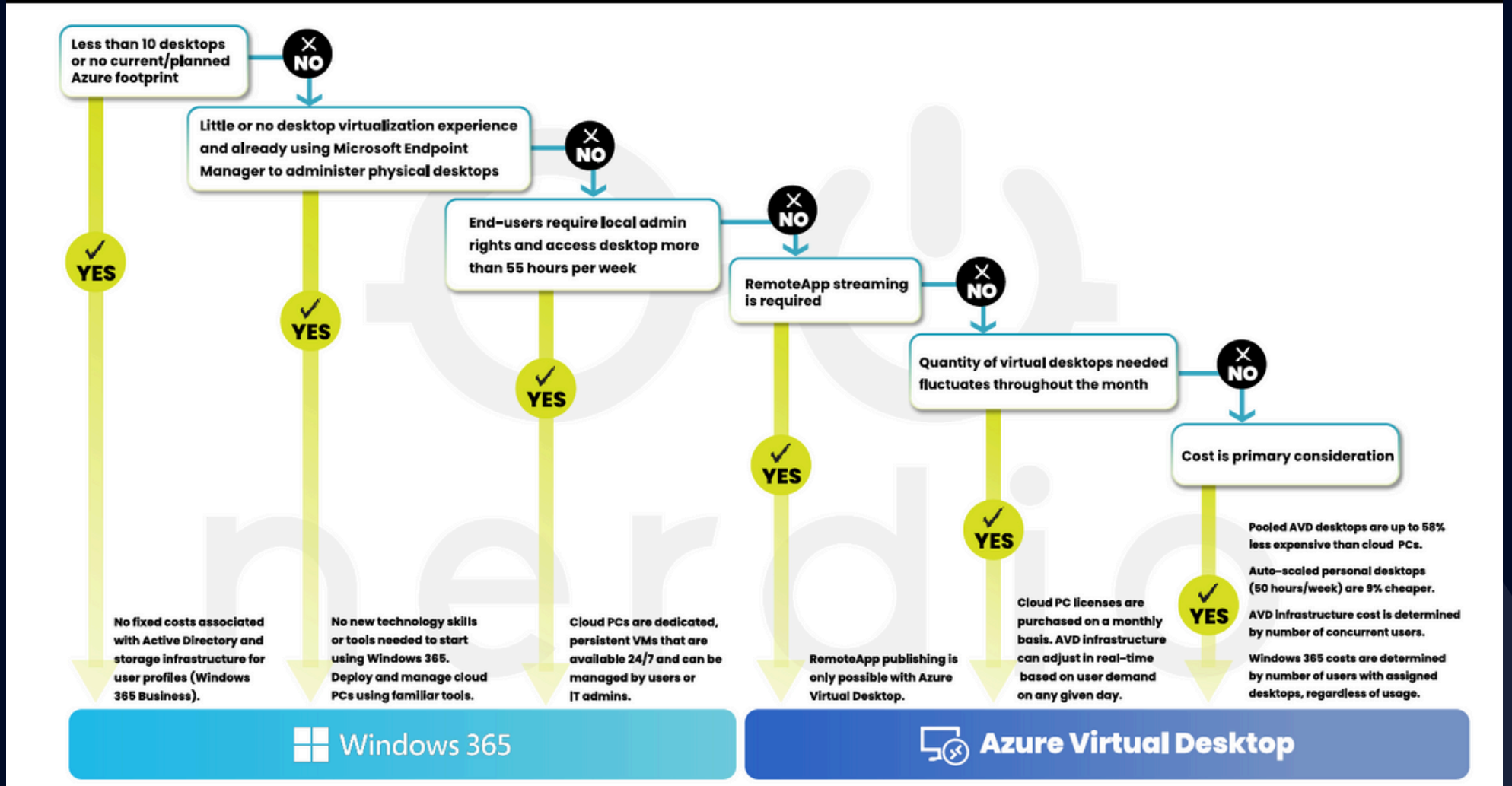
Windows 365 vs. Azure Virtual Desktop - Decision Flow



Still not sure? The next page provides use case options for both Windows 365 and Azure Virtual Desktop to help provide some more clarity!

06 USE-CASES WHERE WINDOWS 365 IS A BETTER FIT THAN AZURE VIRTUAL DESKTOP

01

YOU HAVE FEWER THAN 10 DESKTOPS

If there are a small number of desktops in your IT environment, then Windows 365 Business is the perfect choice. It does not require any pre-requisites like AVD does. For example, there is no need for an Active Directory configuration or a storage location for FSLogix containers. So, from an ease of deployment, management, and cost-effectiveness perspective Windows 365 Business is a clear winner.

02

NO CURRENT/ PLANNED AZURE FOOTPRINT

Some organisations have simple, cloud-only IT environments with Microsoft 365 and other SaaS products and no infrastructure footprint in Azure with no plans to add any such infrastructure. In this scenario, Windows 365 Business is an excellent choice because it is easy to assign desktops to users and there is no administrative overhead for IT admins.

03

NO PRIOR DESKTOP VIRTUALISATION EXPERIENCE

Only a small fraction of Windows devices are virtualised today with technologies like AVD. Desktop virtualisation is a complex technology requiring a specialised skill set. Many organisations do not possess such a skill set and are not looking to build it. In this scenario, Windows 365 Enterprise is a great option. It does not require knowledge of multi-session administration, profile encapsulation, auto-scaling, and other complex concepts found in AVD. Instead, it provides a simpler way to deploy and manage Cloud PCs alongside existing physical PCs in much the same way.

06 USE-CASES WHERE WINDOWS 365 IS A BETTER FIT THAN AZURE VIRTUAL DESKTOP

04

YOU HAVE CURRENT INVESTMENT INTO MICROSOFT ENDPOINT MANAGER

Organisations that have already made an investment into Microsoft Endpoint Manager to administer physical desktops and laptops will find Windows 365 an easy way to extend their existing environment with Cloud PCs. Similar policies can be used to manage both physical and Cloud PCs.

05

PERSONALISED DESKTOPS AND LOCAL ADMIN RIGHTS

Cloud PCs are designed to be dedicated, personalised VMs belonging to each individual user. These users may need the ability to administer their own PCs by installing software or making other configuration changes that require local administrator rights. Windows 365 Cloud PCs make it easy for IT to delegate administration of Cloud PCs to their users.

06

USERS NEED TO ACCESS DESKTOP 24/7

Auto-scaling is a common way to save on Azure costs when using Azure Virtual Desktop. Cloud PCs, on the other hand, run 24/7 and shutting them down does not save any costs. If users need access to their Cloud PC on a 24/7 basis (or even more than 55 hours per week), then Windows 365 is not just easier to deploy and manage, it is also more cost-effective.

03 SCENARIOS WHERE AZURE VIRTUAL DESKTOP MAY BE A BETTER FIT THAN WINDOWS 365

01

REMOTEAPP APPLICATION STREAMING

Sometimes all that's needed is a published application rather than a complete Windows desktop session. In these scenarios using a full Cloud PC (or AVD desktop) would be overkill and a published RemoteApp application is a better way to go. Since RemoteApps cannot be published from Windows 365 Cloud PCs, Azure Virtual Desktop is the preferred choice.

02

HIGH FLUCTUATIONS OF NUMBER OF DESKTOPS NEEDED THROUGHOUT THE MONTH

Windows 365 licenses are monthly subscriptions. Once purchased, they are available for use and the cost is incurred regardless of users actually making use of their desktops. In IT environments where numbers of virtual desktop users fluctuate throughout the month, AVD may be a better fit. Azure Virtual Desktop infrastructure costs are only incurred when users are actually consuming the resources whereas Windows 365 costs are incurred as soon as a per-user license is purchased.

03

COST IS PRIMARY CONSIDERATION

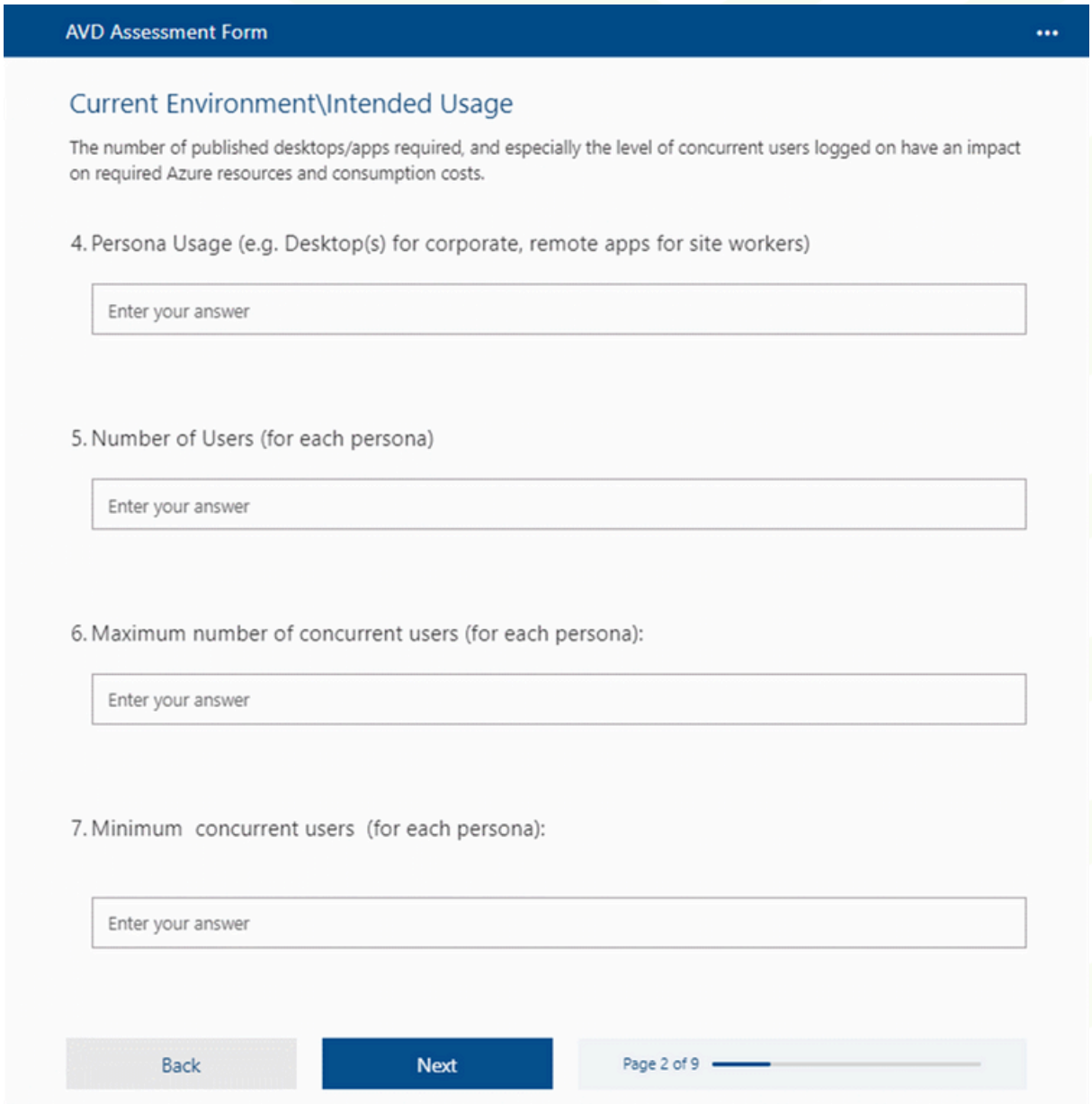
When cost is the primary consideration and pooled Azure Virtual Desktops can be used to consolidate several users on a shared VM, then AVD will be the better option since it will be more cost-effective than Windows 365 in this scenario. On average, pooled AVD desktops are up to 58% less expensive than dedicated Cloud PCs. Even auto-scaled personal AVD desktops can be up to 9% cheaper than Windows 365 equivalents if users only utilise their desktop 50 hours per week. Finally, Windows 365 costs are determined by the number of users with assigned Cloud PCs, regardless of actual usage. Azure Virtual Desktop infrastructure cost is determined by the number of concurrent users, which is often much lower than the total number of users assigned to desktops.

02

UNDERSTANDING YOUR CURRENT ENVIRONMENT

UNDERSTANDING YOUR CURRENT ENVIRONMENT

Before you meet with one or our amazing cloud engineers, we send out a quick questionnaire to help us learn more about your business and how we can help. Because, to know where we need to go, we need to understand where we are. This deep dive questionnaire looks like this:



Users profile type (resource usage)

The below user profile definitions contribute to VM sizing guidance. For more information refer to: https://docs.microsoft.com/en-us/windows-server/remote/remote-desktop-services/virtual-machine-recs#multi-session-recommendations.
Light: Users doing basic data entry tasks. Database entry applications, command-line interfaces.
Medium: Consultants and market researchers. Database entry applications, command-line interfaces, Microsoft Word, static web pages.
Heavy: Software engineers, content creators. Database entry applications, command-line interfaces, Microsoft Word, static web pages, Microsoft Outlook, Microsoft PowerPoint, dynamic web pages.
Power: Graphic designers, 3D model makers, machine learning researchers. Database entry applications, command-line interfaces, Microsoft Word, static web pages, Microsoft Outlook, Microsoft PowerPoint, dynamic web pages, Adobe Photoshop, Adobe Illustrator, computer-aided design (CAD), computer-aided manufacturing (CAM)

11. Light

Enter your answer

12. Medium

Enter your answer

13. Heavy

Enter your answer

14. Power

Enter your answer

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Based on these questions, we can make a full assessment of your current environment and recommend an architecture that is designed for you and your users.

WHAT THIS WOULD LOOK LIKE

**NOTE – this information is an example only. It is not based on a real organisation.

AVD COMPUTE COST

The below table presents cost estimates focusing on compute to cater for staff, based on PAYG consumption cost model.

The Dv4 family of Azure VMs have been recommended. This family of general purpose VMs are powered by Intel® Xeon® processors and offers an optimal blend of compute and memory. The D4s v4 SKU (4 vCPUs (2.70GHz), 16GB RAM) has been recommended, with comparable specifications to existing hosts used on-premises currently.

COMPUTE

Currently, all of these workloads are hosted on Citrix infrastructure consisting of 18 Windows Server 2016 servers.

Primary Regions

ITEM	COMMENTS / PRICE
Azure VM SKU	D4s v4
VM vCPU	4 (4 users per core)
VM RAM	16
Users per VM	16
Hours per month / month	195 / business hours 533 / after hours
Required VMs – Business Hours	219
Require VMs – After hours (on 24x7)	10

After hours VM Compute cost (24x7)	$2,424.57
After hours Premium SSD OS Disk cost (24x7)	$262.57
Business hours VM Compute Cost (209 x 195 hours)	$13,573.24
Business hours Premium SSD OS Disk cost (209 x 195 hours)	$1,470.09
HDD OS Disk cost – Deallocated VM) (209 x 533 hours)	$1,920.37
Cost/month (PAYG)	$19,650.84

DR Region

ITEM	COMMENTS / PRICE
Required standby VMs (Deallocated)	50
HDD OS Disk cost (Deallocated VMs)	$627.51
Cost/month (PAYG)	$627.51

AVD PROFILE STORAGE COSTS

The below storage costs assume an average profile size of 5GB for staff.

Primary Region

ITEM	COMMENTS / PRICE
Assumed Profile Size	5TiB, 1GB (x 5000 staff)
Azure NetApp Files (Premium performance tier)	$2,609.08
Cost/month (PAYG)	$2,609.08

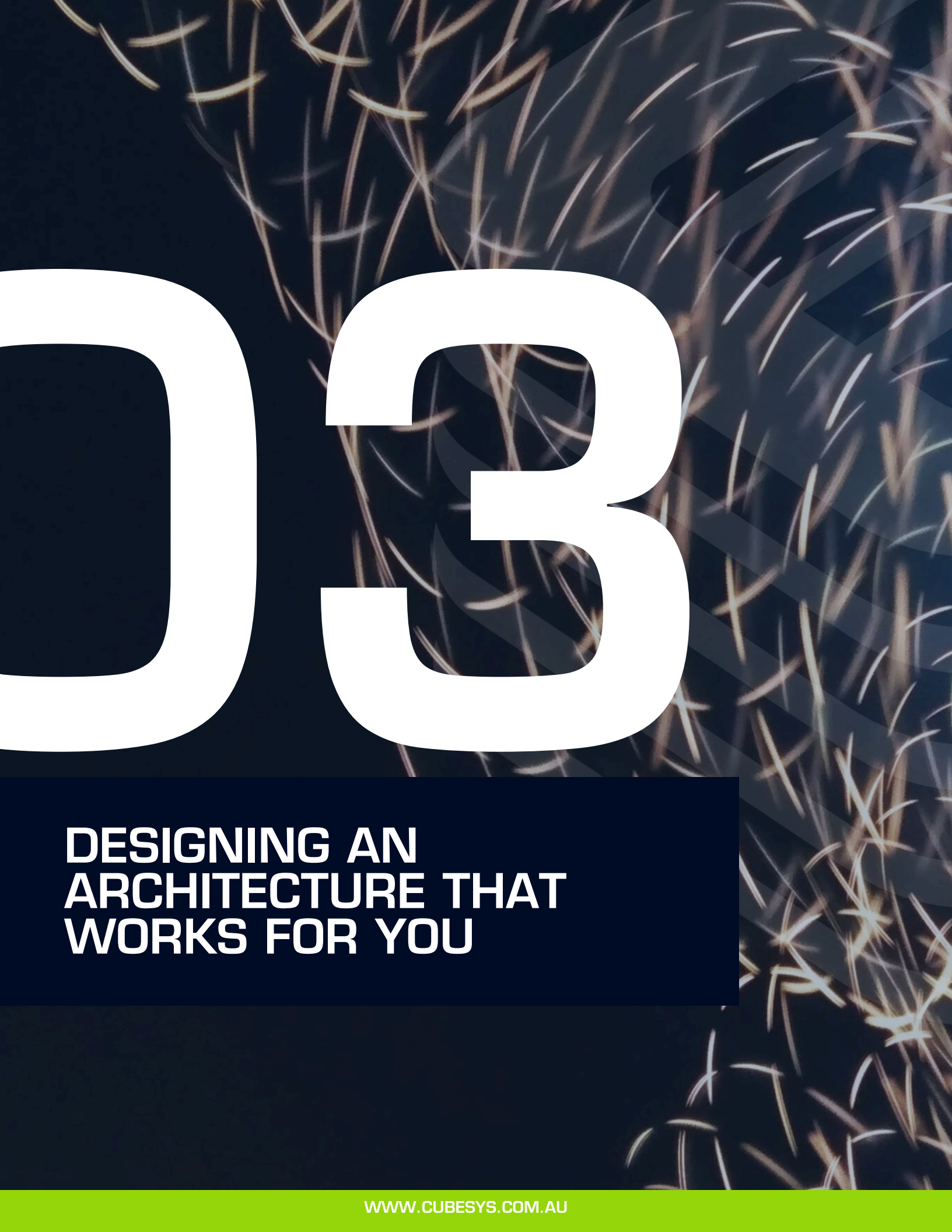
DR Region

ITEM	COMMENTS / PRICE
Assumed Profile Size	5 TiB, 1GB (x 5000 staff)
Assumed Profile Size	$1,110.30
Cost/month (PAYG)	$1,110.30

AVD MONITORING COSTS

To monitor the AVD environment, logs need to be collected from the Azure VMs and other Azure resources to a Log Analytics workspace. The below cost calculation is based on each VM sending 2GB of data to Log Analytics per month and assuming a retention of data for 31 days (which is the default and free). The cost is based on the VMs in the primary region only, as the secondary/DR region will be inactive normally.

Network Item	Costs / month
Logs for permanent VMs (219 VMs)	$1,870.91



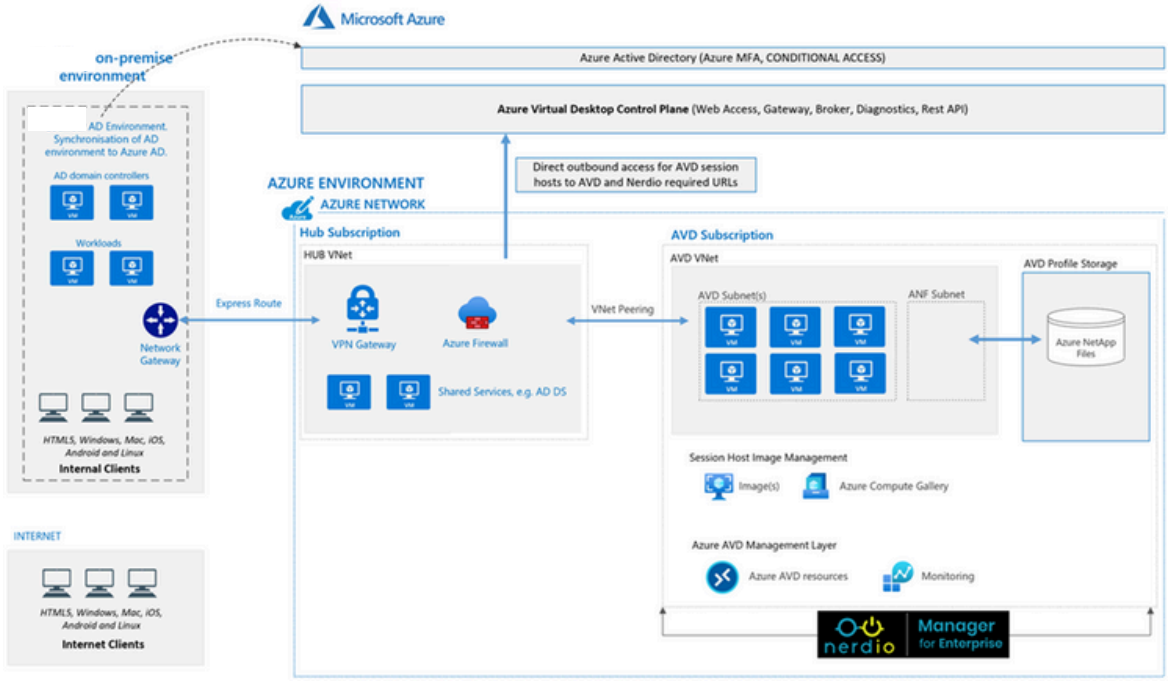
03

DESIGNING AN ARCHITECTURE THAT WORKS FOR YOU

DESIGN AN ARCHITECTURE THAT WORKS FOR YOU.

After working thorough your current environment, the cubesys team can recommend the best architecture option.

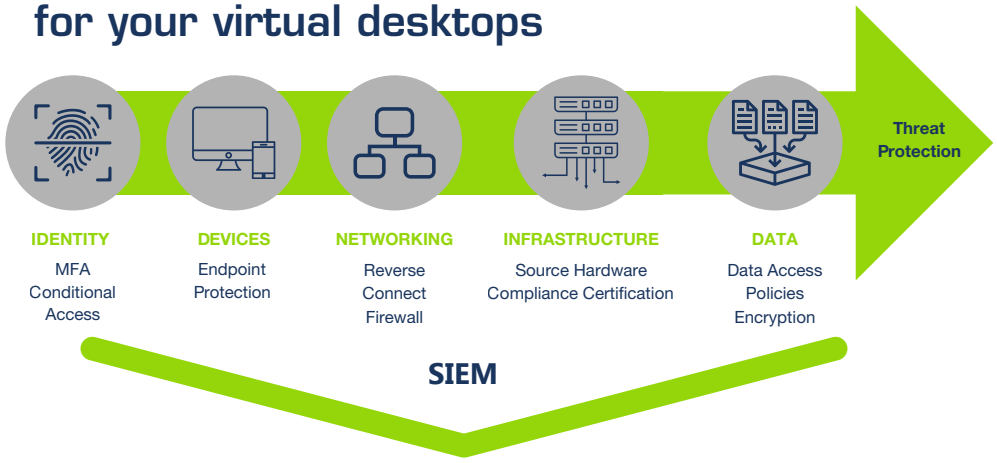
Below is a sample Azure Virtual Desktop (AVD) architecture.



Now you have seen a sample architecture, we would forgive you for thinking, "Are Microsoft's Virtual Desktops safe?"

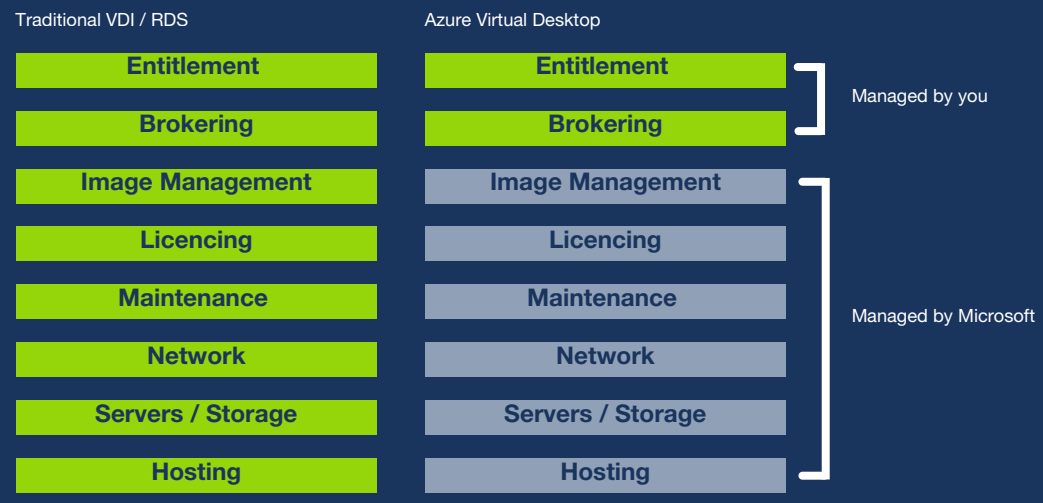
The short answer is yes! Microsoft is one of the few providers that provide end-to-end security and its one of the safest on the market.

Microsoft provides end to end security for your virtual desktops



Another thing you might be thinking is, "With all this new 'Technology' am I going need more people to manage it?"

The simple answer is, "No you won't." The below image showcases the difference when utilising Azure Virtual Desktop. Pretty great, right?



Azure Netapp Files

As we scale VDI solutions, it's important we maintain the end-user experience. A key component of this is disk performance. Guaranteeing disk performance can be challenging as we scale or deal with high-demand periods, such as the morning log-on storm. What we need is a data-centre-grade disk performance in the cloud. On top of that, we'll need to natively integrate with AD and NTFS permissions, scale in/out on-demand, provide a highly secure storage service, and do so at a cost point aligned to VDI. That seems like quite a challenge, doesn't it?

Luckily, Microsoft has just what we need with Azure NetApp Files. The addition of NetApp's technology to the Azure service allows us to meet all of these demands. cubesys highly recommends Azure NetApp Files for all our AVD deployments. It's been a key cornerstone to our success and client satisfaction.
You can find out more here: https://azure.microsoft.com/en-au/services/netapp/
or talk to the cubesys team for more details.

04

WHAT ARE THE COSTS?

WHAT ARE THE COSTS?

Now on to the scary part (well, we promise it won't be too scary!) The costs associated with implementing a Virtual Desktop environment in your organisation depends on your individual needs.

Here is an example (based on the above questionnaire) that shows the costs involved.

**REMEMBER – this is a sample and is not based on a real organisation.

Azure Virtual Desktop Costs

Primary region cost: $60,539.61

ITEM	MONTHLY COST
Compute	$19,650.84
Profile Storage	$2,609.08
Network usage	$12,500.00
Monitoring	$1,870.91
Nerdio Manager for Enterprise (PaaS)	$408.78
Nerdio Manager for Enterprise licensing	$23,500.00
Secondary (DR) region cost: $1,737.81	
Compute	$627.51
Profile Storage	$1,110.30

There are also a number of strategies you can implement to reduce your running costs using our partner Nerdio!

SOLUTION	CONSUMPTION COST/M	CONSUMPTION COST/M/USER
Single region solution (Australia southeast)	$64,056.74	$12.81
Redundant region (DR) solution (Australia southeast & east)	$66,160.96	$13.23

THERE ARE ALSO A NUMBER OF STRATEGIES YOU CAN IMPLEMENT TO REDUCE YOUR RUNNING COSTS USING OUR PARTNER NERDIO!

NERDIO IS USED BY THOUSANDS OF ORGANISATIONS ACROSS THE WORLD, SO WHEN IT COMES TO AVD, THEY KNOW WHAT THEY ARE TALKING ABOUT. BASED ON THOUSANDS OF USE CASES, NERDIO'S COLLECTED THE FOLLOWING COST REDUCTION STRATEGIES WHICH CAN LOWER THE COSTS OF A TYPICAL AVD DEPLOYMENT BY MORE THAN 80%.

1. Manage VM Power.

When it comes to the cost of AVD, the largest component is VM compute costs which can account for as much as 70% of the overall expense of running the service. To lower this compute expense, an AVD optimisation solution such as Nerdio Manager for Enterprise can help you throttle back the virtual machines (VMs) during off-peak hours. For example, if users are accessing their desktop only 50 hours a week, there's no reason to keep the VMs on and running the Azure compute meter 24/7. Using patented auto-scaling technology, VMs can be turned on automatically at the beginning of the day (or upon user login) and turned off once they are no longer needed, such as on nights and weekends. Of course, users can still connect when needed off hours, but the overall system is optimised so that it doesn't just run the compute clock. VM power management in practice has shown to deliver a compute cost reduction of up to 70%.

2. Burst Your Capacity.

While significant cost savings can be seen by simply powering VMs off when not in use, your operating system (OS) disks associated with the off-powered VMs are still running up the bill. Here "just-in-time" (JIT) provisioning capabilities remove VMs that are not in use. This will help deliver additional cost savings as only the base capacity disks will remain while the additional VMs will only be created automatically as needed and deleted when not in use.

3. Reduce Reserved Instances Cost.

Azure offers both pay-as-you-go and reserved capacity pricing. Reserved Instances (RI) are typically offered in one-year or three-year terms to reserve virtual machines in advance for future needs and requirements. A tool such as Nerdio Manager uses RI Analytics to observe auto-scale behavior and more accurately recommend the number of CPU cores that need to be reserved based on actual usage to save you potentially 60% on top of the savings from optimizing VMs and OS disks.

80%

4. Optimise Your Storage.

Even though you may have already reduced OS disk storage costs through implementing JIT provisioning, there are still the remaining VMs used for base capacity that can be better optimised to improve disk costs. When VMs are in use, they must be high performing to deliver the user experience you require, that necessitates the use of premium solid-state drives (SSD). However, when the VMs are stopped, using cheaper standard HDD disks can significantly save on storage costs.

5. Shrink VM OS Disk Capacity.

While auto-scaling can further cost optimise disk usage, shrinking the size of VM OS disk can deliver even more savings. In fact, in multi-session, pooled environments no data is actually being stored on the C: drive and all user data is redirected to the FSLogix file share. To prevent paying for extra space you don't need, you can reduce the size of the default 128 GB OS disk to 64GB. Since VMs are being regularly deleted and re-created from the image, there is no growing disk space consumption on the system drive. This will have up to 50% on OS disk storage and further bring down your AVD expense.

6. Reduce White Space.

The final cost reduction strategy to consider focuses on the remaining large cost component of AVD: FSLogix storage. FSLogix user profiles are VHD(X) files stored on a file share. Because they are "thin-provisioned" they can grow once data is added to the user profile. This can create inefficiency and extra cost. Using an AVD optimisation solution can help to remove the white space from FSLogix profiles. When the process is run regularly it can reduce space utilisation by up to 50%. When combined with storage auto-scaling technology to adjust the provisioned quota on the Azure files share, additional savings can be realised.

When applying each of these practices across your AVD deployments, significant cost reductions will be seen.

Consider the savings outlined in the following chart for an AVD implementation with 192 users optimised with Nerdio Manager for Enterprise:

WHAT ARE THE TYPICAL AZURE VIRTUAL DESKTOP COSTS?

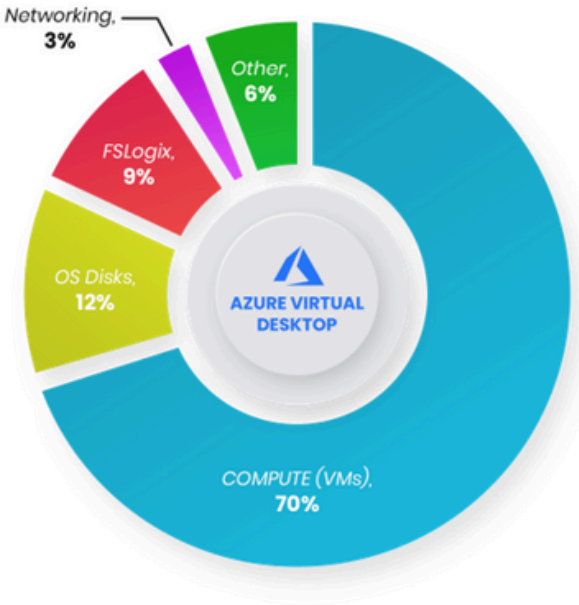
COMPUTE– *70%*

OS DISKS STORAGE- *12%*

FSLOGIX STORAGE- *9%*

NETWORKING– *3%*

OTHER– *6%*



Cost Reduction Strategies For Azure Virtual Desktop

	AZURE COMPONENT COSTS			Monthly Total	Per-User Cost	% Savings
	Compute (VMs)	OS Disks (Storage)	FSLogix (Storage)			
Unoptimized	$4,038	$215	$737	$4,991	$25.99	N/A
#1: VM Power Management	**$1,202**	$215	$737	$2,154	$11.22	**57%**
#2: Just-in-time Provisioning (50% Burst)	**$1,202**	**$140**	$737	$2,079	$10.83	**58%**
#3: 3-year Reserved Instances	**$457**	**$140**	$737	$1,333	$6.94	**73%**
#4: OS Disks Auto-scale	**$457**	**$89**	$737	$1,283	$6.68	**74%**
#5: OS Disks Shrink to 64 GB	**$457**	**$46**	$737	$1,240	$6.46	**75%**
#6: FSLogix Shrink by 50%	**$457**	**$46**	**$369**	$871	$4.54	**83%**

Assumptions

- Number of users: **192**
- User type: **Heavy** (2 users per vCPU)
- Session host VM size: **D8s_v4**
- OS disk: **P10** (128 GB Premium SSD)
- FSLogix profile size: **20 GB**
- FSLogix storage: **Azure Files Premium**
- Hours in work week: **50**
- Azure list pricing: **South Central US**

TOTAL SAVINGS **83%**

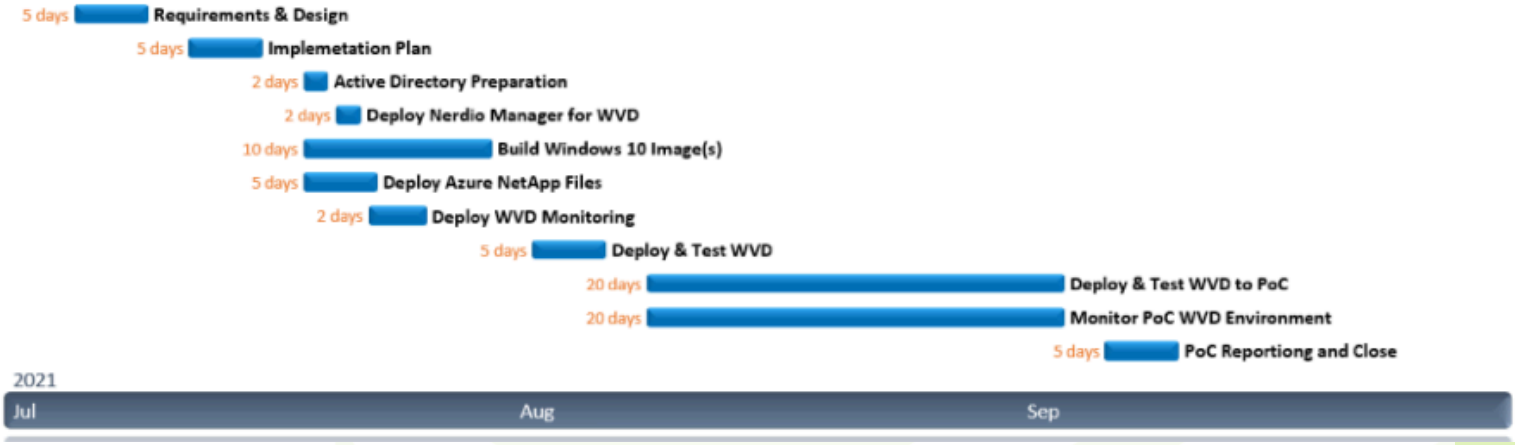
* FROM WWW.NERDIO.COM

05

WHAT A ROADMAP TO ADOPTION LOOKS LIKE

What a Roadmap to adoption looks like

Now onto the roadmap! How long does it take and what are the phases?
Below is a sample (not based on a real organisation) roadmap to implementation.



THE ABOVE PHASES ARE EXPLAINED BELOW.

- Requirements and Design (5 days): Workshop(s) to confirm scope, AVD design prerequisite requirements, business requirements, as well as a review of Azure governance.
- Implementation plan (5 days): Preparation of Implementation Plan detailing all requirements and design decisions.
- Prepare AD (2 days): Preparation of on-premises AD environment, including group policy, OU structure, service accounts, AD groups, and permissions.
- Deploy Nerdio Manager for AVD (2 days): Implementation and configuration of Nerdio Manager for AVD (NMW). This would include tailoring NMW autoscaling configuration to minimise Azure consumption costs.
- Build Windows 10 image(s) (10 days): Build of Windows 10 multisession image with required applications and configurations.
- Deployment of Azure NetApp Files (5 days): Deployment of Azure NetApp Files and configuration of file shares.
- Deploy monitoring (2 days): Deployment of Azure and Sepago monitoring for the AVD environment.
- Deploy and test AVD (5 days): Initial deployment of AVD hostpool for limited IT/testing group and cubesys. Testing of the environment will be carried out to objectives and general success criteria defined in the next section.
- Deploy AVD to PoC group (20 days): Increase AVD hostpool capacity as appropriate to accommodate PoC users.
- Monitor AVD environment (20 days): Monitor AVD usage, performance, and issues. Include further PoC validation by checking against defined success criteria. This phase would include meetings or workshops to address any issues and remediation.
- PoC Reporting and close (5 days): Produce report confirming successful proof-of-concept

AVD Cost Visibility & Chargeback

With over 120 AVD projects delivered, we've seen just about all the scenarios and questions you're likely to have. One which comes up time and time again is visibility of the AVD cost base and having the ability to build Chargeback models with your business.

The best way to optimise the operational costs of AVD deployments is to use Windows 10 multi-session and combine users onto the same infrastructure, so you can minimise the number of VM's running and maximise your cost per user – Our good friends at Nerdio are awesome at helping us achieve this.

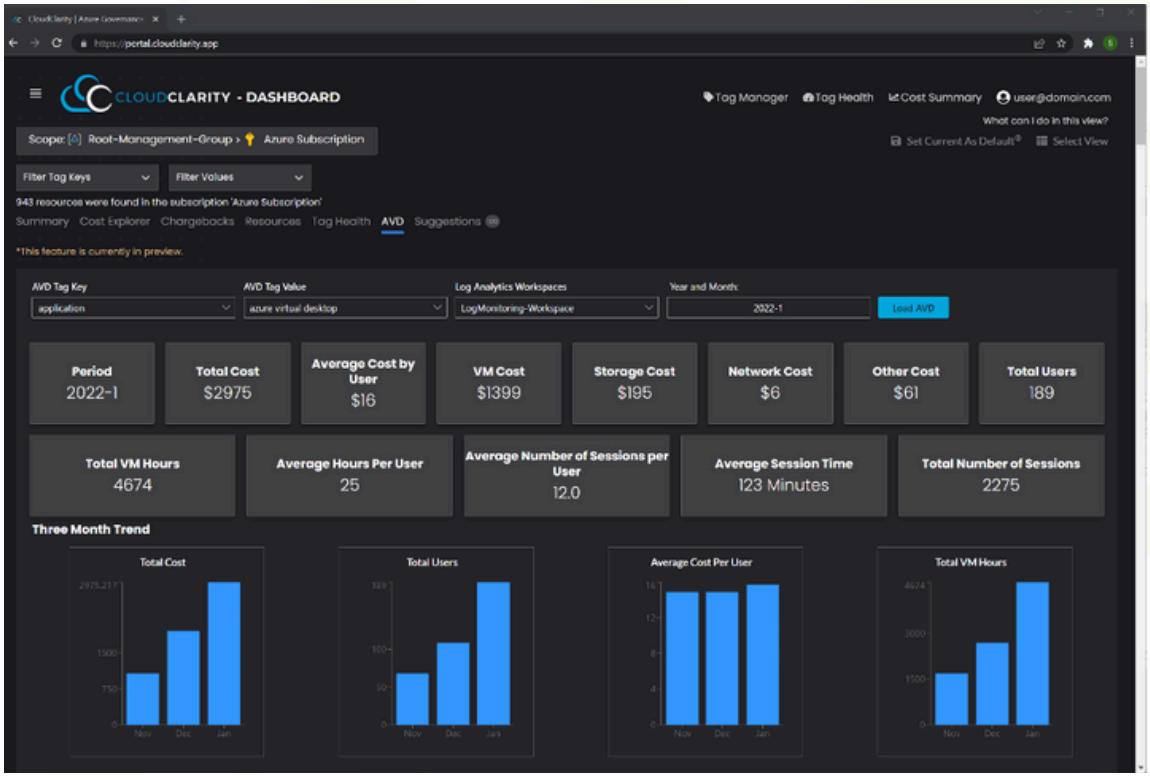
But how do you see what each user or each user session costs? And when you combine users with different business units (cost centres), how do you allocate cost back to them or even just have visibility of these costs so you can justify your IT budget?

Wouldn't you like to be able to react to the next work from home surge and know that you can allocate cost for every minute of every user back to the appropriate business unit? And when the accounts team ask why the change in your Azure spend, you know you have the answer…

HERE IS THE SOLUTION: CLOUDCLARITY.

CloudClarity now has a dedicated AVD module which analyses your AVD environment to provide the detail you need. Once configured (it takes 5 minutes) you will be able to see the cost allocation to each user. Better than that, it'll show each of their sessions and what the cost was broken down into Compute, Network, Disk and more..

Reach out to the cubesys team for more details and a free demo!



NEXT STEPS

Now that we have explained to the process, lets lock something in.

Book in your discovery call and we can lock in your Virtual Desktop Economic Plan for Success session.

Book in now

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