



Cloud migration: The text book guide

Planning to migrate to public cloud?

This guide cuts through the noise and waffle to give you the knowledge and tools to lead the process and make the optimum transition.



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It's time to reach for the cloud



With the world of work continuing to change at breakneck pace, companies are depending on the expertise of IT teams to ensure they have flexible infrastructure that powers new ways of working.

To further future-proof, many organisations are also accelerating 'cloud-first' strategies with leaders seeing the cloud as more flexible, scalable, reliable, fast and cost-effective than on-premises.

But this rush to cloud is not without pitfalls for the unwary. Many companies have made significant investments in on-premises IT and have developed the skillsets to maintain it – which is where you come in.

Whether you are a cloud evangelist or a bit of a sceptic, this guide will cut through the waffle and the jargon, to give you the tools to lead a migration. No ifs. No buts.

Along the way we identify some of the pitfalls, help you understand how to approach cloud adoption and share a refreshingly easy-to-follow framework to get you to the public cloud.

Make this your go-to guide. Take the driving seat. Unlock the potential.

A handwritten signature in black ink, appearing to read 'John Pickford'.

John Pickford
CTO, Synapse360



Reap the benefits – a quick recap on the upsides of cloud

Cloud is a transformational technology that brings business-wide benefits. Too often though, the benefits are presented from a business perspective, and the benefits to the IT department are lost amid noise.

With the benefits to you and your team being many and varied, we thought we'd provide a quick recap.



Improved security posture

Cloud promises greatly enhanced security over on-premises. When correctly set up and configured, it improves threat prevention, detection, response capabilities, security auditing and significantly reduces the chances of human error.



Easier systems maintenance

Forget about software updates, feature additions and maintenance – cloud can eliminate humdrum IT procurement, maintenance, updates, security, and de-commissioning tasks. Staff can focus on more interesting and impactful tasks.



Business continuity and disaster recovery

The ability to quickly access and retrieve data allows you to maintain business as usual, minimising any downtime and loss of productivity.



Mobility and productivity

Cloud provides the default ability to access data from home, on holiday, or on the commute and for many, it has made remote working a viable option. People can login normally from their chosen device, from anywhere and perform work as usual.



Flexibility and scalability

Cloud resource is available on-demand to pay-as-you-go. A correctly designed application allows companies to use only the things they need to, helping avoid overspend on unnecessary resource.



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Seize the initiative – become the IT hero!

Want to be an IT hero? Want to ditch the humdrum and do interesting stuff? Grab the cloud opportunity and become the hero that the leaders of your business are looking for.

While cloud is a new world for many IT teams, it is an exciting world. One that is full of opportunity and benefit. Forget about the business benefit for a second – we're talking about personal benefit.

For IT leaders and teams that embrace change, exciting opportunities lie ahead. So grab the bull by the horns!

Fortune favours the bold

Turning to the cloud can be a shrewd move for IT experts.

- **You'll be valued for driving it internally** – with many business leaders planning to migrate to the cloud, there can be no denying that cloud is on its way, so by getting in the driving seat and grabbing the challenge head-on – you will align with the goals of your business and get noticed by the people who are driving the business transformation agenda. This could position you favourably for progression opportunities.
- **Upskilled, more employable** – being the person who internally drives the shift, you will go on a natural pathway to upskilling and learning new career defining skills. Managing a physical IT estate is a vastly different skillset to managing cloud infrastructure. The latter being the future, offering greater earning potential and being in greater demand – will see you become naturally more employable and gain far greater job security.
- **Job enjoyment** – moving those pesky, tedious, routine jobs to the cloud will free you and your team to focus on innovation and new initiatives.

Make IT the driver – some key takeaways



Increase IT's engagement with the rest of the business



Evangelise the benefits of cloud, position IT as the knowledgeable authority



Be honest about technical debt which might constrain innovation and be ready for change



Use your cloud strategy to advocate the right decisions and defend agreed plans



Prepare IT staff for inevitable change, highlighting the positive opportunities for rewarding work and career development.



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Getting yourself ready to lead the migration – top things to consider

It's been decided – you're taking your business to the cloud and you're ready for the challenge – but how do you get yourself ready to lead a successful migration to the public cloud?

Cloud adoption is not just about swapping one technology for another. And in fact a 'lift and shift' approach can be counter-productive as you'll likely be lifting and shifting your existing problems.

Here we share the top things to consider ensuring a smooth journey to the public cloud.

Take the driving seat

Cloud planning should be undertaken by somebody who understands your company's full IT ecosystem. It is important to let business leadership know from the start that this isn't going to be an immediate transition. Legacy technical limitations (technical debt), licensing restrictions, interdependencies and cost considerations are all likely. The process will involve lots of upfront planning and consultation followed by a phased migration of suitable workloads.

Involve the whole business

This will give you an understanding of every department's key IT needs and when you pay attention to this in your strategy, it will give you the buy-in you need to push ahead.

Create a strategy

A strategy document must come before any detailed, technical deployment or migration plan and should clearly convey the role cloud plays in achieving business outcomes. It should show the key reasons for moving to the public cloud such as modern cloud-native applications, instant scalability or on-premises systems reaching end of life.

Make sure your plan addresses concerns such as security, backup, and Disaster Recovery (DR), security and privacy standards compliance, loss of control vs on-prem, cost and IT performance concerns. As you won't know everything upfront, your cloud strategy document will need to be a living document.

Upskill yourself and your team

Managing a physical IT estate is vastly different from managing a cloud ecosystem; look at this as a personal upskilling opportunity for you and your whole IT team. Look at training, support, and resources available to fuel in-house knowledge. This will enable you and your team to lead the migration and ultimately to manage the new system.

“ Organizations that create a cloud strategy gain the most from their use of cloud computing ”

Gartner, The Cloud Strategy Cookbook, 2021



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Get help and support from cloud experts

The high costs of consultants and the difficulty in recruiting cloud experts forces many to consider DIY. Yet to migrate by learning on the job is likely to lead to long migration times, missed deadlines, expensive mistakes, and significantly increased risk – so it is always best to seek external advice from dedicated cloud experts.

Experience levels among consultants vary massively and many command top dollar, so another option is to use a suitably experienced and accredited managed service provider like Synapse360 to access skills immediately without committing to an expensive salary bill. Look for a provider that can help develop the skills of your team over time. Going down this route also means you will have dedicated resource to quickly resolve support issues.

Costs

Despite 76% of organisations using cost efficiency and savings to measure cloud progress it is not uncommon that using public cloud results in increased opex cost over time. Globally, at least 35% of cloud spend is wasted. Poorly configured environments can also leak significant costs over time too. Overprovision is a major reason for this with 45% of businesses moving to the cloud with IaaS being over-provisioned by 55% and overspend by 70%.

By using a Managed Service Provider, you can ensure your environment is right-sized whilst regular reporting will ensure you keep track of costs.

Multicloud Myth

Using multiple clouds might seem like a good idea, you may be able to get a better deal or service from another provider for certain workloads. But managing multiple clouds effectively requires more skills, has interoperability issues, and in the long run for mid-size business we'd recommend limiting cloud use to one cloud public provider and one private cloud provider if running a recommended hybrid.

Exit Strategy

It may seem counter-intuitive to consider your exit from a public cloud at this stage, but it should be a consideration. There could be a myriad of future reasons you might want to extricate your data, including moving it to another cloud provider. Identify and understand the processes and procedures you need to follow to do this.



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Getting started – the cloud migration plan in 6 steps

You have your strategy, you've worked through the considerations, now you need a migration plan to make it all happen.

In the following section we will look at the steps necessary to migrate to the UK's most popular platform Microsoft Azure. Your path to becoming an IT hero starts here...

1

Configure an Azure Tenancy

Setting up an Azure Tenancy will enable you to plan your migration by giving you access to Azure Migrate which is the simplest freely available tool to assess your existing infrastructure. If you are already utilising Office 365 or Microsoft 365, you will already have a tenancy in Azure – this will be the same subdomain that your 365 tenancy is tied to (customer.onmicrosoft.com).

A tenancy can be created at no cost to your business, and you will only be charged once you start deploying resources into a subscription on the tenancy. During the assessment phase, the cost to a business will be nominal, with costs incurred for storage of the assessment data only (typically no more than a couple of pounds per month).

You will also need a subscription within your tenancy before you can deploy any assessment and planning tools. Typically, these come as a Pay-as-you-go (PAYG), Cloud Services Subscription (CSP), New Commerce Experience (NCE), or Enterprise Agreement (EA) model. At this point, PAYG will suffice for assessment and planning, but NCE subscriptions would be our suggested model going forward.



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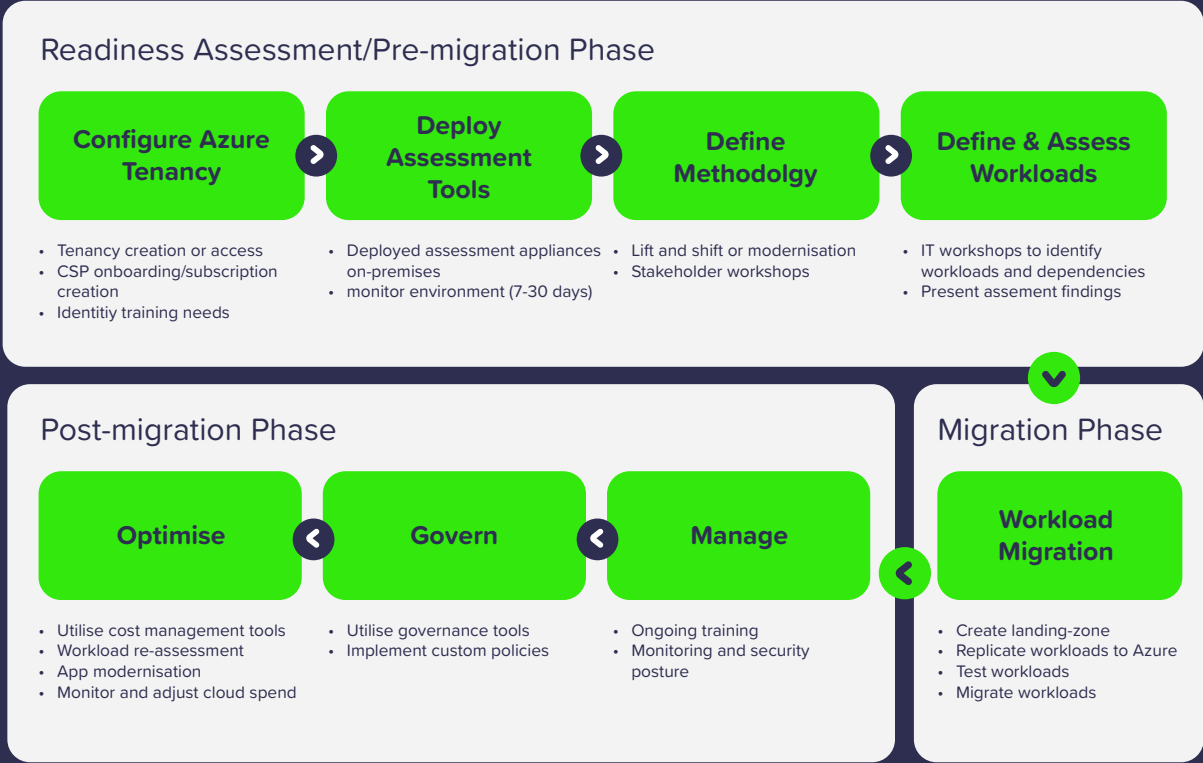


2

Deploy Assessment Tools

Now you have a tenancy and a base subscription, the assessment tools can be deployed to assess your environment for IaaS and PaaS. An Azure Migrate project can be created in a matter of minutes in the tenancy, plus the deployment of a virtual machine at your on-premises site. Once deployed they will monitor your environment continually.

For the most accurate assessment, it is recommended to have at least 30 days of performance metrics. Where possible, all types of assessment should be run to build the clearest picture and help shape your future strategy!



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3


Define your methodology

There are several considerations when deciding how to approach a migration to the cloud:



Business aims and goals

What does the business want to achieve, and over what timeframe?
What are the success metrics and are they relevant to the right stakeholders? (Cloud strategy)



Migration strategy

Can servers and workloads be migrated “as-is”, or is application modernisation key?



Security and Compliance

What controls must be in place from day one? What standards must be adhered to?



Stakeholders

What support and cooperation is required from the business?

It is important during this phase to decide upon the approach that will be taken to ensure that any migration plan aligns to your cloud strategy. Be sure to validate the need, timelines, and scope of the migration and include key stakeholders in the discussions.

A phased migration is the preferred and safest path to cloud. This provides space to tailor an environment for individual applications and the countless differing complexities that a workload will have. Taking the opposite “big bang” approach can lead to excess complexity, migration overrun, and increased cost.

“ There are plenty of pieces in the cloud migration puzzle – design, planning, configuration, implementation, management, training – and they all need to fit and work together perfectly.

”

John Pickford, CTO, Synapse360

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4

Define and assess workloads

It is important to break down your existing infrastructure into individual workloads. This forms the basis of a phased approach and enables each individual workload to perform in the Public Cloud from day one. This will also provide a solid platform upon which costs can be estimated for moving to the cloud.

Any good assessment tool such as Azure Migrate will analyse an environment and provide easily digestible output that estimates the cost per month of a particular virtual machine – effectively creating a Bill of Materials for a customer. It will also suggest what version of Azure VM, and on what type of storage a VM should sit.

There are additional tools as part of Azure Migrate that will assess your SQL and web server instance readiness for PaaS. These are particularly relevant where a strategy of app modernisation is preferred as they will highlight most issues with the existing application. Instructions and relevant links will be displayed depending on the type of assessment needed.

Two examples of a typical workload and the assessments they may be run are as follows:

Web app with SQL backend

- IaaS assessment for lift and shift “as-is”
- Web server assessment to look at readiness for importing into an App Service
- SQL assessment for Azure Managed Instance or Azure SQL Database.

RDSH with supporting servers

- IaaS assessment for lift and shift “as-is”
- Storage assessment for Azure File Services (retire on-prem profile file servers)
- VDI assessment (WVD viability)

Currently, the following assessments are available:

IaaS	(Windows / Linux, Azure VMware Solution (AVS))
PaaS	SQL Managed Instance / Database (VMware on-premises environments only)
PaaS	Web Apps (Azure App Services)

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4

Define and assess workloads

Assessment tools alone will not capture all the necessary information though. It is critical to gather additional information around a workload or application to properly ascertain the viability of migrating to the cloud with the minimal re-engineering work as possible. This should be done in direct consultation with key stakeholders of a workload:

Device Integrations

- Load-balancers
- Firewalls
- Specialised appliances
- Dedicated storage devices

Firewall Rules & Requirements

- Document rules for both outgoing and incoming, including NAT
- Check Azure service rule requirements (these are not open by default)

Operations Integrations

- Automated agents (monitoring / security / notification)
- Manual process to maintain a workload/system
- Existing scripts / processes that may need updating

Connectivity

- Azure ExpressRoute or VPN connectivity from your existing colo / offices; ExpressRoute can take a number of weeks to order and install / VPN Gateways can be provisioned and connected within the hour

Backup / DR / HA

- Current backup procedure / schedule / retention
- Current DR capability
- HA technology (SQL Always On, Oracle, Exchange DAG, etc).

DNS Mappings

- Document all existing internal and external IP addresses, and all DNS records they map to
- Map to an Azure Public IP where external access is required

Availability SLA

- Document expected SLA / Uptime requirements

Active Directory

- Pre-create any network mappings in AD Sites & Services

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Workload Migration

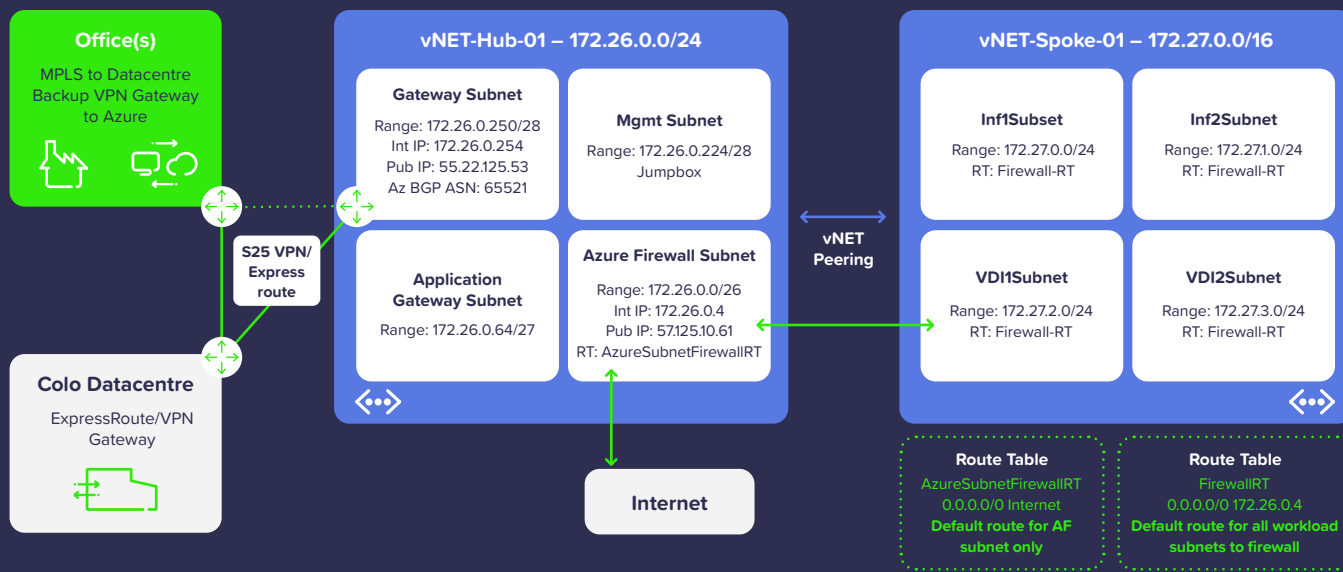
Now that you have all the assessment data, indicative costs, and a plan of what will be migrated and when – the next step is to create a landing zone within your Azure tenancy and connect this back to your offices. This typically consists of connectivity, networking, and management group structure. It is critical to get this foundation right, as changing it in the future may require downtime for anything in the cloud.

Current best practice is to utilise a hub and spoke topology for networking, where the hub contains your core network infrastructure (VPN/ExpressRoute Gateways, App services subnet, Firewall subnet, etc), with spokes added for other networks (Web App Presentation, Databases, Servers, VDI, etc).

For testing your migration workload candidates in the cloud, it is best practice to create an isolated network in the cloud. This will enable you to bring workloads online without risk to a live environment and also provides an area where the majority of applications can be validated with minimal risk to the business.

We recommend grouping by workload where possible. There is no standard best practice in this area, so ensure the way you group resources is meaningful to your business. The one principle that is agreed on is that you should avoid deploying all your resources into a single resource group, for all but the very smallest Azure deployment.

Hub & Spoke Example



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5

Workload Migration

Resource Group Example



RG-CFS-Hub-Network

- Hub vNET (Core Networking)
- Gateway Subnet
- Azure Firewall Subnet
- Application Gateway Subnet
- Azure Firewall
- Network Gateways (S2S VPN)
- Hub vNET (Core Networking)
- Route Tables/UDR

RG-CFS-Spoke-Network

- Spoke vNET (Workload Networking)

RG-CFS-Management

- Management Jumpbox
- Supporting Infrastructure

Resource Groups

- Base networking & management components separate
- Workload specific groups
- Mirrored for Site Recovery (DR) to another region (TBD)
- Backup & SR RG's automatically created during deployment

RG-S360-AAA

- S360-AD-SVR-01
- S360-AD-SVR-02

RG-DevTest

- MT-DB1
- MT-WEB-02

RG-S360-SQL

- S360-HO-DB1

RG-S360-Presentation

- S360-HO-WEB1
- S360-HO-WEB2
- S360-HO-WEB3

RG-S360-Misc

- S360-FS1 (Share migration to Azure File Shares)
- S360-HO-MISC

Once your landing zone is place, you can begin replicating your workloads into the clouds. With Azure Migrate this is easily achievable for IaaS workloads as the assessment appliances previously deployed double up as replication appliances replicating workloads based on the assessments previously generated. This also reduces risk of human error, as your workloads will automatically be configured to the exact specifications listed in the assessment.

For PaaS workloads, Azure Migrate will recommend a tool best suited to the type of workload; for SQL this is typically the MS Database Migration Assistant tool and for Web Apps typically the App Service Migration Assistant tool.

For IaaS workloads it is also important to clean up the virtual machine immediately after migration. Like physical servers that were virtualised in the past, the VM will contain old hardware references hidden from view, which can have an impact on performance and should be removed as soon as possible.

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6

On-going management, governance and optimisation

Public Cloud is fast moving. New functionality is added and older parts removed almost daily. This can make maintaining an environment quite a headache if you don't have the right tools in place.

Fortunately, there are a wealth of tools that greatly reduce this complexity such as VMware, vRealize Operations, CloudCheckr, LogicMonitor, and CloudHealth which can be used to monitor and optimise your environment.

Within Azure itself there are some excellent tools available out of the box that are worth taking the time to familiarise yourself with:

Security Centre:

A one stop shop for security and compliance that provides all the necessary tools to strengthen and maintain your security posture directly within Azure and the ability to apply policies pertaining to a number of standards: ISO 27001, PCI DSS 3.2.1, SOC, NIST, HIPAA HITRUST and several more. Policies can be enforced across the entire estate to continually audit resources and report on compliance.

Policy:

Works with Security Centre and enables an organisation to create custom policies and initiatives across an estate, for example, only allowing a certain number of resources such as a specific virtual machine specifications, enforcing naming conventions against resources, or enforcing tagging.

Monitor:

Collects data and monitors your resources to help ensure the performance and availability of your VMs and applications remains high.

Cost Billing & Management:

Provides ongoing insight into the monthly spend of your subscription, and can be used to analyse your costs, set budgets and view previous bills.

Migrate:

Although predominantly used for assessing migration from other locations, this is also useful as a tool to monitor your VMs from an optimisation perspective by providing sizing recommendations based on performance data, on demand.

Whatever tools you do decide to use, it is important to continually skill up your staff due to the fast-moving nature of cloud. What was relevant yesterday may not be the next.

This may sound like a tall order, but the rewards for keeping up with Public Cloud are vast. Cutting edge tools at your fingertips without setting foot in a datacentre or powering on physical infrastructure – just imagine that!

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Cloud migration hints and tips

Assessing EVERYTHING for cloud migration has limited use

Whilst it is useful for estimating the total cost and readiness of an entire estate, the reality is more nuanced – very rarely will everything be suitable for Public Cloud. There may not be a technical barrier to moving a particular server, but there may be other barriers such as licensing restrictions and cost. All infrastructure should be assessed but should not automatically earmarked for migration.

Public Cloud is not on-premises

When migrating workloads to Public Cloud, many organisations attempt to apply the same logic to their resources as they do on-premises. This will almost certainly result in spiralling costs. Over the past 20 years, with the proliferation of virtualised environments, rightly or wrongly, many organisations have built virtual machines with greater resources than they require because they are able to within the confines of their own virtual environment.

These workloads should be right sized during your cloud assessment phase to avoid overspend. As an example, a VM with 16 CPU's and 64GB on-premises may only require 2CPU's and 8GB of RAM in a Public Cloud. This would represent a significant cost saving!

The Azure Migrate tool will provide solid right-sizing recommendations – do not be afraid to follow them. If a migrated workload has performance issues, resources can be scaled up, or scaled out very quickly in most circumstances.

If you provision an object in Public Cloud, it will almost certainly incur costs by the second / minute / hour. It is important to look at what you want to run the cloud and work out when it needs to be available. If you can turn a server off between 5pm and 9am, this will translate into significant cost savings over the course of its life. If a workload is required 24/7 and is very high spec, its suitability to move to cloud must be questioned – you may be able to significantly reduce the costs by purchasing a reserved instance, which is a committal to pay for an object for a set time (1 to 3 years in Azure) – this can save up to 60% of the cost. It may be that the workload is deemed unsuitable even with discounts. Hybrid-Cloud should never be discounted for this reason!

Identify workloads

When migrating to public cloud, it is generally best practice to migrate a complete workload. A workload is the group of components that deliver a specific application or service. For example, a webserver that utilises a back-end SQL database or server may be considered a workload. Identifying workloads should start with the existing knowledge from the IT team.

Where there are gaps and unknowns, software capable of tracking dependencies between servers and applications should be deployed. Workloads should be fully tested in the cloud prior to any full migration.

Don't forget perimeter services

Most assessment tools are narrow in their scope. They look at migrating a VM from a location to Public Cloud as a VM, or as PaaS / SaaS (SQL) – they don't include other areas such as firewalls, data charges, public IPs, load-balancing, backup, DR, connectivity back to on-premises locations and so on. This can be more time consuming than assessing the servers themselves but is absolutely necessary to from accurate costing to successful planning.

Another common mistake organisations expanding into public cloud themselves make is to assume that it is already secure. This isn't the case. A firewall, the first line of defence for the majority, is often not deployed. To a point some security is provided in Azure networks, as interfaces can be protected by Network Security Groups (NSGs) which allow an organisation to apply firewall-like rules to objects, but this is a decentralised system. Most vendors have firewalls available in the various marketplaces. Be sure to consider what firewall rules need to exist and whether there any other new requirements because of moving an application.



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Knowing external and internal workload dependencies is crucial

When a workload is migrated to Azure, you need to ensure tertiary requirements are captured and fully documented. For example, capturing DNS requirements internally and externally is essential because public and internal IP addresses will almost certainly change.

In a similar vein, identifying any hard-coded IP addresses in a server, app or database that will need to be amended either pre or post migration, will save hours of time.

Compliance & Data Classification

Most public cloud offerings now have industry leading compliance tools available out of the box such as Azure Security Centre and Azure Defender. This does not mean an environment is compliant from day one. Thought needs to be given into what level of compliance required, and what tools are needed to ensure your environment follows all necessary requirements. Public cloud is fast-changing, and compliance should be seen as a long-term, living, focus.

The network is just as important as your cloud

A base network can be created in the cloud in a matter of minutes but can easily be misconfigured from the start. It is much harder to re-engineer networking in public cloud than on-premises. Using Azure as the example, some common issues we often see causing knock-on headaches include utilising a public IP range for internal resources, re-using private IP ranges from on-premises networks that still exist on-premise and incorrectly sized subnets.

It is also recommended to use a hub and spoke topology from day one. The hub network should

contain all network related devices, such as your firewall, routing tables and gateways. The spoke should contain everything else. Additional spokes can then be added to suit your needs, such as a dedicated spoke for VDI, databases, or a DMZ.

Using resource groups effectively

Think about how you are going to group your workloads and resources. It is very easy when starting out to completely ignore this aspect and it is vital to any well-run cloud. Many customers start with a single resource group or folder and put everything into it. This makes housekeeping very difficult, with resources getting lost in a vast list of unrelated resources.

We often see environments that are functioning well, but running at high cost due to a lack of housekeeping, so we would recommend applying simple logic to your structure. Have resource groups for your core network and management infrastructure, and then have resource groups for specific workloads or types of resource (SQL, App Services). Then when a service or workload is no longer required, it is much easier to delete a resource group than to track down individual components in a single group.

Even in an optimised environment, cost can be an issue so if a resource is no longer needed, delete it. When you have deleted that resource, check for any child resources, and delete those too. This is easy to do if all those components are grouped together. If not, you could be being charged for resources, even if they are no longer used.

Going it alone can be painful.

It is easy to sign up for a free subscription in any of the public cloud spaces. Your first workload can be running and live within the hour, even with no solid cloud experience. However, this has its drawbacks. If problems arise with a deployment, the options to

obtain support are very limited. Support tickets can be raised with your provider, but the response time leaves many frustrated. Additionally, most environments built this way result in unnecessarily high costs.

Partnering with a certified MSP has many benefits. They can usually offer preferential pricing, special offers and most importantly... a solid platform upon which you can get support. Public Cloud can also be much more complicated than traditional on-premises. It makes sense to work with a partner from the very start to ensure that they know your environment as well as you do.



The can-do guide to public cloud migration

- > A message from our CTO
- > Reap the benefits
- > Seize the initiative
- > Getting yourself ready
- > **Getting started – The cloud migration plan in 6 steps**
 - 1 Configure an Azure Tenancy
 - 2 Deploy Assessment Tools
 - 3 Define your methodology
 - 4 Define and assess workloads
 - 5 Workload Migration
 - 6 On-going management, governance and optimisation
- > **Hints and tips**
- > Public Cloud Foundation

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Public Cloud Foundation: Fast, secure, optimised

Synapse360's PCF – your competitive advantage in the public cloud

Moving to the public cloud could be your best business decision ever. Make that a certainty by selecting Synapse360's Public Cloud Foundation.

Public Cloud Foundation is the perfect starting point for your cloud journey and a safe home for your existing cloud environment.

“ Synapse360 were the most responsive, listened to our needs carefully and proposed a simple but highly effective solution that was reasonably priced.

Myers Group



Your public cloud issue	How PCF solves it
Slow platform deployment	PCF ready in 5 days or less
Expensive, error-prone configuration	Cost-effective, standardised PCF
Lack of in-house cloud experience	Synapse360's experienced team
Risky initial migration	Assessment and first migration included
DIY security, poor backup and DR	State-of-the-art protection with PCF
Platform missing vital components	PCF is a proven complete package
Unexpected costs	Clear pricing with fixed cost options
Poor performance	Optimised from the start
No roadmap	Strategic guidance with quarterly innovation sessions
Poor integration with private cloud	PCF fits perfectly with Synapse360's Private Managed Cloud



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Migration-ready in **5 days or less**, the PCF package includes all the essential components, combined with over 300 pre-configurations and workflows that deliver the best architecture for security, connectivity and availability. We've gone through months of scripting, task automation and testing – so you don't have to.



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WHY SPEND MONTHS TO MIGRATE TO THE CLOUD WHEN YOU CAN DO IT IN 5 DAYS!

Start your cloud journey or migrate your cloud environment today...

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