



# Cloud Infrastructure

Microsoft Practice  
Development  
Playbook



[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)

# About this Playbook

This playbook is intended for the business and technical leadership for new and existing Microsoft partners that are adding a new practice to their business focused on cloud infrastructure.

## Objectives

The goal of this playbook is to help you accelerate or optimize your Azure-focused practice and understand the cloud infrastructure and management practice opportunity. Our goal is not to re-write the existing body of detailed guidance on how to perform any given recommendation—instead we point you to resources that will help you.

For the business side, this playbook provides valuable resources for driving new revenue opportunities, developing strategies for marketing, selling, and lead capture, as well as building deeper and longer term engagements with your customers through potential new service offerings like managed services.

For the technical side, the playbook offers guidance on a number of topics that range from the technical skills your team will need, to resources that you can use to accelerate learning as well as an explanation of some of the key opportunities for technical delivery to focus on as you get started and grow your practice.

## How this playbook was made

This playbook is part of a series of guidance written by a Microsoft Partner [Opsgility](#), in conjunction with the Microsoft One Commercial Partner group and 22 other successful Azure partners that have volunteered time to provide input and best practices to share with the rest of the partner community.

To validate the guidance provided in these playbooks, we worked with MDC Research to conduct a survey of 1,136 global Azure partners. In this survey, we gathered insights on a range of topics, including how partners hire, compensate and train resources; their business model, revenue and profitability; what practices and services they offer; and what skillsets they have in place to support their offers. The results of this survey are provided in line with the guidance found within this playbook.

## CONTRIBUTING PARTNERS

[Artis Consulting](#)

[Atea](#)

[AwareComm](#)

[Blue Meteorite](#)

[DEFTeam Solutions](#)

[Dimension Data](#)

[Empired](#)

[Equinix](#)

[Frama Data Systems](#)

[Hanu Software](#)

[Kloud Solutions](#)

[Mirabeau](#)

[New Signature](#)

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[SQL Services Ltd.](#)

[Theta](#)



## Using the playbook effectively

Quickly read through the playbook to familiarize yourself with the layout and content. Each section includes an executive summary and key actions for that specific topic. Review these summaries first to decide which areas to focus on. Go over the content several times, if needed, then share with your team.

### TO GET THE MOST VALUE OUT OF THIS PLAYBOOK:

- Get your team together and discuss which pieces of the strategy each person is responsible for.
- Share the playbook with your sales, marketing, support, technical, and managed services teams.
- Leverage the resources available from Microsoft to help maximize your profitability.
- Share feedback on how we can improve this and other playbooks by emailing [playbookfeedback@microsoft.com](mailto:playbookfeedback@microsoft.com).

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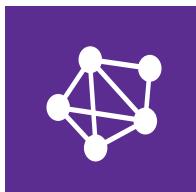
March 2019

# Digital Transformation

The path to unprecedented growth goes through the cloud, helping your customers connect people, data, and processes in new ways to embrace the possibilities enabled by modern technologies. To succeed in a digital-first world, business leaders are bringing business and IT closer together and optimizing processes to create new value for customers.

The potential is huge. By 2019, IDC predicts \$1.7 trillion USD in spending worldwide to create new business models, operational efficiencies, and customer experiences. Digital transformation is now an executive mandate and partner development capabilities will take advantage of customer demand for custom and packaged software.

Three trends are helping shape this profitability opportunity:



## DIGITAL PLATFORMS AND ECOSYSTEMS

By 2020, 60% of all enterprises will have fully articulated an organization-wide digital platform strategy and will be in the process of implementing that strategy as the new IT core for competing in the digital economy.



## CLOUD

By 2021, spending on cloud services and cloud-enabling hardware, software and services will more than double to over \$530 billion, leveraging the diversifying cloud environment that is 20% at the edge, and over 90% multi-cloud.



## HYPER-AGILE APPLICATIONS

By 2021, enterprise apps will shift toward hyper-agile architectures, with 80% of application development on cloud platforms (PaaS) using microservices and cloud functions, and over 95% of new microservices deployed in containers.

Partners play a key role in helping businesses make the platform and cultural shifts needed, and such transformations are creating amazing partner multiples. In a recent IDC study, partners reported earning \$9.64 in revenue for every \$1 of Microsoft revenue generated in 2017. This is expected to continue through 2022 and include a mix of software (45%), services (50%), and hardware (5%), that are sold in relation to Microsoft solutions.

These changes affect all aspects of a modern business, both internal and external. Microsoft models these changes in four pillars:

ENGAGING CUSTOMERS	EMPOWERING EMPLOYEES	OPTIMIZING OPERATIONS	TRANSFORMING PRODUCTS
Give them new personalized experiences that bolster acquisition and strengthen loyalty.	Boost productivity with flexible workstyles and mobile solutions that enable a data-driven culture.	Drive efficiencies with a cloud platform that accelerates agility.	Create new revenue opportunities using intelligent technology to innovate new products and processes.
 Customer centricity integrated across the business	 Intentional about people priorities and related strategies	 Harnessing technology for next level of efficiency	 Leveraging data to enter new markets
 Creating fans & segment of one	 Using more data to drive insights and decision making	 Leveraging digital platforms to reduce delivery timeframes	 Revising business models to prioritize agility and emerging trends
 Data driven customer insights	 Delivering self-service & simplifying processes	 Testing new products and services at a fraction of the cost	 Making customers your business partners
 Marketing leaders as technology decision makers	 Enhancing HR employee skills	 Anticipating and solving customer issues before they become issues	 Connecting products to amplify and redefine their value

## FURTHER READING

- ➔ [Microsoft Digital Transformation eBook Series](#)
- ➔ [Designed to Disrupt: Reimagine your apps and transform your industry](#)
- ➔ [Cloud Migration & Modernization Practice Development Playbook](#)

# The Cloud Enables Digital Transformation

Cloud technologies are at the center of the digital transformation revolution. The cloud has changed more than the way we implement and manage IT; it's changing the very fabric of business. With ready access to data, and intelligent new ways to view, analyze and use the information, the cloud has engendered powerful new capabilities which are disrupting entire business models.

There are many advantages to adopting the cloud. Businesses moving to the cloud do so for a range of motivations, seeking a variety of benefits. These benefits fall into four categories: cost, agility, service quality, and new scenarios:

- **Cost:** Cloud computing offers significant potential cost-savings over on-premises infrastructure, especially considering the full cost of the latter. In addition, cloud computing enables organizations to move IT spending from capital expenditure (CapEx) to operational expenditure (OpEx). Since the fixed costs associated with shared infrastructure are avoided, the cloud also provides much greater visibility into the true cost of individual applications.
- **Agility:** Where traditional on-premises infrastructure can take weeks or even months to deploy, Azure offers near-instant provisioning of resources. This enables Azure projects to move much more quickly, without the need to over-provision resources in advance or spend considerable time on infrastructure planning. To take full advantage of this new flexibility, organizations are accelerating the adoption of new ways of working, such as by using agile software development methodologies, continuous integration and deployment (CI/CD), and modern PaaS-based application architectures.
- **Service quality:** Azure's infrastructure has been designed to support some of the world's most demanding workloads. These workloads continuously raise the bar on the quality of service Azure must provide. As a result, migration to Azure often offers significant improvements in performance, reliability, and security over on-premises infrastructure.
- **New scenarios:** Azure enables new application scenarios which are simply not possible, or would be prohibitively expensive to deliver, using on-premises infrastructure, such as big data storage and analytics, machine learning, and compliance with industry certifications such as ISO, PCI, HIPA and GDPR, where customers can leverage the certifications offered by cloud providers. These technologies are enabling new application scenarios, driving innovation and competitive advantages only available in the cloud.

## Business Value of the Cloud



### Costs

- CapEx → OpEx
- Transparency
- Cost Savings



### Agility

- Instant Provisioning
- DevOps and CI/CD
- Modern Application Architectures
- Faster Time to Market



### Service Quality

- Performance
- Scalability
- Reliability
- Security and Compliance



### New Scenarios

- Big Data and IoT / Analytics
- Machine Learning
- Artificial Intelligence
- Digital Transformation

These benefits are all central to a successful digital transformation strategy.

Reduced costs and the shift from CapEx to OpEx dramatically lowers the cost of innovation, enabling a ‘fail-fast’ experimental approach.

This is supported by the increase in agility that lowers innovation cost and enables a faster time-to-market. The scale, performance, reliability, and global reach of the cloud enables small development teams to develop global services for global audiences.

Most of all, new technologies including big data, IoT, machine learning, and AI empower the insight and customer focus upon which digital transformation depends.

These technologies are often only available in the cloud or are prohibitively expensive on-premises. Moreover, competition between major cloud providers is driving a tidal wave of innovation within the cloud itself. New features and services are added on a weekly or even daily basis, providing an ever-richer platform and enabling business to continue to experiment, innovate, reduce cost and deliver increasing value.

Embracing the cloud is not simply the easiest, or cheapest, or fastest way to drive digital transformation—it is the only way. For many businesses, the first step on this journey is to migrate existing applications to the cloud.

CLOUD OPERATIONS	DIGITAL TRANSFORMATION VALUE
IT becomes an enabler to the business	⇒ Driving envisioning and agility
Security by design	⇒ Continuous regulatory compliance delivery expertise
Dynamic monitoring with anomaly detection	⇒ Proactive insight into end user experience
DevOps tools and processes, CI/CD skillsets	⇒ Scale up, scale down, and move to different geographies
Solution and application-based SLAs	⇒ Meet business outcomes and customer performance expectations
Decentralized operations and resources	⇒ Modernize operations
Software and cloud-based solutions	⇒ Automation and orchestration
Expertise consulting, designing, architecting, automating, and optimizing for the cloud	⇒ Increase agility and optimization

# Partner Practice Development Framework

The partner practice development framework defines how to take a practice from concept to growth. It is the foundation of this playbook, and each phase of the framework is covered in a dedicated chapter.

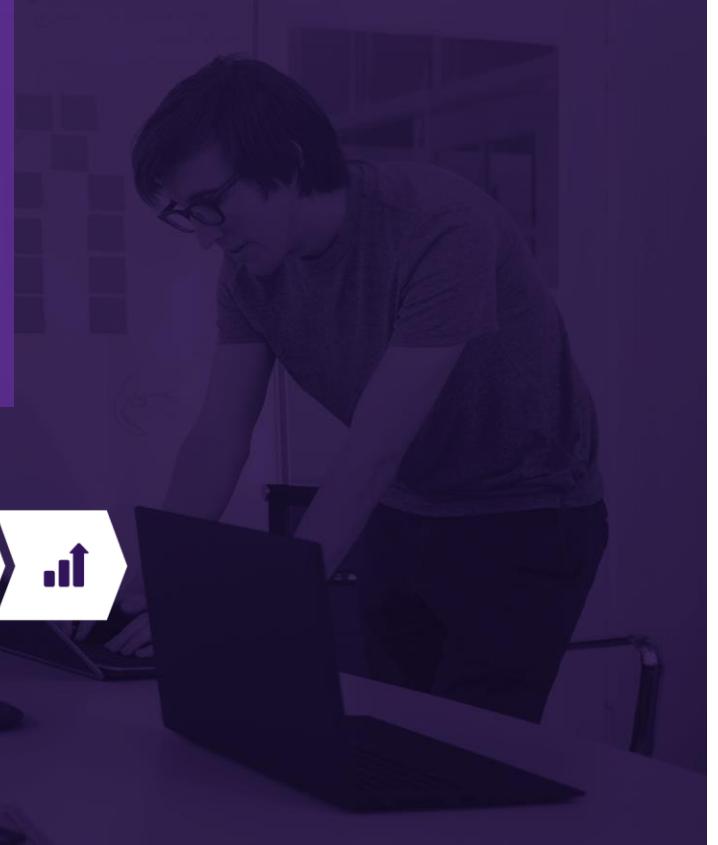


Microsoft  
Partner  
Network

# Define Your Strategy

Cloud  
Infrastructure

[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)



# Executive Summary

Now that you understand the opportunity before you in building a cloud infrastructure practice, we will begin by helping you thoroughly define the strategy upon which your practice will be built. Like the foundation of the house, the right strategy is critical to the long-term success of your practice — and it is worth it to take the time to think this strategy through.

We begin by providing an overview of the areas of expertise within a cloud infrastructure practice. Your practice may have expertise in just one of the areas, across multiple, or all areas. For each area, we provide details about the nature of the business opportunity and the key Microsoft products and services leveraged in delivering solutions that capitalize on the opportunity.

Then we will guide you through the process of defining your offer and its value proposition. This is a critical piece of your strategy — specifically, the definition of what you will sell and why customers will want to buy it. Along the way we will review the four cloud business models (reselling, project services, managed services, and intellectual property), their respective profitability and how you can assess the profitability of your own practice. We will help you drill into how you should price your

offer, including what pricing strategy to use to drive adoption of your offer, and how to minimize your risk by establishing up-front fees and payment terms. The ultimate goal here is to help you build a solid business plan that address your team, marketing, sales and financial aspects.

Then we dive deeper into sales, to help you define your pre-sales and post-sales engagement process, and how to compensate your sales executives.

If you are not yet a Microsoft Partner, we will give you a walking tour of the Microsoft Partner Network, the programs you can leverage to grow your practice, how you earn competencies that yield you additional benefits, and how to maximize the benefits you get from the program.

After that, we'll give you a head start in how to identify potential customers when starting your practice, as well as potential service offerings.

We'll conclude this section helping you understand support — how to support your customers, Microsoft's support offerings, and the support-related benefits you get from establishing competencies in the Microsoft Partner Network.

## Top 4 things to do

Measure twice and cut once. Here are the top 4 things you should absolutely do when defining the strategy for your practice.

- Define your focus & value proposition
- Understand the cloud infrastructure opportunity
- Define and design the solution offer
- Define your pricing strategy

# Cloud is the New Way to Think About Your Datacenter

## Traditional Model

Most companies are running custom applications that are stitched together, they have purpose-built hardware to think about, specialized teams, and everything has been carefully customized (over many years in some cases!).

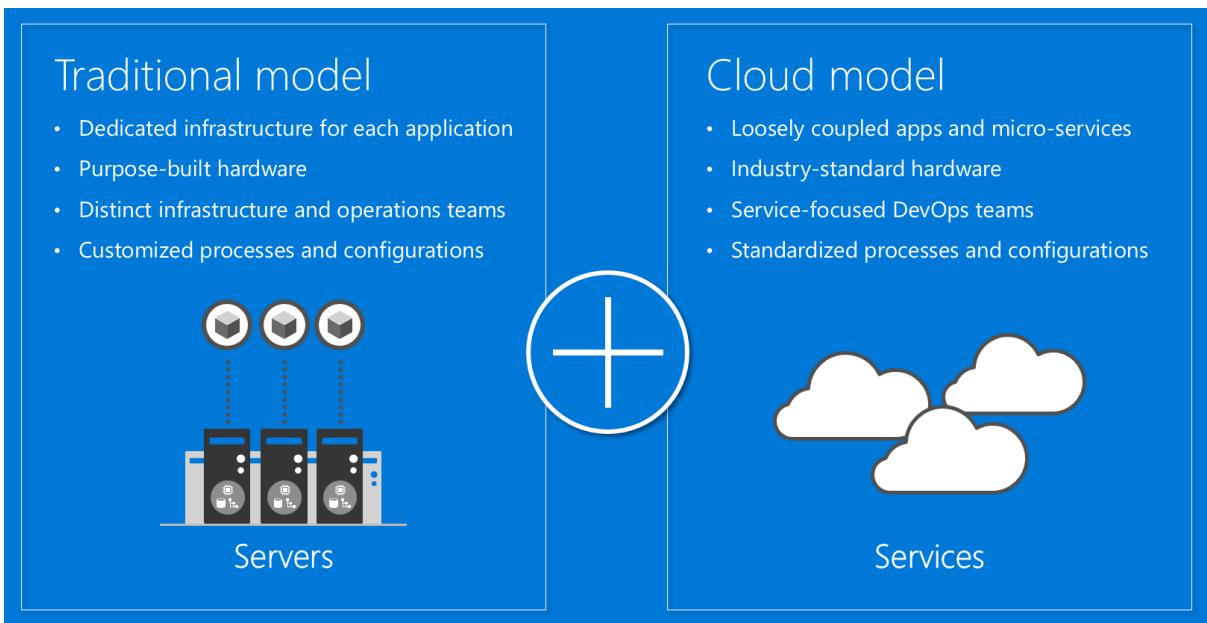
This may be done for all the right reasons, but consider that it might be holding your customers (and their business) back in many ways given that the business context has fundamentally changed. In this new age of apps, the traditional model causes friction because IT is not moving as fast as business wants it to.

This is manifested in developers not getting the speed and freedom they need to create the best end-user experiences. That leads to lost productivity on their side, which results in 'Shadow IT'. In 2015, 42% of the technology budget resides outside IT; this will grow to 50% by 2020 (Gartner).

## Cloud Model

Now let's look at the cloud. Everyone knows that the cloud offers agility and innovation. It's proving itself to be the way forward for the modern enterprise and we'll talk more about that in a bit. But for some of our IT customers, the cloud might seem a little daunting. They might be asking, "Is this something I want to lead the charge on? How does it help my career? The tension some of them experience is because you're not sure if things are consistent with what you're doing on-premises and it seems like it will be hard to manage.

There's also a tension between developers who want speed and freedom (represented by business demands), and the IT teams who have to worry about things like security and compliance.



# Define and Design the Solution Offer

With an understanding of the cloud infrastructure models, it is important to next understand the business models of the infrastructure practice because not all revenue streams are equal.

## THERE ARE FOUR WAYS TO MAKE MONEY SELLING CLOUD:

- Resale
- Project Services
- Managed Services
- Packaged IP

Partners that focus almost entirely on product revenue have the biggest barrier, and typically see margins in the range of 5–20%. This is because the margins for this revenue line are tied to vendor incentives. These partners are subject to changes in strategy and the desire to fund programs, and have the least control over their own destiny.

Project services typically drive a range of approximately 35% gross margin, but this has been under pressure for some time. This is a result of little differentiation in the channel, which has caused billable price points to hold steady over the past five or more years. Concurrently, increasing salary and benefit costs of consultants and inflation have eroded profitability. As a result, aggressive and entrepreneurial members of the channel have

adapted and gone after the higher margin opportunities of managed services, which generate on average 45% gross margin and packaged IP, which often exceeds 70%.

It is these partners who are setting themselves up to be rewarded. The mergers and acquisitions space is quite active. The partners who gravitated toward the recurring revenue lines and realized healthy growth are being presented with much higher valuations. This can have a dramatic increase in the cash event of the company and overall shareholder value — far higher than what a traditional partner focused on product and billable services can realize.

A business plan is a critical asset that can help you envision and think through the details of your practice, identify gaps you will need to address, and explain the fundamentals of your practice to others. Leverage the [Cloud Practice – Develop a Business Plan](#) guide for details, profitability scenario overviews, business plan templates, and financial models.

Read on to understand what types of project services, managed services, and intellectual property you should be considering in your cloud infrastructure practice.

## Not all revenue streams are created equal

AVERAGE GROSS MARGINS



Source: IDC eBook, sponsored by Microsoft, The Modern Microsoft Partner Series, Part 2: Differentiate to Stand Out, 2016

# Understanding Project Based Services

Building a new practice is a daunting challenge. It is not that different from starting a business from scratch. Just like any business venture, it is important to start with a vision of what your business will do, what problems it will solve, and how it will make money.

Project based services are services you offer to help your customers design, configure, implement or support a solution and are typically charged on a one-time or non-recurring revenue basis. In the Microsoft Cloud Practice Development Study, 866 partners that identified as having a cloud infrastructure practice were asked what project services they offer within their practice. The results are below. Consider this data when designing your project based offerings.

## PROJECT BASED OFFERINGS

Backup & Storage Deployment	62%	Cloud Solution Costing & Spend Optimization	35%
Cloud Migration Planning	60%	Health Checks	34%
Virtualization Migration & Deployment	56%	Custom Application Development	33%
Proof of Concept	56%	Training	29%
Systems Integration	55%	Network readiness assessment	27%
Deployment Services	53%	Security & Compliance Enablement	26%
Solution Configuration/Customization	47%	Security & Compliance Assessment	25%
Disaster Recovery Deployment	47%	Scalability & Load Testing	23%
Solution Analysis, Scope, & Design	43%	Mentoring	23%
Data Center Migration	40%	Bandwidth Planning	21%
Cloud Readiness Assessment	39%	Network Remediation	19%
Solution Support & Training	38%	Security-Penetration Testing	14%
Simple File Server Migration	36%	We do not offer any of these services	2%
Desktop Virtualization	35%		

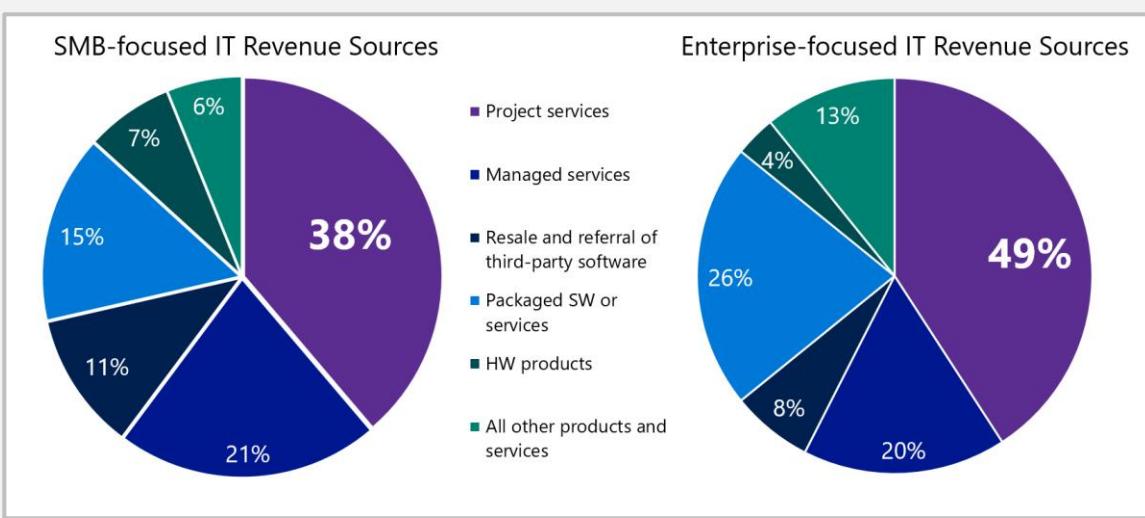
## REVENUE

<b>Total Median (n=164)</b>	<b>\$150,000</b>
<b>BY CUSTOMER FOCUS</b>	
SMB (n=116)	\$137,500
Enterprise (n=48)	\$300,000

When designing your project services, our research with partners emphasized the importance of targeting the enterprise customer to attain significantly higher per-project revenue.

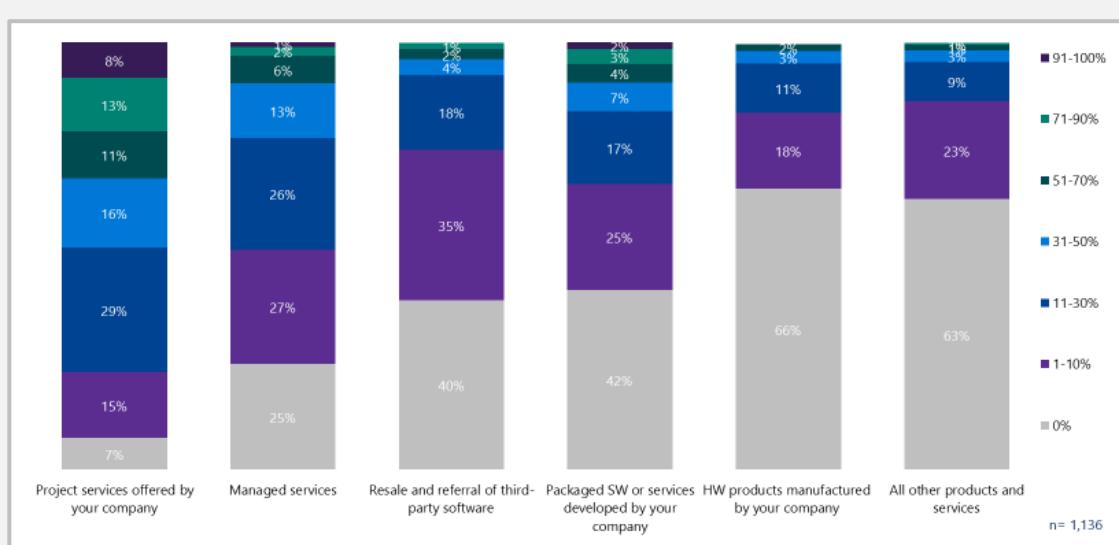
Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016.

## ESTIMATED PERCENTAGE REVENUE FROM DIFFERENT TYPES OF IT-RELATED PRODUCTS AND SERVICES



Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016

## PROJECT SERVICES DRIVE IT REVENUE



Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016

# Cloud Migration and Modernization

Many businesses will seek help on their cloud migration journey. Cloud migration represents an enormous business opportunity for partners.

As businesses of all sizes embrace digital transformation, traditional on-premises IT becomes increasingly seen as a costly, restrictive, and distracting burden. This creates pressure to reduce or even eliminate on-premises IT by moving existing applications and services to the cloud.

The business-critical nature of many existing applications means any change—especially one as fundamental and far-reaching as cloud migration—represents a business risk. Migration must be as seamless and safe as possible. Cloud migration is a highly technical endeavor and requires skills and experience that are lacking in traditional IT departments. Recognizing this, many businesses seek outside expertise to help them with their cloud migration journey.

This trend has created a rapidly growing business opportunity for specialist IT providers. The global market

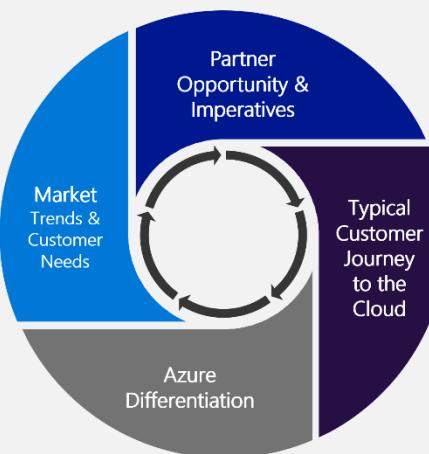
for cloud migration services is forecast to grow from \$2.4B to \$7.1B between 2016 and 2021.<sup>1</sup> This opportunity does not end with cloud migration. Once moved to the cloud, applications must continue to be maintained and updated. Once again, this requires specialist cloud skills and expertise, and once again many businesses will outsource this ongoing maintenance to specialist managed service providers. Outsourcing this work also enables a business to focus on their core activities rather than IT.

This playbook focuses on the opportunity afforded by offering cloud infrastructure services. Partners considering offering cloud migration services should also study the [Cloud Migration & Modernization Practice Development Playbook](#).

## Building a Migration Practice – The Why

- Public cloud is exploding - \$500B by 2020<sup>1</sup>
- Most apps are on premise, but 42% will move to public cloud in 2 years<sup>2</sup>
- Modernization is the key driver - CTO/IT, EOL technologies, LOB Users/Shadow IT
- Cost reduction, On-demand capacity and IT as a strategic asset - motivators<sup>3</sup>
- Private/Hybrid cloud will be relevant

- 46% of customers prefer Azure over any other public cloud (AWS 42%)<sup>2</sup>
- Azure is Secure, Hybrid, Scalable
- Application footprint is heterogeneous – Azure has native support for Windows and Linux
- Great ecosystem of ISVs for tooling
- Managed services with CSP



- Migration – entry point for Cloud MSPs
- > 50% of customers will look to 3rd parties for help<sup>3</sup>
- Plan, Design, Build, Manage - immediate opportunities?
- Security and roadmap offers are critical
- Automation is key and a source of increased revenue

- Monitoring, security and compliance are top of mind
- Most start with IaaS 'Lift & Shift', IaaS optimization
- IaaS to PaaS, App modernization through architecting/re-platforming
- Customer size does not equal to migration complexity

<sup>1</sup> IDC CloudView 2016 Survey, 2016

<sup>2</sup> PULSE Gatepoint Research, March 2016

<sup>3</sup> 451 Research April 2016

<sup>4</sup> Markets and Markets 2016

# Azure Governance

## Making the Cloud Enterprise Ready

A key service that your practice can offer as a partner as a project or through managed services is setting up your customer's subscriptions for governance.

### KEY CUSTOMER CHALLENGES

- Customer lacks technical expertise required to support all services that Azure offers
- Customers do not know how to enable charge back across departments internally
- Customers do not know how to identify where they are spending their money in Azure

Azure provides several built-in tools to help apply governance at scale. A resourceful cloud infrastructure and hybrid practice can also build tooling, scripts, templates, and policies to accelerate customers to apply more control.

### KEY SERVICES FOR THIS OFFERING

- Configure and set up the [Azure Enterprise Agreement \(EA\) portal](#)
  - Implement charge back for departments and setup PowerBI for reporting
  - Implement custom reporting for your customers using the [Azure Resource Usage and RateCard API](#) or the usage and billing portal sample
  - Integrate 3rd party cloud pricing solutions
- [Configure Role Based Access Control \(RBAC\)](#)
- Create and deploy [Azure Resource Manager policies](#)
  - Create a supported service catalog
  - Control which regions are supported
  - Enforce Azure resource naming conventions
  - Enforce tag policies
  - Auditing of events in Azure subscriptions

### SET UP POWERBI FOR AZURE EA MONITORING

The Azure Enterprise Agreement makes it easier than ever for enterprises to use Azure. With the release of the [Microsoft Azure Enterprise content pack for Power BI](#), you can now quickly import and analyze your Azure consumption data in Power BI. This data allows you to gain insights into which departments, accounts, or subscriptions are consuming the most. It also provides visibility into which service your organization used most and trends for spending and overall usage.

### AZURE USAGE AND BILLING PORTAL

The [Azure Usage and Billing Portal](#) is an open source project hosted in GitHub that you can use as-is or customize and extend to make your own usage and billing solutions.



# Hybrid Cloud Networking

## Hybrid and Globally Connected

For companies with a hybrid cloud strategy cloud networking is a foundational technology for any migration or serious workload deployment. Opportunities could involve extending an existing wide area network to the cloud with [Azure ExpressRoute](#) or to providing connectivity services between virtual networks using site-to-site VPN or peering.

Many customers are developing a multi-cloud strategy, whether that is with other public cloud providers or their own private cloud and public cloud connectivity is still an integral part of that offering.

### KEY CUSTOMER CHALLENGES

- Unsure of how much bandwidth or capacity is needed
- Customers have compliance issues and are not sure how to protect their infrastructure to build compliant solutions
- Customer lacks technical expertise required to connect their existing data centers or sites to the cloud
- Customers want to build a disaster recovery solution between their location and Azure but lack the skills in networking to make a viable solution

### KEY SERVICES FOR THIS OFFERING

- Network design and bandwidth planning
- Enabling hybrid connectivity with ExpressRoute or Site-to-Site networking (or both)
- Building geo-redundant or multi-cloud solutions with Azure Traffic Manager
- Performing network readiness assessments for Office 365 customers that require ExpressRoute
- Deploy firewall virtual appliances and network security groups to secure the network and ensure compliance
- Implement secure connectivity for remote administration and development and test with point-to-site networking



### RESOURCES

- ➔ [Azure ExpressRoute](#)
- ➔ [ExpressRoute for Office 365 and Dynamics CRM](#)
- ➔ [Optimize ExpressRoute routing](#)
- ➔ [Apply to become an ExpressRoute Partner](#)
- ➔ [Site-to-Site VPN](#)
- ➔ [Protecting the Cloud Boundary with Azure](#)
- ➔ [Azure Traffic Manager](#)
- ➔ [Azure Point-to-Site Networking](#)
- ➔ [Protecting Data and Privacy in the Cloud Whitepaper](#)

# Automation and DevOps

## The DevOps Partner Opportunity

Automation and orchestration are extremely important functions to a successful Azure practice. Your ability to automate routine tasks allows you to lower your delivery costs and offer superior SLAs – driving a virtuous cycle of efficiency and repeat business. Automation is the key to creating the right balance between cost, reliability, speed, and time to market.

Automation can also offer significant benefits to the customer as it can optimize Azure spending and increase reliability for workloads that have varying resource requirements.

### KEY CUSTOMER CHALLENGES

- Lack of technical expertise required to efficiently manage PCs, servers, software, user access, and policies
- Lack of a unified toolset for implementing an appropriate configuration management work stream
- Lack of a unified management plan and instead carries out changes on live equipment on an ad hoc basis
- Lack of resources and knowledge to maintain their own system and integrate automation capabilities
- Automation tools are perceived as too complicated and too expensive to implement
- Lack of familiarity with DevOps approach to operations - or unable to bring the cultural change required to adopt DevOps as a way of doing things
- Fear and uncertainty surrounding the loss of control associated with automation
- IT environments are not mature or well defined enough to warrant automation
- Developer costs associated with unnecessary development resources

For DevOps on Azure it is important to have a strong understanding of the command line tools and Azure Resource Manager templates as well as services like [Chef](#), [Puppet](#), [Ansible](#), [SaltStack](#), [Azure PowerShell](#), or [Azure Automation DSC](#) to enable configuration management for a stronger offering. With these tools in your toolbelt you can automate tasks normally done through the Azure management portal and control large amounts of resources with fewer people. Some tools, such as [Azure Automation](#), even work across both on-premises and cloud based resources enabling advanced DevOps scenarios such as process automation, update management, change tracking and inventory collection.

### KEY SERVICES FOR THIS OFFERING

- Template and script authoring
- Automatic start and stop of virtual machines
- Cost management of developer cloud resources using [Cloudyn Cost Management](#)
- Automatic scale down of services
- Continuous deployment and integration
- Configuration management
- Container management

# Backup and Disaster Recovery

## Business Continuity is Key

Enable business continuity for the enterprise with Azure.

Microsoft Azure offers a rich set of services to backup workloads and hybrid storage support. [Azure Backup](#) is one service that supports file and folder based workloads, virtual machine backup, as well as workload specific support such as Hyper-V, VMWare, SharePoint, and Active Directory straight to Azure removing the need for physical backups like tape. [Azure StorSimple](#) is an appliance (physical and virtual) that provides hybrid tiered storage to automatically offload data to the cloud: [Azure Site Recovery](#) protects important applications by coordinating the replication and recovery of physical or virtual machines. You can replicate to your own datacenter, to a hosting service provider, or even to Azure to avoid the expense and complexity of building and managing your own secondary location. Azure Site Recovery continuously monitors service health and helps automate the orderly recovery of services in the event of a site outage at the primary datacenter.

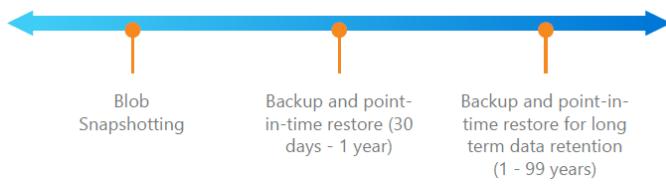
### KEY CUSTOMER CHALLENGES

1. Will you help me restore my data when it is corrupt or lost? Will you take care of my data's long term retention compliance requirements?
2. Will you protect my mission critical applications? Will you make DR and recovery plans and run DR drills?
3. Will you ensure business continuity in case of any interruption? What kind of SLAs will you provide?

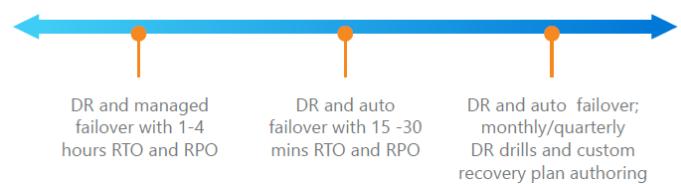
### KEY SERVICES FOR THIS OFFERING

- Enabling disaster recovery from on-premises to Azure or on-premises to on-premises with Azure Site Recovery with physical servers, VMWare or Hyper-V virtual machines
- Azure Automation Runbook authoring for automated failover
- Backup deployment and configuration of virtual machines in Azure
- Backup deployment and configuration of enterprise workloads such as VMWare, Hyper-V, Active Directory, SharePoint, and SQL Server
- Enabling hybrid storage and backup services with StorSimple

VALUE ADD SPECTRUM - BACKUP



VALUE ADD SPECTRUM - DISASTER RECOVERY





## Identity and Access Management

Identity Management is another “Must-Have” service offering for Cloud MSPs. For MSPs focused on productivity and mobility solutions, identity management is a natural add-on.

Azure Active Directory provides comprehensive, Enterprise-grade identity and access management solution. It works with on-premises Active Directory to offer an integrated solution enabling a common identity to be used to access both on-premises and cloud-based services, including third-party services.

- You can run Windows Server Active Directory (AD) in the cloud using virtual machines created with Azure Virtual machines. This approach makes sense when you're using Azure to extend your on-premises datacenter into the cloud.
- You can use Azure Active Directory to give your users single sign-on to Software as a Service (SaaS) applications. Microsoft's Office 365 uses this technology, for example, and applications running on Azure or other cloud platforms can also use it.
- Applications running in the cloud or on-premises can use Azure Active Directory Access Control to let users log in using identities from Facebook, Google, Microsoft, and other identity providers.

### KEY CUSTOMER CHALLENGES

- Is Azure Active Directory secure?
- Is it safe to deploy Active Directory in an Azure Virtual Machine?
- How can I enable single-sign-on with my existing Windows Server Active Directory domains and my resources in Azure?
- Can I enable single-sign-on with other cloud based SaaS services?
- Do I need to deploy Active Directory Federation Services?

## HOW AZURE ACTIVE DIRECTORY CAN HELP

USER ACCESS MANAGEMENT	USER TAGGING AND CHANGE MANAGEMENT	SINGLE-SIGN-ON	MULTI-FACTOR AUTHENTICATION
This is a simple but important aspect of ID management that gives admins the power to identify and control the state of users logged in to the network. MSPs, on their customers' behalf, can add or delete users, query or filter users, set access policies, and enforce strong authentication when users access resources. This can be done using CSP Partner Center and Azure Portal.	This allows you to use Azure tags and manage the logging of all user activity on Azure. Maintain multiple Azure subscriptions, as well as role-based access, for individual users for specific subscriptions and specific Azure resources.	This enables your customer to have access to their resources by using a single set of user credentials and a unified authentication method across Azure, hosted infrastructure, on-prem infrastructure and other SaaS apps. Free your customers from multiple authentication processes for accessing different apps.	A method of ID authentication that requires more than one verification process (e.g., phone verification), adding a valuable second layer of security to signing in and completing any transactions. MSPs can provide improved application security with Microsoft Azure Active Directory Multi-Factor Authentication (MFA).

Enabling hybrid identity is a foundational step in for many organizations' digital transformation.

### RESOURCES:

- ➔ [What is Azure AD?](#)
- ➔ [Deploying a Hybrid Identity Solution](#)
- ➔ [How to Deploy ADFS in Azure](#)
- ➔ [Azure AD Domain Services](#)
- ➔ [Azure Active Directory Proof of Concept Playbook](#)



# Plan Proof of Concept

One of the key services in your project services arsenal is the Proof of Concept (PoC).

## PROOF OF CONCEPT HIGH LEVEL FLOW



### Why Perform a Proof of?



PoCs serve several purposes. One of the primary goals is to overcome customer objections by demonstrating that the solution will solve the problem it's being designed for. The PoC also can serve as evidence that your practice can use for future engagements with the same customer or with new customers. Many times, the output of a PoC can be added to your practice's intellectual property list for demonstrations, or used to accelerate future solutions. Proof of concepts are one of the key tools when trying to displace the competition by rapidly showing value and hopefully a quick return on investment.

### POC Execution



First, identify the technical resources needed for the PoC. This will include the technical implementation team, as well as project management for tracking the progress of the engagement. Beyond identification of resources, ensure all members of your team and your customer's technical team (if they are participating) are clear on responsibilities. During the PoC it is important that the initial design [follows best practices and is designed for production](#) (just scaled down) from the beginning. Communication is critical, so ensure that the progress of the PoC is communicated to all stakeholders on a regular basis.

### Define Scope



A proper PoC is defined with a clear and concrete scope. Conduct an application design session (ADS) to align business and technical requirements and set clear goals. This should include:

- Identify workloads and features to demonstrate.
- Determine what you want to prove and which objections need to be overcome.
- Clearly demarcate responsibilities and set up organization.
- Set up subscriptions, define payment, and perform cost estimates of the PoC.
- Agree on the next step if success criteria are met.

### Next Step



At the end of the PoC, create a report that explains the overall status of the PoC and any issues identified during the PoC. The report should elaborate on the pros and cons of the delivery and clearly explain the value prop of moving forward with a real implementation to the stakeholders along with expected production costs over time. Assuming the stakeholders agree to move forward, put a plan into place to deploy the PoC into production while ensuring that the PoC is designed for production usage.

“

Ensure you are solving a problem. Attach managed services wherever possible and make sure you have a very robust offering around it. This allows for a scalable high margin business.

**NICK SONE**

CEO of Ensysit



# Understanding Managed Services

With managed services, you can help your customers on a regular basis by offering white-glove services. As a managed service provider, your offerings can span from planning and enablement to day-to-day operations and support.

Managed services is not a new business model. For more than 20 years, large enterprises have relied on service providers to manage their IT assets. Whether you call them an outsourcer, an RMM provider, or a managed IT provider, service providers have been managing their customers' workloads — either in their own data centers or those operated by their customers. Cloud, however, requires a new method of management because of its focus on scale, elasticity, and automation. For CIOs, cloud represents a paradigm shift in the way they think about embracing IT. Dev-ops has completely changed the way applications are developed and maintained. The hyper-scale nature of cloud provides a completely new meaning to scalability, elasticity and resiliency — and has redefined how applications are architected and delivered. The pay-as-you-go model provides a fail-fast, agile method of app development. Device and data proliferation means customers want to — and can — do so much more with their IT assets, with cloud providing the computing resources to do so. Because of cloud, CIOs are demanding a new way to think about data governance and security. A cloud MSP is someone who helps their customer transition to (and embrace) this paradigm shift in technology — by guiding them in all aspects of their cloud journey. From consulting to migrations, to operations management, cloud MSPs show customers all the benefits that come with cloud adoption.



## PLANNING

- Assess your customer's IT environment and determine the data and apps that are viable opportunities for Azure migration
- Offer customers a roadmap for Azure adoption and associated values
- Provide a TCO and ROI analysis for moving their applications to Azure



## ENABLEMENT

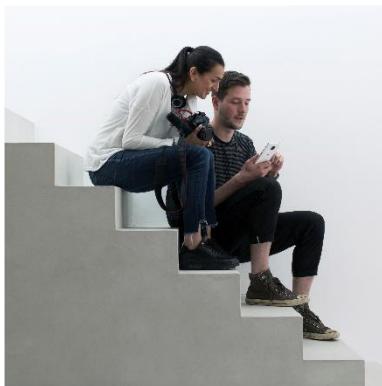
- Migrate workloads to Azure
- Re-platform applications to run in the cloud
- Optimize workloads running in hybrid and public cloud environments
- Help your customers with staging, testing, and validation before moving their production environments to Azure



## SUPPORT OPERATIONS

- Offer support while delivering on SLAs and uptime guarantees
- Operate and monitor your customer's Azure and hybrid cloud Environments
- Provide your customers with governance over their cloud usage by managing their billing and Azure capacity planning

## Resources



Take your managed service provider model to the next level by becoming a Microsoft Azure Cloud Solution Provider

- [Getting Started](#)
- [Cloud Reseller FAQ](#)
- [Azure Managed Services Playbook for CSP Partners](#)
- [View the CSP Infographic](#)

## Accelerate your Managed Service Model

The Microsoft Cloud Solution Provider (CSP) program enables partners to directly manage their entire Microsoft cloud customer lifecycle.

Partners in the CSP program utilize in-product tools to directly provision, manage, and support their customer subscriptions. Partners can easily package their own tools, products, and services, and combine them into one monthly or annual customer bill.

### CSP DIRECT

The CSP Direct model is great for partners who have the infrastructure in place to do it all. If your business meets these requirements and you are ready to go, [enroll today](#).

#### CSP DIRECT REQUIREMENT CHECKLIST

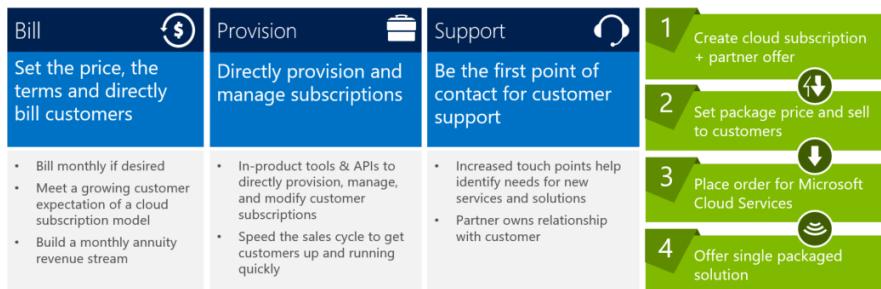
- Services business model
- Customer support infrastructure
- Customer billing and invoicing capabilities
- Ability to scale

#### KEY SERVICES FOR THIS OFFERING

- You are the first point of contact for your customers' needs
- You own and control the billing cycle
- You sell integrated offers and services — one sales motion to drive services, attach, and upsell
- You receive in-product tools to directly provision, manage, and support your customers

### CSP INDIRECT

Spend more time with your customers and provide specialized service offerings. If you're not interested in building an infrastructure to provide customer support and billing, [get connected with an Indirect Provider](#).



# Support as a Managed Service

It should go without saying that one of the most important functions of your MSP practice is supporting your customer once their applications and data are firmly in the cloud or a hybrid deployment.

No matter how well a cloud or hybrid environment is planned, provisioned, operated or monitored, problems will arise, and those problems will need to be remediated. It's your job as an MSP to offer support to your customers to deal with outages, breaches, inefficiencies, and disaster scenarios. MSPs need to consider the level of support that makes sense for their practice — in terms of resources and revenue — as well as what makes sense to the customers they serve.

## KEY CUSTOMER CHALLENGES

- They lack the expertise and resources to troubleshoot problems.
- They are unable to determine the root cause of performance issues and glitches.
- They have no knowledge of how to remediate problems when they correctly identify them.
- They do not want to spend time and resources fixing problems.

## KEY SERVICES FOR THIS OFFERING

- **User Support:** Provide support for frequently asked questions, setup and usage, best practices, questions around billing and invoicing, break-fix support for developers, architecture design, and solution design support for architects.
- **System Support:** Provide customers with information on any service interruption, and relay expectations on when the system will be back online.
- **Product Support Support:** Provide support when the Microsoft product is not working as expected or the service stops working. Escalate to Microsoft when

the issue cannot be resolved with existing documentation and/or training.

- **Extended Support Support Hours:** Many customers need the ability for 24/7 support support, but cannot justify the overhead internally.
- **Account Management:** Offering an account manager that is responsible for reporting service consumption and ultimately minimizing time to resolution is a service that can be offered at a premium.
- **Dedicated Support:** The value add of a dedicated support team cannot be understated. Engineering resources that already know your customers' environment, including the business and technical reasons for how a solution was implemented can add a tremendous value over the lifetime of an agreement.

Adding managed support services to your offerings increases your value and profitability. Learn more in this article: [Four ways owning the customer life cycle makes you more profitable](#).



# Cloud Monitoring Services

Back in the 2000s, Managed Services was synonymous with Remote Management & Monitoring (RMM).

In the cloud world, the tools and requirements have evolved, but the problem statement hasn't fundamentally changed. How do I monitor the health and performance of my IT infrastructure? There is no easy answer to this and customers expect their service providers to solve it for them. Most mid-market and enterprise organizations simply do not have the time, resources, or dedicated staff required to monitor every aspect of IT, and this is where MSPs add the most value. While Azure offers many monitoring capabilities built within the platform, there is still a place for partners who (a) provide additional, deeper monitoring tooling (b) triage the false positives from the real alerts (c) proactively act upon the alerts before any measurable loss in performance.

## KEY SERVICES FOR THIS OFFERING

SYSTEM HEALTH MONITORING	LOG ANALYTICS AND ALERTING	DATABASE MONITORING	APP PERFORMANCE MONITORING
Complete monitoring of VMs, CPU utilization, memory usage, storage IOPs, and OS performance. Includes monitoring of application performance and operation health, and dashboards and reports on system health.	Every client, device, and user accessing a network produces data that is logged. Analyzing those logs can offer deep insight into performance, security, resource consumption, and a number of other meaningful metrics.	A view into your customer's database that helps MSPs ensure high availability of database servers. The process involves keeping logs of size, connection time and users of databases, analyzing use trends, and leveraging data to proactively remediate issues.	End-to-end tracking of all aspects of an application (or webpage). App monitoring involves watching every part — from shopping carts to registration pages — of a customer's app(s) for performance issues in an effort to provide the best user experience possible.

## RESOURCES

- ➔ [Azure Advisor](#)
- ➔ [Azure Application Insights](#)
- ➔ [Azure Diagnostics](#)
- ➔ [OMS Log Analytics](#)
- ➔ [System Center](#)
- ➔ [Log Analytics](#)
- ➔ [Automation](#)

## THIRD-PARTY RESOURCES

- ➔ [App Dynamics](#)
- ➔ [Nagios](#)
- ➔ [New Relic](#)
- ➔ [Science Logic](#)
- ➔ [Splunk](#)
- ➔ [Logic Monitor](#)

# Hybrid Device Management: Manage PCs, Servers and Devices

With the increasing demand to support bring-your-own-device (BYOD) scenarios, organizations are faced with the challenge of finding the right balance between allowing their employees to choose which devices they use, while making sure those devices have access to the right set of applications and meet corporate data protection and compliance requirements.

## KEY CUSTOMER CHALLENGES (USER)

- Demand their own choice of devices and apps
- Expect anywhere connectivity and productivity

## KEY CUSTOMER CHALLENGES (IT)

- Needs to maintain compliance and data protection
- Must avoid the complexity and cost associated with many discrete management infrastructures

## KEY SERVICES FOR THIS OFFERING

	Microsoft's solution builds on market-leading client management by combining System Center Configuration Manager with Microsoft Intune to provide organizations with a comprehensive, cross-platform, and user-centric way to deploy applications and manage users' devices, whether they are corporate-connected or cloud-based.
	With Configuration Manager and Intune, organizations can enable their employees to choose devices, unify management infrastructure, and simplify IT administration. IT can deliver and manage consistent application experiences for employees based on their corporate identity, network connectivity, and device type, helping maintain productivity as employees use various devices throughout their day. Through a single infrastructure and administrative console, IT can manage PCs, servers, mobile devices, endpoint protection, and virtual machines across various platforms, including Windows, Linux/Unix, Mac OS X, iOS, and Android.
	Simplified server and client deployment, streamlined updates, and consolidated reporting enable your IT staff to easily manage your mobile, physical, and virtual client environments, reducing costs and increasing efficiency through comprehensive application and device management. Unified security, including System Center Endpoint Protection, protects your corporate information and helps you better manage risk by deploying software updates and antimalware definitions to PCs, as well as enabling selective wipe of mobile devices. New improvements — such as the support of latest Windows 10 features, Windows in-place upgrade, more frequent and easier updates, unified end-user portal, and on-premises MDM — make deploying and managing Windows easier than ever.

## RESOURCES

- ➔ [Managing Corporate Devices](#)
- ➔ [Choose between Microsoft Intune Standalone and Hybrid Mobile Device Management with System Center Configuration Manager](#)

## Additional Managed Services Offerings

The project services discussed earlier are all potential offerings in your managed services offering. Beyond those, as an MSP you can offer a much broader set of long-term support and consulting offerings.

In the Microsoft Cloud Practice Development Study, 866 partners that identified as having a cloud infrastructure practice were asked which managed services they offered within their practices. The results are below. Consider this data when designing your managed services-based offerings.

MANAGED SERVICES OFFERINGS		
Virtual Machine Management & Upgrading	55%	
Configuration Management	44%	PowerShell Script Automation
Microsoft support (interface between MSFT & customer)	43%	Network Monitoring
Domain Management	43%	Reporting and Analytics
Troubleshooting	43%	Critical Response Support
Update & Patch Management	42%	Anti-Virus Monitoring
Hybrid Environment Support (Basic Infrastructure)	40%	Reports and Dashboard Maintenance
User Rights & Account Management	40%	Security Management & Identity Protection
Azure Consumption Monitoring & Optimization	38%	Application Lifecycle Management & Support
Reactive Help Desk Support	37%	Virtual Database Administration
Disaster Recovery Monitoring & Testing	37%	Data Center Performance Monitoring & Optimization
Performance Monitoring and Reporting	36%	Regulatory Compliance via O365 Infrastructure
Proactive Backups & Anti-Virus Monitoring	36%	Online Training and Self-Paced learning
Virtualization Support & Efficiency Optimization	34%	We do not offer any of these managed services

## REVENUE

<b>Total Median (n=118)</b>	<b>\$100,000</b>	When designing your managed services, our research with partners emphasized the importance of targeting the enterprise customer to attain significantly higher managed revenues.
<b>BY CUSTOMER FOCUS</b>		
SMB (n=82)	\$75,000	
Enterprise (n=36)	\$150,000	

Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016.

# Understanding Intellectual Property

The idea of coming up with “productized” IP may sound daunting. But many partners found that they already had IP, it just wasn’t packaged that way. If you did something custom that was successful for one client, there may be more customers that would benefit from solving the same problem.

Review your most successful projects to see if there are repeatable elements that you can productize. Repeatable elements can be about your own vertical or process best practices, or else they can focus on common customer pain points. Start small. Your IP can be a simple template or just a few lines of code that automates a particular function in a way your market typically needs. Productizing IP and creating repeatable processes has been a very successful strategy for many partners. Some partners are achieving gross margins in excess of 70% by productizing IP and selling it to their customers on a recurring revenue basis. Productizing IP helps you create stickiness with customers and opens up opportunities to sell your solutions through the partner channel. If you don’t want to create your own IP, you can also look to the partner ecosystem for incremental solutions that can be bundled with Microsoft’s offerings to round out your total solution. There are multiple opportunities for building intellectual property that can be used to expedite engagements, or even as an entire engagement. With the ability to create fully automated solutions partners can challenge their creative side to offer up solutions that can save their customers money as well as add a striking differentiator amongst your peers. In the Microsoft Cloud Practice Development Study, 866 partners that identified as having a cloud infrastructure practice were asked which intellectual property offerings they provide within their practice. The results are below. Consider this data when designing your intellectual property offerings.

## INTELLECTUAL PROPERTY OFFERINGS

Automated Backups & Disaster Recovery	34%	Automated Load Balancing	18%
Automated Monitoring, Alerting, & Logging	26%	Automated Consumption Monitoring & Reporting	16%
Office Connectivity & Other Plug-Ins & Add-ons	21%	Automated Disaster Recovery Testing	16%
Customer Self-Serve Portals	20%	Online Training & Self-Paced Learning	13%
Pre-Configured Dashboards	19%	Middleware for Hybrid Synchronization	12%
External Portals for End Customer Information	18%	We do not offer any of these intellectual property	40%

## REVENUE

**Total Median (n=67)** **\$50,000**

### BY CUSTOMER FOCUS

SMB (n=45)	\$40,000
Enterprise (n=22)	\$62,500

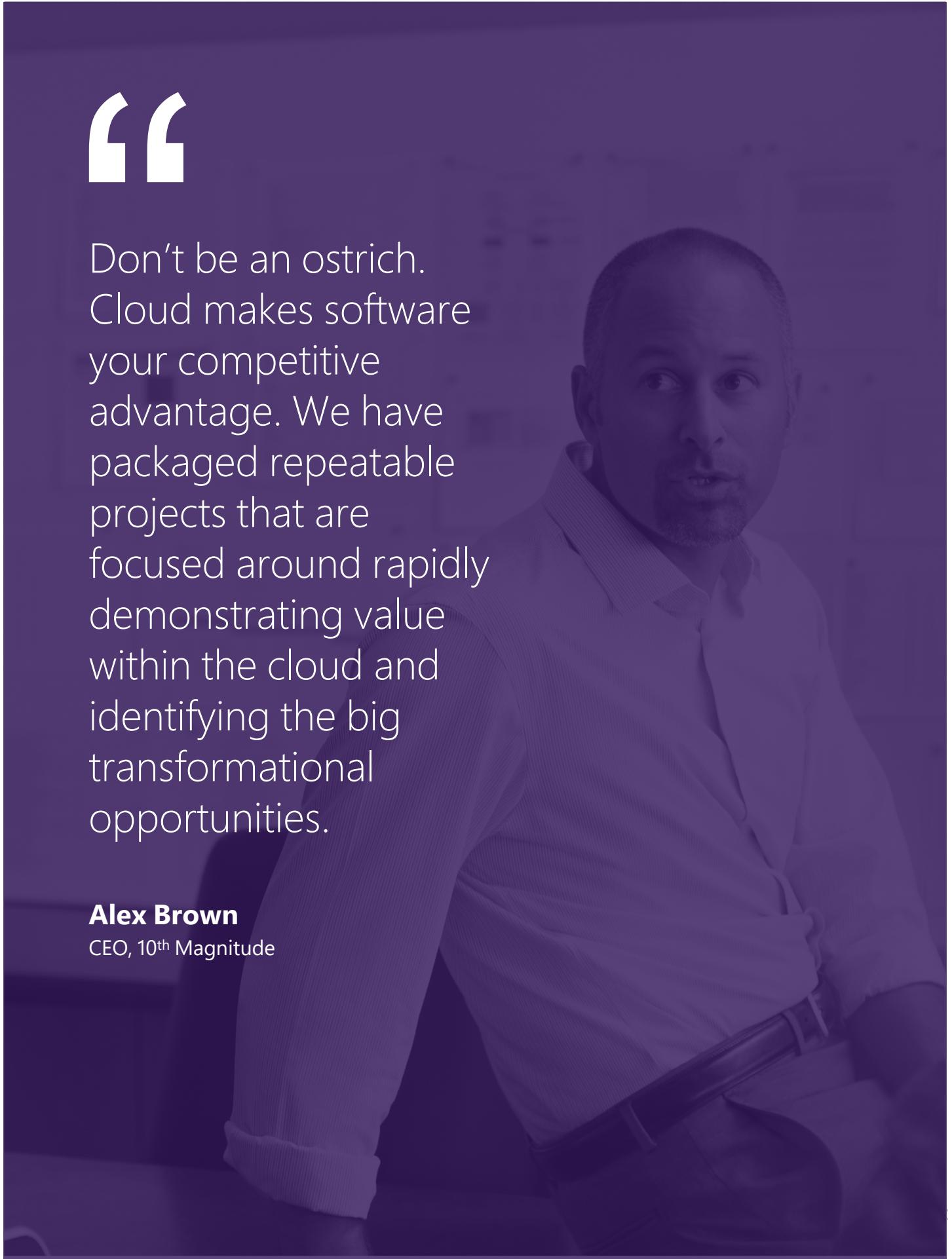
When designing your IP offerings, our research with partners emphasized the importance of targeting the enterprise customer to attain significantly higher managed revenues.

“

Don't be an ostrich. Cloud makes software your competitive advantage. We have packaged repeatable projects that are focused around rapidly demonstrating value within the cloud and identifying the big transformational opportunities.

**Alex Brown**

CEO, 10<sup>th</sup> Magnitude



# Define Vertical Offerings

## Resources



Delivering datacenter level networking expertise is critical to an enterprise hybrid cloud offering.

- [Maximize your profitability with vertical solutions](#)
- [Cloud Partner Strategy 2.0 Going Vertical](#)

## Consider Verticalizing Your Offer

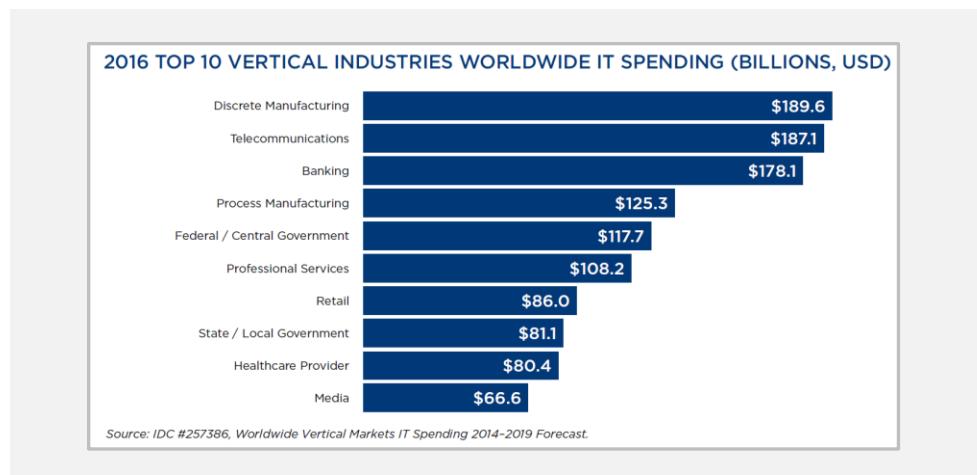
It is recommended that you specialize by vertical, functional process, or technology.

### EXAMPLES OF THESE TYPES OF SPECIALIZATION:

- Vertical specialization: manufacturing, banking, retail
- Functional process specialization: accounting, human resources, marketing campaign management
- Technology specialization: systems management, analytics, enterprise resource planning

Think about it this way; if there is lack of differentiation in the market owing to approaches like verticalization, then price becomes the primary differentiator between you and your competition. This can erode your margins and trap you in a business they can't afford to invest in as prices race to the bottom in order to win customers.

Establish your company as an expert in your selected areas. You can also focus on a specific technology or become known as an early adopter and technology leader. But the real value comes from IP or expertise in an industry, vertical, or business process. The combination of adding IP to a vertical or business process expertise makes that advantage even more powerful.

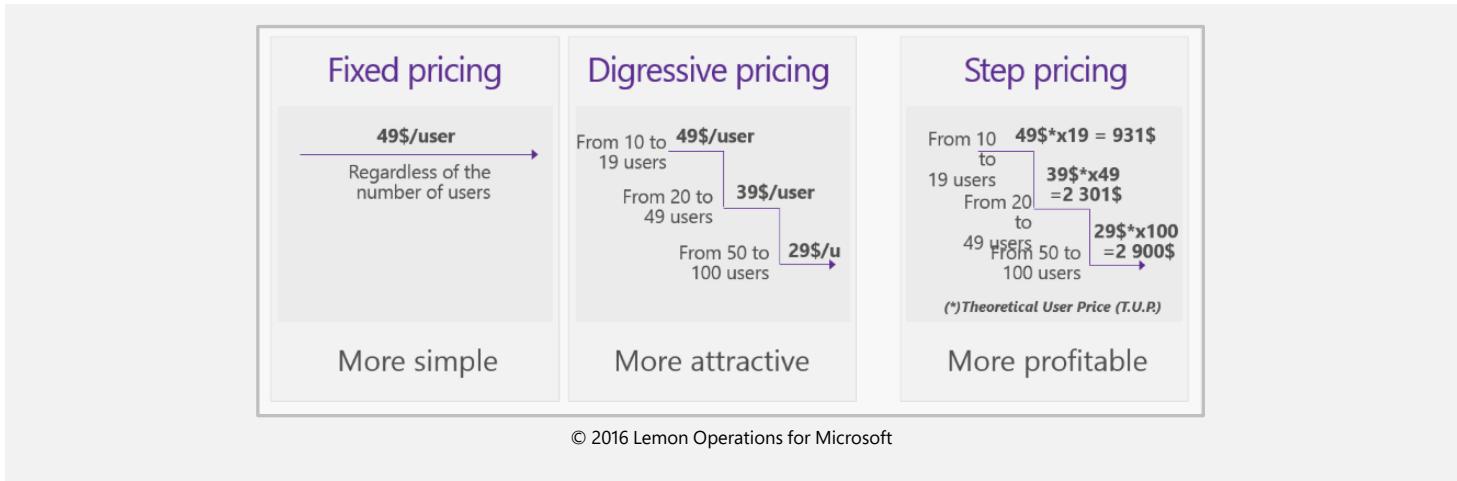


Our research with partners suggests mastering one specialization before adding additional ones. We understand that it is easy to be distracted, by saying "yes" to every request, and by diversifying into too many offerings. But in the long run, it is better to say "no" to those projects that are outside of your focus. Partners have shown benefit from having a strict focus on one key solution and growing by expanding one vertical at a time.

# Define Your Pricing Strategy

Pricing your cloud infrastructure offer is no longer determined simply by cost plus margin.

Pricing a product or offering is different in today's marketplace. Increasingly it is about return on value (ROV) — the added benefits (e.g., better per-unit price, improved service characteristics) your customer gets by being a better customer of yours (e.g., buying contracts with longer durations, making upfront payments, etc.). Customers will only pay as much as the value they estimate they will get from the offering. Price is rarely mentioned on service provider websites. The sales copy speaks of partnerships and the price is often revealed only after speaking to a sales representative. In an offer-based strategy, this will not work. In the business of cloud, price is always disclosed up front. Because price is part of your value proposition and solution offer, your pricing is something you can be proud of and share. Remember you are in a race against yourself and the competition. Be proud and show your price early, removing any customer concerns. Pricing is now a result of the product, and it begins with your value proposition. To understand how to price your offers, let's review the pricing strategies to see the benefit they bring to your solution offer.



## STANDARD PRICING

Pricing is the consequence of the product and aligns to the accepted industry/application standard. Think of this as reference pricing — as in customers have seen similar products sold for this amount, so you price your offer so that it is similar. What's the standard price for a mobile phone app? \$0.99. If you charge more, you are breaking from the industry accepted, standard pricing. This is an old way to look at pricing. Buyers today will accept this model, but they do not prefer it and it provides minimal help in getting your offer purchased.

## VIRTUOUS PRICING

Virtuous pricing is about using the price as a sales weapon. The goal of virtuous pricing is to create a virtuous sales cycle with your customers, where each sale encourages the next sale within the customer organization. It fosters product adoption and proliferation. Let's begin with a counter example of what is not virtuous pricing — a fixed price per user. Here, you have a simple pricing structure (which is important), but there is nothing to encourage more aggressive purchasing by the customer.

Enter digressive pricing, which drops the per-unit price with the purchase of more units. Your customers get a discount per unit price the more they buy. This can help create a virtuous sales cycle with the customer because now the customer is looking for ways to bring their cost per unit (e.g., user) down.

For example, assume one line of business has already purchased 19 users from you at \$49 per user. Now, there are discussions within another line of business within the same customer organization to purchase a similar product from a competitor or to purchase yours. Your existing customer is incentivized to lobby on your behalf because if the other line of business purchases your product, their cost per user will drop to \$39 per user. And the cycle can continue as each new group evaluates your solution offering.

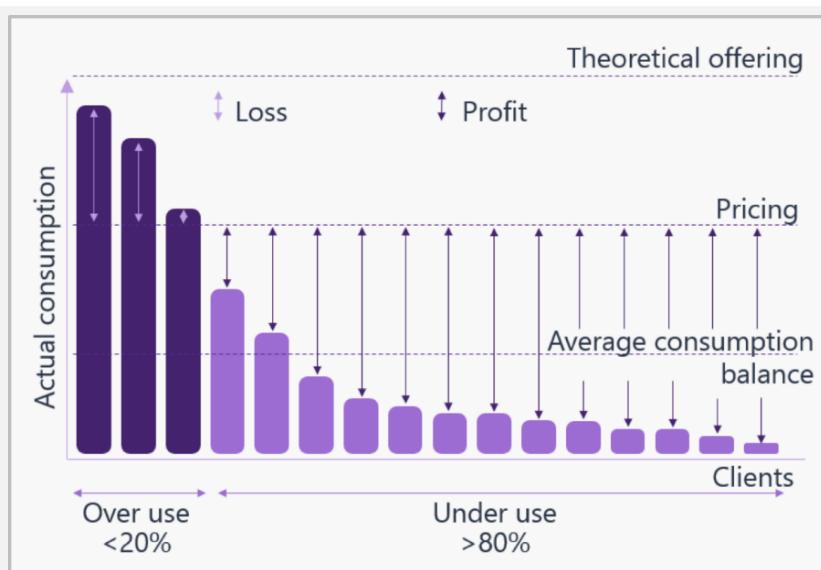
There is a way to adjust digressive pricing slightly to make it significantly more profitable - step pricing. This method sets the price for each step as the top number of users in the range. Building on the example from digressive pricing, let's say that the customer purchased 15 users. They would pay for the equivalent of 19 users since that is the price for this range of units. Why is this more profitable? Because your customer is effectively paying you for the 4 users they are not using (yet) — which goes straight into your profits. What's more is you have amplified the virtuous sales cycle because the customer wants to get as close the maximum number of users for the step as possible in order to get the lowest cost per unit within the step.

### FLAT RATING PRICING

This is one of the most powerful business pricing strategies.

You have probably already experienced it, although you may not have realized. Flat rating pricings is leveraged by banks, insurance, etc., every time you pay premiums. While it can have varying levels of sophistication (banks and insurance firms use sophisticated versions of this based on significant work by their actuaries), the model can be described and implemented in a simple fashion.

The basic idea is to provide a certain quantity of value for a set cost that all customers pay. Some customers may come close to (or even exceed) using the full value of what they pay for, while the rest are nowhere close. A well-crafted model identifies the average consumption across all of your customers, and creates a situation where over 80% of the customers are using less than what they are paying for (and ideally less than the average consumption) and fewer than 20% are using more. Set your price above the rate of average consumption. By doing so, customers in the 80% who use less than what they pay for generate your profit. The further they are below the average consumption, the more profit they generate. For the 20% who use more than they pay for, you might take a loss on them individually. However, in the aggregate, the long tail represented by the 80% of customers who do not fully use what they pay for more than covers the cost of your heavy consumers, and these heavy consumers are likely to be your biggest champions. So, there are tangential benefits to supporting their cost. Pricing models built around flat rate pricing have shown between 1.5 and 3 times as much profit as traditional models.



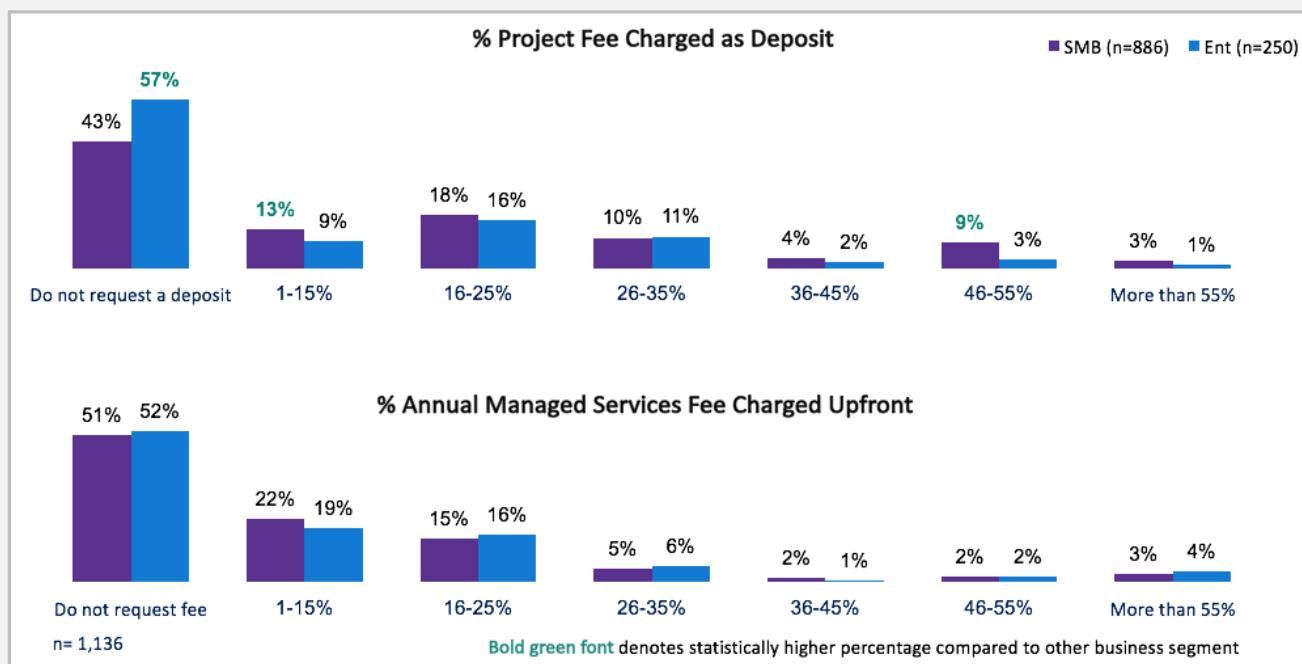
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## UPFRONT FEES

Another consideration of your pricing strategy is whether to charge your customers an upfront fee.

An upfront fee provides some working capital to get resources going in the early days of your practice, mitigates the risk a customer abandons a project without any payment, and ensures the customer is as invested in a project as you are. It can also serve to minimize financial impact to your practice when the customer has requested longer payment terms (see next section).

In our recent survey of 1,136 Azure partners, we found that only about half charged an upfront fee for project or managed services. When an upfront fee was requested, it was typically less than 25% of the total project or managed services fee.



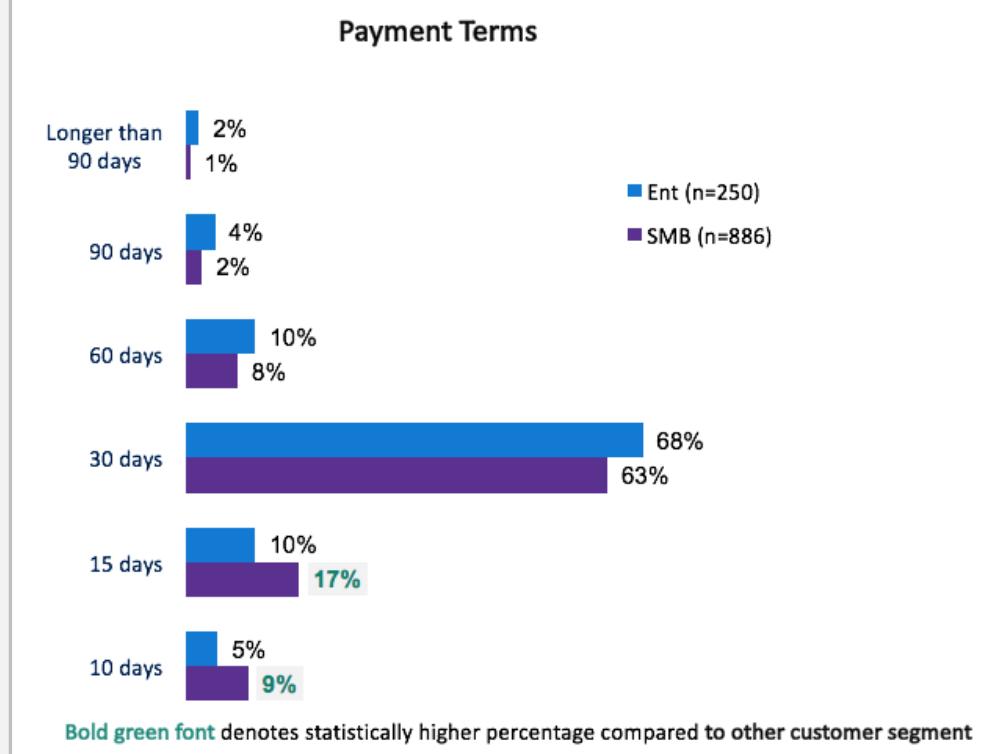
Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016

## PAYMENT TERMS

The final consideration for your pricing strategy is the payment terms. This is defined as the duration of time between when you invoice the customer for service rendered and when you receive payment from the customer.

Payment terms are measured in days – for example: 10 days, 15 days, 30 days or 90 days. These are usually expressed as NET 10, NET 15, NET 30 or NET 90 payment terms. In addition, you might consider offering the customer a discount for prompt payment on your shortest payment. For example, NET 2/10/30 is used to describe terms where a 2% discount is provided for payment received within 10 days of invoicing. Otherwise the full invoice amount is due in 30 days.

In the Microsoft Cloud Practice Development Study, we found that the most common payment terms used was NET 30, and that for SMB customers shorter payment terms were preferred.



Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016

# Identify Partnership Opportunities

## Partner to Partner

Build smart partner relationships and focus on what you do best

It is tempting to want to do everything related to your business, but the fact remains you will never have enough time. This is a primary reason to seek out compatible partners that can help you to:

- Complete Your Solution
- Build Credibility
- Partners for Infrastructure
- Leverage Joint Marketing
- Add-on to Sales
- Broaden your Customer Base

Finding the right type of partnerships is key to finding success in today's incredibly competitive market. Learn how working with other partners can help you better scale and your solution. Some partner combinations meld together wonderfully to create truly satisfying success, and to help you find the right mix, here's an example of a partner recipe we know works:

ISV + channel-based MSP partners = international success  
[Find out what's in it for the Partners and customer and the secret of success.](#)

## Make connections with Dynasource.com

It's hard to beat the value of partner-to-partner conversations and networking. Luckily, there are communities to help you expand your network and make an even bigger impact on your business.

[Dynasource](#) is, a global two-sided marketplace that allows partners to connect with other firms that have complementary expertise and capabilities. If you have excess capacity, increase your billability and profitability by finding partners that can drive utilization of your staff. If you lack the capacity, Dynasource can help you connect with partners that have the expertise to enable and expand your solutions. If your customers are looking for a solution that is outside your particular expertise, you can use Dynasource to find an expert that can provide that solution. By connecting through Dynasource and agreeing to work together, you can meet customer demand for needs across the Microsoft portfolio and grow your business.

### TRANSFORM THROUGH COLLABORATION

After you've created a profile on Dynasource, you can search the Dynasource Microsoft Partner Community for qualified resources that can collaborate with your team on an opportunity. This allows you to transform your cloud business and expand your offerings at a pace that works for you.

### INCREASE DEMAND FOR YOUR RESOURCES

Business is not always predictable, but retaining your quality staff is essential to your success. With Dynasource, you are able to make your resources and capabilities available to partners who can utilize them today, making your workforce agile and billable.

### GET STARTED NOW

In order to join Dynasource, all you'll need is general information about your business. Once you create a profile, you will be able to search for other resources and jobs, as well as create and post your own. You will be able to control the availability of your resources and what level of information you would like to share about your capabilities. With the Dynasource premium membership, you'll be able to request connections with other members and resources.

### RESOURCES

- [Smart Partner to Partner Relationships](#)

# Define Engagement Process

## Pre-Sales, Post Sales, and Support

Define the technical effort required before the sale (pre-sales), after the sale (post-sales), and in support of the sale. Understand the technical pre-sales and post-sales requirements for your solution offer.

### PRE-SALES

The technical effort required to make the sale involves:

- Discussing the customer requirements and address their objections.
- Developing technical pitch decks.
- Providing a technical demo. This demo may be generic or may need customization to better meet the requirements of the customer. The goal of the technical demo is to inspire confidence in your ability to deliver the desired solution by demonstrating you have "already done something like it before."

### POST-SALES

The technical effort required after the sale includes:

- Addressing follow-on customer concerns about the technology or implementation.
- Providing training to increase awareness of the solution that will be implemented.
- Providing a more customized technical demo for the customer to better understand their needs before moving on to the next phase of the project.
- Following up with the customer to ensure implementation is on track and meeting expectations.

For guidance with sales efforts, consider the learning paths available in the Microsoft Partner Network [Learning Portal](#).

Leverage presentations designed for cloud application development that can be used for technical briefings or sales pitches, pitch decks such as on:

- ➔ [Hybrid and Cloud Infrastructure](#)
- ➔ [Dev and Test \(IaaS\)](#)
- ➔ [Development and Test Solution Architecture](#)
- ➔ [Line of Business](#)
- ➔ [SAP on Azure](#)
- ➔ [Microsoft Apps](#)
- ➔ [Java Apps](#)
- ➔ [Consistent Hybrid Cloud](#)
- ➔ [Software Define Data Center](#)
- ➔ [Business Continuity and Disaster Recovery](#)
- ➔ [Backup and Archival](#)
- ➔ [Disaster Recovery](#)

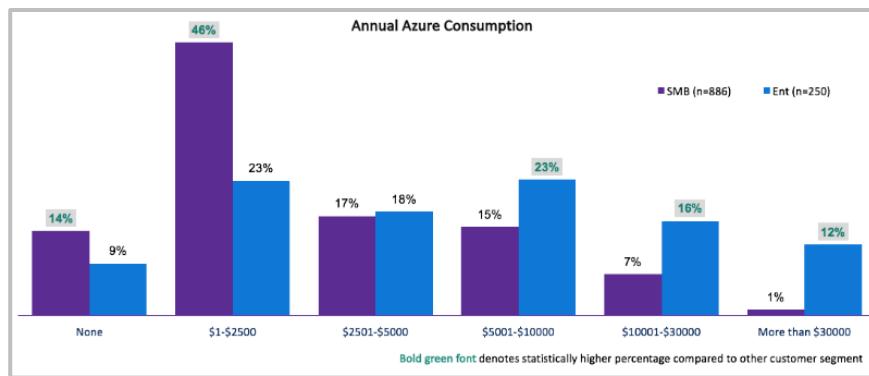
You should customize each presentation to explain how your unique offering makes the overall solution a true differentiator.

Leverage the [technical presales and deployment services](#) available from Microsoft to help you build your technical capabilities faster to accelerate sales, deployments, and app development.

# Calculate Your Azure Practice Costs

Your practice relies on Azure services to deliver customer success, so understanding the Azure related expenses incurred in delivering a customer solution is critical. How do you calculate these Azure costs?

In our research of 1,136 Azure partners, we found that enterprise-focused partners spent a median of \$8,107 in Azure for research and development annually; whereas SMB-focused partners spent a median of \$1,933 annually.



Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016.

Use the [Azure Pricing Calculator](#) to estimate Azure costs and be sure to check the resources list for pricing on the various services within EMS. You can build an estimate online and export it to Excel for further refinement and analysis. This tool will give you the retail rates (also known as the Pay-As-You-Go option) for Azure services, so treat it like the "high end" of your consumption estimate.

Become familiar with the discounted pricing and Azure credits:

- **Graduated Pricing:** Services like Azure Storage have tiered pricing based upon the volume used. For example, in January 2018, if you used less than 50 TB per month it would cost \$0.0184 per GB per month, but if you used significantly more it could drop to \$0.017 per GB per month.
- **Enterprise Agreement:** By making a three-year monetary commitment, Azure services are available at a discount off retail rates. To learn more, see [Enterprise Agreements](#).
- **Azure Credits:** Microsoft Partners can receive Azure credits as a part of their benefit. For example, partners with the Silver Cloud Platform Competency receive \$500 USD per month in Azure credits; those with Gold

Cloud Platform Competency receive \$1,200 USD per month in Azure credits.

It can be helpful to identify items which are used elastically versus items that have a fixed monthly cost. Significant savings can be achieved via elastic use of resources because you can turn them off (or pause them) when they are not in use.

## FOR EXAMPLE

- **Elastic:** SQL Data Warehouse is used only during month-end calculations; it can be paused the rest of the month. Another example of elastic use is to leverage auto-scale capabilities of the resource, such as auto-scaling the number of App Services instances down in the evenings and back up during the workday.
- **Fixed:** Azure App Service hosting your website in a Web App. This App Service needs to run 24x7 because your visitors will arrive at all hours.

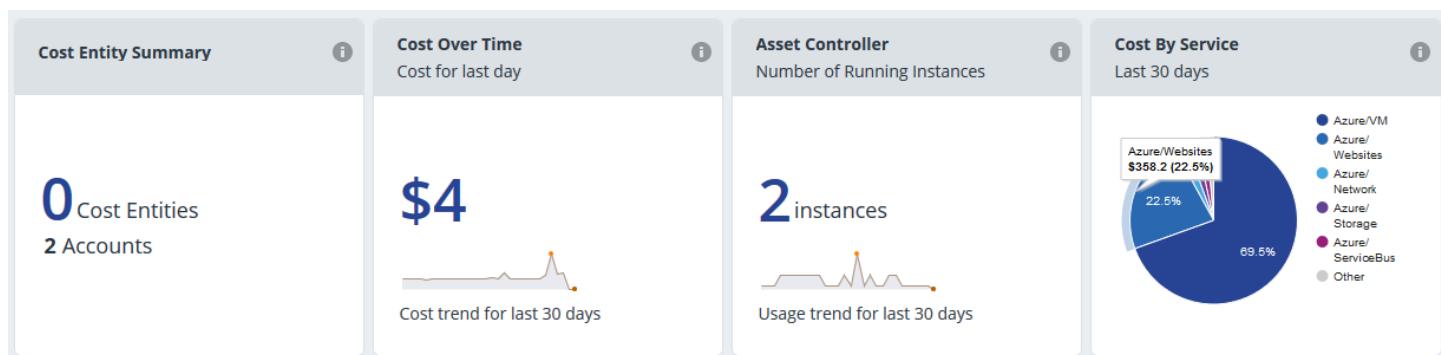
Finally, if you don't understand how much of a given resource you will use, consider building a scaled down proof-of-concept to get a first estimate.

## AZURE COST MANAGEMENT WITH CLOUDYN

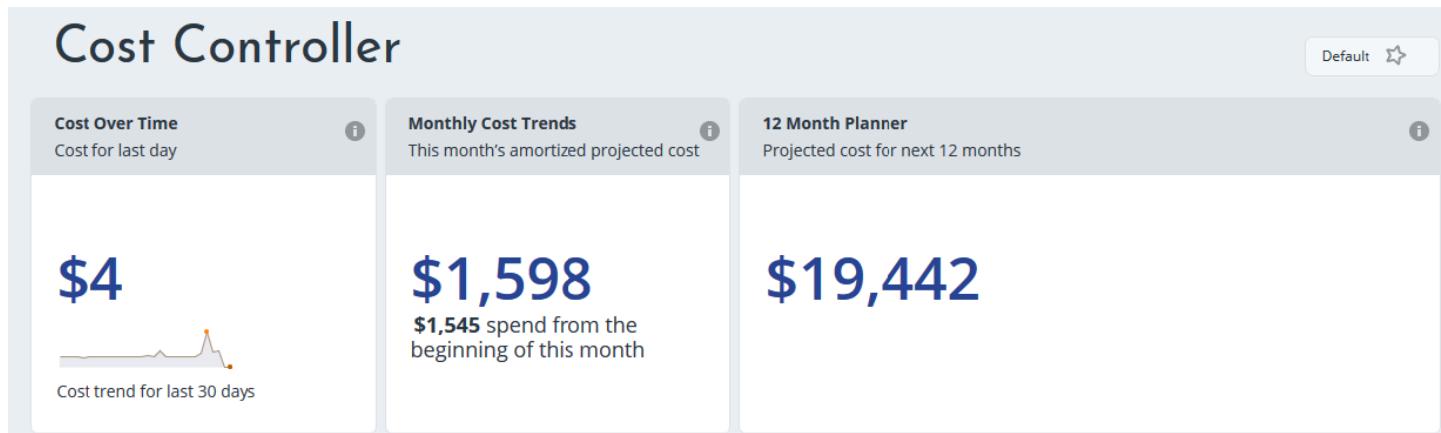
In addition to the Azure Pricing Calculator, you can also utilize the free Microsoft service called [Cloudyn](#). This service helps you to monitor cloud spend, drive organizational accountability, and optimize your cloud efficiency. Through a series of dashboards, you can get an idea of how your organization is using Azure resources and where your budget dollars are going.

### CLOUDYN DASHBOARDS

The Cloudyn management dashboard gives you a high-level overview of your Azure usage metrics breaking them down by services and assets.



The Cloudyn cost controller dashboard gives you an even deeper look at what your monthly and yearly Azure costs will be and what resources make up the majority of your cloud costs.

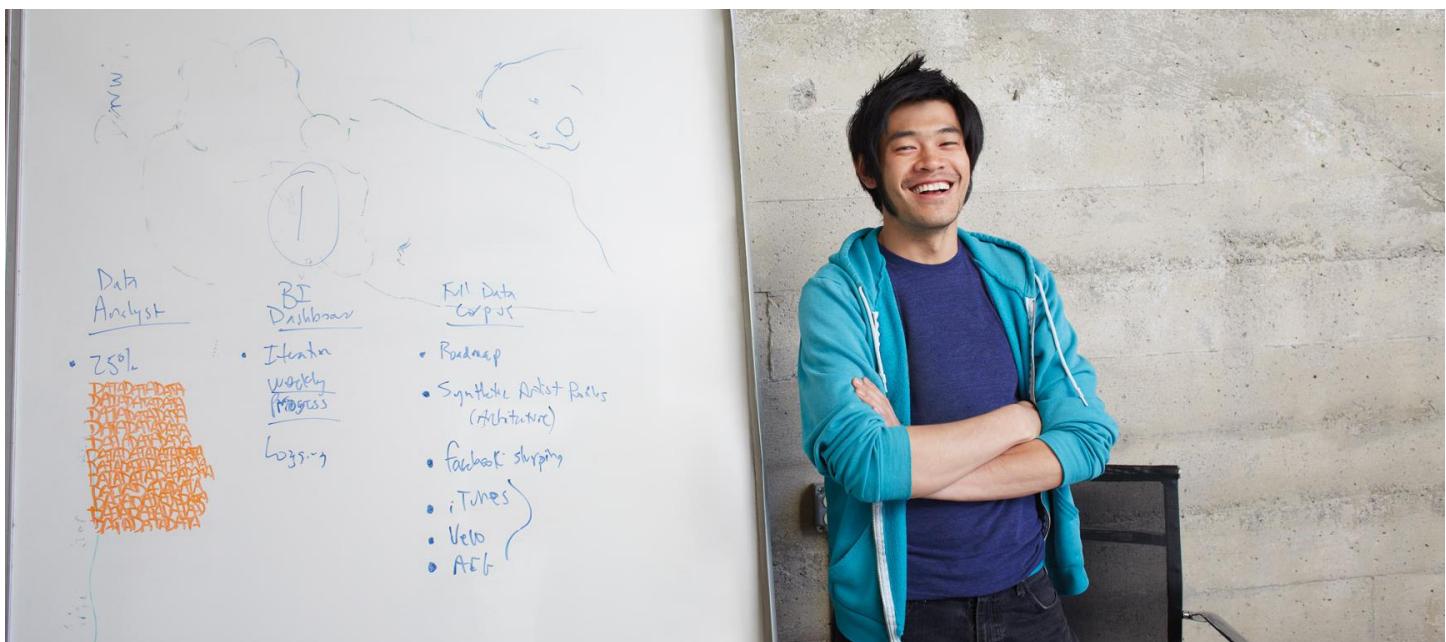


## RESOURCES

- ➔ [Azure Pricing Calculator](#)
- ➔ [Enterprise Agreements](#)
- ➔ [Azure Cost Modeling](#)
- ➔ [Azure Active Directory Pricing](#)
- ➔ [Azure Information Protection Pricing](#)
- ➔ [Microsoft Intune Pricing](#)
- ➔ [Advanced Threat Analytics Pricing](#)

# Define Customer Support Program & Process

It has been said that an unhappy customer represents an opportunity to make a customer for life. Studies have found when a customer gets to the point of a complaint, they are very emotionally engaged. If you can turn that negative around to a positive, you may just have a customer for life.



When it comes to support, there are two perspectives you should consider. First, how will you support your customers when they have engaged you for project services, managed services, or are utilizing your intellectual property. Second, where do you go for Azure support from Microsoft for a solution you are building, or because you need assistance on behalf of your customer?

## THE ITEMS YOU WILL NEED TO WORK THROUGH INCLUDE

- Defining your support model
- Provisioning your support infrastructure
- Defining and implementing your escalation process
- Selecting and enabling your support options for Azure

We cover each of these topics in the pages that follow.

## RESOURCES

- ➔ [Azure Support for Customers](#)

# Supporting Your Customers

Let's begin with the first scenario in which you support your customers directly. It should go without saying that one of the most important functions for your MSP practice will be supporting your customer once their applications and data are firmly in the cloud or sitting in a hybrid deployment. No matter how well a cloud or hybrid environment is planned, provisioned, operated, or monitored, problems will arise — and those problems will need to be remediated. It's your job as an MSP to offer support to your customers to deal with outages, breaches, inefficiencies, and disaster scenarios. MSPs need to consider the level of support that makes sense for their practice — in terms of resources and revenue — as well as what makes sense to the customers they serve.

## SUPPORT MODEL

How do you package and sell your support? The typical options are to provide support either on a retainer basis (where the customer pays a monthly fee for up to a certain number of "use it or lose it" support hours) or per incident (where the customer pays a fee every time they utilize your support). You must also define your support availability so your customers have a realistic expectation of when they can access your service.



## ESCALATION PROCESS

How does a customer get help at the right technical level? For your support process to make economic sense, avoid having your most skilled and most expensive resources (e.g., architects, senior developers, data scientists, etc.) answer every support call. For your particular solution offering, consider implementing a tiered support offering of junior-level resources that are equipped to handle common issues. These resources should be equipped to escalate a customer support case to a more senior-level resource once the common issues have been ruled out. You will need to decide how many levels of tiered support to offer, but two to three tiers is most common. When defining your escalation process, do not forget about the basics. For example, how do customers get in touch with you for support in the first place? This could be a dedicated support telephone number, forum or chat room, Twitter handle, email address etc.



**Support infrastructure:** How will you manage customer support requests and track them to closure? Many MSPs offer premium support offerings such as a Technical Account Manager who is responsible for tracking, reporting, and escalating an issue.

## RESOURCES

- [Azure Support for Customers](#)

# Reach Customers

How do you reach customers with additional support from Microsoft?

## SIGNATURE CLOUD SUPPORT

Signature Cloud Support is provided as benefit to Silver and Gold Partners. It primarily provides support for issues occurring in Azure subscriptions you own or on which you are a co-admin. It is not intended for use in supporting issues in subscriptions owned by your customers.

## MICROSOFT ADVANCED SUPPORT FOR PARTNERS

Microsoft Advanced Support for Partners is the ideal solution for partners who are growing their cloud business. Not quite ready for Premier Support, but need a higher level of service than the Microsoft Partner Network core benefits provide? The Advanced Support program delivers the right level of support to meet you in the middle while your business grows. With Advanced Support for Partners, you get cloud support at an accessible price point, which helps you be a great ally to your customers and grow your business faster. The program includes valuable proactive and reactive services delivered by experienced Services Account Managers and Partner Technical Consultants. Advanced Support for partners enables you to provide support on behalf of your end customers, in addition to providing support on subscriptions you own directly. Designed from the feedback of over 1,500 partners like you, Microsoft Advanced Support for Partners addresses the specific needs of Cloud Solutions Providers (CSPs), born-in-the-cloud partners, and all other partners selling Microsoft Cloud services.

## MICROSOFT PREMIER SUPPORT FOR PARTNERS

Microsoft Premier Support for Partners delivers a managed support offering for you and your customers — proactive support services for developing, deploying, and supporting Microsoft technology whether on-premises, hybrid, or in the cloud. As the only partner program with complete, end-to-end managed support across the full Microsoft platform, Premier Support for Partners also provides a powerful marketing tool to gain competitive advantage in the marketplace.

Microsoft offers a range of paid support options for customers from developers starting their journey in the cloud to enterprises deploying business-critical, strategic applications on Microsoft Azure. These options are available in tiers — **Premier, Professional Direct, Standard and Developer Support Plans** — that are available for purchase directly for those who are not Microsoft Partners. In addition to these paid plans, Azure offers **core support**, which is free and provides support via forums, and help with account billing or management questions.

## RESOURCES

- [Signature Cloud Support](#)
- [Microsoft Advanced Support for Partners](#)
- [Advanced Support Video](#)
- [Premier Support for Partners](#)
- [Azure Paid Support Plans](#)
- [Submit Azure Support Requests Step by Step](#)

## SUBMITTING AZURE SUPPORT REQUESTS

Support requests need to be submitted using the Azure portal. First you must log in to the subscription for which you want to receive support. Next, submit a support request. Once submitted, you can manage the incident from the Azure portal.

## TECHNICAL PRESALES ASSISTANCE & DEPLOYMENT SERVICES

Partner benefits are used as currency for technical presales and deployment services offered by the Microsoft Partner Services team.

As part of your company's Microsoft Partner Network membership, your organization receives partner advisory hours for attaining a Microsoft competency, membership in Microsoft Cloud Accelerate, and subscribing to Microsoft Action Pack Develop and Design.

NETWORK MEMBER	MAPS	SILVER	GOLD
<b>0 hours</b>	<b>Access + Advisory</b> Unlimited remote technical training 5 partner advisory hours for technical presales, development and deployment consultations	<b>Access + Advisory</b> Unlimited remote technical training Unlimited technical presales assistance for Cloud deals 20 partner advisory hours for development and deployment consultations	<b>Access + Advisory</b> Unlimited remote technical training Unlimited technical presales assistance for Cloud deals 50 partner advisory hours for development and deployment consultations

## SUPPORT OPTIONS

PARTNER-FACING OPTIONS	RESPONSE TIME
Signature Cloud Support	Less than 2 hours
Microsoft Advanced Support for Partners	Less than 1 hour
Microsoft Premier Support for Partners	Less than 1 hour
Partner advisory hours	N/A

CUSTOMER-FACING OPTIONS	RESPONSE TIME
Premier	Less than 1 hour
Professional-Direct	Less than 1 hour
Standard	Less than 2 hours
Developer	Less than 8 hours
Core	N/A

## RESOURCES

<https://partner.microsoft.com/reach-customers/technical-presales-deployment-services>

Microsoft  
Partner  
Network

# Hire & Train

Cloud  
Infrastructure

[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)



# Executive Summary



In the previous section, you evaluated the various services your business can pursue as you set up or build your Cloud Infrastructure & Management practice. Now that you've identified some avenues of success, you may be wondering how to build and train your team.

First, we'll help you define the members of your team and the skills they should bring to the table. If you need to hire to fill gaps, we provide you with detailed job descriptions you can use, as well as ideas on where to look for resources, the factors you should look for in a candidate's skillset, and what you should expect to pay by role and region.

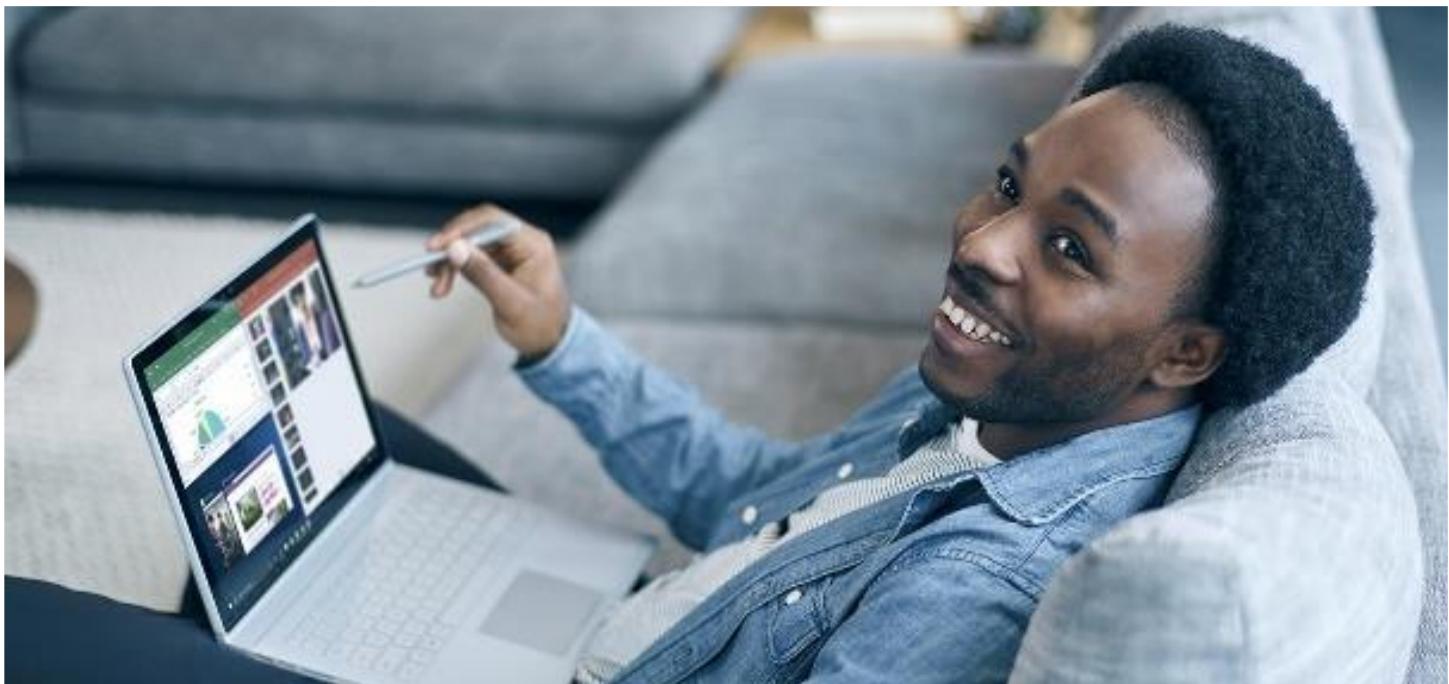
A big focus of this section is the critical piece of ensuring all of your practice resources are trained and continue to receive ongoing training. We cover not just the technical training, but also sales and marketing training.

Additionally, we'll give you details on the specific Microsoft certifications your technical resources should be working towards, both for their own professional development and to earn your organization Microsoft Partner Network competencies.

## Top 5 things to do

You're crafting your gameplan to build your team, make sure you nail down these 5 tasks before you move to the next section.

- Define the members and roles required
- Identify capability and skills gaps
- Decide which skills to hire and train
- Hire to fill gaps in your team
- Train and certify your team



## Create a Hiring Plan

Human resources are a critical asset to any services-based practice. Starting a new practice requires you to start with an evaluation of your existing team members (if any) and then make the decision of whether to hire new employees or bring your existing team up to speed.

The following sections describe the recommended resources across sales, technical and support functions that you will likely need. In many practices that are just getting started you may not be able to fill all roles with individual professionals. In this situation one person will likely be required to fulfill the duties of multiple roles.

### Partner Skillsets

Referrals and LinkedIn are top sources for identifying skilled labor. Once a candidate is identified, work history, cultural fit, and years of experience become the important considerations.

Roles associated with cloud practices typically have at least 3 years of experience. Furthermore, most companies engage in at least annual ongoing staff learning efforts like conferences/events and online training. A median of 8.5% of technical resource time is spent on training.



# Hire, Build, and Train Your Team

## Sales Resources

You have a vision for developing the next great cloud solution, but even the best products need a sales strategy to gain maximum market traction. Consider hiring for the following sales positions for broad reach.

The **Solution Sales Manager** (SSM) is a senior leader within the enterprise sales organization. The SSM leads, develops, and manages a team of high-performing sales and technical pre-sales/post-sales resources to drive solution opportunity revenue and market share by leveraging the Microsoft Products and Cloud offerings to meet their customers' Mission Critical Tier1 security needs. Ten or more years of sales experience is required for this position. Qualifications include people management, business development, competitive selling, and the ability to thrive in complex, ambiguous, and dynamic environments.

The **Cloud Solutions Sales Manager** is a solution sales leadership role that is responsible for delivering sustainable new business growth across segments; providing thought-leadership; and driving customer acceleration to cloud and mobility across the enterprise sales and marketing teams. The Solution Sales Manager is a great sales coach and leader, has a challenger mentality, is savvy in sales leadership practice, and contributes with vision and flawless execution of solution sales across workloads and solution areas.

The **Technical Sales Manager** (TSM) is a senior leader within the enterprise sales organization. A TSM drives revenue and market share by leading a team of technical sellers that provide customers with insights and solutions. The Technical Sales Manager will manage, coach, and lead a team of solution architects and tech sales professionals to uncover and support the business and IT goals of customers by driving the technical decision and providing business value with the Microsoft platform, thus securing

long-term sustainable growth. A computer science degree or related field is required for this role. Additional qualifications include strategic insight, project management, analytical problem solving, customer/partner relationship building, and exceptional product and technical expertise.

## Technical Resources (Architecture, Infrastructure, and Development)

These roles form the heart of your cloud solution. Hiring the right people can turn your vision into reality.

A **Cloud Architect** (CA) drives customer initiatives in collaboration with customers. The CA is a technical, customer-facing role that is accountable for the end-to-end customer cloud deployment experience. CAs own the technical customer engagement, including architectural design sessions, specific implementation projects and/or proofs of concepts. The ideal candidate will have experience in customer-facing roles and success leading deep technical architecture and application design discussions with senior customer executives to drive cloud deployment. A computer science or related engineering degree is required.

The **Mobility Solution Engineer** is responsible for the design, implementation, integration, support and monitoring of enterprise mobility solutions. The ideal candidate should have a diverse understanding of the current state of security best practices, including identity and access control, mobile technology, and mobile best practices throughout a variety of industries. In addition, this individual must have working knowledge of mobile development standards, can identify a landscape of mobile vendors (MDM, MADPs, etc.), and be familiar with the deployment of mobile applications across platforms. The candidate must have prior experience formulating, planning, and implementing a mobile strategy, including formulating policies for "bring your own device" (BYOD)

policy and remote access. The candidate should have outstanding technical and analytical skills to outline why a mobile strategy is needed, and how to identify and prioritize applications, data, and devices to manage.

The **Identity Solution Engineer** is responsible for the design, implementation, integration, support, and monitoring of enterprise identity and access control solutions. The ideal candidate should have a diverse understanding of the current state of security best practices, including identity and access control, mobile technology, and best practices throughout a variety of industries. In addition, this individual must have a strong knowledge of identity standards and protocols, as well as a deep skillet with Windows Server Active Directory and industry security solutions.

## Management

Consider the following management positions if your development effort will involve eight or more technical staff. In smaller teams, senior-level employees sometimes take on management duties along with their other responsibilities, removing the need for dedicated managers.

The **Product Manager** (or Product Management team) establishes and sustains the business case for the project and plays a key role in identifying and setting priorities across the target audience. This includes ensuring that business expectations are clearly articulated and understood by the project team, and that the functional specifications respond to business priorities.

Product Management owns the vision statement for the project. The vision statement is an informal document that communicates the expectations and assumptions on which the project is based.

Product Management is also responsible for high-level project communications such as business projections, project costing, and contract negotiation. Product Management communicates the high-level milestones to the target audience and other team members.

The **Program Manager** or Program Management team "owns" the specification for an application's features and functionality and coordinates the day-to-day communication required to develop and deliver the application effectively and consistently within organizational standards.

Program Management has a key communication and coordination role. With input from other team leads, Program Management assists Product Management in articulating the vision for the project. Using this vision, Program Management drafts the initial version of the functional specification and is considered the keeper of the functional specification. Program Management is responsible for all activities associated with analysis, specification, and architecture. Program Management is also responsible for defining how the project will interoperate with external standards, maintaining external technical coordination and communication, and managing the master schedule.

## Support Resources

A lot of effort goes on behind the scenes, or in positions that involve post-sales customer engagement. To ensure long-term success of your projects, consider hiring some of these support roles.

A **Customer Success Manager** is passionate about engaging your customers and helping them expand their use cases. They have excellent relational skills, and can create win/win environments for all parties they work with. In their day-to-day responsibilities, they own the overall relationship with assigned clients by increasing adoption and ensuring retention and satisfaction. They make a large impact on your enterprise security business by establishing a trusted and strategic advisor relationship with each assigned client, driving continued value of your products and services. The Customer Success Manager will help drive sales by working to identify or develop upsell opportunities. Additionally, they will advocate customer needs and issues cross-departmentally and program manage account escalations. Qualifications include prior experience in customer success or equivalent history of increasing customer satisfaction, adoption, and retention.

A **Quality Assurance (QA) / Test Technician** is thorough and detail-oriented, and should work well with established processes. The primary goal of this role is to help avoid defects in your final product or solution. This person will be involved throughout the development process and use their intuition to problem solve and identify technical, procedural, and usability concerns. They must take meticulous notes, be organized about recording process steps, and work well with others since they will be coordinating with technical and management teams to ensure that the correct measures are put into place to align the final product with the initial goal.

An **Information Security Analyst** assesses and provides security advice on cloud infrastructure, including network, service, and application components. This role conducts risk assessments and architectural reviews, provides cyber security subject matter expertise, and assists in the building and design of secure solutions. Additional duties may include network and application penetration testing,

and support for cyber security investigations, as well as on-call response for cyber security incidents. A computer science or related engineering degree is required, or the equivalent combination of education, professional training, or work experience.

A **User Support Specialist** assists customers who are having technical issues with your product, or who need help realizing the full benefit of your solution to help them deliver their cloud-based workloads. They will likely be in a position to help customers navigate the operational challenges of cloud computing, so thoroughly training them on both your product — and the infrastructure on which it is built — is paramount to their success, and ultimately, your customers' satisfaction. Qualifications include technical support experience and great communication and interpersonal skills (soft skills). Experience with cloud technologies is a major plus.



# Job Descriptions for your Technical Team

The following tables provides detailed job descriptions you can utilize to hire the key technical resources. All technical skills, non-technical skills, certifications, and technologies listed are potential items a candidate should have, but no candidate will have all the items listed.

## CLOUD ARCHITECT

A Cloud Architect (CA) drives high-priority customer initiatives in collaboration with customers and the your sales team. The CA is a technical, customer-facing role that is accountable for the end-to-end customer cloud deployment experience. CAs own the Azure technical customer engagement, including: architectural design sessions, specific implementation projects and/or proofs of concepts. The ideal candidate will have experience in customer-facing roles and success leading deep technical architecture and application design discussions with senior customer executives to drive cloud deployment. Bachelor's degree in computer science or related field preferred.

<b>Technical Skills</b>	<ul style="list-style-type: none"><li>• Solid understanding of modern authentication protocols and a background in cyber security.</li><li>• Deep understanding of cloud computing technologies, business drivers, and emerging computing trends.</li><li>• Deep technical experience in enterprise mobile, identity and access control, &amp; security solutions.</li><li>• Working knowledge with AGILE development, SCRUM and Application Lifecycle Management (ALM) with one or more of the following programming languages: PowerShell, Bash, .NET, C++, Java, JSON, PHP, Perl, Python, Ruby on Rails, HTML, CSS, JavaScript, Responsive Web Design.</li></ul>
<b>Non-Technical Skills</b>	<ul style="list-style-type: none"><li>• Proven track record of building deep technical relationships with senior executives and growing cloud consumption share in large or highly strategic accounts.</li><li>• Proven track record of driving decisions collaboratively, resolving conflicts &amp; ensuring follow through.</li><li>• Presentation skills with a high degree of comfort with both large and small audiences.</li><li>• Prior work experience in a consulting/architecture position within a software &amp; services company.</li><li>• Problem-solving mentality leveraging internal and/or external resources.</li><li>• Exceptional verbal and written communication.</li></ul>
<b>Certifications</b>	<ul style="list-style-type: none"><li>• MCSE Cloud Platform and Infrastructure, CompTIA Security+, CISSP, MCSA Cloud Platform Solutions Associate, MCSA Linux on Azure Solutions Associate, AWS Certified Solution Architect</li><li>• Exam priorities: <a href="#">Architecting Azure Solutions 70-535</a> (retired), <a href="#">Microsoft Certified Azure Solutions Architect (AZ-300 and AZ-301, or AZ-302)</a>.</li></ul>

<b>Project Experience Types/Qualities</b>	<ul style="list-style-type: none"><li>• 5+ years of architecture, design, implementation, and/or support of highly distributed applications (i.e. having an architectural sense for ensuring availability, reliability, etc.).</li><li>• 2+ years of experience in "migrating" on-premise workloads to the cloud.</li><li>• 5+ years of success in consultative/complex technical sales and deployment projects (where necessary, managing various stakeholder relationships to get consensus on solution/projects).</li><li>• Oversight experience on major transformation projects and successful transitions to implementation support teams.</li></ul>
<b>Technologies</b>	<ul style="list-style-type: none"><li>• Enterprise Mobility Suite, Intune, Azure Information Protection, Azure Active Directory, Octa, Auth0, LDAP, OAuth, SAML, Cloud App Security, Firewalls, Office 365, Windows Server Active Directory, Azure AD Connect, Active Directory Federation Services (ADFS), Mobile Iron, Airwatch, iOS, Android, Windows, Azure Virtual Machines, Virtual Networks, ExpressRoute, Operations Management Suite, Azure Site Recovery, Azure Backup, Azure App Services, Azure Storage, Azure Import/Export, Azure SQL Database, Azure Web Jobs, Azure ExpressRoute, MySQL, SQL Server, SQL Server IaaS, SharePoint on Azure, AWS EC2, S3, AWS DirectConnect</li></ul>

## MOBILITY SOLUTION ENGINEER

The Mobility Solution Engineer is responsible for the design, implementation, integration, support, and monitoring of enterprise mobility solutions. The ideal candidate should have a diverse understanding of the current state of security best practices, including identity and access control, mobile technology, and mobile best practices throughout a variety of industries. In addition, this individual must have working knowledge of mobile development standards, the ability to identify a landscape of mobile vendors (MDM, M4Ps, etc.), and be familiar with the deployment of mobile applications across platforms. The candidate must have prior experience formulating, planning, and implementing a mobile strategy, including formulating policies for "bring your own device" (BYOD) policy and remote access. The candidate should have outstanding technical and analytical skills to outline why a mobile strategy is needed, and how to identify and prioritize applications, data, and devices to manage. Bachelor's degree in computer science or related field preferred.

<b>Technical Skills</b>	<ul style="list-style-type: none"><li>• Solid understanding of modern authentication protocols and a background in cyber security.</li><li>• Deep understanding of cloud computing technologies, business drivers, and emerging computing trends.</li><li>• Experience with mobile device operating systems such as iOS, Android, and Windows.</li><li>• Experienced troubleshooter, analyzing log files, network traffic, permissions issues, identifying problems with performance and scale.</li><li>• Experience with engineering and deploying mobile solutions, including Enterprise Mobile Management (EMM), Mobile Content Management (MCM), and Mobile Application Management (MAM).</li></ul>
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<b>Non-Technical Skills</b>	<ul style="list-style-type: none"><li>• Proven track record of driving decisions collaboratively, resolving conflicts, and ensuring follow through.</li><li>• Presentation skills with a high degree of comfort with both large and small audiences.</li><li>• Problem-solving mentality leveraging internal and/or external resources.</li><li>• Exceptional verbal and written communication.</li></ul>
<b>Certifications</b>	<ul style="list-style-type: none"><li>• MCSE Cloud Platform and Infrastructure, CompTIA Security+, CISSP, MCSA Cloud Platform Solutions Associate, MCSA Linux on Azure Solutions Associate, AWS Certified Solution Architect</li></ul>
<b>Project Experience Types/Qualities</b>	<ul style="list-style-type: none"><li>• 3–5+ years senior (tier 3) level support with mobility as part of responsibilities.</li><li>• 3–5+ years of experience with mobility architecture and OS platforms including iOS and Android.</li><li>• 3–5+ years of experience with enterprise mobility technologies and implementations, including MDM, MAM, Security and App Stores along with back-end infrastructure, including Active Directory, Exchange, remote network access, and Identity Management.</li><li>• Management (EMM), Mobile Content Management (MCM), and Mobile Application Management (MAM).</li></ul>
<b>Technologies</b>	<ul style="list-style-type: none"><li>• Enterprise Mobility Suite, Intune, Azure Information Protection, Azure Active Directory, OAuth, SAML, Cloud App Security, Citrix XenMobile, MobileIron, Airwatch, BlackBerry, Firewalls, Office 365, Windows, Linux, iOS, Android, System Center Configuration Manager</li><li>• Developer Technologies: HTML, CSS, JavaScript, Responsive Web Design, Mobile Frameworks</li></ul>

## IDENTITY SOLUTION ENGINEER

The Identity Solution Engineer is responsible for the design, implementation, integration, support, and monitoring of enterprise identity and access control solutions. The ideal candidate should have a diverse understanding of the current state of security best practices, including identity and access control, mobile technology, and best practices throughout a variety of industries. In addition, this individual must have a strong knowledge of identity standards and protocols as well as a deep skillet with Windows Server Active Directory and industry security solutions. The candidate must have prior experience formulating, planning, and implementing an identity and access control strategy, including formulating policies for the “bring your own device” (BYOD) policy and remote access. The ideal candidate will have a strong understanding of network infrastructure, such as firewalls, proxies, and cross-site connectivity options. Bachelor’s degree in computer science or related field preferred.

<b>Technical Skills</b>	<ul style="list-style-type: none"><li>• Solid understanding of modern authentication protocols and a background in cyber security.</li><li>• Deep understanding of cloud computing technologies, business drivers, and emerging computing trends.</li><li>• Experience with Windows Server Active Directory and other LDAP-based directory services.</li><li>• Experience with Azure AD and Azure Infrastructure as a Service (Virtual Machines, Virtual Networks).</li><li>• Integration and migration experience with Skype for Business, Exchange, SharePoint, and Office 365.</li><li>• Experience with Windows, Linux, iOS, Android, Blackberry.</li><li>• Experienced troubleshooter, analyzing log files, network traffic, permissions issues, identifying problems with performance and scale.</li><li>• Developer experience with .NET, Java, HTML, CSS, JavaScript.</li></ul>
<b>Non-Technical Skills</b>	<ul style="list-style-type: none"><li>• Proven track record of driving decisions collaboratively, resolving conflicts, and ensuring follow through.</li><li>• Presentation skills with a high degree of comfort with both large and small audiences.</li><li>• Problem-solving mentality leveraging internal and/or external resources.</li><li>• Exceptional verbal and written communication.</li><li>• Basic understanding and knowledge of PCI and SOX regulatory standards.</li></ul>
<b>Certifications</b>	<ul style="list-style-type: none"><li>• MCSE Cloud Platform and Infrastructure, MCSA Cloud Platform Solutions Associate, MCSA Linux on Azure Solutions Associate, CompTIA Security+, CISSP, AWS Certified Solution Architect.</li><li>• Exam priorities: <a href="#">Identity with Window Server 2016 70-742</a>, <a href="#">Implementing Infrastructure Solutions 70-533</a> (retired), <a href="#">Microsoft Certified Azure Administrator (AZ-100 and AZ-101 or AZ-102)</a>.</li></ul>
<b>Project Experience Types/Qualities</b>	<ul style="list-style-type: none"><li>• 3–5+ years senior (tier 3) level support with identity management as part of responsibilities.</li><li>• 5–8 years of experience with identity architecture and management.</li><li>• 3–5 years deploying, migrating, or managing an Office 365 environment.</li></ul>
<b>Technologies</b>	<ul style="list-style-type: none"><li>• Azure Active Directory, Office 365, Windows Server Active Directory Domain Services, ADLDS, Rights Management Server, Microsoft Identity Manager (FIM/MIM), Active Directory Federation Services (ADFS), Active Directory Certificate Services (ADCS), Web App Proxy, Site Minder, Octa, Auth0, WebSphere, Enterprise Mobility Suite, Intune, Azure Information Protection, Azure Active Directory, OAuth, SAML, Cloud App Security, Citrix XenMobile, MobileIron, Airwatch, Blackberry, Firewalls, Office 365, Windows, Linux, iOS, Android, System Center Configuration Manager, Exchange, Skype for Business, SharePoint</li></ul>

# Recruiting Resources

## Top 10 Sources to Find Skilled Labor and What to Look For

Sourcing skilled labor can be a challenge. In our recent survey with MDC of 1,132 Azure partners, we found that referrals and LinkedIn rank among the top sources for finding candidates. See the table below for the top 10 sources to identify skilled labor:

	<b>TOTAL</b> (n=1136)	<b>SMB</b> (n=886)	<b>ENTERPRISE</b> (n=250)
Referrals from employees or partnerships	70%	69%	73%
<a href="#">LinkedIn</a>	59%	57%	66%
Posting on website	47%	45%	54%
Local Universities	38%	36%	46%
Local Technical Communities	36%	35%	43%
Recruit from competitors	30%	29%	36%
Meet ups	29%	29%	30%
<a href="#">GitHub</a>	8%	8%	7%
<a href="#">Stack Overflow</a>	8%	8%	7%
Other job posting sites	6%	6%	4%

Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016.

Now that you have an understanding of where to look, what are the most important factors to look for in a potential hire's skillset? In the Microsoft Cloud Practice Development Study, we asked the Azure partners this question. What they told us was that the top three most important factors were work history, cultural fit, and years of experience.

	<b>TOTAL</b> (n=1136)	<b>SMB</b> (n=886)	<b>ENTERPRISE</b> (n=250)
Work history	69%	68%	74%
Cultural fit	43%	40%	53%
Years of experience	42%	41%	47%
Professional certifications	32%	34%	22%
Referrals	28%	29%	26%
Professional training received	20%	21%	16%
Reputation through community	16%	15%	19%
Formal education	13%	14%	11%
Contract to hire or other means to test skills "hands-on"	13%	13%	13%
Publications	3%	3%	2%
Awards received	2%	2%	2%
Attitude	0%	0%	1%
Other	4%	4%	4%

Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016.

[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)

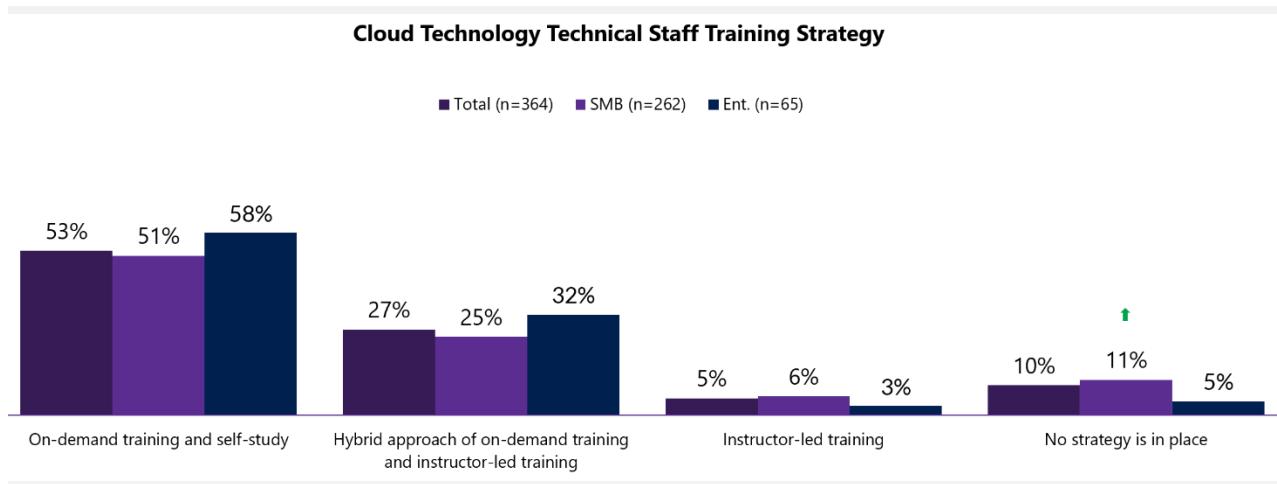


# Training & Readiness

Follow a learning curriculum to build the skills you need most to stay relevant. Fill a skills gap or improve your team's skill surface area with sales and technical training.

Suggested resources to help onboard your team for training success are available in this section. This includes a range of online learning resources for self-paced learning, as well as options for instructor-led training for rapid technology adoption.

In our research, we found that most partners staff are trained using on-demand and self-study, with a smaller percentage using a mix of on-demand and instructor-led training.



Source: Microsoft Azure Migration eBook, MDC Research, January 2018

## MICROSOFT TRAINING RESOURCES

Use the following resources as part of your Azure onboarding for new and existing staff.

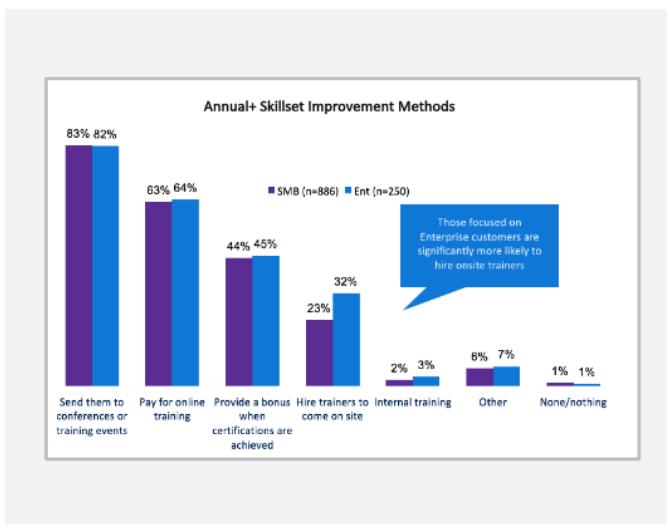
- [Azure Training and Certification](#) provides free online training options including online courses, learning paths, hands-on labs as well as resources to help you find learning partners who can help you achieve your skills development goals using Microsoft Azure services.
- [Microsoft Azure Hands-on Labs](#) provides free, self-paced labs to help you stay current with Azure. The live environments are fully self-contained. You do not need your own Azure subscription to complete the labs, just login with a remote desktop (RDP) client and get started.
- [Microsoft Virtual Academy](#) offers training from the people who helped to build Microsoft Azure. From the basic overview to deep technical training, IT staff will learn how to leverage Microsoft Azure for their business.
- [Microsoft IT Pro Cloud Essentials](#) is a free annual subscription that includes cloud services, education, and support benefits. IT Pro Cloud Essentials provides IT implementers with hands-on experience, targeted educational opportunities, and access to experts in areas that matter most to increase knowledge and create a path to career advancement.
- [The Microsoft IT Pro Career Center](#) is a free online resource to help map your cloud career path. Learn what industry experts suggest for your cloud role and the skills to get you there.
- [Microsoft Learning](#) offers a wide variety of official curriculum on-demand, as well as [edX courses that are taught by Microsoft experts](#), and help you learn through hands-on experiences with a broad reach of Azure technologies.
- [The Microsoft Partner Network \(MPN\) Learning Portal](#) provides a centralized interface with training opportunities and certification options organized by products, competencies, certifications, and job role.

## General Technical Training

Whether you need to fill a skills gap or are looking to improve your team's skill surface area, technical training is critical to your success.



In our research, we found conferences and paid online training are the most common learning mechanisms.



Source: Microsoft Cloud Practice Development Study, MDC Research, November 2016

[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)

### CLOUD AND ENTERPRISE PARTNER RESOURCES

The [Cloud and Enterprise Partner Resources Portal](#) provides a source of sales and technical training for partner practices and key areas of specialization. Resources include customer success stories, sales and technical training, tools, engines, and resources available to help build your skills around selling, deploying, and architecting cloud infrastructure and management, cloud application development, data platform and analytics, and security and compliance solutions.

### MPN LEARNING PORTAL

The [Microsoft Partner Network \(MPN\) Learning Portal](#) provides a centralized interface with training opportunities and certification options organized by products, competencies, certifications, and job role.

### CLOUD + ENTERPRISE UNIVERSITY ONLINE

Leverage the [Cloud + Enterprise University Online](#) to build knowledge, stay sharp, and prove your expertise on selling and supporting Microsoft cloud solutions through our live and on demand webcasts and virtual, instructor-led courses—giving you the flexibility to train at your own pace.

### MICROSOFT INSPIRE CONFERENCE RECORDINGS

Even if you missed the annual live event, the [Microsoft Inspire Conference](#) provides many of its sessions as on-demand recordings — no conference pass required.

### PARTNER COMMUNITY EVENTS, CALLS & WEBINARS

The [Microsoft Partner Enablement Blog](#) maintains a schedule of trainings available to partners. Visit often and plan your training calendar.

### SMART PARTNER MARKETING

Leverage the [Microsoft Smart Partner Marketing](#) site as your starting point for training marketing resources.

## Additional Resources

[Microsoft Learning Partners](#) are available worldwide to help enable your team for Microsoft Azure via live instructor-led training. This can be scheduled as a dedicated delivery at your location or virtually using remote learning technologies. Many courses are scheduled as open-enrollment courses, which doesn't require you to schedule a dedicated class.

- [Pluralsight](#) is a key Microsoft partner that offers Azure training. Gain the know-how and confidence your job demands through these free online courses, delivered in partnership with Pluralsight.
- [Opsgility](#) is a key Microsoft partner that offers Azure training. Find more than 70 online classes focused on Azure with full learning paths for Azure certification. Opsgility also offers a full set of instructor-led Azure trainings that focus on architects, developers, dev ops, operations, sales and decision makers.
- [O'Reilly Safari](#) provides subscription access to more than 40,000 books, videos, and interactive tutorials from over 200 of the world's best publishers, including O'Reilly, Pearson, Harvard Business Review, and Packt. It also offers live online training courses led by instructors from O'Reilly's network of tech innovators and expert practitioners.



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#1 challenge for the cloud adoption is access to talent. Building a learning culture inside the organization is the success mantra for keeping our azure rockstars up-to-date on the ever improving azure platform.

**ANIL SINGH**

CEO, Hanu Software

# Increase Readiness and Marketability with Certifications

For Azure-specific certification exams that can lead to an MCSA or MCSE certification:

## MCSA CLOUD PLATFORM (retired)



MCSA: Cloud Platform  
Solutions Associate

Demonstrate your expertise in Microsoft cloud-related technologies to reduce IT costs and deliver more value for the modern business by passing two of the following:

- [70-532: Developing Microsoft Azure Solutions](#) (retired)
- [70-533: Implementing Microsoft Azure Infrastructure Solutions](#) (retired)
- [70-535: Architecting Azure Solutions](#) (retired)
- [70-537: Configuring and Operating a Hybrid Cloud with Microsoft Azure Stack](#)

## MCSA LINUX ON AZURE (retired)



MCSA: Linux on Azure  
Solutions Associate

Demonstrate your ability to design, architect, implement, and maintain complex cloud-enabled Linux® solutions that leverage Microsoft Azure open source capabilities. This certification also validates your Linux system administration skills to show that you are fluent in today's cloud-native world.

Required exams:

- [70-533: Implementing Microsoft Azure Infrastructure Solutions](#) (retired)
- [Linux Foundation Certified System Administrator](#)

## RESOURCES

- ➔ [MCSA Cloud Platform](#)
- ➔ [MCSA Linux on Azure](#)
- ➔ [Microsoft Badges from Acclaim](#)

## MCSE CLOUD PLATFORM AND INFRASTRUCTURE (retired)



MCSE: Cloud Platform and Infrastructure  
Solutions Expert

The [Microsoft Certified Solutions Expert \(MCSE\): Cloud Platform and Infrastructure](#) certification validates that you have the skills needed to run a highly efficient and modern data center, with expertise in cloud technologies, identity management, systems management, virtualization, storage, and networking. Pre-Requisites:

- [MS Certified Solutions Associate – Window Server 2016](#)
- [MS Certified Solutions Associate – Cloud Platform](#)
- [MS Certified Solutions Associate – Linux on Azure](#)
- [MS Certified Solutions Associate – Windows Server 2012](#)

Choose one of the following Azure exams:

- [70-532: Developing Microsoft Azure Solutions](#) (retired)
- [70-533: Implementing Microsoft Azure Infrastructure Solutions](#) (retired)
- [70-535: Architecting Azure Solutions](#) (retired)
- [70-537: Configuring and Operating a Hybrid Cloud with Microsoft Azure Stack](#)

## MCSE DATA MANAGEMENT AND ANALYTICS



MCSE: Data Management and Analytics  
Solutions Expert

The [MCSE Data Management and Analytics](#) demonstrates your broad skillset in SQL administration, building enterprise-scale data solutions and leveraging business intelligence data — both on-premises and in cloud environments. Pre-Requisites:

- [MCSA – SQL Server 2012/2014](#)
- [MCSA – SQL Server 2016 Database Administration](#)
- [MCSA – SQL Server 2016 Database Development](#)
- [MCSA – SQL Server 2016 Business Intelligence Development](#)

Choose one of the following Azure exams:

- [70-473: Designing & Implementing Cloud Data Platform](#)
- [70-475: Designing & Implementing Big Data Analytics Solutions](#)



## MCSD APP BUILDER



MCSD: App Builder  
Solutions Developer

The Microsoft Certified Solutions Developer (MCSD): App Builder certification validates that you have the skills needed to build modern mobile and/or web applications and services.

Pre-Requisites:

- [Microsoft Certified Solutions Associate \(MCSA\) – Web applications](#)
- [Microsoft Certified Solutions Associate \(MCSA\) - Universal Applications](#)

Choose one of the following Azure exams:

- [70-357: Developing Mobile Apps](#)
- [70-486: Developing ASP.NET MVC Web Applications](#)
- [70-487: Developing Microsoft Azure and Web Services](#)

## MCP PLANNING FOR AND MEASURING DEVICES IN THE ENTERPRISE

Azure exam requirements:

- [70-398: Planning for and Measuring Devices in the Enterprise](#)

### RESOURCES

- ➔ [MCSD App Builder](#)
- ➔ [Planning for and Managing Devices in the Enterprise](#)

# Cloud Infrastructure

Microsoft  
Partner  
Network

Cloud  
Infrastructure

[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)



# Executive Summary

Build a cloud infrastructure practice to help your customers deliver faster innovation through the agility of Microsoft Azure Infrastructure as a Service.

There are three main components to any infrastructure solution: compute, network, and storage. These are complemented by a fourth component, backup and disaster recovery, which provides high availability should any one of these components fail.



## COMPUTE

Help your customer run almost any workload on hardware sizes tailored specifically to the workload. Take advantage of the capabilities of the cloud to only pay for the compute you use and to deploy around the world where your customers are located.



## NETWORK

Help your customer design connectivity options that can scale from simple connectivity between on-premises and the cloud, to a globally connected enterprise grade hybrid network that is easy to control and secure.



## STORAGE

Provide your customers with durable, highly-available and massively scalable storage solutions for files, disks, queues and blobs for



## BACKUP AND DISASTER RECOVERY

Help your customer protect their data and infrastructure with simple and cost effective solutions for backup and disaster recovery.

In this chapter, we will review the technologies offered by Azure in each of these areas. We start by considering traditional infrastructure, for each of the component areas. We will also discuss modern, 'Cloud native' architectures, presenting the additional value they offer and some of the technologies available in Azure to deliver this value.

# Choosing Virtual Machines

Helping customers choose the right virtual machines family and size, with the correct availability options, is an important value-add.

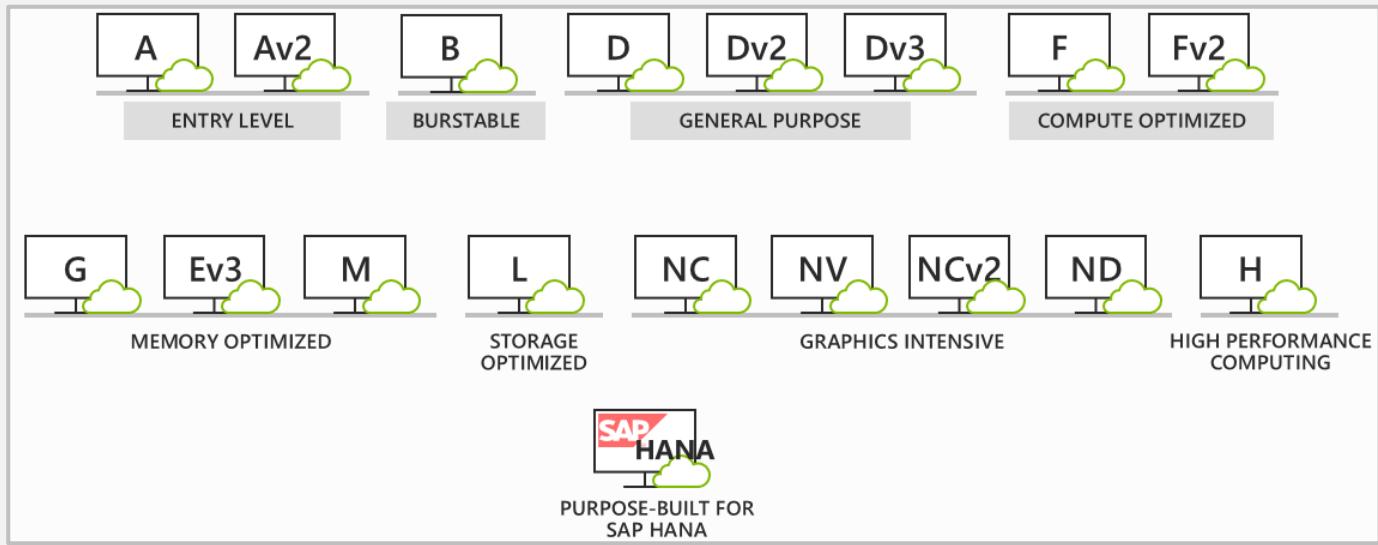
Azure supports a wide range of [virtual machine families](#), with a wide range of compute and memory capabilities. Some virtual machine families offer a balanced mix of CPU, memory and storage, and are suitable for a wide range of general-purpose applications. Others are optimized for CPU, others for memory, and others for storage or networking, and suitable for specific, intensive workloads. There are also dedicated virtual machines for HPC workloads and for workloads that can be accelerated using additional processing power provided by an on-board graphics card.

Not every virtual machine family and size is available in every Azure region. Care should be taken when planning your deployment to ensure the desired virtual machine and region combination is available.

The family and size of each virtual machine used should be determined taking into account the capacity and performance requirements of the application.

Helping your customers navigate the various VM compute series to ensure they are choosing the optimal size both for performance and for cost effectiveness for their workload is an incredible value add, and will be critical to the success of any project.

Virtual machine costs vary significantly with virtual machine family and size. An optimal selection has the potential to enable significant cost savings. Virtual machines can be re-sized, so you do not have to guard against under-provisioning to the same extent as when buying physical hardware. You can choose a relatively small size and scale up later as required.



# Availability Options

Beyond choosing the right family and size of virtual machine, choosing the right availability option will also be integral to the project at hand.

In addition to understanding the native availability requirements for the workload (for example: SQL Server Always On) you will have to plan and choose the right level of availability with Azure Virtual Machines, backed by a suitable [virtual machine availability SLA](#).

## SINGLE INSTANCE VM

When any Azure virtual machine is backed by Azure Premium Storage, (for all disks), Microsoft provides a 99.9% availability SLA.

## AVAILABILITY SETS

[Azure Availability Sets](#) are a logical grouping capability that you can use in Azure to ensure that the virtual machines you place within it are isolated from each other when they are deployed within an Azure datacenter.

Using availability sets helps protect against outages caused by local failures, such as a top-of-rack network switch, or by rolling system updates such as host OS patching.

Availability sets offer a 99.95% availability SLA and require that at least two virtual machines are deployed.

## AVAILABILITY ZONES

[Azure Availability Zones](#) are fault-isolated locations within an Azure region, designed with independent power, cooling, and networking. They help protect your mission-critical applications from failures of entire datacenters, caused by events such as power or cooling failures, fire, or flood.

Availability zones are designed to be sufficiently isolated to protect against coordinated failures, yet close enough for low network latency between zones, so that write operations to [zone-redundant storage](#) take place synchronously.

Availability zones also support zone-redundant networking. Zone-redundant load-balancers can be used to distribute traffic across virtual machine instances, both within and across Availability Zones. Zone-redundant public IP addresses enable a single public IP address to be shared across all zones, with traffic routed away from failed zones automatically.

Availability zones were made generally available as of March 30, 2018. They offer a 99.99% availability SLA. However, they are not yet supported in all Azure regions—see [Azure Regions](#) for details.

## REGION PAIRS

Deploying your application to more than one Azure region helps protect you against large-scale region-wide disasters (such as hurricanes) with the potential to impact all availability zones within a region. However, this comes at a significant cost—as well as the increased Azure consumption arising from the larger deployment footprint, the application design must account for data consistency between regions and traffic routing, both before and during a disaster.

Cross-region data replication can be achieved using a range of database technologies, including [Azure SQL Database](#). Cross-region traffic routing and failover is provided by [Azure Traffic Manager](#), which supports a variety of traffic-routing policies.

When deploying an application to more than one Azure region, you should take advantage of [Azure region pairs](#). Each Azure region has a ‘paired’ region, and Azure avoids deploying system updates to both regions at the same time. Spreading your load across paired Azure regions helps protect against unexpected outages caused by Azure system updates.

# Customized Virtual Machine Images

Take advantage of custom virtual machine images to optimize your deployment time

Many customers use virtual machine images in their existing virtualization environment complete with 3<sup>rd</sup> party and custom software ready for deployment. These images can be used in Azure as well, which can accelerate deployments by removing the need to change configuration settings and deploy software after the virtual machine is created.

## CUSTOM IMAGES FOR WORKING TOOLS

Many of the partners we interviewed create custom images (Windows and Linux) that contain their custom applications and third-party tools they commonly use as part of a migration or modernization project.

With this approach, they get the additional benefit of a common working environment which allows for consistent behavior and a common set of tools. New teams can get started much faster and with less confusion since all of the environments have the expected set of tools and services when they start.

## CREATING YOUR OWN IMAGES

A first step should be to browse the Azure Marketplace, to see if there is an existing virtual machine image available that meets your needs. Using an existing image saves you valuable time in creating your own. However, if you can't find a suitable image in the Marketplace, you can also create a custom image as a baseline for your virtual machines.

The easiest way to create a new image is to start by provisioning a VM from the Azure Marketplace and then customizing it by installing software and services. After the VM is configured you must run sysprep.exe with the generalize and shutdown options selected. Once the VM is shutdown you can use the Azure capture command to store the image for later use. For more information, see [Creating Custom VM Images](#).

You can also use the open source tool '[Packer](#)' to create custom virtual machine images. To build images, you define a Packer template file specifying the build process for the image. Packer supports integration with Azure, allowing you to define Azure resources such as service principal credentials. Running Packer will then deploy a virtual machine to Azure, perform the necessary build steps, create the image, and then clean up the virtual machine. This image can then be used as a baseline for more virtual machines. For more information, see [How to use Packer to create Windows virtual machine images in Azure](#).

## UPLOADING EXISTING IMAGES

Using the Azure Command line tools or Storage Explorer you can upload existing VHD files and register them as managed images that can be used to create new virtual machines in Azure.

For details, see [Migrating Disks to Azure](#).



# Cloud Storage

Data storage is a critical feature of any application. Choosing the right storage technology will help create performant, cost-effective cloud deployments.

There are a wide range of data storage technologies available in Azure. Each offers different features, performance, resiliency and cost characteristics. It is important to understand the options before choosing the storage for your applications.

In this section, we'll consider the storage options available to Azure Virtual Machines, considering both the disks attached to the virtual machines themselves, and also shared file shares.

In addition, Azure supports a wide range of database options. These are considered later in this playbook as well as [online](#).

## VIRTUAL MACHINE DISKS

With the right storage combination, you can achieve up to 256 TB of storage per virtual machine, with up to 80,000 IOPS (input/output operations per second) and up to 2 GB per second disk throughput, with extremely low latencies for read operations. However, achieving this performance requires a large (and costly) deployment, and so whilst Azure supports extreme levels of disk performance, it is important to 'right-size' your design to avoid unnecessary cost.

The first step in planning disk storage is to identify the storage requirements—capacity, throughput, and read/write operations per second. This information will help determine the storage architecture to use, for example the size, type and number of disks.

It is also important to plan separation between OS, Temp, and Data disks.

- The OS disk (C: on Windows; /dev/sda1 on Linux) is used only for the virtual machine operating system
- Each Azure virtual machine is provided with a temporary disk (D: on Windows; /mnt on Linux). This is mounted locally on the virtual machine host. The size and performance of this disk depends on the virtual machine family and size. The contents of this disk may be lost at any time, for example, due to

hardware failure. It is a good choice for local caches, such as page files, but should not be used for persistent data.

- You can also add one or more data disks (use F: or higher on Windows (E: is reserved and should not be used); /dev/sdc1 or higher on Linux).

There are two technologies available for virtual machine OS disks and data disks in Azure. The original approach, which is still supported, is to store the disk image in a 'blob' in Azure storage. The newer approach, called [Managed Disks](#), also uses Azure storage, but abstracts the disk as a first-class resource in its own right. Managed Disks offer numerous advantages over blob storage, and is the recommended approach for all new deployments.

When planning your disk storage, you will need to choose between Standard Storage and Premium Storage:

- [Standard Storage](#) offer lower transaction rates, data throughput and higher latency than Premium disks. They also offer both local and geo-redundant replication. They are a good choice for web and application servers that do not depend on high IOPS or low latency.
- [Premium Storage](#) offers much higher transaction rates, throughput, and lower latency than standard disks. They offer local replication only (no geo-replication). They are suitable for database servers, file servers and interactive applications that require high throughput and low latency. They are also required to take advantage of the Azure SLA for single-instance virtual machines.

In each case, it is important to understand the capacity, IOPS and throughput options available, and to choose a storage design that meets your requirements. In some cases, to meet the required performance, it will be necessary [stripe data across multiple disks](#). Since Managed Disks are stored in Azure storage, which includes its own multi-copy redundancy, there is no need to stripe disks for additional resiliency, only for capacity or performance.

In addition, since both Standard and Premium storage are accessed over the network, it's important to check that the network capacity of your chosen virtual machine supports the bandwidth required for disk access.

## FILE SHARES

[Azure Files](#) offers fully managed file shares in the cloud that are accessible via the industry standard [Server Message Block \(SMB\) protocol](#) (also known as Common Internet File System or CIFS). Azure File shares can be mounted concurrently by cloud or on-premises deployments of Windows, Linux, and macOS. Additionally, Azure File shares can be cached on Windows Servers with Azure File Sync (preview) for fast access near where the data is being used.

Azure Files can be used to:

- **Replace or supplement on-premises file servers:**

Azure Files can be used to completely replace or supplement traditional on-premises file servers or NAS devices. Popular operating systems such as Windows, macOS, and Linux can directly mount Azure

File shares wherever they are in the world. Azure File shares can also be replicated with Azure File Sync to Windows Servers, either on-premises or in the cloud, for performance and distributed caching of the data where it's being used.

- **"Lift and shift" applications:**

Azure Files makes it easy to "lift and shift" applications to the cloud that expect a file share to store file application or user data. Azure Files enables both the "classic" lift and shift scenario, where both the application and its data are moved to Azure, and the "hybrid" lift and shift scenario, where the application data is moved to Azure Files, and the application continues to run on-premises.

- **Simplify cloud development:**

Azure Files can also be used in numerous ways to simplify new cloud development projects, for example for shared application settings, diagnostics, or shared tools.

Azure files are a fully-managed service, requiring no patching or ongoing management, and have built-in resiliency.





# Cloud Networking

The network forms the backbone of any application, both on-premises and in the cloud. It is the doorway to the end users, the glue that enables the application to function, and the security boundary against outside attacks. Establishing the right network architecture is a critical step in designing any cloud application.

Designing the network is a critical part of any application architecture, whether on-premises or in the Cloud. The network design must consider a range of requirements and security threats. Common considerations include:

- Designing network topologies with the right connectivity for application access and internal traffic
- Creating hybrid networks connecting on-premises and Azure-based resources
- Routing traffic for scale, resilience and high availability
- Securing the network against outside threats, including DDoS
- Monitoring and trouble-shooting networking issues

## AZURE NETWORKING

Microsoft Azure offers an extensive range of networking services and features, enabling almost any networking topology to be created in Azure. Familiar network concepts, such as subnets, firewall rules and routing tables each have their Cloud equivalents. These are built using Microsoft's software defined networking technology, which offers cloud scale, fast provisioning, and virtual

isolation of network traffic in the multi-tenant Azure environment.

This guide gives a short overview of the core Azure networking services. Microsoft publishes substantial additional documentation on each of these services online. For further reading, we recommend the [Azure Networking Overview](#).

## VIRTUAL NETWORKS

[Virtual networks](#) are the most fundamental resource in Azure networking. A virtual network allows you to create a dedicated, private network space (for example, 10.0.0.0/16) within the Azure cloud. Resources, such as Azure virtual machines, can be allocated private IP addresses within this space, and use those addresses to communicate with each other.

Each virtual network can be divided into subnets, and virtual networks can be connected with each other, either using [site-to-site VPN connections](#) or [peering](#) connections (both within a region and across regions, where supported). You can configure [user-defined routes](#) and

[network security groups](#) (NSGs), which are like firewall rules, to control traffic in, out, and between subnets.

Inbound Internet traffic is supported by creating a [Public IP Address](#), which can be either IPv4 or IPv6 (not all networking features are supported with IPv6). These IP addresses can be statically or dynamically assigned. Outbound Internet traffic is supported both with and without the presence of a Public IP Address (and can be blocked using an NSG if required).

## LOAD BALANCING OPTIONS

There are three alternative load-balancing technologies available in Azure. It is important to understand all three, and to design your application appropriately.

- [Azure Load Balancer](#) is a Layer 4 (TCP, UDP) load balancer that distributes incoming traffic among healthy virtual machines or other service instances. It can be used for both Internet-facing and internal application endpoints.
- [Azure Application Gateway](#) is a Layer 7 load-balancer with security and routing features, such as web application firewall, SSL off-loading, URL path-based routing and cookie-based session affinity. It is an example of a [network appliance](#); a range of 3<sup>rd</sup>-party appliances is also available via the Azure Marketplace.
- [Azure Traffic Manager](#) is a DNS-based global traffic management service. It provides a range of traffic-routing capabilities, based on end user geo-location, endpoint proximity (based on network latency), and endpoint availability. Traffic Manager can be used to direct traffic between endpoint in different Azure regions, or between Azure and non-Azure endpoints.

Note that all three load-balancing services include endpoint health probes for back-end instances, and the ability to deliver high-availability by automatically removing failed instances from service, and restore them once they return to health.

## DNS SERVICES

Azure supports a range of DNS services and features, for use by both Internet-facing and internal applications:

- [App Service Domains](#) allows you to register a domain name, through a partnership with the name registrar GoDaddy. Originally part of Azure App Service, this is now available in Preview as a standalone service.
- [Azure DNS](#) allows you to host your DNS domain (whether purchased via Azure or elsewhere). It provides a global network of authoritative DNS name servers for high availability and low latency, and supports all common DNS record types. Azure DNS is generally available for Internet-facing domains; Intranet-facing [private domain support is available in Preview](#).
- [Azure-provided DNS](#) is the name given to the recursive DNS service provided by default to all Azure virtual machines. You can [override the virtual machine DNS](#) settings at either the Vnet or individual virtual machine level to specify your own recursive DNS server; the most common scenarios are to specify the DNS service of your Active Directory deployment when using domain joined virtual machines, or to enable DNS lookup for on-premises servers when using [hybrid networking](#).
- Reverse DNS lookup is used to create a mapping from an IP address to a DNS name. Azure lets you [configure the reverse DNS name](#) assigned to the public IP addresses assigned to your virtual machines. You can also [host the reverse lookup zone](#) for your own IP address block using Azure DNS.

## SECURITY, MONITORING AND TROUBLESHOOTING

- [DDoS Protection](#): Azure provides two levels of DDoS protection. The basic level, which is free of charge, provides always-on traffic monitoring and real-time mitigation against common attacks. The paid-for standard-level service, which is currently in Preview, provides policies tuned using machine learning and real-time telemetry.
- [Network Watcher](#) provides a central hub for a range of tools to view network settings across your deployment. It also provides several very useful tools for investigating network issues, such as the ability to run packet captures, and to verify connectivity from a virtual machine to a given endpoint.

# Hybrid Networking

Most Azure customers, especially Enterprise customers, use Hybrid Networking to connect to on-premises resources to the Cloud.

For many customers, for a variety of reasons including data sovereignty or industry-specific regulations, it may be necessary for some parts of an application (typically the application database) to reside on-premises, whilst the other tiers of the application are moved to Azure. In these so-called 'hybrid' networks, a secure and robust connection is required between the database in the on-premises environment and the rest of the application in Azure. We call this connectivity between Azure and on-premises networks 'hybrid networking'.

Another example is Intranet applications. Even if the entire application stack is moved to Azure, some organizations will prefer to access Intranet applications over their internal network, rather than a public IP address. Here again, a secure connection between the on-premises network and the Azure network is required.

Azure provides two approaches to implement hybrid networking: Virtual Private Networks and ExpressRoute. These are summarized below.

## VIRTUAL PRIVATE NETWORKS

In a Virtual Private Network (VPN), traffic flows over the public Internet through a secure, encrypted tunnel, but appears from a networking perspective to be between two private networks.

Azure supports two types of VPN:

- [Site-to-Site VPN](#): Used to join on-premises networks to Azure, for example to connect application servers with database servers. At the Azure end, a VPN Gateway is deployed into a dedicated subnet in your virtual network. The on-premises network endpoint is a VPN gateway device. These devices form a VPN tunnel over which traffic between the networks flows.
- [Point-to-Site VPN](#): Used to join individual machines to the Azure network, for example to connect remote worker laptops to an Azure application, or for Dev/Test purposes. Once again, a VPN Gateway is

deployed in Azure, in this case connecting to a VPN client deployed on the remote machine.

Point-to-Site VPN connections require configuration on each remote worker laptop, and must be initiated by the user. Misconfiguration or user training issues can result in high volumes of support calls. An alternative approach for web-based intranet applications is to use [Azure Active Directory Application Proxy](#). This enables Intranet-based web applications to be accessed securely from any Internet-enabled PC, without exposing the application via an open network port and without needing to install or configure a client VPN connection.

## EXPRESSROUTE

[Microsoft Azure ExpressRoute](#) lets you extend your on-premises networks into the Microsoft cloud over a private connection facilitated by a connectivity provider. All traffic flows over this private connection, not over the public Internet. As such, ExpressRoute connections offer a higher level of performance and reliability compared to VPN connections.

Where VPN connections provide connectivity only to a single Azure virtual network in a single region, ExpressRoute connectivity supports all Azure regions in a given geopolitical region, or all regions worldwide with the ExpressRoute Premium add-on.

VPN connections only provide connectivity to Azure resources. With ExpressRoute, you can establish connections to all Microsoft cloud services, including Microsoft Azure, Office 365, and Dynamics 365. For guidance on using ExpressRoute to access Office 365 visit <http://aka.ms/ExpressRouteOffice365>.

ExpressRoute offers a choice of [connectivity models](#):

- **Co-located at a cloud exchange** If you are co-located in a facility with a cloud exchange, you can order virtual cross-connections to the Microsoft cloud through the co-location provider's Ethernet

- exchange. Co-location providers can offer either Layer 2 cross-connections, or managed Layer 3 cross-connections between your infrastructure in the co-location facility and the Microsoft cloud.
- **Any-to-any (IPVPN) networks** You can integrate your WAN with the Microsoft cloud. IPVPN providers (typically MPLS VPN) offer any-to-any connectivity between your branch offices and datacenters. The Microsoft cloud can be interconnected to your WAN to make it look just like any other branch office. WAN providers typically offer managed Layer 3

- **Point-to-point Ethernet connections** You can connect your on-premises datacenters/offices to the Microsoft cloud through point-to-point Ethernet links. Point-to-point Ethernet providers can offer Layer 2 connections, or managed Layer 3 connections between your site and the Microsoft cloud.

ExpressRoute capabilities and features are all identical across all of the above connectivity models.

## RESOURCES

[Reference Architecture: Hybrid Networking](#)



# The Virtual Data Center

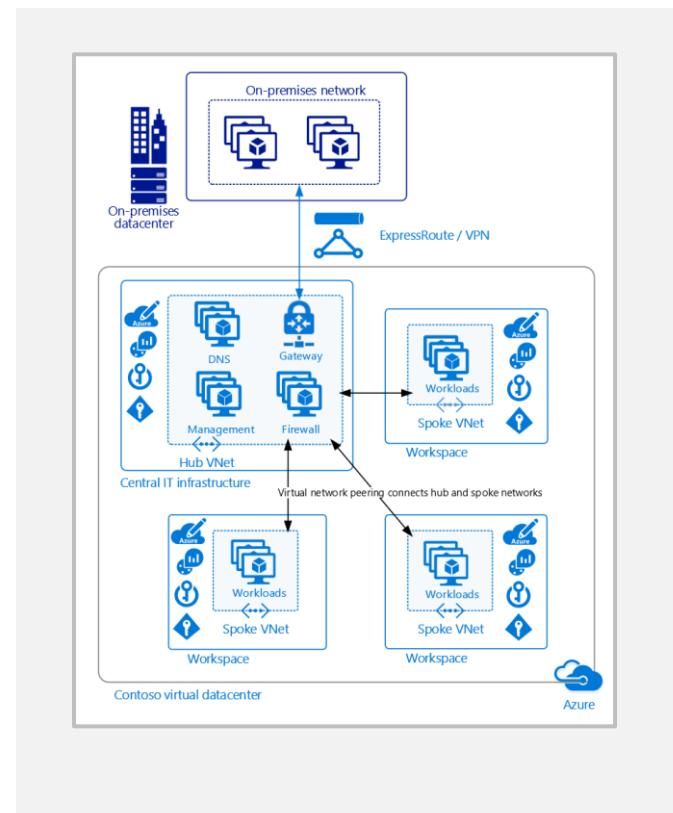
Azure Virtual Datacenter is an approach to making the most of the Azure cloud platform's capabilities while respecting existing security and networking policies. When deploying enterprise workloads to the cloud, IT organizations and business units must balance governance with developer agility. Azure Virtual Datacenter provides models to achieve this balance.

Unlike an existing on-premises datacenter environment, the Azure public cloud operates using shared physical infrastructure and a software-defined environment abstraction. The Azure Virtual Datacenter model allows you to structure isolated workloads in the Azure multitenant environment that meet existing governance policies.

With this approach, a set of shared services, access controls and policies are deployed and managed independently of the actual application workloads. These services include shared components such as load balancers, hybrid network connections, network security appliances, and management jumpboxes. Policies ensure that all traffic is routed through this shared infrastructure, which is responsible for implementing and enforcing governance standards.

Individual application workloads are then deployed separately into this infrastructure. Each workload uses a dedicated virtual network, integrated with the shared infrastructure using peering and routing rules. The resulting network is a 'hub and spoke' model, with a central hub of shared components, with each application workload isolated in separate spokes.

With this approach, partners can deliver a flexible and agile and yet also highly secure and compliant infrastructure, with the aim of meeting any customer security policy requirements and assuaging security concerns. By sharing network security infrastructure, partners can also demonstrate significant cost savings over siloed application deployments. These advantages will be especially important for Enterprise customers, who typically have more demanding requirements and a larger number of applications.



## FURTHER READING

Deploying and configuring an Azure Virtual Datacenter requires a deep understanding of a broad range of Azure technologies. Fortunately, the Microsoft Customer Advisory Team (AzureCAT) have published extensive guidance, based on their experience of helping Microsoft's largest customers on their Azure journeys. For more information, see the [Azure Virtual Datacenter White Paper](#) and the [Mesh and Hub-and-Spoke Networks on Azure White Paper](#).

# Business Continuity

Providing guaranteed continuity of service even in the event of failures is a key requirement of any business application. Services in Azure are no exception.

Business continuity requires that services keep running, or recover quickly, even when disaster strikes. That could be a large-scale IT failure, or a data loss event.

This presents both a challenge, and an opportunity. You can use Azure services to enhance your offerings to support business continuity for customers. In designing your business continuity service, be prepared to answer common customer questions, such as:

- Will you help me restore my data when it is corrupt or lost? Will you take care of my data's long-term retention compliance requirements?
- Will you protect my mission critical applications? Will you make DR and recovery plans and run DR drills?
- Will you ensure business continuity in case of any interruption? What kind of SLAs will you provide?

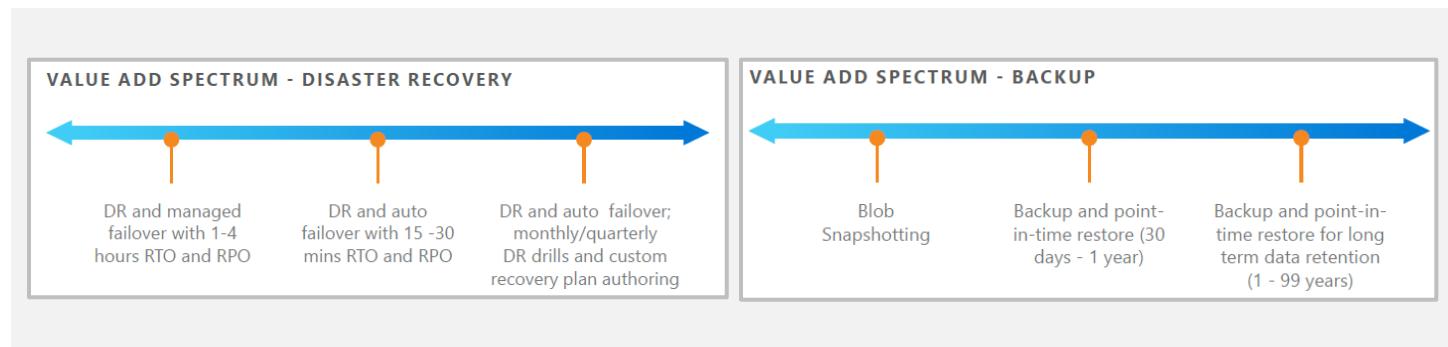
To protect against IT failures, Azure Site Recovery enables critical workloads to replicate their running state to Azure, and to rapidly fail over to an Azure-based infrastructure when needed. Whilst this creates data redundancy, it does not protect against data corruption, accidental data deletion, or ransomware, and thus additional data backups, as provided by Azure Backup, are also essential.

These services can be used to protect both cloud workloads and on-premises deployments. As a Managed Service Provider, providing additional resilience to on-premises applications by integrating these Azure services

can be a 'quick win', helping to build customer trust prior to a full Azure migration.

Microsoft Azure offers a rich set of services to backup workloads and fail over critical workloads, in addition to hybrid storage support.

- [Azure Backup](#) supports file and folder-based workloads, virtual machine backup, as well as workload specific support such as Hyper-V, VMware, SharePoint, and Active Directory straight to Azure, removing the need for physical backups like tape. Azure Backup [recently added support](#) for application-consistent backups for a range of common Linux-based workloads.
- [Azure StorSimple](#) is an appliance (physical and virtual) that provides hybrid tiered storage to automatically offload data to the cloud.
- [Azure Site Recovery](#) protects important applications by coordinating the replication and recovery of physical or virtual machines. You can replicate to your own datacenter, to a hosting service provider, or even to Azure to avoid the expense and complexity of building and managing your own secondary location. Azure Site Recovery continuously monitors service health and helps automate the orderly recovery of services in the event of a site outage at the primary datacenter.



# Automation and DevOps

Use automation to improve the speed, efficiency, consistency and reliability of your, deployments. A DevOps culture encourages end-to-end ownership and promotes agility.

The Cloud offers a dramatic increase in the flexibility and speed of infrastructure provisioning. Infrastructure that previously took weeks or even months to purchase and provision can now be set up in a matter of minutes.

To take full advantage of the speed of deployment of the Cloud, businesses need to change their infrastructure and deployment practices. The agility of the Cloud is wasted if it is tied to old-fashioned, multi-week development and deployment procedures.

For many businesses, the full agility of the Cloud is best realized by adopting a culture of full automation of all infrastructure provisioning, coupled with a DevOps organization structure. In this section, we'll explore these approaches in more detail.

## AUTOMATION AND INFRASTRUCTURE-AS-CODE

Infrastructure as Code (IaC) is the process of writing scripts to automate the deployment and configurations management of infrastructure. Using automation to manage your infrastructure enables you to:

- Increase accuracy and reliability of resource deployment and configuration.
- Automate the process of replicating environment configurations across dev, test, and production environments.
- Add version control to infrastructure configuration management.

Automation is also a key component to implementing DevOps practices, and Infrastructure as Code fits in well with the other aspects of DevOps such as Continuous Integration (CI) and Continuous Deployment (CD).

There are two methods to writing scripts for implementing Infrastructure as Code: **Imperative** and **Declarative**. The imperative approach utilizes traditional command-line scripts to define the step-by-step process to modify current state to the desired end-state. The declarative approach utilizes a definition file that declares

what the desired end-state is, and the tooling automatically figures out how to modify the current state to reach the desired end-state.

With the infrastructure deployment and configuration automated with scripting, these scripts can then be checked into Source Control, such as Git or Visual Studio Team Services. This integration with Source Control adds the ability to effectively track infrastructure version changes over time in the same manner that all other source code is tracked. It also enables Infrastructure as Code (IaC) to be integrated into the release pipeline through Continuous Integration (CI) and Continuous Deployment (CD); alongside the source code for the enterprise applications that may run on the infrastructure being automated.

## RESOURCE MANAGER TEMPLATES

Azure Resource Manager Templates offer a **declarative** method of implementing Infrastructure as Code (IaC) for deploying and maintaining environment and infrastructure deployments. Put simply, a template consists of a text file, in JSON format, specifying the resources in a given deployment.

Templates can be parameterized, allowing a small number of inputs to control the type, number and size of resources deployed. This allows the same template to be used for multiple deployments in different environments, such as Test, Pre-Production and Production.

Consistency across the Azure ecosystem allows for ARM Templates to be written that can deploy environment configurations to both the Azure public cloud and Azure Stack without requiring any changes to the template.

Templates can be authored through the use of a plain-text editor, or a variety of IDEs (Integrated Development Environments), such as Visual Studio 2017 and Visual Studio Code. These editors enhance the authoring experience with syntax highlighting, code completion, and other common IDE features.

Templates can be easily deployed, either directly from Visual Studio, using the Azure portal, PowerShell or CLI, or even integrated into a Continuous Integration / Continuous Delivery (CI/CD) pipeline using Visual Studio Team Services, Jenkins, or some other automated build and deployment tool.

Templates support two deployment modes, incremental and complete. In both modes, all resources specified in the template are deployed. The differences are in what happens to pre-existing resources that are *not* specified in the template—in incremental mode, they are unchanged, whereas in complete mode, they are deleted. This enables templates to be used both for clean deployments and to update existing deployments.

Developing Azure Resource Manager Templates is a skill. The template language supports a wide range of features, some of them quite advanced such as conditionals and nested templates. Learning to use the full power of Templates is a highly worthwhile investment for any team making significant use of Azure. A number of guides and samples are available to help you—see the links in the Resources section below.

## DEVOPS

In a traditional IT organization, there is a separation between Development teams, who create applications, and Operations teams, who provision the infrastructure on which those application will run, deploy the applications, and take responsibility for on-going management, availability, upgrades, and patching.

This separation promotes a development process that requires code releases to be released from Development to Operations relatively infrequently. It therefore promotes a ‘waterfall’ development process, typically with multi-week (or longer) release cycles. These long releases cycles prevent an organization from taking full advantage of the agility of Cloud-based infrastructure.

To fully address this requires an organization change. The boundaries between Development and Operations must be broken down, enabling new code to transition rapidly from development, through testing and staging, to deployment into production. Ideally, small changes such as a simple bugfix can be coded and deployed in a single day. This level of agility requires investment in full automation of all stages of the development / test / deploy / operate lifecycle.

In some cases, the separation between Development and Operations is removed altogether. The same team is responsible for the entire lifecycle of the service: development, testing, deployment and on-going operations. This is known as ‘DevOps’. This approach promotes agility and accountability, since the same team that created the service will ‘feel the pain’ should any issues with that service arise in production.

Converting traditional Development and Operations teams to a DevOps model is a difficult transition. The new roles will require additional responsibilities and skills, such as developers taking part in an on-call rotation, and operations staff learning to code. Managing changes of this magnitude can be disruptive and challenging, hence some organization choose a less extreme approach, maintaining both roles while re-building development processes to promote agility.

## RESOURCES

- [Azure Resource Manager Overview](#)
- [Authoring Azure Resource Manager Templates](#)
- [Azure Quickstart Templates](#)
- [Sample templates from the Azure Resource Manager team](#)
- [Create and deploy your first Azure Resource Manager template](#)



# Cloud-Native Architecture and Design

Most of the traditional application designs and architectures that are common place in on-premises datacenters are able to run in the cloud without change. However, the cloud brings with it many new capabilities and features. Applications that make use of cloud capabilities are often referred to as “cloud-native” applications.

On the surface, designing applications for the cloud is not very different than designing for on-premises. All the same development tools, language, and frameworks can be used in the cloud. This enables all the familiar tools and existing skillsets of the development team to be used.

However, the cloud also offers a range of additional capabilities, and taking advantage of these requires some design changes. In addition, there are a wide range of cloud services and features available, and a variety of design approaches available. As an infrastructure partner, you are responsible for:

- Choosing the right cloud-native application architecture for your application.
- Incorporating proven best practices into your cloud designs.
- Optimizing implementation by leveraging existing deployment templates for common architectures

You’re not on your own. Microsoft has published extensive guidance on designing applications for the cloud. This guidance can be found in the [Azure Architecture Center](#), provides a wealth of resources and proven cloud architecture best practices, based on real-

world experiences gained from working directly with the largest Azure customers. Using this guidance can accelerate your design process, as well as ensuring that your designs follow proven best practices. Amongst other resources, the Architecture Center includes:

- The [Azure Application Architecture Guide](#), which presents a number of common architecture styles, technology choices, and design principles for Azure applications.
- [Azure reference architectures](#), which demonstrate recommended practices and include deployable solutions which can be used as the basis of your own deployments.
- [Azure architecture best practices](#) for a wide range of common topics, including API design and implementation, autoscaling, use of background jobs, monitoring, fault handling, and more.
- [Design review checklists](#) for [Availability](#), [Resiliency](#) and [Scalability](#), which can be used to validate and improve your own designs, enabling you to catch potential problems early and avoid expensive re-work later.

# Deploy PaaS Services

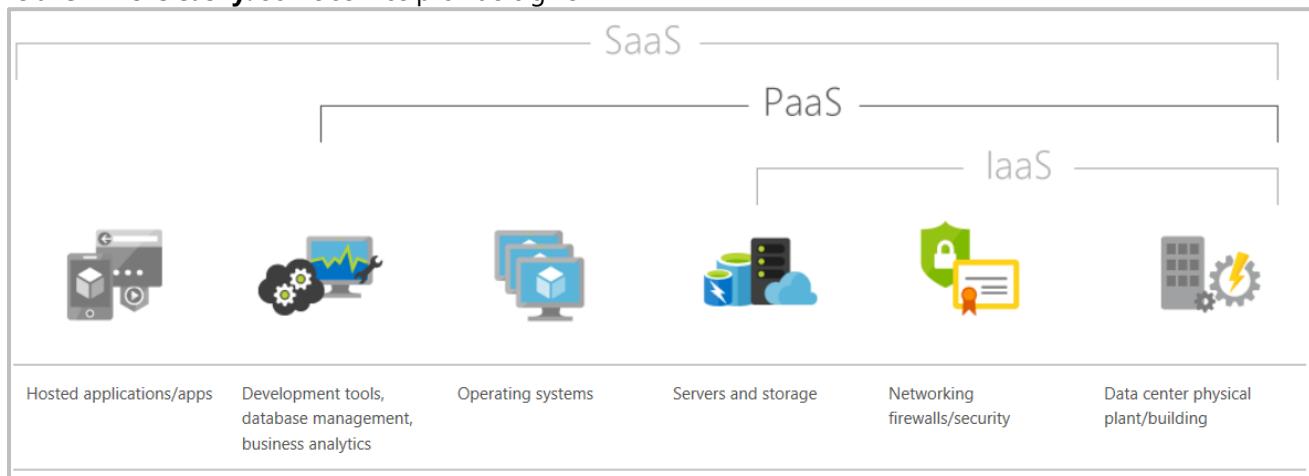
Platform-as-a-Service (PaaS) offers significant advantages over traditional Infrastructure-as-a-Service (IaaS) deployments. Consider PaaS as an alternative to IaaS for increased efficiency and agility.

PaaS is a complete development and deployment environment in the cloud, with resources that enable the delivery of everything from simple cloud-based apps to sophisticated, cloud-enabled enterprise applications. Like IaaS, PaaS includes infrastructure (servers, storage, and networking) but also middleware, development tools, business intelligence (BI) services, database management systems, and more. PaaS is designed to support the complete application lifecycle.

## BENEFITS OF USING PAAS

Here are the biggest benefits of using PaaS services to modernize and host applications in the cloud:

- **Managed Virtual Machines (VMs):** PaaS hosting is provided by Managed VMs that do not require the traditional maintenance and updates required by traditional IaaS VMs. This provides an abstraction that automates Operating System Updates and Patches so the development team only needs to be concerned with the Application, Data, and Deployment rather than infrastructure maintenance.
- **Cut coding time:** PaaS development tools can cut the time it takes to code new apps with pre-coded application components built into the platform, such as workflow, directory services, security features, search, and so on.
- **Add development capabilities without adding staff:** PaaS components can give your development team new capabilities without you needing to add staff having the required skills.
- **Develop for multiple platforms—including mobile—more easily:** Some service providers give you development options for multiple platforms, such as computers, mobile devices, and browsers making cross-platform apps quicker and easier to develop.
- **Use sophisticated tools affordably:** A pay-as-you-go model makes it possible for individuals or organizations to use sophisticated development software and business intelligence and analytics tools that they could not afford to purchase outright.
- **Support geographically distributed development teams:** Because the development environment is accessed over the Internet, development teams can work together on projects even when team members are in remote locations.
- **Efficiently manage the application lifecycle:** PaaS provides all the capabilities that you need to support the complete web application lifecycle: building, testing, deploying, managing, and updating within the same integrated environment.



There are a wide range of PaaS technologies available in Azure, each aimed at different application architectures or use cases. Some services (such as virtual machine scale sets, or Azure App Service) are generic, and can be used to build a wide range of applications. These services enable you to build, deploy and manage applications more quickly and efficiently than with traditional infrastructure.

Other Azure services are focused exclusively on a specific use case, such as Azure Stream Analytics or Application Insights. Using these services enables your application developers to focus on the core application business logic, without spending time on supporting services. This enables faster development, more rapid innovation, and lower development costs.

In the remainder of this section, we give an overview of two of the most-used Azure PaaS services: Azure App Service and Azure SQL Database.

## AZURE APP SERVICE

[Azure App Service](#) is a fully-managed platform for hosting web, mobile and API applications. Key features include:

- A fully-managed PaaS platform, enabling you to focus on your application code instead of spending time on infrastructure management.
- Support for a wide range of development platforms and languages, including .NET, .NET Core, Java, Ruby, Node.js, PHP and Python, using both Windows and Linux.
- Integration with a wide variety of source code repositories, including Visual Studio Team Services and GitHub, enabling agile development practices with continuous integration and continuous deployment (CI/CD).
- Support for multiple deployment slots, enabling staged testing, roll-out, and roll-back.
- Auto-scaling of capacity to meet demand peaks whilst scaling back to reduce cost during troughs.
- Integration with Azure virtual networks for access to private resources or for hosting Intranet applications.
- Enterprise-grade security and compliance features, including integration with Azure Active Directory.

Azure App Service enables the rapid development and deployment of Enterprise-grade applications using familiar tools and application architectures. In many cases, existing web applications can be ported to run in Azure App Service with minimal changes. Azure App Service therefore offers an accessible route to the benefits of using PaaS services.

## AZURE SQL DATABASE

[Azure SQL Database](#) is a fully-managed, enterprise-grade database service. Key features include:

- Broad compatibility with Microsoft SQL Server, further enhanced when using [SQL Database Managed Instances](#).
- Built in replication and automatic failover, that guarantees a [99.99% SLA](#), with an RPO as low as under 5 seconds (depending on configuration chosen)
- Flexible pricing models based on either 'database transaction units' or resources (cores, memory, storage) consumed.
- Support for [Elastic Pools](#), enabling you to spread the load of multiple databases over a common resource pool, avoiding trade-offs between performance and efficiency.
- Support for standard tools and development libraries.
- Automatic performance tuning based on learned query patterns.
- Built-in security features to mask sensitive data and encrypt data at rest
- Extreme transaction processing performance using [in-memory OLTP](#).
- Support for [PostgreSQL](#) and [MySQL](#) databases as a managed service, in addition to Microsoft SQL Server compatibility.

Azure SQL Database delivers the power of a relational SQL database as a fully-managed service, so there is no database or server infrastructure to deploy or maintain. The high level of compatibility with existing databases makes Azure SQL Database one of the most accessible and easily adopted of all the platform services in Azure.

# Deploy Containerized Applications

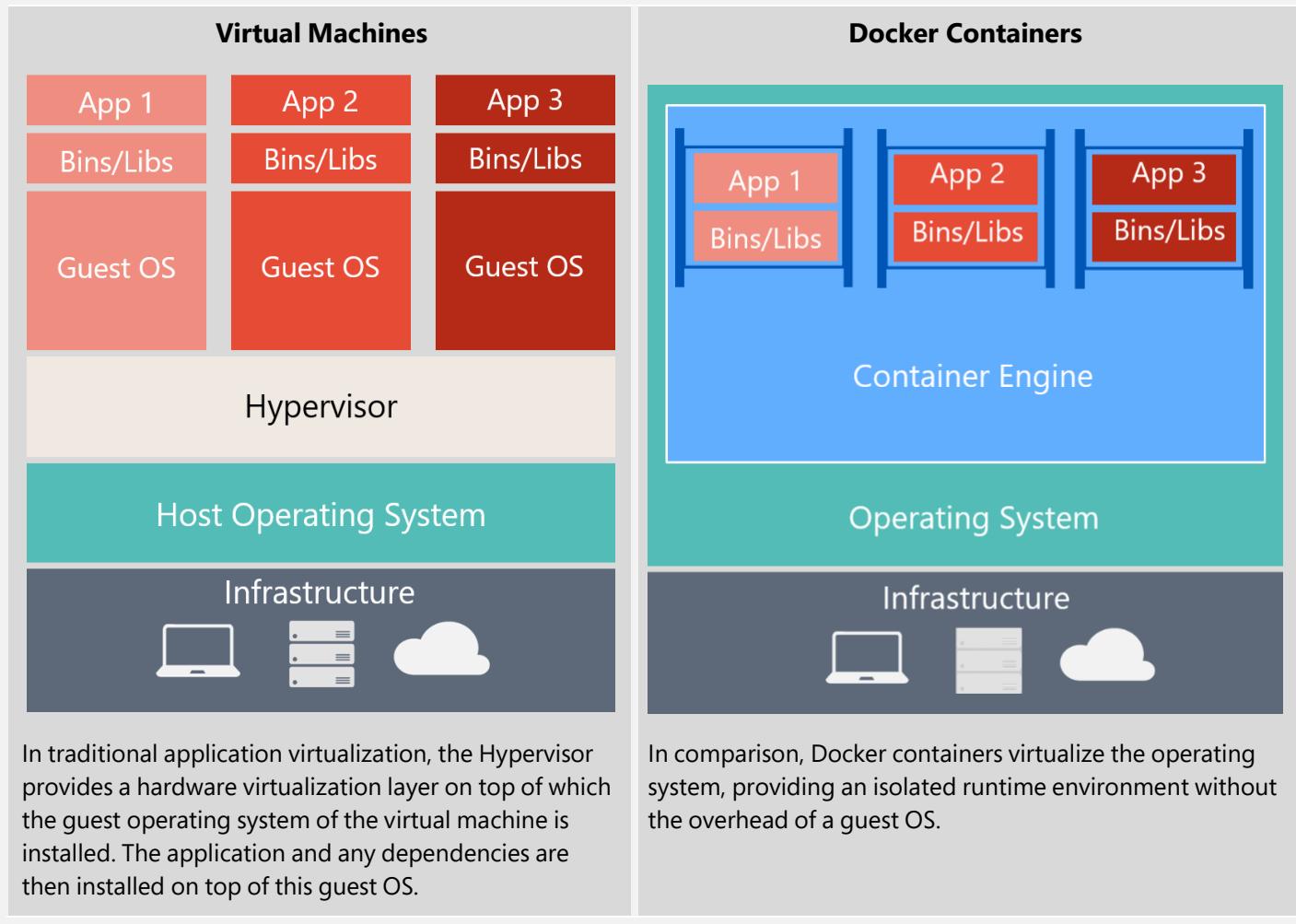
Containers offer significant agility and efficiency advantages over traditional virtualization, due to their fast deployment and low footprint. Consider using containers in your application designs.

Traditional application architectures build applications in large, monolithic components. These large components are deployed as a single unit, making it hard to maintain strict separation between internal components. This results in long integration, test and release cycles, which slow development, reduce agility and increase costs.

The primary design principle of a microservices architecture is to design an entire software system to be built using smaller software components, called microservices. Each microservice performs a single function of the overall system that can be developed, deployed, and scaled independently. This independence

## WHAT ARE CONTAINERS?

The following comparison highlights the architectural principle behind Docker containers in comparison to conventional virtual machines:



enables accelerated development by enabling individual component teams to work more independently, thereby avoiding long integration, test and release cycles. For more information, see the article [Why a microservices approach to building applications?](#)

Containerization is an approach to deployment and application management that combines an application with its dependencies and configurations (via manifest files) into a container image. Due to their highly efficient resource consumption, containers are an ideal platform for the development of microservices. Each microservice is built into a dedicated container image, and can then be more easily deployed, scaled, and managed as a single package. Using microservices and containers reduces the effort required to manage the deployment and scalability of a particular application.

In addition, even legacy applications can often be adapted to be deployed and operated in containers. This approach may lack the flexibility and agility of a microservices architecture but can still offer significant advantages in deployment time and resource efficiency over a traditional virtual machine-based deployment.

## BENEFITS OF CONTAINERIZATION

Because they require fewer resources, containers are easy to deploy, start fast, and have lower resource usage

allowing higher density. Containers allow you to run more services on the same hardware, reducing costs.

Containers are also highly portable. Whilst there is a distinction between Windows and Linux containers, they are otherwise fully compatible between systems. There are no OS-level configurations or dependencies—all settings and code are included within the container package. This means the container runs in exactly the same way in any environment—on a Dev machine, on-premises, or in the cloud.

Having all code, settings and dependencies encapsulated in the container image also means that containers run consistently, with reproducible results. Controls on container resource usage also enable applications to address ‘noisy neighbor’ scenarios to deliver consistent performance.

The main downside of containers is that they don’t offer the same level of isolation as virtual machines. Whereas virtual machines have strong isolation enforced by the hypervisor, Docker containers rely on process isolation within the host OS. This is not typically a concern in single-tenant applications. Hyper-V containers provide greater isolation, and are more suitable for multi-tenant applications.

The other challenge is skills—containers are a relatively new technology and there is high demand for the limited number of IT staff with real-world container experience.

## CONTAINERIZED APPLICATIONS

As we have seen, containers are an ideal technology for the development and deployment of modern applications using a micro-services based architecture.

In addition, the ease of deployment and consistent behavior of containers makes them ideal vehicles for hosting and scaling traditional applications. In many cases, legacy applications can be deployed using containers with few if any changes. Containerizing applications in this way can significantly increase the efficiency of running legacy applications, in terms of both hardware and staff time required.

## CONTAINER SERVICES IN AZURE

Azure supports a number of services to support container-based applications:

- [Azure Container Services \(AKS\)](#): Kubernetes is the leading platform for orchestrating container deployments. The Azure Container Service for Kubernetes (AKS) simplify the deployment, management, and operation of Kubernetes.
- [Azure Container Instances \(ACI\)](#) provides a fully-managed service in which you can run your containers, without any need to deploy or manage the underlying infrastructure. This service enables you to easily run containers on Azure with a single command, and with per-second billing.
- [Azure Container Registry](#) is a fully-managed Docker Registry service. Container registries can be used to

store and manage container images across all types of deployments.

- [Azure Service Fabric](#) is a platform for deploying and operating always-on, scalable, distributed, microservice-based applications. Service Fabric supports its own microservices framework, and also supports containers.
- [Web App for Containers](#) allows you to easily deploy and run containerized web apps that scale with your business, and provides a fully-managed platform for infrastructure maintenance.

## RESOURCES

For further reading, see:

- [Introduction to Containers and Docker](#)
- [.NET Microservices: Architecture for Containerized .NET Applications](#)



# Modern Data Platform

The cloud has driven rapid changes in how applications handle data. Whatever your data needs, Azure offers a service to suit.

Modern data platforms are designed to ingest and process petabytes of data for a variety of purposes. These systems are capable of ingesting and storing data in nearly any format and at any scale. Data may be structured like a relational database or unstructured such as a web log. These modern data platforms enable a variety of applications types such as large scale cognitive and AI applications and high throughput IoT data ingestion.

There are several options for running a modern data platform in Azure. There are big data stores such as Azure Data Lake Store and Azure Storage and there are compute technologies such as HDInsight and Data Lake Analytics. There are also more focused database options such as Azure SQL Data Warehouse and Cosmos DB that can also operate on large amounts of data.

As a Microsoft partner, you can add value by helping the customer choose and implement their modern data platform solution. This will require you to understand the variety of data platform services available and choose the most suitable services for the given application. Once chosen, further work will be needed to choose the correct configuration, for example assessing and optimizing the cluster and storage size.

Transferring large data volumes to the cloud can be another challenge. Online transfers, either via the Internet or an ExpressRoute connection, are the default approach, enabled by tools such as AzCopy. For very large volumes, you can use disks or the Azure Data Box appliance (currently in Preview) to ship data to Microsoft data centers.

A common scenario is data analytics, perhaps from incoming telemetry or using existing data stores. Azure offers several services to help, such as Azure Analysis Services for data modelling and analytics to Azure Event Hubs and Stream Analytics for real-time processing of incoming data streams.

In many on-premises environments, it is common to configure a single monolith Hadoop cluster to handle all types of data ingestion and processing. The architecture we use in the cloud allows us to store all of our data in the same location such as an Azure Data Lake Store and then spin up any number of compute clusters to operate on that data. Two benefits of separating compute and storage:

- **Decoupled compute and storage scale.** Scale compute and storage independently of each other. If you need more processing power, you can simply increase the size of your HDInsight cluster.
- **Optimized spending.** Have multiple, purpose-built compute clusters allowing you to optimize cluster size and runtime based on a single workload rather than all workloads in aggregate.

Microsoft's modern data platform services include:

- [Azure HDInsight](#): A fully-managed cloud service that makes it easy, fast, and cost-effective to process massive amounts of data. Use popular open-source frameworks such as Hadoop, Spark, Hive, LLAP, Kafka, Storm, R & more. Azure HDInsight enables a broad range of scenarios such as ETL, Data Warehousing, Machine Learning, IoT and more
- [Azure Data Lake Analytics](#): Develop and run massively parallel data transformation and processing programs in U-SQL, R, Python, and .NET over petabytes of data with zero infrastructure.
- [Azure Data Lake Store](#): Store your unstructured, semi-structured and structured data with no limits on size or throughput. Secure, massively scalable, and built to the open HDFS standard, allowing you to run massively-parallel analytics.
- [Azure Cosmos DB](#): A low latency, horizontally scalable and globally distributed multi-model database. Support for many APIs such as SQL, JavaScript, Gremlin (Graph), MongoDB, Cassandra and Azure Table storage. CosmosDB was formerly known as DocumentDB.

- [Azure SQL Database](#): A fully-managed database service for structured, relational data.
- [Azure SQL Data Warehouse](#): A massively parallel processing server with independent compute and storage scalability. Allows you to integrate with big data stores, and create a hub for your data marts and cubes—to drive highly tailored, enterprise-grade performance, while leveraging your existing SQL and BI skills.
- [Azure SQL Server on Azure Virtual Machines](#): Hosting Azure SQL Server on Azure virtual machines gives a SQL environment that is fully compatible with on-premises SQL. Licensing can be included in the virtual machine costs, or you can use a bring-your-own-license model, allowing existing SQL Server licenses with Software Assurance to be re-used.
- [SQL Server Stretch Database](#): Dynamically stretch cold and warm data from SQL Server 2016 to Azure, providing increased scale for longer retention times.
- [Azure Data Factory](#): Fully managed ETL service in the cloud. Connect all of your data sources and orchestrate your data workflows wherever your data lives.
- [Azure Storage](#): Offering fast and scalable blob, table and queue storage, and shared file storage for Azure virtual machines
- [Azure Storage Import/Export Service](#) and [Azure Data Box](#): Use physical disks or a custom-built appliance to ship large data volumes to Azure
- [Azure Analysis Services](#): A fully-managed service enabling you to combine data from multiple sources into a single semantic model, enabling reporting through client tools such as Power BI and Excel.
- [Azure Stream Analytics](#): A managed event-processing engine for real-time analysis on streaming data.
- [Azure Event Hubs](#): A hyper-scale telemetry ingestion service supporting real-time and batch processing.

For more information on the Microsoft data platform, see the Microsoft partner [Data Platform & Analytics Playbook](#).



# SAP Solutions

Building on over 20 years of collaboration, Microsoft and SAP have created a joint ecosystem for running SAP solutions on Azure, allowing SAP customers to enjoy the cost, agility, quality of service and innovation benefits of the cloud.

For many organizations, SAP is a mission-critical system driving many aspects of business operations. SAP systems must offer exceptionally high levels of reliability and availability. Businesses considering migrating their SAP workloads to Azure will rightly be demanding of strong assurances that migration and ongoing operations will operate without disruption to critical services.

In addition, running SAP applications places significant technical demands on the infrastructure. SAP systems often have exceptionally large requirements for CPU, memory and storage in order to run effectively.

Running SAP in Azure offers a variety of potential cost savings. These are not limited to the provisioning of core SAP systems. For these large environments, the ability to provision Dev and Test environments with pay-as-you-go billing is particularly attractive. Similarly, utilizing the cloud for disaster recovery and archiving can significantly reduce running costs in comparison to traditional infrastructure.

The benefits of SAP in Azure extend beyond cost savings. The familiar cloud value propositions of speed of provisioning, flexibility of Dev and Test environments, and scalable capacity are magnified in the context of the large hardware demands of SAP systems.

Azure provides a range of infrastructure options designed specifically to meet the demands placed by SAP. This includes a wide range of Azure virtual machine sizes and configurations which have been certified for various workloads in the SAP suite of services.

In addition, for SAP HANA workloads, Microsoft provides dedicated bare-metal infrastructure. These Azure Large Instance configurations support up to 960 CPU cores, 20TB of RAM, and 46TB of attached storage. This allows you to run SAP HANA on the dedicated bare-metal hardware with the SAP application layer or workload middle-ware layer hosted in native Azure Virtual Machines.

Azure is far more than a cutting-edge infrastructure platform for SAP. Support for SAP workloads on Azure is the result of a [strategic partnership between SAP and Microsoft](#), resulting in a joint ecosystem offering. Azure provides certified end-to-end solutions for running critical SAP workloads, with Azure-specific reference architectures, documentation, and integrated features for backup, high availability, disaster recovery, and scale-out configurations.

The result is that SAP support on Azure is a unique offering, differentiated from the competition. For Microsoft Partners, enabling enterprises to run SAP on Azure represents a high-value opportunity with significant consultancy and managed services revenue potential.

## RESOURCES

- [SAP on Azure](#)
- [SAP on Azure documentation](#)
- [SAP on Azure reference architectures](#)

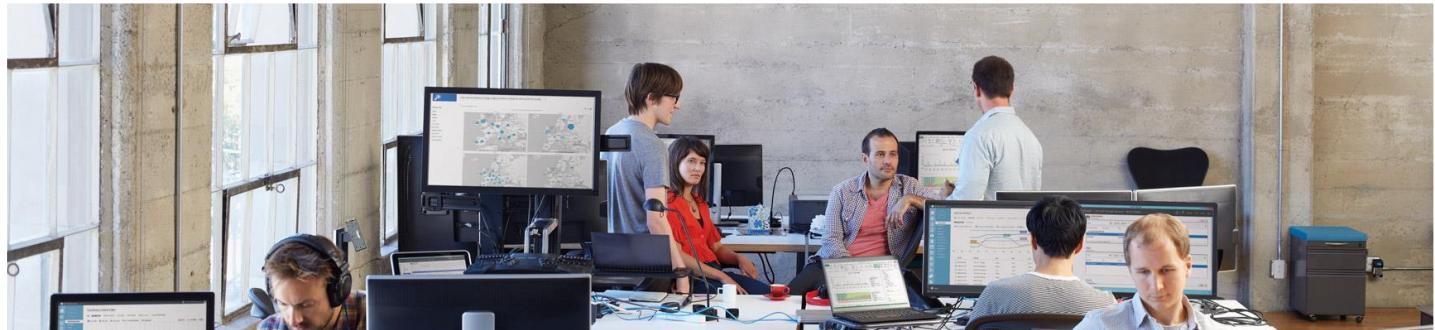
# Operationalize

Cloud  
Infrastructure

[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)



# Executive Summary



In the previous section, we reviewed how you should hire, train, and equip your staff. In this section, we will guide you through the steps to operationalize your business plan.

We walk you through the options for leveraging your internal use benefits that provide you complementary software licenses and subscriptions for use within your organization, as well as show you how can deepen relationships with your customer by re-selling it as an overall package along with your custom software, creating a new revenue stream for your business.

This section also provides guidance on how to operate your business, from how to build materials to support your sales and marketing efforts to the key contracts you will want to put in place.

Whether you're building products, providing managed services, or performing project work for customers, your success may be impacted by your ability to manage your customer records, your projects, and your support trouble tickets. We provide guidance on what tools and systems you should consider implementing.

We also cover how you can increase visibility for your practice by reviewing the Microsoft marketplaces and how to get listed on them as well as provide guidance on the social offerings your practice should set up.

We conclude this section with checklists and templates you can use to standardize your customer engagement process.

## Top 5 things to do

Get your practice off ground by putting your plan into action. These are the top 5 things you should do to get the momentum going.

- Leverage your internal use benefits
- Prepare your key contracts
- Setup your support process and systems
- Setup your social offerings
- Standardize your engagements using checklists



# Implement a Solution Delivery Process

The process you follow in delivering your solution to your customer is just as important as the technologies you use to deliver it.

When it comes to delivering solutions for your practice, choose from among the following (or incorporate the aspects from the below) that best fit your needs and your team

## Scrum Process

The [Scrum](#) process works great if you want to track product backlog items (PBIs) and bugs on the Kanban board, or break PBIs and bugs down into tasks on a task board. This process supports the Scrum methodology as defined by the [Scrum organization](#). Tasks in this process support tracking remaining work only.

## Agile Process

Choose [Agile](#) when your team uses Agile planning methods, including Scrum, and tracks development and test activities separately. This process works great if you want to track user stories and bugs on the Kanban board, or track bugs and tasks on the task board. You can learn more about Agile methodologies at the [Agile Alliance](#). Tasks support tracking Original Estimate, Remaining Work, and Completed Work.

## CREATE REPEATABLE PROCESSES

Repeatable processes make for profitable practices. Use the following example checklist to kick start your own checklist to use when executing a new engagement.

- Hold initial requirements meeting
- Identify product owner/manager(s)
- Follow-up meeting to clarify and establish next steps
- Discuss MVP (minimal viable product) criteria
- Establish development process (Agile, Scrum, etc.)
- Identify milestones and tasks; share with customer
- Provide cost estimates for development, cloud services, and ongoing maintenance/support
- Address customer objections to proposed technology and services
- Acquire data (or sample of data) for initial data assessment and proof of concept development.
- Host project artifacts (issues, code, etc.) to share with internal team and customer (e.g. Visual Studio Team Services)
- Follow up with customer and provide status/demos on a regular basis (e.g. 2 week sprint)
- Coordinate a final handoff to customer
- Conduct project debrief with customer
- Organize internal project post-mortem
- Customer conducts acceptance test

# Claim Your Internal Use Benefits



## AZURE CREDITS

Providing access to Azure for your technology professionals is one of the key first steps to preparing for a successful Azure practice. Microsoft provides several ways for your organization to gain access to Azure for development of new services, testing workloads, delivering services, or learning in general. Members of the [Microsoft Action Pack](#) program receive \$100 monthly Azure credits.

Microsoft Partners with the Cloud Productivity Competency get Azure credits as a part of the Visual Studio subscription's core benefit (see the next section on Visual Studio).

Microsoft Partners with a Cloud Platform Competency at the Silver or Gold level get even more — \$6,000 per year and \$12,000 per year respectively.

## OFFICE 365 BENEFITS

As a Microsoft Partner, your core benefits include access to the Microsoft Office 365 Demo tenant that you can use to sell Microsoft Office 365, Power BI Pro, Microsoft Dynamics CRM Online and Project Online. You also get 25 seats of Office 365 E3 at the silver level or 100 seats of Office 365 E3 at the gold level from your core benefits.

As a Microsoft Partner with the Small & Midmarket Cloud Solutions Competency, in addition to your core benefits, you get 10 seats of Office 365 E3 at the silver level and 25 seats of Office 365 at the gold level.

As a Microsoft Partner with the Cloud Productivity or Communications Competency, you get 25 seats to Office 365 E5 and 100 seats with the Gold Competency.

## VISUAL STUDIO

If your organization has Visual Studio subscriptions, you should know that each subscription has a set amount of Azure credits built in that the subscriber can use. The credit amount varies depending on the type of subscription purchased. You can also use MSDN software within your MSDN subscription on Azure Virtual Machines for development and test at no extra charge. The rate you will pay does not include any licensing costs — even virtual machines with SQL Server, SharePoint Server, or other software that is normally billed at a higher rate.

Providing your team access to Azure is just as important as providing them a computer.

\$50 AZURE CREDIT	\$100 AZURE CREDIT	\$150 AZURE CREDIT
<ul style="list-style-type: none"><li>• Visual Studio Professional – annual</li><li>• Visual Studio Professional with MSDN</li><li>• Visual Studio Test Professional with MSDN</li></ul>	<ul style="list-style-type: none"><li>• MSDN Platforms</li></ul>	<ul style="list-style-type: none"><li>• Visual Studio Enterprise – annual</li><li>• Visual Studio Enterprise with MSDN</li><li>• Visual Studio Enterprise with MSDN (BizSpark)</li><li>• Visual Studio</li></ul>



## Ways to Purchase Azure

There are a few ways you can purchase Azure.

### ENTERPRISE AGREEMENTS

Another option for getting access to your technical professionals is to purchase an Enterprise Agreement (EA). This arrangement is ideal for larger organizations that require the ability to create subscriptions for different departments, and even implement charge-back based on the department. Azure subscriptions within an EA agreement are managed through the Azure EA portal and allow for delegated administration and the ability to set quotas at the department or subscription level. For more information on how to get started with purchasing an enterprise agreement for Azure usage or adding Azure to an existing EA, visit:

<https://azure.microsoft.com/pricing/enterprise-agreement/>.

### PAY AS YOU GO AND TRIAL ACCOUNTS

You can also create a free trial with Azure and allow it to convert to a pay-as-you-go subscription. An Azure free trial is valid for 30 days and allows up to \$200 in Azure credits. After the initial 30 days, any Azure usage is billed

directly to you on your credit card. You can start a free trial by browsing <http://azure.microsoft.com> and clicking the free trial link.

### OPEN LICENSE

You can also purchase Azure through a reseller using the Microsoft Open License Program. Open Value is the recommended program for small to midsize organizations with five or more desktop PCs who want to simplify license management, manage software costs, and get better control over their investment. It also includes Software Assurance, providing access to valuable benefits such as training, deployment planning, software upgrades, and product support to help you boost the productivity of your entire organization. For more information on the Microsoft Open Licensing program, visit: <https://www.microsoft.com/licensing/licensing-programs/open-license.aspx>.

### CSP SANDBOX

Make sure you to take advantage of the CSP sandbox capability. Every Microsoft Partner onboarded in CSP has access to \$200 worth of test accounts for every subscription they provision.

# Identify and Apply for Azure Sell Incentives Resources

## Digital Partner of Record



- [Setup Digital Partner of Record](#)
- [Setup DPOR Step-By-Step Video](#)

DPOR automates how partners are attached as the Partner of Record for the subscriptions you are actively managing for customers.

### DPOR ALLOWS PARTNERS TO

- Support customers' cloud services, helping to deliver strong business outcomes and high ongoing services levels for the customer.
- Qualify for MPN cloud competencies that will help you grow your business and unlock benefits, such as unlimited cloud support, sales and technical training to develop your expertise, internal software use rights, and other special offers.
- Gain insight into your customers' cloud consumption and usage, allowing you to monitor and proactively engage with your customers, implement solutions, and help them reach their desired business outcome. This insight can also be leveraged for cross-sell/upsell opportunities, and allows partners to proactively engage customers at risk for non-renewal.

### HOW DOES IT WORK?

The key to receiving incentives for digital partner of record (DPOR) is to obtain the Silver or Gold Cloud Platform Competency. Each competency has a minimum amount of Azure Consumption you must reach through DPOR before you will receive incentives. To get started, all you need do is ask your customers to add you as the DPOR on any of their subscriptions that you manage. For instructions on how to add a DPOR to a subscription, see Digital Partner of Record (DPOR) User Step-by-Step Video.

# Manage and Support an Azure Deployment Resources

## Support Resources



- [Azure Security Center Overview](#)
- [Azure Advisor Announcement](#)
- [Azure Forum Support Resources](#)
- [OMS Log Analytics](#)
- [Partner Support Resources](#)

Supporting an Azure deployment involves transitioning from deployment focus to ongoing health and occasional troubleshooting. Microsoft Azure offers several services to help manage and monitor workloads running in Azure, as well documentation for troubleshooting the services for your practice.

### AZURE SECURITY CENTER

Security Center helps you prevent, detect, and respond to threats with increased visibility into and control over the security of your Azure resources. It provides integrated security monitoring and policy management across your Azure subscriptions, helps detect threats that might otherwise go unnoticed, and works with a broad ecosystem of security solutions. Azure Security Center should be part of any managed service practice to assist with monitoring and support.

### AZURE ADVISOR (PREVIEW)

Azure Advisor analyzes your resource configuration and usage telemetry to detect risks and potential issues. It then draws on Azure best practices to recommend solutions that will reduce your cost and improve the security, performance, and reliability of your applications. In this blog post, we will do a quick tour of Azure Advisor and discuss how it can help optimize your Azure resources.

### OMS LOG ANALYTICS

Even if you are not offering OMS as part of your core offering, using Log Analytics for support and monitoring can be a huge time saver. Log Analytics can help you collect and analyze data generated by resources in your cloud and on-premises environments. It gives you real-time insights using integrated search and custom dashboards to readily analyze millions of records across all your workloads and servers regardless of their physical location.

### ENGAGING MICROSOFT SUPPORT

If you are a CSP or have sold support as part of your managed services solution you are the front-line support for your customer. At some point, you may need to contact Microsoft to escalate an issue. Microsoft support for partners can be accessed via [Partner Center](#).

# Implement Intellectual Property Offerings

## Resources



- [Building IP to Drive Margins](#)
- [Create Stickiness with IP](#)

## Implementing IP in Your Offerings

Consider these tips to start productizing your IP and go to market.

### DEFINE YOUR SOLUTION

When we ask partners how they determined what IP they were going to build, we often get the same answer, which is that they realized most of their customers were asking for the same thing or something very similar. And rather than continuing to do high-cost custom work for every customer, they decided to productize what their customers were asking for. Bring your sales, marketing, technical, and delivery teams together to brainstorm and define what your solution will look like.

### DETERMINE WHAT WILL DIFFERENTIATE YOUR SOLUTION FROM OTHERS IN THE MARKET

It is important that you think about your differentiation strategy. What is going to make your solution better than other similar solutions in the industry?

### MAINTAIN RIGHTS TO THE IP

As partners make the transition from project or custom services to packaged IP, it is critical they revise their customer agreements so the partner can maintain the IP rights to the solutions.

### ESTABLISH A RECURRING REVENUE MODEL

The beauty of deploying IP in the cloud space is that you can light up the recurring revenue model, which will have a positive impact on the valuation of your business and even help your cash flows in the future.

### CONSIDER YOUR CHANNEL STRATEGY

One of the advantages of productizing your IP is that it opens up a lot of doors to sell your solution through channel partners.

# Create Engagement Checklists & Templates

## Standardize Customer Engagement

Repeatable processes make for profitable practices. Use the following example to kickstart your own checklist for executing a new engagement.

- Conduct initial requirements meeting.
- Identify product owner/manager(s).
- Conduct follow-up meeting to clarify and establish next steps.
- Discuss minimal viable product (MVP) criteria.
- Establish development process (Agile, Scrum, etc.).
- Identify milestones and tasks; share with customer.
- Provide cost estimates for development, cloud services, and ongoing maintenance/support.
- Address customer objections to proposed technology and services.
- Acquire data (or sample of data) for initial data assessment and proof of concept development.
- Host project artifacts (issues, code, etc.) to share with internal team and customer (e.g., Visual Studio Team Services).
- Follow up with customer and provide status/demos on a regular basis (e.g., two-week sprint).
- Conduct a final handoff to customer.
- Conduct project debrief with customer.
- Conduct internal project post-mortem.
- Customer conducts acceptance tests.

### HYBRID PRACTICE ACCELERATORS

The Cloud Infrastructure & Management Practice Accelerators are designed to help you build your Hybrid Cloud practice based on Microsoft Cloud Infrastructure Platform: Microsoft Azure, Microsoft Azure Stack, Windows Server, and System Center.

### RESOURCES

- ➔ [Azure Deployment Planning Services for Public Cloud](#)
- ➔ [Hybrid Practice Accelerators](#)

# Architecture Design Session (ADS)

An architecture design session is a working session between your experts and the customer.

This intensive, two-day session delivers in-depth technical information on integrating data from across your customer's entire organization and delivering it in an analysis-ready form. Presentations, demonstrations, and whiteboard discussions are customized to address your customer's needs. In many cases, the design session is used to identify candidate proofs of concept. Here are some potential topics that are covered during an architecture design session:

- **Server topology:** To plan and deploy your customer's business productivity solution, it's necessary to understand the required server topology.
- **Integration platform:** The Azure services work seamlessly together and can also be integrated with third party and LOB applications. The ADS will endeavor to fit diverse systems together.
- **Social computing:** Companies need to leverage their employees' ability to make business connections and create, share, and evaluate content in a natural way.

- **Secure framework:** Companies can create experiences that are both user based and role based. Choose from a range of options for restricting sensitive information, and deliver the most relevant experience while meeting industry standards and enterprise security requirements.
- **Virtualization and cloud computing:** Extending your customer's enterprise by leveraging cloud resources or virtualization reduces the cost of hardware and additional resources.

## PRIMARY AUDIENCE

- Architects
- Developers
- Test and quality assurance (QA) engineers
- Technical staff



# Phases of a successful architecture design session

## BEFORE THE ARCHITECTURE DESIGN SESSION

Prior to performing the architecture design session, it is important to conduct a simple session with the customer to establish the scenario. This session is oftentimes referred to as ideation or opportunity definition. The goal is to establish the 5 Ws (who, what, when, where, and why) of their needs, which can be used as a guide for the ADS, streamlining the brainstorming process, and informing the agenda and milestone goals you will bring to the session.

- **Schedule a time for the design session:** normally 1-2 days
- **Schedule a location:** ensure you have whiteboards and a projector
- **Schedule resources:** experts from your team, and a cross-cutting panel of technical and business stakeholders from the customer
- **Build an agenda:** establish milestone goals in advance so that the ADS doesn't get consumed discussing a single topic
- **Prepare preliminary documentation and architectural diagrams:** Even if you only have the basic building blocks, it's good to come prepared with something you can modify during or after the session

## DURING THE ARCHITECTURE DESIGN SESSION

Begin by reviewing requirements with your customer. As you conduct the design session, whiteboard the requirements and proposed solutions, and arrive at a consensus for each major topic. During this time, be sure to capture photos of the whiteboard so as not to lose your notes. There are typically the following phases during an architecture design session: Discovery, Envisioning, and Planning:

### DISCOVERY

- Customer background and business technology strategy

- Project background and its drivers/aims
- Functional and non-functional requirements
- Usage scenarios
- Technology landscape

### ENVISIONING

- Key functions and capabilities
- Components of the solution
- External connections and integration points
- Security considerations
- Abilities considerations
- Map requirements and scenarios to components

### PLANNING

- Establish proof points
- Exclusions, risks, and issues
- Pre-requisites
- Deliverables
- Resources
- Escalation, communication, and long-term plans

## AFTER THE ARCHITECTURE DESIGN SESSION

During the ADS, you and your customer planned a high-level architecture framework and conceptual design for a solution that addresses their organization's business goals and technical requirements. In addition to a summary of the engagement, you'll deliver information about:

- Special areas of concern to your customer's organization, such as security, compliance, and compatibility.
- Deployment scenarios that map to established deployment and practices and that cite specific examples where applicable.
- Familiarity with the Microsoft technologies proposed for the solution, in addition to any trade-offs among the differing technology options.
- The capabilities of your solution to deliver business performance on premises or in the cloud.

The outcome should be polished architecture diagrams that can be reviewed and signed off on by the customer. If one or more proof of concepts are desired, provide a plan and a timeline to deliver.

# Implement Proof of Concepts

## Proof of Concepts

The ability to quickly provision infrastructure and managed services makes it much easier to stand up a proof of concept and use it for demonstrating a concept to key stakeholders.

The acceptance criteria for a proof of concept should be chosen early and short but clearly defined milestones should lead the way to a successful proof of concept. Some common best practices that can help you as you and your customer go through the journey of a PoC.

- Start small by identifying the minimum problem you are trying to solve and focus on it.
- Look for high value but low risk opportunities when getting started.
- Take advantage of the platform. Azure can replicate some of the best technology in your datacenter but it can also do much more. Consider PaaS services that can accelerate your milestones and lower your overall burden from manageability and support.
- Treat each PoC as a continuous learning and improvement process. As your skills in Azure improve so will the way you approach a PoC.
- After you prove the concept, test it for performance, security, usability and supportability.

## ESTABLISH EVALUATION CRITERIA

Ideally the solution you are deploying with Azure offers some key benefits over the existing solution (if any). Establish goals early on and measure them throughout the PoC. Some common goals your customers may ask for:

- How easy is it to scale up or down?
- Offer the service to users in different regions?
- How can I monitor and support the solution if it fails?
- How do I know my data is secure?

## COMMON PROOF OF CONCEPTS FOR INFRASTRUCTURE AND MANAGEMENT

- Lift and shift migration of an application to Azure
- Backup SQL Server to Azure Storage
- Implement hybrid monitoring with OMS Log Analytics
- Implementing Azure Backup for on-premises workloads
- Implementing hybrid storage with Azure StorSimple
- Setting up disaster recovery with Azure Site Recovery
- Establishing a site-to-site connection from on-premises to Azure
- Deploying a highly available workload such as SQL Server with Always On availability groups

## RESOURCES

- ➔ [Azure Deployment Planning Services for Public Cloud](#)
- ➔ [Pricing Azure Services with the Calculator](#)

# Managed Services Transition

## Transitioning customer support to a managed services team

This is the stage where transitioning to the service delivery management team.

Depending on what was delivered there this could be a simple as validation of expectations. However, in the transformative world of cloud there is expectations and opportunity at this stage.

### EXPECTATIONS

If you delivered IP (SaaS) then there is an expectation that you will maintain and support this IP. This allows for annuity for maintenance. It is recommended your handle this stage as an upsell unless the maintenance was agreed upon prior to/or during delivery.

### OPPORTUNITY

Even if you did not deliver IP to the customer there is an opportunity to make continued annuity by offering levels of support (if your company business model supports this). This is where the Digital Partner of Record (DPoR) conversation can happen for annuity, or your company can establish levels of support on your own cost structure.

### DIGITAL PARTNER OF RECORD

Customers benefit from adding a [Digital Partner of Record](#). Doing so provides the partner with access to usage and consumption data, which allows the partner to better serve the customer and help them perfect the use of Microsoft services for their desired business outcome. This partner will also be automatically contacted for any FastTrack (<https://fasttrack.microsoft.com/>) services questions or issues.



Microsoft  
Partner  
Network

# Optimize & Grow

Cloud  
Infrastructure

[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)



# Executive Summary

So far, we've covered strategies for building your cloud infrastructure practice, finding and keeping customers providing them with ongoing support.

In this section, we'll focus on how to optimize your practice, strengthen your relationship with customers, and evaluate your performance to help you continue to delight prospects and customers.

Are your customers delighted by your services and products? Delighted and not just satisfied? In this section, you'll learn why customer lifetime value is so important, and how to create more customers for life. We'll share how to get to know your customers better by following their journey with secret shopping and analysis. We'll also explore the use of a "land and expand" strategy and see how getting to know your customers better can lead to incremental opportunities to provide additional services.

You will also discover ways you can keep your solutions top of mind for prospects and customers through nurture

marketing, and how to grow and improve your lead generation practice through a well-planned referral marketing program. We'll show you how to make the most of your renewal process, and how to get ahead of deadlines.

We will help you learn how to grow your business by identifying the best customer personas and creating "look-alike" prospects, deepening your expertise in key verticals and marketing that expertise, and collaborating with other partners to offer your customers a more comprehensive level of service and support.

We will end by discussing how important it is to create advocates for your company. This includes turning a customer into a fan and collecting testimonials to create case studies that can be used in future marketing campaigns. Map your customer's experience and ask for feedback to ensure you are turning satisfied customers into delighted customers who can wait to tell your story!

Use the strategies we provide in this section and in the [Optimize and Grow guide](#) to optimize and grow your practice.

## Top 5 things to do

Learn from your customers and experience to optimize your practice, and expand to new markets through strategic partnerships. These are the top 5 things you should do to optimize and grow your practice.

- Gather feedback from your customers
- Nurture existing customers
- Turn customers into advocates
- Generate referrals with marketing
- Nurture strategic partnerships

# Guide: Optimize and Grow

Leverage the Microsoft resources available in the [Optimize and Grow guide](#), for details on building customer lifetime value, executing nurture marketing efforts, optimizing and growing from feedback, refining your customer value proposition, growing partnerships, and measuring results.



# Cloud Infrastructure Playbook Summary

Thank you for taking the time to review this playbook. We hope you have gained new insight on how to create a cloud infrastructure practice, and how to successfully grow your practice by taking advantage of unique offerings from Microsoft, engaging with your customers, and forming strategic partnerships.

Our goal, when creating this playbook, was to organize resources and provide insight that you can use to quickly accelerate or optimize your Azure focused practice. To this end, we laid out the practice's opportunity, then provided relevant information on business strategies and technical topics to capitalize on the opportunity, within five sections that you can review in order, or individually at any time.

In the first section, **Define Your Strategy**, we helped you thoroughly define the strategy upon which your practice will be built. The key actions we prompted you to take are: Identify your unique value proposition, define and price your offer, build your business plan, leverage the Microsoft Partner Network, and plan your support options.

In the second section, **Hire and Train**, we focused on the importance of hiring the right team, and then providing appropriate and ongoing training and certifications.

In the third section, **Cloud Infrastructure**, we presented several of the core infrastructure technologies provided by Azure. Planning, deploying and managing these services will form the foundation of your Cloud Infrastructure practice.

In the fourth section, **Operationalize**, we suggested you put your plan into action. Leverage your internal use

benefits to get your Microsoft licenses and subscriptions, create your key contracts, setup your support process, setup your social offerings and organize your engagement process into checklists.

The fifth section, **Go to Market & Close Deals**, emphasized getting your practice off the ground by defining your sales process, building materials to support sales and marketing, finding new customers, and then nurturing and investing in them to build lasting relationships. We also provided you tools to help you in the sales process with the pitch and negotiation.

The final section, **Optimize & Grow your Practice**, stressed the importance of learning from your customers and your experience in providing solutions to them, to optimize your practice, and expand to new vertical markets through strategic partnerships. The top five actions we provided for you in this section were: Gather feedback from your customers, learn from your project successes and failures, create case studies and a marketing plan to expand into new vertical markets, maximize your efficiency and profit to fuel growth, and establish and nurture strategic partnerships.

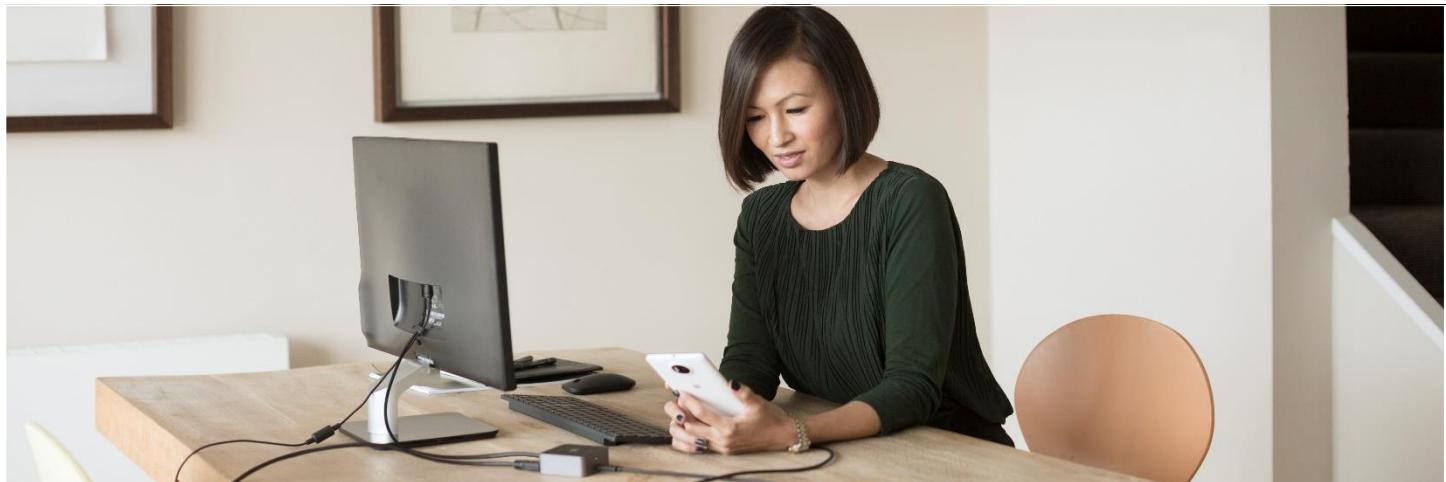
## FEEDBACK

Share feedback on how we can improve this and other playbooks by emailing [playbookfeedback@microsoft.com](mailto:playbookfeedback@microsoft.com)

# Why Choose Microsoft?

A trusted global leader, committed to partners, a leading cloud platform.

More than 86% of Fortune 500 companies have the Microsoft Cloud (source: Microsoft), which offers companies a fully integrated stack for any kind of data from on-premises, hybrid or fully in the cloud, with an open cloud platform that supports a wide variety of Operating Systems and programming languages.



## 50 REGIONS AND COUNTING

In order to help organizations meet data residency, sovereignty and compliance requirements, Microsoft has a worldwide network of 50 announced Microsoft-managed datacenter regions, offering services in 140 countries. Microsoft continues to make significant investments in geo-expansion through our local and sovereign offerings.

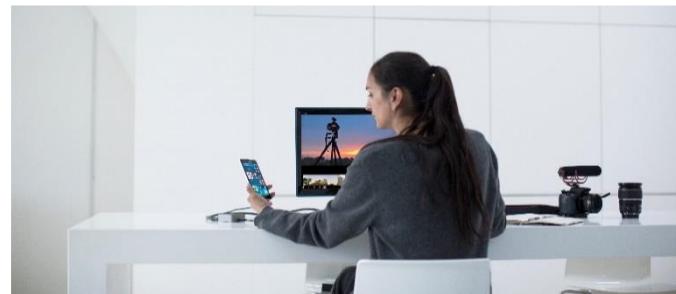


## WHY CHOOSE THE MICROSOFT CLOUD

No other company has such a complete portfolio, from IaaS to PaaS and SaaS, from productivity and social solutions to ERP, from smartphones to APIs. Microsoft offers the most connected, comprehensive set of cloud solutions (Azure, Office 365, Microsoft Dynamics), with an unmatched breadth and depth of capabilities from platform to productivity apps to business solutions. Our integrated portfolio of cloud services works across devices and is supported by one of world's largest developer and partner ecosystem. From a customer perspective, this means a lower cost and complexity associated with the product/services integration, IT provider management and support.

## THE ONLY CLOUD: ENTERPRISE LEVEL, HYPER SCALE, AND TRUE HYBRID

Microsoft is the only Cloud provider that combines a Hyper Scale cloud offering, a truly hybrid platform and an Enterprise Level Support for your cloud workloads with Enterprise level SLAs.



## COMPLETE SET OF INTEGRATED CLOUD OFFERINGS

Microsoft has a complete set of integrated cloud offerings, from infrastructure as a service (IaaS), to Platform as a Service (PaaS) and all its Software as a Service (SaaS) offerings. As an example, a PaaS development can easily integrate with a VM on Azure IaaS and easily integrate with app services like SharePoint and CRM Online.

## NATIVE SSO AMONG SERVICES AND ON-PREMISES

Being able to offer Single Sign On is key among multiple cloud services and on-premises apps is key for employee productivity and IT management. Microsoft natively offers SSO among its cloud services, offers REST API for custom

[aka.ms/practiceplaybooks](http://aka.ms/practiceplaybooks)

apps and federation and directory sync services with AD and other directories.

## BROADEST PARTNER ECOSYSTEM

Microsoft Partner Network includes over 430,000 organizations worldwide. By working with this broad partner ecosystem we can offer better solutions and better services to our customers.



## BEST AND MOST INNOVATIVE ENTERPRISE CLOUD PRODUCTIVITY SOLUTION

No other cloud provider offers such a complete suite of productivity services. Office 365 is recognized as the leading cloud productivity platform. Our customers can access the productivity platform through the browser or through the Office application, used by 1B users worldwide.

## INTEGRATED BUT SEPARATED ENTERPRISE AND CONSUMER CLOUD OFFERINGS

Not all competitors in this space offer consumer solutions. Others have only one consumer platform that they extend to the enterprise, mixing SLAs and involving the greater risk of sharing private information in a public environment.

## ENTERPRISE MOBILITY

The Enterprise Mobility Suite (EMS) is the first comprehensive offering in the industry to recognize that success in enterprise mobility is not just about devices. A complete mobility strategy requires the cohesive management of data, identity, and devices. With an integrated platform for universal device management, identity/access management, and data protection, EMS reduces licensing complexity and makes it easier to extend your existing productivity infrastructure to the cloud.

## MICROSOFT CLOUD COMPLIANCE CERTIFICATIONS & ATTESTATIONS SEPT 2016

All of Microsoft's services are independently verified to meet legal and compliance requirements, are financially backed, and offer transparent information on their availability. Microsoft was the first cloud provider that adhere to ISO 27018 and ISO 22301.

	Regulatory and Compliance Domain	Office 365	Microsoft Azure	Microsoft Dynamics CRM	Microsoft Intune
Broadly Applicable	ISO 27018:2014	✓	✓	✓	✓
	ISO 27001:2013	✓	✓	✓	✓
	SOC 1 Type 2 (SSAE 16/ISAE 3402)	✓	✓	✓	✓
	SOC 2 Type 2 (AT Section 101)	✓	✓	✓	✓
United States Government	CSA STAR 1	✓	✓	✓	No
	FedRAMP Moderate	✓	✓	✓	No
	CJIS Security Policy, Version 5.3	✓	✓	✓	No
	DISA SRG Level 2 P-ATO	✓	✓	✓	No
	FDA 21 CFR Part 11	✓	✓	✓	No
	ITAR	✓	✓	No	No
	IRS 1075	✓	✓	No	No
	HIPAA BAA	✓	✓	✓	✓
Industry Specific	PCI DSS Level 1	N/A	✓	N/A	N/A
	FERPA	✓	✓	✓	N/A
	CDSA	N/A	✓	N/A	N/A
	EU Model Clauses	✓	✓	✓	✓
Region/Country Specific	UK G-Cloud v6	✓	✓	✓	✓
	Australia Gov ASD	✓	✓	✓	No
	Singapore MTCS	✓	✓	✓	No
	Japan FISC	✓	✓	No	No
	New Zealand GCIO	✓	✓	✓	✓
	EU-US Privacy Shield	✓	✓	✓	✓
	China (MLPS, TRUCS, GB 18030)	✓	No	No	No

## COMMITMENT TO OPEN SOURCE

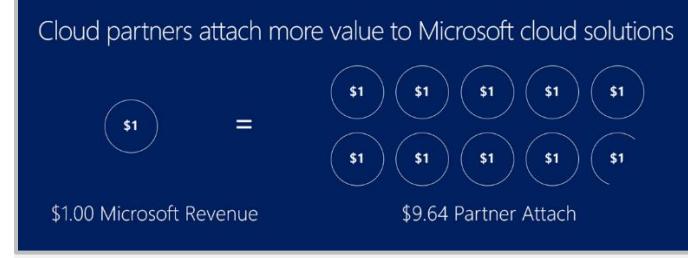
With Azure, you have choices. [Choices that help you maximize your existing investments](#). Get support for infrastructure as a service (IaaS) on Linux and Java and PHP Web application platforms. Develop and test your Linux and open source components in Azure. You bring the tools you love and skills you already have, and run virtually any application, using your data source, with your operating system, on your device. [Much of the Azure tooling and frameworks your technical teams use is open source and hosted in GitHub](#).

## COMMITTED TO PARTNERS

From the diverse range of partner focused training Microsoft produces on sales, marketing and technical topics, to the business investment funds it makes available to help partners succeed in their customer engagements, to unique programs like the Cloud Solution Provider program that enable partners to own the complete customer relationship and to marketplaces and digital show cases that highlight partners to new customers and

give partners broad exposure, Microsoft is committed to enabling partner success.

Research shows this commitment to partners also appears in partner revenue. In a recent IDC study, partners reported earning \$9.64 in revenue for every \$1 of Microsoft revenue generated in 2017. This is expected to continue through 2022 and include a mix of software (45%), services (50%), and hardware (5%), that are sold in relation to Microsoft solutions.



Source: IDC eBook, sponsored by Microsoft, The Microsoft Digital Transformation Series, Part 1: The Digital Transformation Opportunity, 2018

# Troubleshooting Resources

To assist your support team, we have compiled several resources to assist with troubleshooting the related services your team may use as part of delivering services in this practice.

## MSDN SUPPORT FORUMS

[MSDN support forums](#) are moderated by Microsoft staff and others in the community. This is a great location for asking troubleshooting questions for Azure.

Direct links to EMS forums:

- [Azure Active Directory \(AAD\)](#)
- [Advanced Threat Analytics \(ATA\)](#)
- [Cloud App Security \(CAS\)](#)

## STACK OVERFLOW

[Stack Overflow](#) is the largest online community for programmers to learn, share their knowledge, and advance their careers. This a great community-based resource for assisting developers with troubleshooting code related issues on Azure.

## SERVER FAULT

[Server Fault](#) is a question and answer site for system and network administrators. This a great community-based resource for assisting IT Professionals with troubleshooting infrastructure related issues on Azure.

## AZURE TROUBLESHOOTING RESOURCES

### TROUBLESHOOTING AZURE ACTIVE DIRECTORY

[Azure AD Connectivity](#)[Password Management](#)[Azure AD Domain Services](#)[Azure AD Connect Synchronization Issues](#)

### TROUBLESHOOTING MICROSOFT INTUNE

[Device Enrollment](#)[App Deployment](#)[Client Setup](#)[Policies](#)[Conditional Access](#)[Endpoint Protection](#)[Company Resource Access Problems](#)[Software Updates](#)[Exchange Connector](#)[Mobile App Management](#)[Lookout Integration](#)

## TROUBLESHOOTING INFORMATION PROTECTION

[Troubleshooting Azure AD Connectivity](#)

[Troubleshooting Password Management](#)

[Troubleshooting Azure AD Domain Services](#)

[Troubleshooting Azure AD Connect Synchronization Issues](#)

## TROUBLESHOOTING ADVANCED THREAT ANALYTICS

[Troubleshooting using Known Errors](#)

[Troubleshooting ATA using Logs](#)

[Troubleshooting using performance counters](#)

[Troubleshooting using the ATA Database](#)

## TROUBLESHOOTING AZURE INFRASTRUCTURE AS A SERVICE

[Troubleshooting RDP Connections](#)

[Reset Remote Desktop Connections](#)

[Troubleshoot Creating a new VM](#)

[Troubleshooting Specific RDP errors](#)

[Troubleshoot restarting or resizing a VM](#)

[Troubleshoot Application Access](#)

[Troubleshoot Allocation failures on Windows](#)

[Troubleshooting SSH connections](#)

[Troubleshooting Application Access on Linux](#)

[Troubleshooting Allocation issues on Linux](#)

[Troubleshooting Resource Manager Deployment issues with Linux](#)

[Redeploying a Virtual Machine](#)

[Troubleshooting ARM Template Deployment Errors](#)

[Troubleshooting and monitoring Azure Storage](#)

[End-to-End Storage Troubleshooting](#)



# Best practices for running Azure projects

Deploying or creating a solution in Azure can cover a broad surface area of technologies and services that are used.

A common problem for customers implementing solutions on their own is not following established best practices and existing reference architectures. It is our recommendation to ensure that your team is aware of and takes advantage of established best practices from Microsoft where possible. We have compiled a list of best practices resources as it relates to deploying infrastructure in Azure or for hybrid deployments.

DOCUMENT	OVERVIEW
<a href="#">Pricing Azure Services with the Calculator</a>	Pricing calculator to price out services used in your Azure project.
<a href="#">Azure Guidance from Patterns and Practices</a>	Checklists for availability, scalability, security for a broad list of topics and services in Azure
<a href="#">Azure Reference Architectures</a>	A collection of documented best practices for deploying virtual machines
<a href="#">Best practices for running a Windows Virtual Machine on Azure</a>	Configuring storage, availability, performance, and connectivity
<a href="#">Performance Best Practices for SQL Server running in Azure</a>	Performance tuning SQL Server in Azure Virtual Machines
<a href="#">Azure Resiliency Technical Guidance</a>	Best practices for building resilient solutions in Azure
<a href="#">Azure Security Best Practices and Patterns</a>	Best practices and patterns
<a href="#">Best Practices for Network Security</a>	Best practices for protecting networks using virtual appliances, network security groups and hybrid connectivity solutions
<a href="#">Patterns for Designing ARM Templates</a>	Best practices with template design and deployment
<a href="#">OMS Architecture</a>	Reference Architectures for Operations Management Suite components
<a href="#">Asymmetric Routing with Azure ExpressRoute</a>	Best practices for asymmetric routing using Azure ExpressRoute.
<a href="#">Best practices for Azure App Services</a>	Best practices for deploying, monitoring and troubleshooting Azure App
<a href="#">Instrumenting applications using Application Insights</a>	Using Application Insights to instrument applications for troubleshooting, monitoring and telemetry capture.

# Case Studies

One important avenue Microsoft provides is a track record of successful partner engagements. A track record of customer success is an easy way to build confidence in the solutions your practice recommends and helps win over customers. Microsoft provides a collection of case studies highlighting how partners make their customers successful through [Cloud Infrastructure and Management](#), including artifacts like case study PDFs, PowerPoint slides summarizing the key learnings and videos. The Cloud Infrastructure and Management section of the [Partner Stories](#) website also provides a curated collection of case studies. Use these case studies to help you position your offering to customers and to identify potential solution partners whose practices may complement yours.

The following is a selection of case studies available from the [Microsoft Customer Stories](#) website. It is recommended you check back periodically for new case studies that empower your efforts as a partner.

CUSTOMER	CHALLENGE	SOLUTION	RESULT
<b>PORT AUTHORITY OF NEW SOUTH WALES</b> <a href="#">See the full case study here</a>	<p>Providing a solid disaster recovery solution and development environment and managing 200 servers and large amounts of data from different organizations after merging with three new locations</p>	<p>Using Azure Infrastructure as a Service to for disaster recovery and development and test environment.</p> <p>Creating a new disaster recovery solution that is based on Microsoft Operations Mgmt. Suite, Azure Site Recovery, &amp; Azure Backup services.</p> <p>Using Azure ExpressRoute to connect the on-premises production datacenter to Azure for rapid &amp; secure replication &amp; recovery.</p>	<p>By moving to the cloud, the Port Authority can take on current and future challenges more easily.</p> <p>"We have a flexible platform now," says Chilton "If we had to upgrade some infrastructure to accommodate a new business requirement, we can do it without actually having to procure, install, and integrate infrastructure. It makes provision of services to our customers sleeker and smoother."</p>
<b>HARPER COLLINS UK</b> <a href="#">See the full case study here</a>	<p>Cost savings and flexibility over their existing infrastructure</p> <p>Enterprise connectivity to cloud applications</p>	<p>HarperCollins realized that it needed a fast, secure, reliable link between employee computers in the London area and the Azure datacenter in Dublin to deliver acceptable application response times.</p> <p>It decided to use Microsoft Azure ExpressRoute—a private, high-speed connection between Azure and customer datacenters or colocation environments such as the Equinix Cloud Exchange.</p> <p>HarperCollins UK began moving four of its main business</p>	<p>Deliver Fast, Reliable Access to Cloud-Based Applications</p> <p>Without ExpressRoute, HarperCollins UK could not have made Azure hosting practical for its London employees.</p> <p>Better Match IT Costs to Business Needs</p> <p>A cloud strategy helps HarperCollins recategorize IT spending from a capital expense to an operating expense and deliver IT as a monthly expenditure. This better aligns IT costs with changes in the</p>

		<p>applications to Azure: a large-scale 25-terabyte digital asset system, a reprographics system, a procurement system, and an application that tracks contract rights and royalties.</p> <p>To host its applications, HarperCollins UK uses a range of Azure infrastructure-as-a-service offerings, including Azure Virtual Machines, Azure Virtual Network, and Azure Storage, and some platform-as-a-service offerings such as Azure Cloud Services and Azure SQL Database.</p>	<p>business cycle. When it ran applications in its own datacenter, HarperCollins UK built in 25 to 30 percent of overcapacity (known as headroom) so that it would have extra processing power if needed.</p>
<b>CLOUDRUNNER. IO</b>  <a href="#"><u>See the full case study here</u></a>	<p>A flexible platform that embraces open source software (OSS) to run their DevOps platform on.</p> <p>Customer feedback on CloudRunner tools has been positive, and consequently the company wanted to push for greater business growth. With this in mind, it began looking for a cloud provider that not only had extensive reach, but could also support its open source tools.</p>	<p>CloudRunner added Linux distribution and open source tools on top of Azure virtual machines, so its DevOps teams could use their own choice of scripts, including Bash, Python, Ruby, Chef-Solo recipes, Ansible, and Powershell. This allowed for configuration, deployment, and monitoring of nodes across any kind of infrastructure, including Azure Infrastructure-as-a-Service.</p> <p>CloudRunner also deployed Aerospike as a NoSQL database and Postgre/MySQL as an open source transactional database.</p> <p>CloudRunner uses Docker for application deployment automation into the core operating system and the CloudRunner framework for managing the infrastructure. Secure communication is based on SSL certificates and a fast, reliable transport backend is provided via ZeroMQ, although a different backend can be used as plugins.</p>	<p>These developments illustrate Azure's flexibility and its extensive support for a wide variety of open source technologies. This support has underpinned CloudRunner's accelerated growth in line with company business plans.</p> <p>The company also benefits from faster development and deployment processes for DevOps, given that it can now accelerate processes by re-using templates and legacy code and combining Powershell and Linux scripts.</p> <p>Microsoft's support and investment in open source was an eye-opener for CloudRunner, and Microsoft's attentiveness to partner needs and requirements surprised the company.</p>