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Making the Most of Azure Pack

This free tool can bring an Azure-like environment to a private cloud. Find out what Azure Pack is and why it's useful.

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ITOS MEDIA

Azure Pack is one of Microsoft's most underrated tools. This free utility allows you to transform your private cloud into a Microsoft Azure-like environment that can be blended with Microsoft's public IaaS service offerings. This white-paper examines use cases for the Microsoft Azure Pack as well as some deployment considerations.

What Is Azure Pack?

The Azure Pack could be described as an Azure-like interface for accessing resources that exist within an organization's own datacenter. Although accurate however, this description is completely inadequate because Azure Pack is more than just an interface. Azure Pack is nothing less than the embodiment of a major transition in the way that IT operates.

Since its inception, IT has adhered to a centralized administrative model.

Since its inception, IT has adhered to a centralized administrative model. This model placed the IT department in direct control over all of the organization's information systems. The IT department was responsible for tasks such as system maintenance, hardware upgrades, equipment and software acquisitions, and technical support. More importantly, it was the IT department that granted or denied access to these resources.

Today the long used IT-centric operations model is giving way to a service provider model, even in the enterprise. The service provider model accomplishes two main things. First, the service provider model changes IT's role in the organization. Rather than functioning as a bureaucratic committee (or a dictatorial regime), IT takes on the role of a service provider. The individual departments within the organization take on the role of subscribers to the service that IT is providing.

The other thing that this transition accomplishes is that it empowers the individual departments. No longer does every decision have to go through the IT department. Instead, the departments can act as stewards of the resources to which they subscribe.

This does not mean that the departments are given free reign, but rather that departments can subscribe to a collection of resources and can use those resources as they see fit, within limits set by the IT department. As such, the individual departments might be able to create virtual machines, set up user accounts, or deploy applications.

Why Use Azure Pack?

One of the first questions that IT professionals are likely to have regarding Azure Pack is why they should use it. As previously explained, the Azure Pack is oriented toward transitioning toward a service provider model (which is sometimes called the private cloud model or the subscriber model). Although such a transition is likely to beneficial and appealing, System Center has the ability to create private cloud environments without the need for Azure Pack. In fact, System Center Virtual Machine Manager 2012 R2 includes native capabilities for building multi-tenant, private cloud environments.

In order to understand why an organization might benefit from deploying Azure Pack, it is necessary to understand a little bit about Microsoft's cloud strategy. As you have no doubt heard, Microsoft is adopting a cloud first, devices first approach philosophy. Although this philosophy sounds really simple (and it is), the way in which Microsoft is approaching this philosophy is anything but.

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Microsoft has adopted a three-pronged approach to delivering cloud services. In other words, Microsoft is offering three different sets of cloud technology to its customers.

The first of these offerings is Microsoft Azure. Microsoft Azure is Microsoft's Infrastructure as a Service (IaaS) offering for the public cloud. Microsoft Azure is subscription based. Customers pay a monthly fee, which allows them to create virtual machines, Web sites, databases, etc. in the public cloud. The primary advantage to using Microsoft Azure is that because Azure operates in a hosted environment, subscribers do not have to worry about investing in server hardware, storage, server software licenses, etc.

Microsoft's second cloud offering is Office 365. Office 365 is Microsoft's Software as a Service (SaaS) offering. Like Microsoft Azure, Office 365 runs on a public cloud and is subscription based. Office 365 customers pay a monthly fee to gain access to Microsoft's application server software. Microsoft offers a number of different Office 365 subscription plans and each of these plans includes slightly different offerings. Most plans however, include access to SharePoint, Exchange Server, Lync, and Yammer. Some subscription plans also include access to Microsoft Office 2013 Professional Plus.

Microsoft's third cloud offering is the private cloud. The private cloud is a cloud that you build within your datacenter for your own purposes. Private clouds are based around System Center and Hyper-V. A private cloud allows you to use your own hardware and to maintain direct control of the cloud resources.

Microsoft initially chose to take this three pronged approach to the cloud because of the realization that no two customers had the same needs. Microsoft Azure for instance is a good fit for startups that do not have sufficient capital to invest in their own server hardware. Similarly, Office 365 is a good fit for organizations that do not want to have to maintain server applications because Microsoft handles all of the day to day management such as patching.

A private cloud is best suited to organizations that have a well-established IT infrastructure. The private cloud allows such organizations to leverage their existing hardware and software investment and has the added benefit of allowing data and applications to reside on premises and to remain under the IT department's direct control.

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So what does any of this have to do with Azure Pack? Soon after introducing the three pronged approach to the cloud, Microsoft began to realize a couple of important things. First, there was a degree of overlap between its cloud offerings. For example, SharePoint can be run on premises, as a part of Office 365 (although it's known as SharePoint Online), or SharePoint can be installed onto a Microsoft Azure virtual machine.

Another thing that Microsoft started to realize was that its customers could benefit from cloud integration. There are a number of situations in which an organization might use multiple cloud types, and could possibly even migrate resources between clouds. For instance, an organization might choose to keep its file servers on premises, but run applications such as Exchange and SharePoint in the cloud because the organization does not have the expertise in place to adequately support those applications. Similarly, an organization might continue to host existing Exchange Server mailboxes on premise, but create any new Exchange mailboxes on Office 365.

The bottom line is that each of Microsoft's cloud approaches has its own set of strengths and weaknesses. Office 365 for instance, is

great for running Microsoft server application. Microsoft's customers are guaranteed that the server applications are configured according to Microsoft's own best practices and that the applications are kept up-to-date. Some of the disadvantages to using Microsoft Office 365 include the difficulty of backing up some types of Office 365 data and the fact that the ability to create public facing SharePoint sites is going away.

The primary advantages to building a private cloud around Hyper-V and System Center include privacy, flexibility, and customization. An organization that builds its own private cloud has the ability to create that public cloud in a manner that best suits their organization's needs. The disadvantages however, can include cost and complexity. Building a private cloud requires a lot of hardware and a lot of software licenses. Furthermore, the organization's IT staff needs a deep understanding of Hyper-V, System Center, Windows Server, and virtual networking in order to make the private cloud model work.

One of the biggest things that Microsoft Azure has going for it is scalability.

Like Office 365 and System Center based private clouds, Microsoft Azure has its advantages and disadvantages. One of the biggest things that Microsoft Azure has going for it is scalability. Azure can be scaled to an enormous level and can offer a wide variety of services. There are however, a couple of disadvantages to using Microsoft Azure. One such disadvantage is the lack of flexibility. Because Microsoft Azure is a multitenant environment, Microsoft does not give administrators low level access to Azure. You cannot for example, make a change to the underlying Hyper-V servers.

Another disadvantage to using Microsoft Azure is that the costs can be somewhat unpredictable. Microsoft builds its Azure customers based on the cloud resources that they consume. These resources include things like compute, storage, storage I/O, memory, etc. Some of the billing formulas are rather complex and it can be difficult for an organization to estimate the monthly cost of running a workload on Microsoft Azure

Because each cloud platform has its own strengths and weaknesses, organizations are becoming increasingly likely to use multiple cloud platforms. Although Microsoft has designed its various platforms so that they can be integrated with one another, the management of disparate clouds has always been somewhat of a challenge.

Microsoft provides a completely different set of management tools for System Center, Office 365, and Microsoft Azure. Although the variation in tools does not impact the end user experience, it can make life difficult for the administrators who are responsible for maintaining the organizations cloud initiatives. Each of the management tools are somewhat complex and there can be a significant learning curve associated with mastering all of the necessary tools.

This is where the Microsoft Azure Pack comes into play. The Microsoft Azure Pack is designed to provide a much more consistent experience for administrators.

There are a number of different components to the Microsoft Azure Pack, but from a management perspective the Azure Pack can be thought of as an overlay for System Center. This overlay allows private clouds that are based around System Center to be managed in a manner that is identical to that of Microsoft Azure.

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Should You Use Azure Pack?

Organizations must consider whether the Microsoft Azure pack can be beneficial to the. Whether or not an organization should make use of the Microsoft Azure Pack depends heavily on the resources that the organization is currently using.

If the organization is making use of System Center, but has not configured System Center to act as a private cloud, then the Azure Pack might not be a good fit for the organization. The Azure Pack was designed primarily for private cloud environments.

Organizations that operate a System Center based private cloud, but that do not take advantage of the Microsoft Azure public cloud may benefit from using the Azure Pack, but will not receive as large of a benefit as they would if they were using both public and private cloud environments.

The Azure Pack includes an Administrative portal and a Tenant portal (as well as admin and tenant authentication sites and a configuration site). If an organization is currently using System Center as a private cloud, then deploying the Azure Pack will introduce a learning curve for administrators. The System Center management tools are perfectly adequate on their own, so there is not a pressing need (at least from

an administrative standpoint) for an organization that operates solely in a private cloud environment to deploy the Azure Pack.

The main benefit to deploying the Azure Pack in such an environment is that the Azure Pack will likely provide a better experience for your tenants. Authorized users will be able to use the Azure Pack to provision private cloud resources, which can then be accessed through the tenant portal. The Azure Pack generally provides a more cohesive experience than what is available natively through System Center and the various downloadable add-ons.

Organizations that currently make use of both System Center and Microsoft Azure are the most likely to benefit from deploying the Azure pack. The Azure Pack provides a private cloud experience that is nearly identical to the Microsoft Azure experience. In this way, the Azure Pack has the potential to make life easier for the administrative staff.

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Deployment Considerations for Azure Pack

Once an organization decides to begin evaluating the Microsoft Azure Pack, they must consider the required resources and the best practices for doing so. According to Microsoft, one of the most commonly asked questions about the Azure Pack is whether it works with competing environments such as VMware.

One thing that must be understood is that Microsoft runs Azure on top of the same server products that they offer their customers – namely Windows Server 2012 R2, Hyper-V, and System Center. That being the case, deploying the Microsoft Azure Pack on top of a System Center based private cloud can almost be thought of as setting up miniature, on premise deployment of Microsoft Azure. An organization that is using the Azure Pack and System Center is for the most part making use of the same software that Microsoft uses in their public cloud. Consequently, the short answer to the question is that Microsoft Azure is a Microsoft solution that is designed to work with Microsoft software. It was never intended to be used with a VMware environment.

Interestingly, Microsoft System Center Virtual Machine Manager 2012 R2 can be connected to a VMware environment. It is

theoretically possible to expose some VMware resources through the Microsoft Azure Pack. However, Microsoft recommends using third-party software to bridge the gap between VMware and the Azure Pack if VMware support is required.

So what about organizations that are running purely Microsoft software? In those types of organizations, it is relatively easy to get the Azure Pack up and running. In fact, Microsoft provides an entire series of video tutorials that are available on YouTube (https://www.youtube.com/watch?v=a0rSFjL30Gg).

As infrastructure requirements go, there are two main things that you need to understand about the Azure Pack. The first thing that you have to understand is that the Azure Pack is made up of a number of different components. Throughout this white paper, I have talked about the Azure Pack primarily from the standpoint of its administrative interface and its tenant portals. However, there are actually a number of different components that make up the Azure Pack. These components include:

Microsoft recommends using third-party software to bridge the gap between VMware and the Azure Pack if VMware support is required.

- Portal Components
  - > Admin Site
  - > Admin Authentication Site
  - > Tenant Site
  - > Tenant Authentication Sit
  - > Configuration Site

- API Components
  - > Tenant API
  - > Tenant Public API
  - > Admin API

- Resource Providers
  - > Virtual Machines
  - > Web Sites
  - > Service Bus
  - > SQL RP
  - > MySQL RP

- Infrastructure
  - > Monitoring
  - > Web App Gallery
  - > PowerShell Modules
  - > Usage
  - > Usage Collector

The other thing that you have to understand about the Azure Pack is that it is essentially a collection of web applications. As previously explained, the Azure Pack is designed to deliver the Microsoft Azure experience for local private clouds. Microsoft Azure resides in the public cloud, and is therefore managed through a web browser. The same thing goes for the Azure Pack. Even though the underlying resources (such as System Center and Hyper-V) exist locally, the Azure Pack uses browser-based interfaces.

Organizations should adhere to best practices regarding scalability and high available for Web applications.

So as we talk about infrastructure requirements for the Azure Pack, the main requirement is that you must adhere to the same set of best practices that you would for any other collection of web applications. In other words, organizations should adhere to best practices regarding scalability and high available for Web applications.

Is Anything Else Required?

The Azure Pack obviously depends on one or more IIS servers, but the Azure Pack also has a dependency on the Service Provider Foundation. The Service Provider Foundation (https://technet.microsoft.com/en-us/library/jj642895.aspx) is a System Center Orchestrator component that allows System Center Virtual Machine Manager functionality to be exposed through a Web service. This is what makes it possible for an administrator or a tenant to create and manage virtual machines using a Web interface.

Is Azure Pack Customizable?

Another commonly asked question that is commonly asked about Azure Pack is whether it is customizable. As previously explained, Azure Pack is designed to provide a consistent experience between Microsoft Azure and an organization's private cloud. As such, customization is not always desirable. However, some organizations like to put their own branding on the Azure Pack interface.

Fortunately, Azure Pack offers several features that are geared toward extensibility and customization. These features include:

- Custom Management Portals
- Custom Theming
- Usage Service
- Custom Resource Providers
- PowerShell

Is Anything Missing?

Cloud service providers typically Bill customers based on their resource usage. In private cloud environments it has also become common for the IT department to issue chargebacks for the resources that are consumed by individual departments. Unfortunately, the Azure Pack does not include a mechanism for chargeback reporting.

Azure Pack overcomes capacity limitations by adopting the concept of stamps.

Those who are interested in performing chargebacks can take advantage of the Usage Service REST API. This API exposes resource usage data, for which an organization can develop their own chargeback mechanism.

How Scalable is Azure Pack?

Initially, Azure Pack might seem to be geared more toward enterprise scale deployments than to cloud scale deployments. This is because Azure Pack works with clouds that are based on System Center Virtual Machine Manager, which of course has capacity limitations.

Azure Pack overcomes the existing capacity limitations by adopting the concept of stamps. A stamp is essentially a System Center Virtual Machine Manager deployment, and all of the corresponding resources (such as Hyper-V servers and storage). When an organization reaches the capacity limitations of a stamp, they can simply create another stamp. Azure Pack can work with multiple stamps.

The Final Word

Microsoft Azure Pack is an excellent tool for private cloud environments that are based on Hyper-V and System Center. This tool allows administrators to have the same management experience that they do in Microsoft Azure environments, while also providing self-service portals for tenants. R

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