

# ***Understanding the Microsoft Cloud***

by Ken Withee

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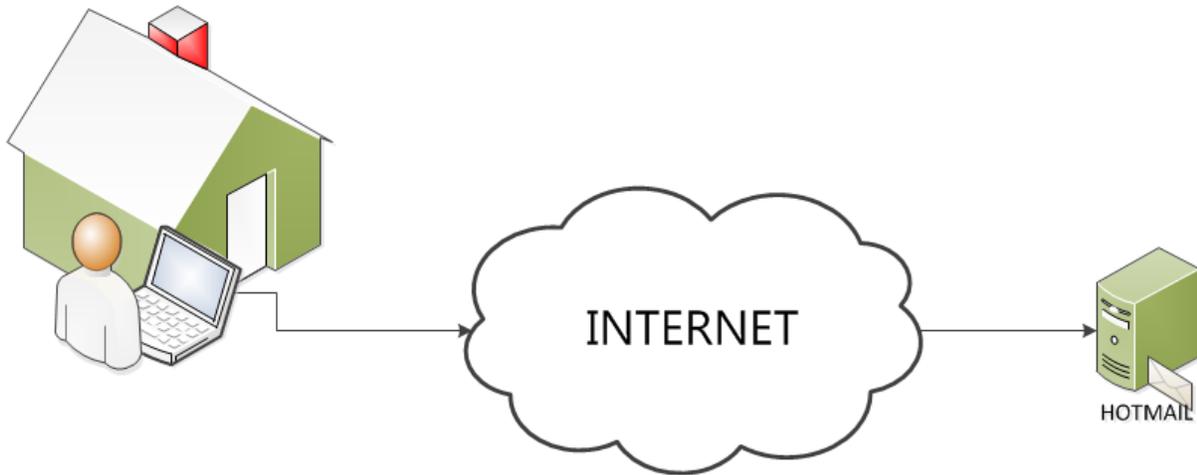
## Understanding the cloud

Trying to understand what a company means by a 'cloud' offering can seem like trying to understand fog. The term 'cloud' has come to mean different things to different people. Much of the confusion can be chalked up to marketing teams embracing the momentum of the 'cloud' buzzword. In the end, the benefit of the 'cloud' is that you offload the burden of server infrastructure and maintenance, and you are left with a simple, straightforward cost structure.

The term 'cloud' is nothing new. Back in the early days of computer networks, engineers would need to map out all the components of a network. As networks became bigger and more complex it became impossible to map everything out in a single diagram. To accommodate the diagramming of complex computer networks, engineers developed a shortcut. Whenever a computer would talk to another computer across a complicated network the engineers would simply draw an abstraction for the network in the form of a cloud shape like this:



The cloud shape thus became analogous with a complicated computer network. The largest computer network of all is of course the combination of networks and computers that make up the Internet. Mapping the Internet network isn't possible, so whenever someone needs to reference a computer talking to another computer over the Internet, they use a cloud shape. For example, let's say you want to show how a person at their home checks her Hotmail account. She logs in to her computer and then opens the Hotmail webpage. The server hosting the Hotmail service is located in a Microsoft data center and is accessed over the Internet as shown here:

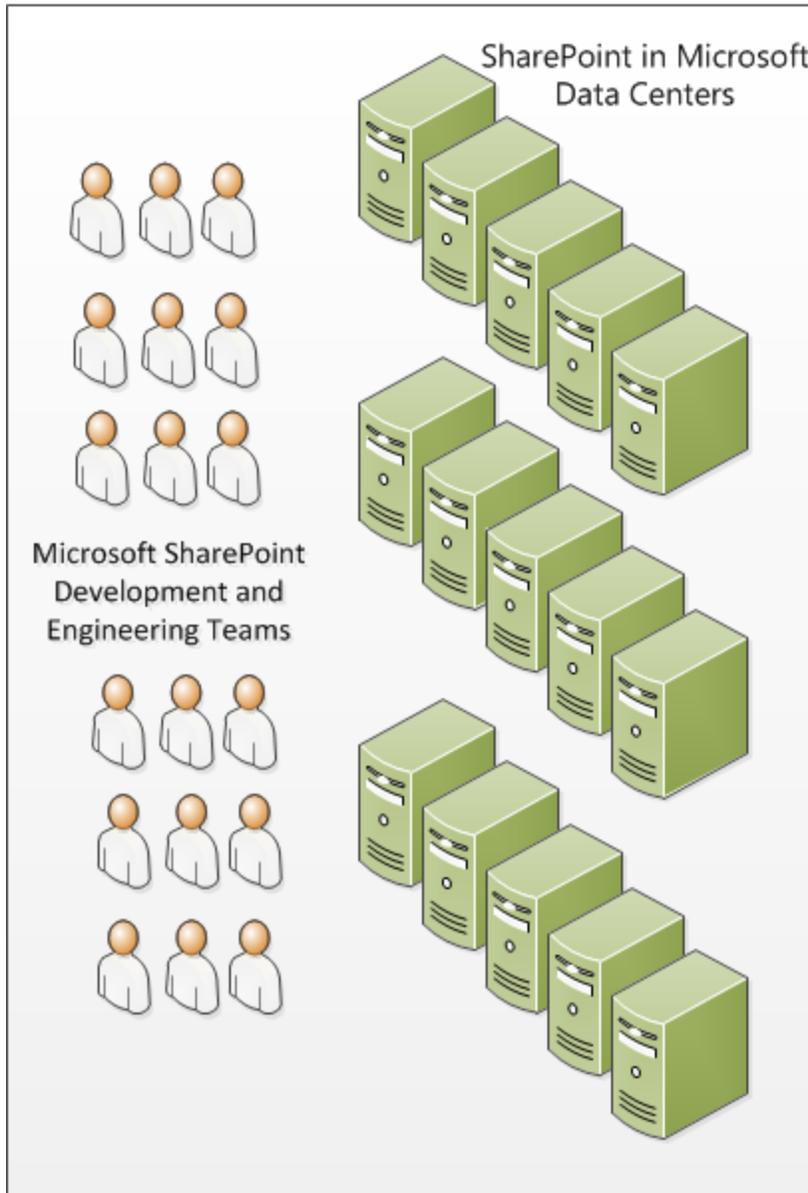


In fact, email was one of the first widely used cloud-based software services. If you have ever used one of Microsoft's email services like Hotmail or Live then you have already used the Microsoft cloud. Now enterprise class business software like SharePoint, Exchange, Lync, Project Server, and Dynamics are finally moving to the cloud-based model as well.

### **The shift to cloud-based software**

In the past, software companies like Microsoft would only sell licensing for their products. Organizations would pay for the licensing and then their engineers would buy computers and install the software. The nature of the Internet, being always available, opened a massive door of opportunity. With the Internet, a company like Microsoft can now install its software in its own data centers and then customers can access and use the software over the Internet. This has some major benefits for both customers and the software company. For customers, it removes the complexities that come with installing and managing enterprise-class software. For the software company, it allows the same engineers that develop the software to fully integrate with its installation and management, as shown in the next picture. The result is that Microsoft gains control over the functioning of the software and ensures an optimized environment and better customer experience.

# MICROSOFT



## Looking through the cloud

Microsoft has fully embraced the new cloud-based software paradigm and has spent billions of dollars building out state-of-the-art data centers around the world. The data centers are where the computers that run Microsoft's cloud offerings are physically located. These include massive amounts of computer power housed in bunker-like structures, as shown here:



Microsoft has staked its entire reputation on this new software paradigm. To ensure that things run smoothly, Microsoft has built technology into the base operating systems specifically designed for offering software over the Internet. The Windows Server advertisement shown here specifically calls out that it was built for the cloud.

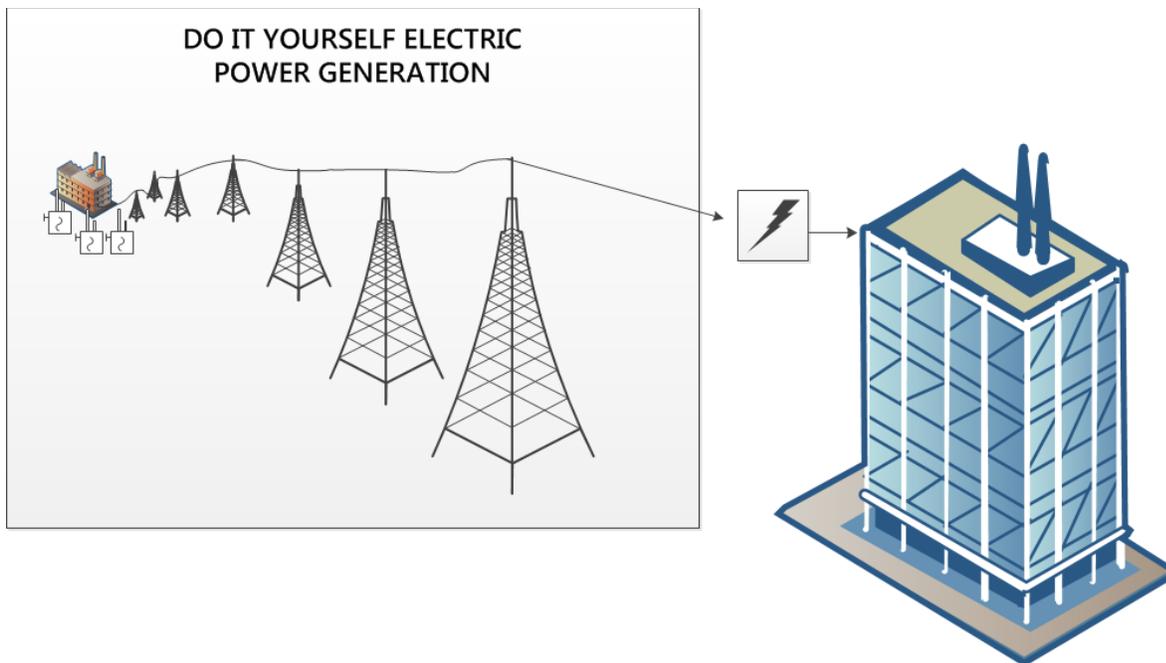


What does "built for the cloud" mean? It means the operating system now includes built-in functionality for multiple levels of redundancy, backup, recovery, and virtualization. For example, if a physical computer crashes, another computer in the data center automatically takes over and the users are not affected. The same redundancy holds true at the entire data center level. Should a natural disaster hit one data center, another one, in another part of the country, or world, automatically accepts the user load and take its place. From the customer point of view, the software continues to operate as expected. This level of engineering is required for modern software delivered over the Internet.

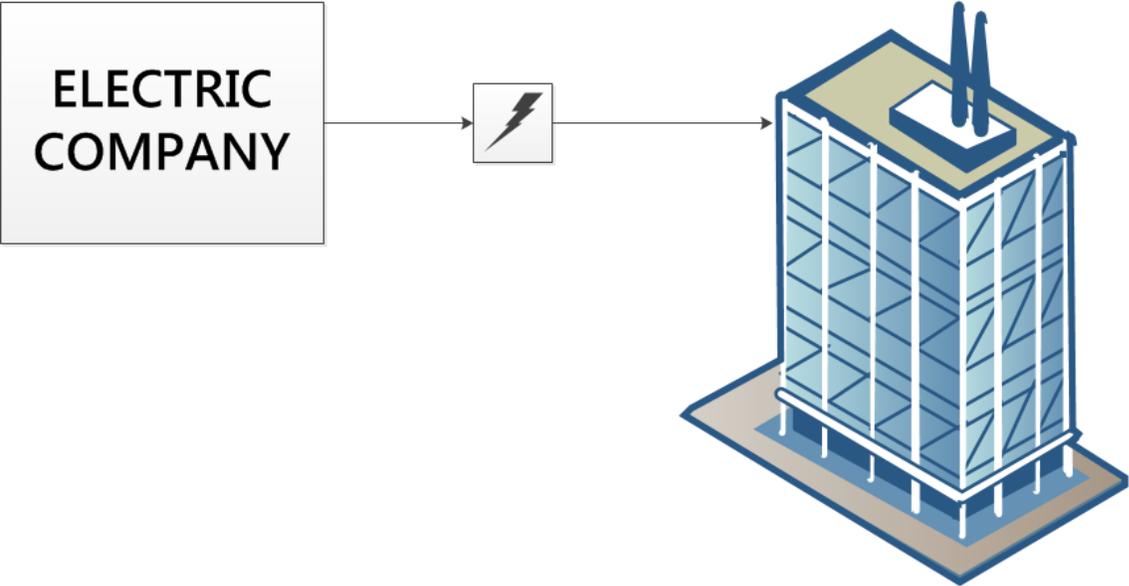
## Benefits of cloud-based software

Organizations can now think of enterprise-class software the same way they think of electricity in their home. That is, they don't really think about how it works, they just know that it is on and available when they need it. In this sense, it is a natural progression in software.

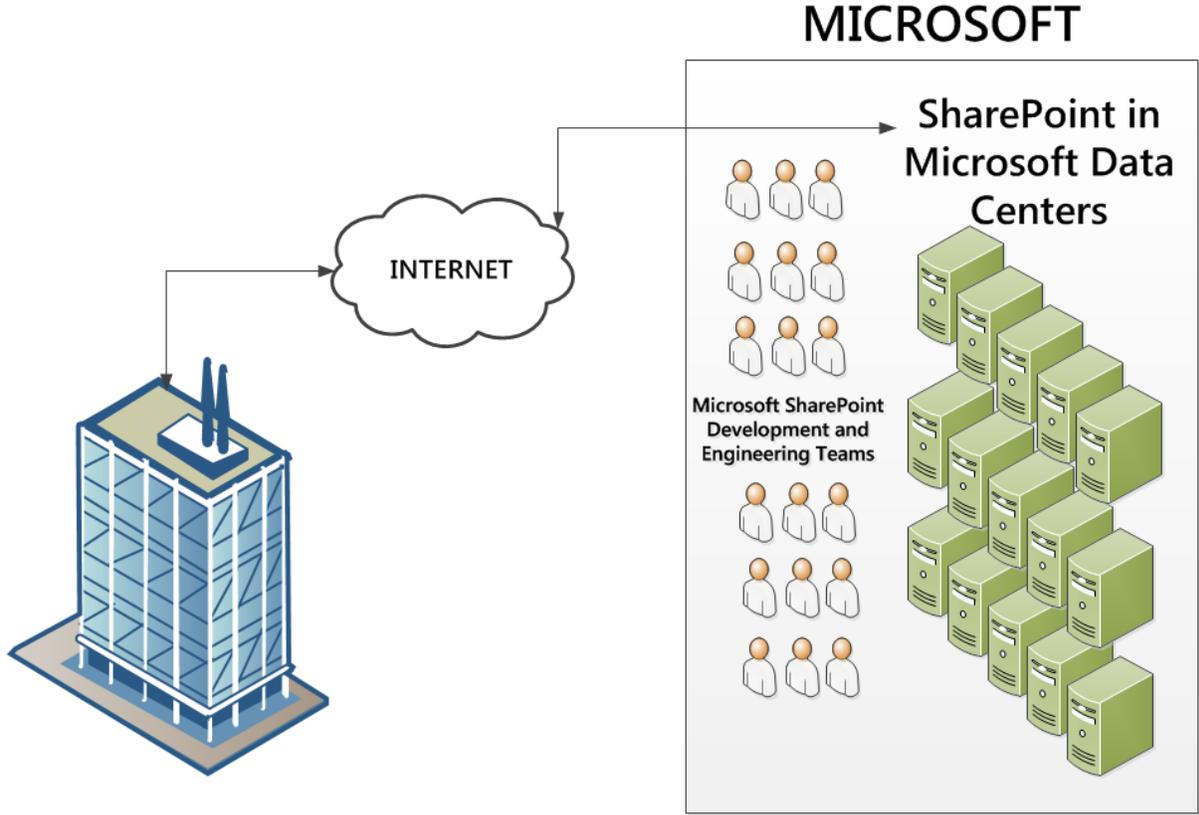
To take the analogy further, can you imagine if your organization had to be responsible for its own electricity generation and management? The amount of resources you would have to dedicate to the task of generating your own power would be enormous and cost-prohibitive.



Sure, it is possible to build a power generation station and run wires and install transformers and all that comes with electricity. The cost and complexity entailed would surely put electricity out of reach for all but the biggest organizations. With our modern electric grid, any size organization or individual can avail itself of all of the benefits of electricity without the burden. The organization simply signs up for electric service and the electric company takes care of the rest.



Software delivery over the Internet follows this same example. Organizations don't have to expend the resources required to install and maintain enterprise software on their own. They can simply sign up and tap into the existing software service within minutes:



## Cloud-based software categories

Microsoft has a number of cloud-based offerings, and this often creates confusion. The offerings all have their pros and cons, but taken together as a single lump it can be overwhelming to understand how they all fit together and how they can be used. Cloud-based software falls into three primary categories: Software as a Service, Platform as a Service, and Infrastructure as a Service.

When deciding to adopt a software solution, it is important to consider all of your options. For example, let's say you are thinking about adopting a Microsoft SharePoint solution for your organization. You have heard about cloud offerings but aren't really sure how things like Azure fit in with Office 365 or what it means to install On-Premises. What you need is a solid understanding of your options so that you can make the right decision for the circumstances of your organization.

There are four primary scenarios you need to investigate when thinking about a SharePoint solution for your organization.

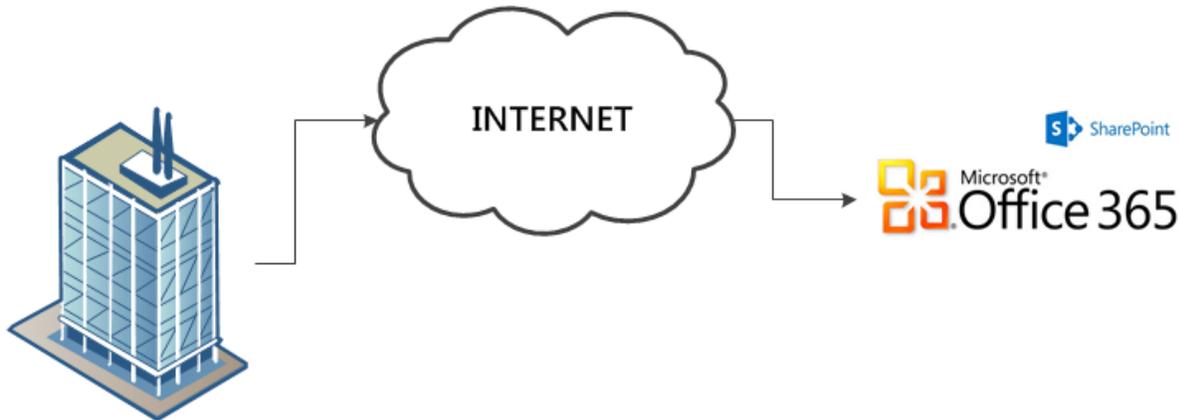
Option	Description	Type
You can choose to purchase the software on a subscription basis and access it over the Internet.	This is called Software as a Service (SaaS) and the offering by Microsoft is called SharePoint Online, which is part of a bundle of products collectively known as Office 365. In addition to SharePoint Online, the Office 365 bundle also includes Exchange Online and Lync Online.	Software as a Service
You can choose to take advantage of infrastructure such as the operating system and database hosted by Microsoft but install and manage the SharePoint solution yourself.	This is called Platform as a Service (PaaS) and the offering by Microsoft is called Azure.	Platform as a Service
You can choose to purchase the software licensing and pay your own personnel to install and manage it locally.	This is called On-Premises software since you have the entire stack of hardware and software on the premises of your organization.  Additionally, you could purchase virtual computers and access those virtual computers over the Internet. You would still be responsible for hiring your own personnel to install and maintain SharePoint Server. The	On-Premises / Infrastructure as a Service

	difference here would be that the computers they would use to do it would be virtualized. This scenario is called Infrastructure as a Service (IaaS).	
You can choose a combination of the previous options in a "hybrid" approach.	This is a combination of using SharePoint Products in various capacities: using SharePoint Online, Azure, or On-Premises SharePoint Server.	Hybrid

**Software as a Service model for SharePoint Online**

The most straightforward way to implement SharePoint is to sign up for Office 365, which includes SharePoint Online. Office 365 is a bundle of products that are fully managed and maintained by Microsoft at its data centers and accessed over the Internet by customers. This is known as the Software as a Service (SaaS) model because the software is available and ready to use instantly. There is no need to install SharePoint Online. You sign up for it and can start using it within minutes. The major benefit to this service is that it is purchased per user so you can begin using SharePoint Online with a single user or scale up to tens of thousands of users. In the past, using a SharePoint solution for a small organization was unheard of because of the overhead involved in implementing the software.

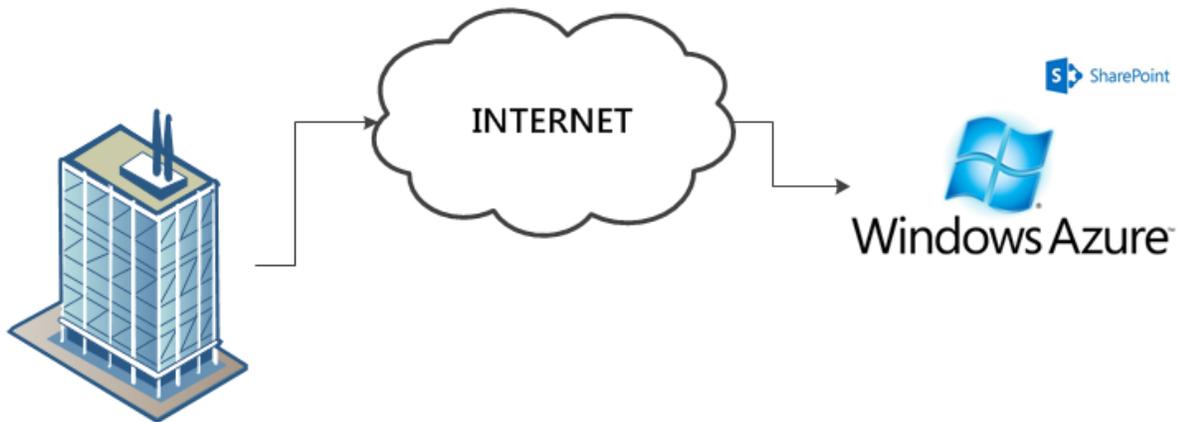
Other Microsoft products that are offered using the Software as a Service model include Exchange, Lync, Project, and Dynamics CRM. To learn more about these offerings, see <http://office.microsoft.com/> and <http://www.microsoft.com/en-us/dynamics/crm.aspx>.



## Platform as a Service model for SharePoint Server

If you have an established IT team that wants full control over SharePoint but doesn't have the bandwidth to manage the rest of the infrastructure, then Azure fits the bill. Azure provides a platform on which you can install SharePoint Server. The platform includes the operating systems and databases but you install and manage SharePoint Server on this platform. This gives your IT team full control over SharePoint Server but abstracts the underlying infrastructure platform. The infrastructure platform runs in Microsoft data centers and your team is responsible for installing and running SharePoint Server on that platform.

In addition to an operating system and database platform on which you can install SharePoint Server, Azure can also be a platform for other functions such as running .NET code in the cloud or performing identity management to name a two examples. To learn more about Windows Azure, see <http://www.windowsazure.com/>.



## On-Premises model for SharePoint Server

An On-Premises implementation is where you install SharePoint Server on your local server computers and manage the entire thing with your own personnel. Because SharePoint Server is installed on servers on your organization's own premises it is called an On-Premises implementation. This has been the primary means of using enterprise software in the past. Because of the resource requirements and high cost, it is generally only large organizations with mature IT departments that are able to avail themselves of server products like SharePoint Server using an On-Premises model.



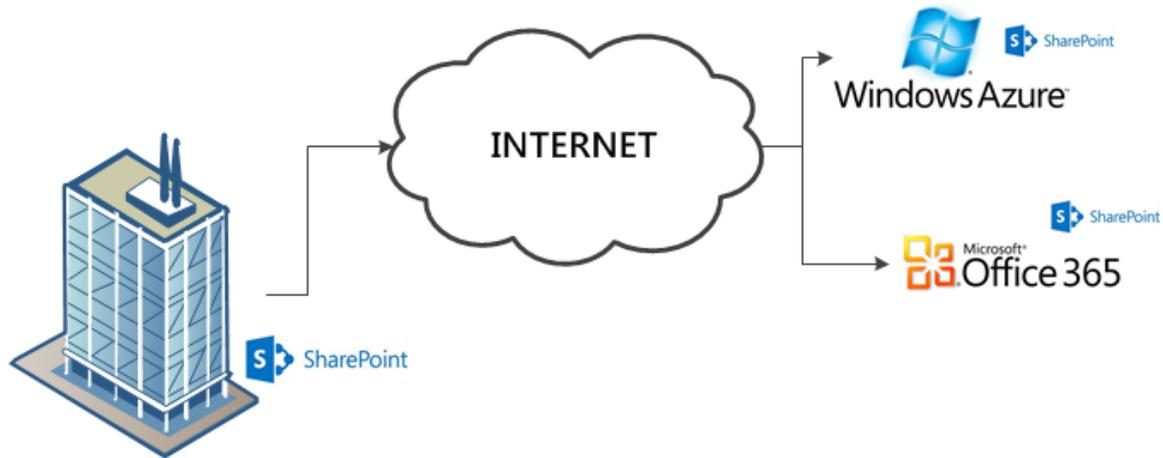
**<Note>** We haven't mentioned Infrastructure as a Service, but it is similar to the On-Premises model. The difference is that instead of purchasing physical servers and installing the operating systems and software yourself, you purchase virtual servers. Amazon and other companies provide virtual servers to accommodate this model. When you create a virtual server on Windows Azure, you are free to do with it as you please. You might decide to install the Linux operating system instead of Windows Server. Think of a virtual server just like you would think of a physical server but accessed over the Internet. You create the virtual servers and then use them just like you would if they were physical servers on your own premises.

The Windows Azure Infrastructure as a Service offering is called Windows Azure Virtual Machines. For more information, see <http://www.windowsazure.com/en-us/services/virtual-machines/>. For information specific to using SharePoint Server with a Windows Azure Virtual machine, see:

- [SharePoint 2013 on Windows Azure Infrastructure Services](#)
- [SharePoint 2010 Deploying on Windows Azure Virtual Machines](#)

## Hybrid model for SharePoint Products

A hybrid option is where you use SharePoint Server on your local premises for some requirements within your organization and use SharePoint Online or SharePoint Server installed on Azure for other requirements. The hybrid approach assumes that your organization has the IT resources to manage an On-Premises implementation. A common scenario involves offloading some of the standard business uses of SharePoint to the cloud offerings and maintaining an On-Premises implementation as well for internally built and highly customized solutions that rely on SharePoint functionality.



Keep in mind that with a hybrid approach, you can mix and match in any number of scenarios. For example, in the diagram, an organization maintains a local On-Premises SharePoint implementation for some parts of its business. It also subscribes to Office 365 and uses SharePoint Online as a service, and it has also installed and run SharePoint on Windows Azure. Alternatively, it might choose not to have a local, On-Premises implementation of SharePoint Server but still have an implementation of SharePoint Server on Azure. In this scenario, the organization would deploy highly customized applications to an on-premises installation of SharePoint Server while using SharePoint Online for general business use and document management.

**<Important>** The important point to note is that a hybrid approach does not follow any strict guidelines. A hybrid approach can be any combination of using SharePoint Products across the different offerings.

## Conclusion

A decision about the best way to adopt enterprise software is dependent on many factors. As a decision maker, your job is to understand the options and then make the best decision for your organization. Determining cost for each option can be difficult. For an On-Premises solution, the licensing costs alone might look less expensive than licensing for Office 365. However, the On-Premises solution also needs to take into account the people and infrastructure required to install and maintain the software. "Infrastructure" can be a deceptively simple word. Infrastructure includes security, high availability, backup and restore options, and disaster recovery. It also includes data center space and cooling systems and power redundancy.

Getting a grasp on the infrastructure involved in implementing enterprise software can be daunting and difficult to fully understand. The nature of *infrastructure* is one of the primary business drivers in moving to the cloud. It is very easy to calculate the cost of an Office 365 solution. The cost for Office 365 is calculated per user and the infrastructure burden is offloaded to Microsoft. Calculating the true cost of an On-Premises solution is a guess at best because you don't know what you don't know. The cost might be thought to be one figure and then the team realizes that it did not take into account a disaster

scenario where the data center loses power completely. In this scenario the team would need to add on a geographically separated data center to accommodate data integrity policy within the organization. With a Software as a Service solution such as Office 365, the costing exercise is simple and straightforward and the infrastructure burden is shifted to Microsoft.