INTRODUCTION TO MICROSOFT AZURE BASICS

A Beginner's Guide

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Overview

Gone are the days where you needed dedicated hardware for servers to host an online business. Now, everything is hosted on the cloud. Microsoft already has a huge share in the operating system market, and according to a **recent report**, it is also gaining ground as a cloud service provider with Microsoft Azure having an 18% market share and still increasing as it's server products and services rose by around 30% in the final quarter of 2019

Some Amazing Azure stats:

- The report of Microsoft's Q2 earnings of 2020 shows Azure has helped increase Microsoft's commercial cloud revenue by 29%. Azure alone contributes $50 billion in annual revenue run-rate

- Azure is also trusted by political and legal entities.

  This is evident in many examples, like:

  a. Azure government, which is the first commercial cloud platform to meet the U.S. Criminal Justice Information Services (CJIS) requirements for state and local governments

  b. Azure is the first Level 1 certified end-to-end cloud service approved by Singapore MTCS

- Azure has data centres spanning across 42 regions and provides 24/7 support like no other cloud provider.

Also, with Microsoft boasting of having more than 1400 large companies as their customers, which also covers almost 66% of Fortune 500 companies, it has become a highly in-demand skill for companies looking to hire. So, if you are a developer looking for a job in dream companies like eBay, Samsung, BMW, and Microsoft itself, chances are that Azure is the tool that you will need to understand their tech stack. With easy scalability, a number of services, the support of industry leaders like Microsoft, and an essay learning curve, Azure is a great choice as the cloud computing platform for your next endeavour. But, we all know that keeping up with the ever-evolving tech world is a hard task. Hence, this eBook will introduce you to the basics of Azure to help you understand the fundamentals of this trending cloud service.

What is Microsoft Azure?

Microsoft Azure is an ever-growing collection of cloud services, currently providing 17,000+ certified apps- all ranging from analytics and computing to database and networking. It offers a set of pre-built templates and services that help build and manage an enterprise on various platforms. Shifting to a cloud-based service helps you ignore many burdens that you would have while maintaining servers in house, like networking, storage, virtualization, and scalability. This also increases the uptime of your service as Azure has data centres across 3 continents that ensure you are always there to serve your clients.

With Microsoft Azure, you can choose your choice of deployment, whether Paas (Platform as a service) for minimalistic management, IaaS (Infrastructure as a Platform), if you prefer more control or even a hybrid of both. You decide the stress that you wish to handle, Azure deals with the rest. The huge collection of tools and resources helps ease the process of migration and management of your application.

Some of the key features of Azure are:

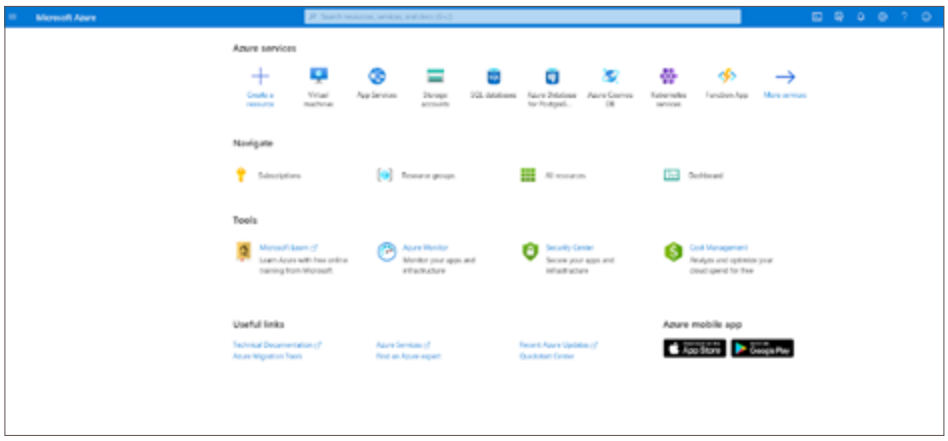
- **Easy migration and expansion:** Azure easily integrates with existing IT environments through secure private networks, smart storage solutions and thus makes it easy to migrate your existing architecture onto the cloud.
- **Pay as you scale:** With Azure, you don't need to panic when there is a spike in traffic to your online service as you can quickly scale up or down to match demand. And, with per-minute billing, you only pay for what you use.
- **Open and flexible:** It supports a variety of operating systems when creating virtual machines, provides support for most programming languages like python, c#, java, etc. and also all kinds of databases and other frameworks. Some frameworks like ASP.NET and Node.js are enabled by default.
- **Data protection:** With data residency and encryption features, Azure ensures that your data is always safe and backed up.

Exploring Azure

When working on a cloud-based system, you will find yourself making Virtual Machines for testing, deployment, and several other reasons. Let us suppose you want to create a Virtual Machine running an Ubuntu server and understand how Azure makes the process easy enough for anyone to follow.

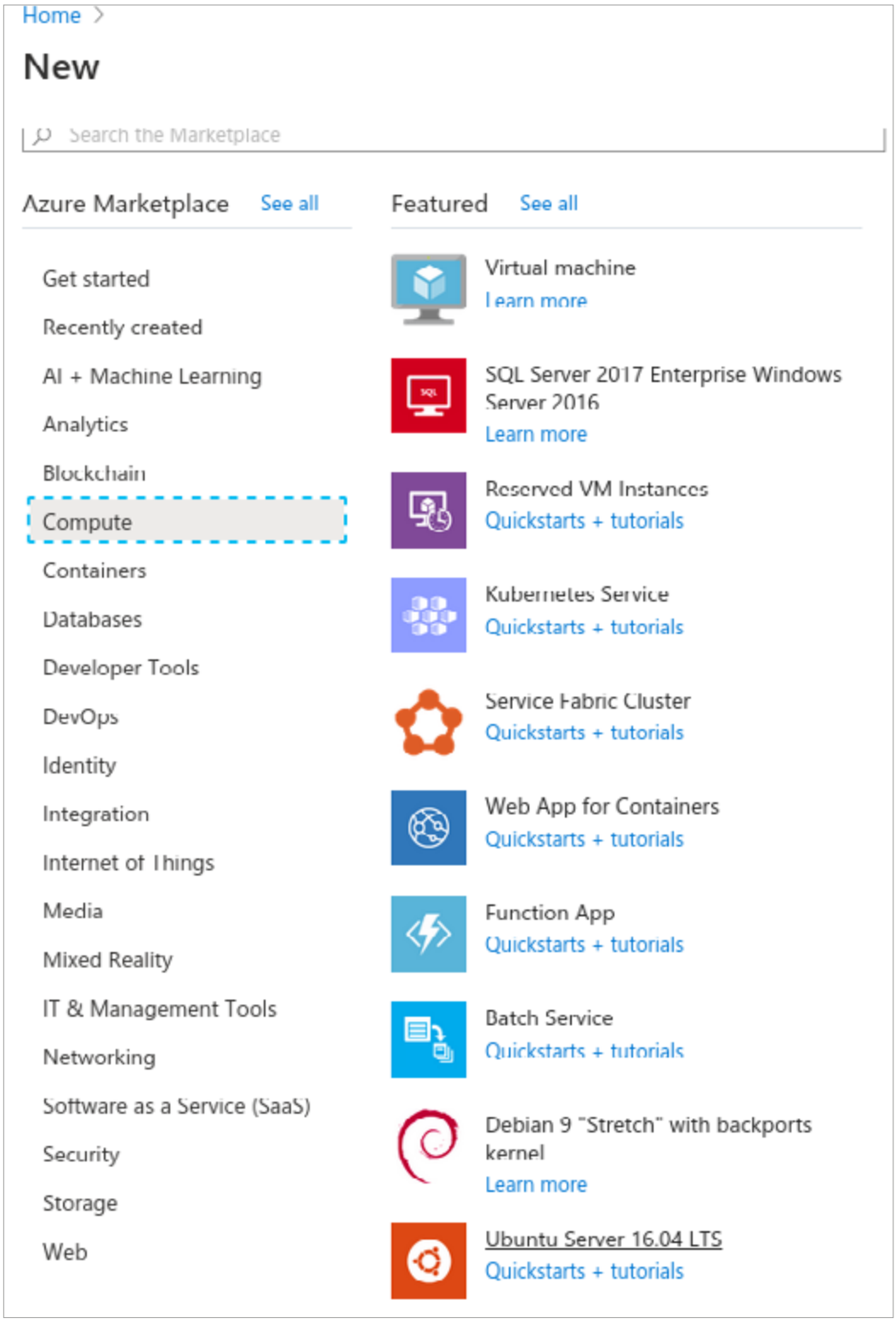
Here's the five-step guide:

- Sign in to the Azure Portal using your Microsoft account.
- Click on the **Create a resource** option in the top-left corner of the portal page. This should redirect you to the **Azure MarketPlace.**



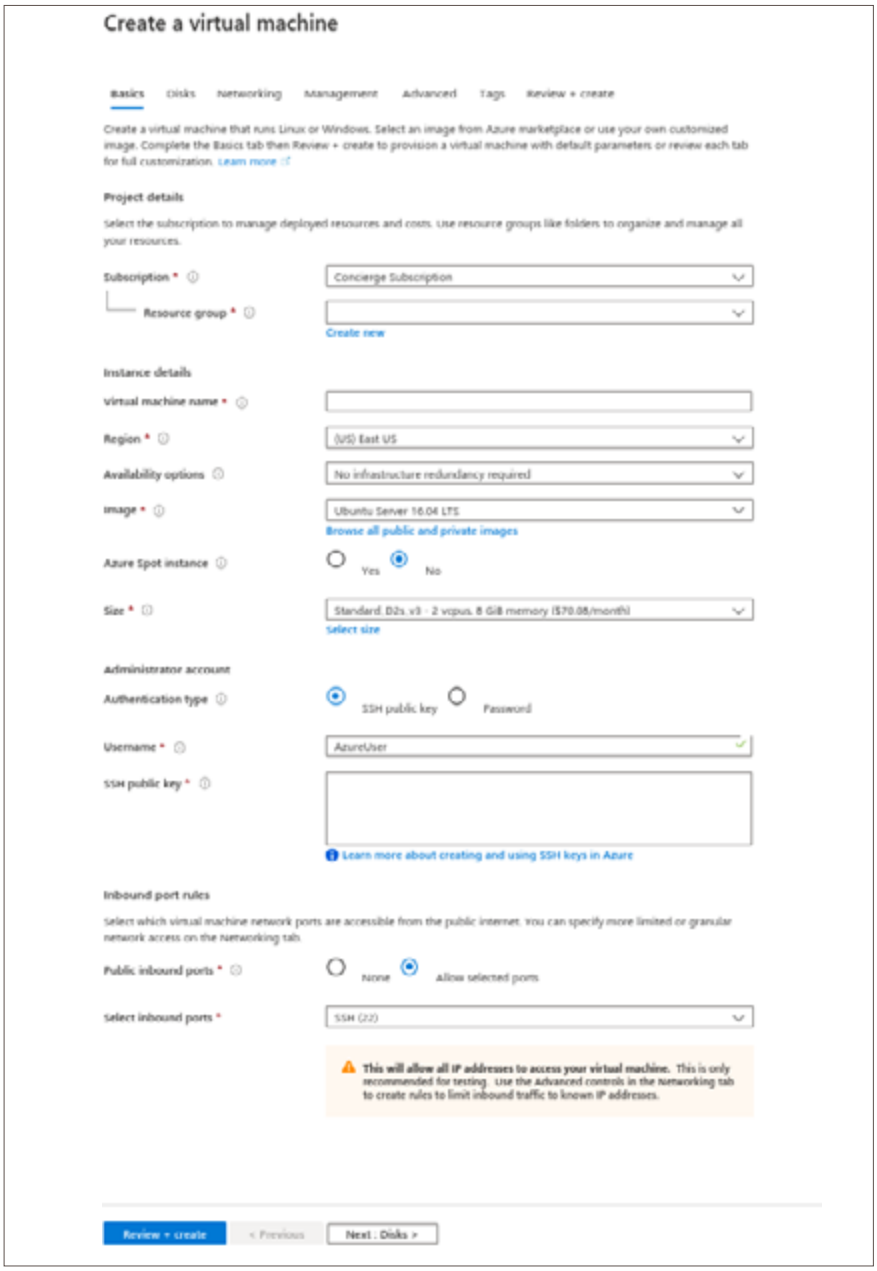
As you can see, the portal presents a variety of options like SQL databases, Kubernetes, App services, etc. These are meant to monitor the resources that we will be creating.

- This will redirect you to a search dialogue as shown below. Search for Ubuntu Server. You can also find it under the compute section as the **Ubuntu server** is a compute resource (Note the other resources that can be added).



Azure Portal This will lead you to the Create a Virtual Machine page.

- Enter the details of the server like its network type, location, SSH key, system name, and everything else. For those who don't wish to get too technical, Azure defines a lot of default values as well



- Then, click on **Review+Create** and wait as your virtual machine is created.

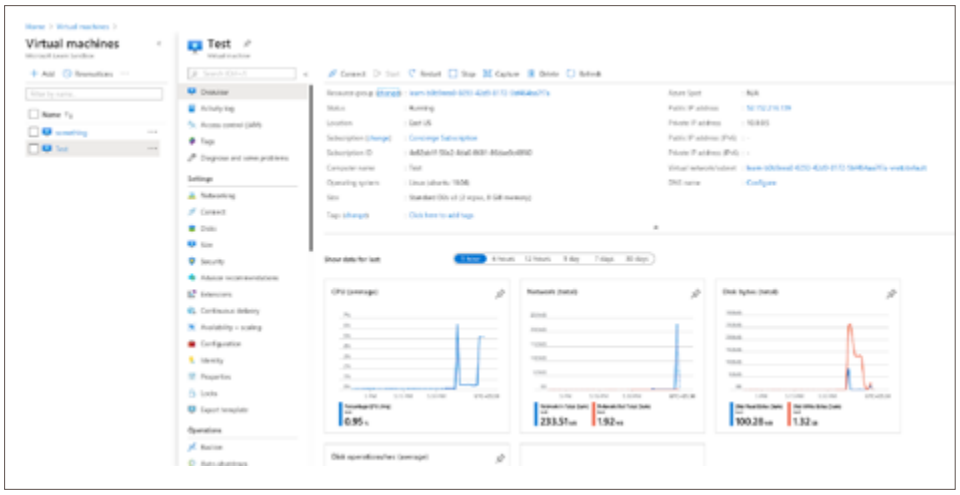
And, there you go! Did you see how easy it is compared to hosting it on a physical server? You don't need to worry about storage management or the ISO image with Azure.

Also, not only is it easy to create a virtual machine, it is also very easy to customize and monitor its performance. Azure provides a

great dashboard that lays out all stats as a graph.

1. Go back to the Azure Portal and click on **Virtual Machine** This will list all the VMs that you have created.

2. Select the machine you wish to monitor or configure and Azure will serve all the data for you as a graphical beauty rather than a numerical mess.



3. To configure your virtual machine, select the property that you wish to make changes to under the **Settings** section and save the changes.

No need for any third-party tools to assess the resource usage, nor a long downtime for making changes to your server. This convenience helps a lot during sudden traffic spikes where fast upscaling and downgrading is the key to make profits off of the incoming clients.

And, the best part is that, you only pay for what resources you use with the per-minute billing scheme. Another service that helps give an idea of how Azure helps increase remote and distributed development is by setting up a **DevOps environment**. We will be using the Azure DevOps Demo Generator to see how we can distribute the respective tasks in a premade project among the team members by using the premade templates on Azure.

- Sign in to the Azure DevOps Demo Generator or click on **Get started for free** to just explore the service if you do not have an organization and wish to manage your projects on Azure.

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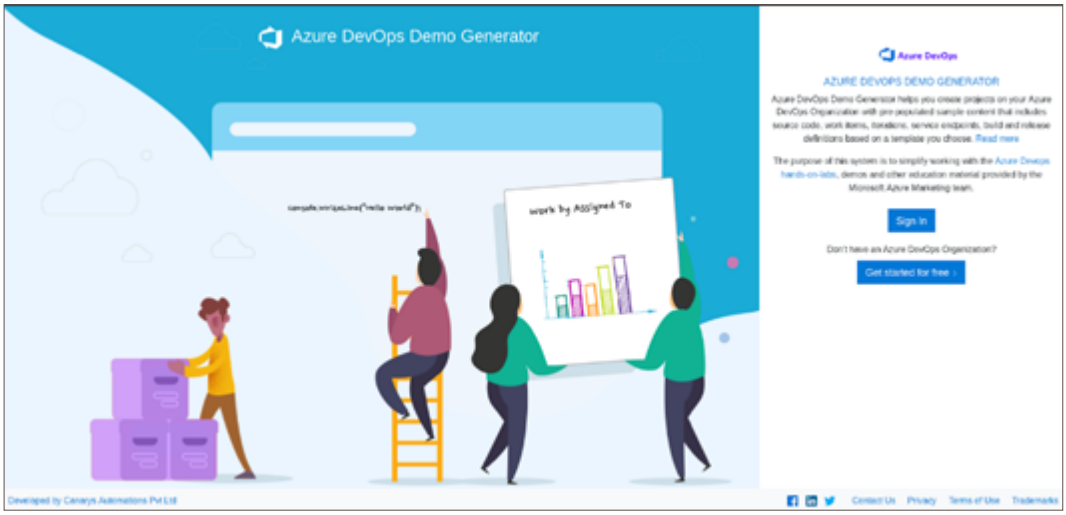
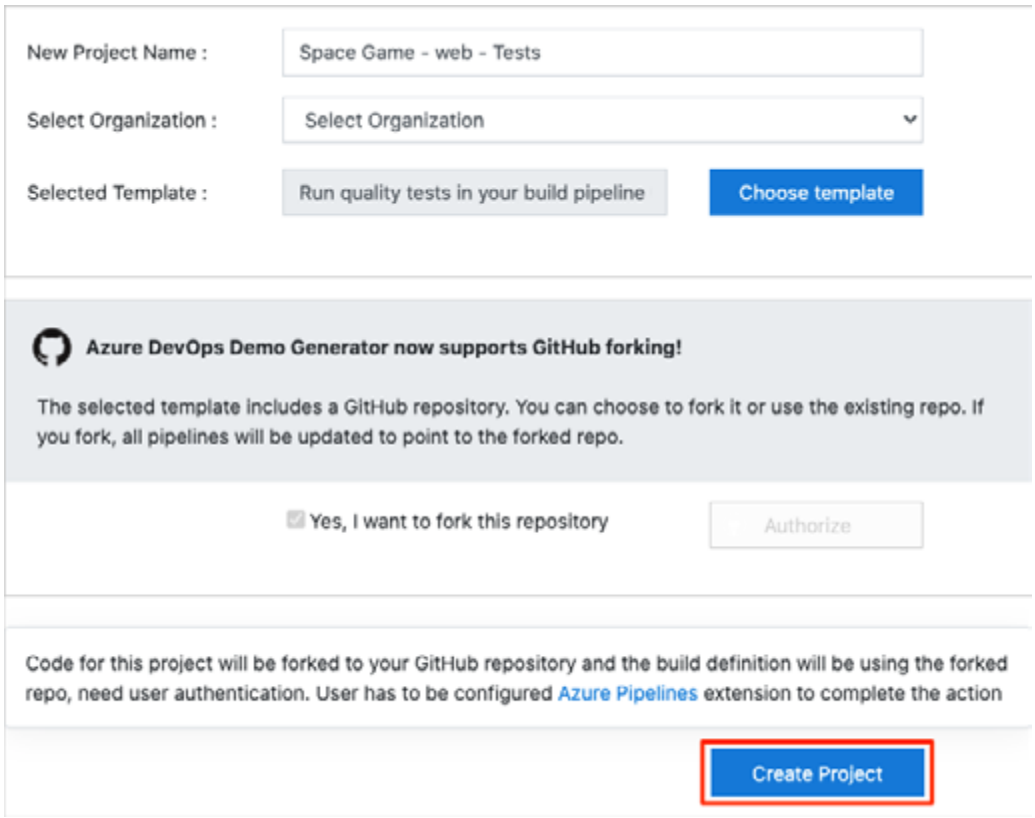
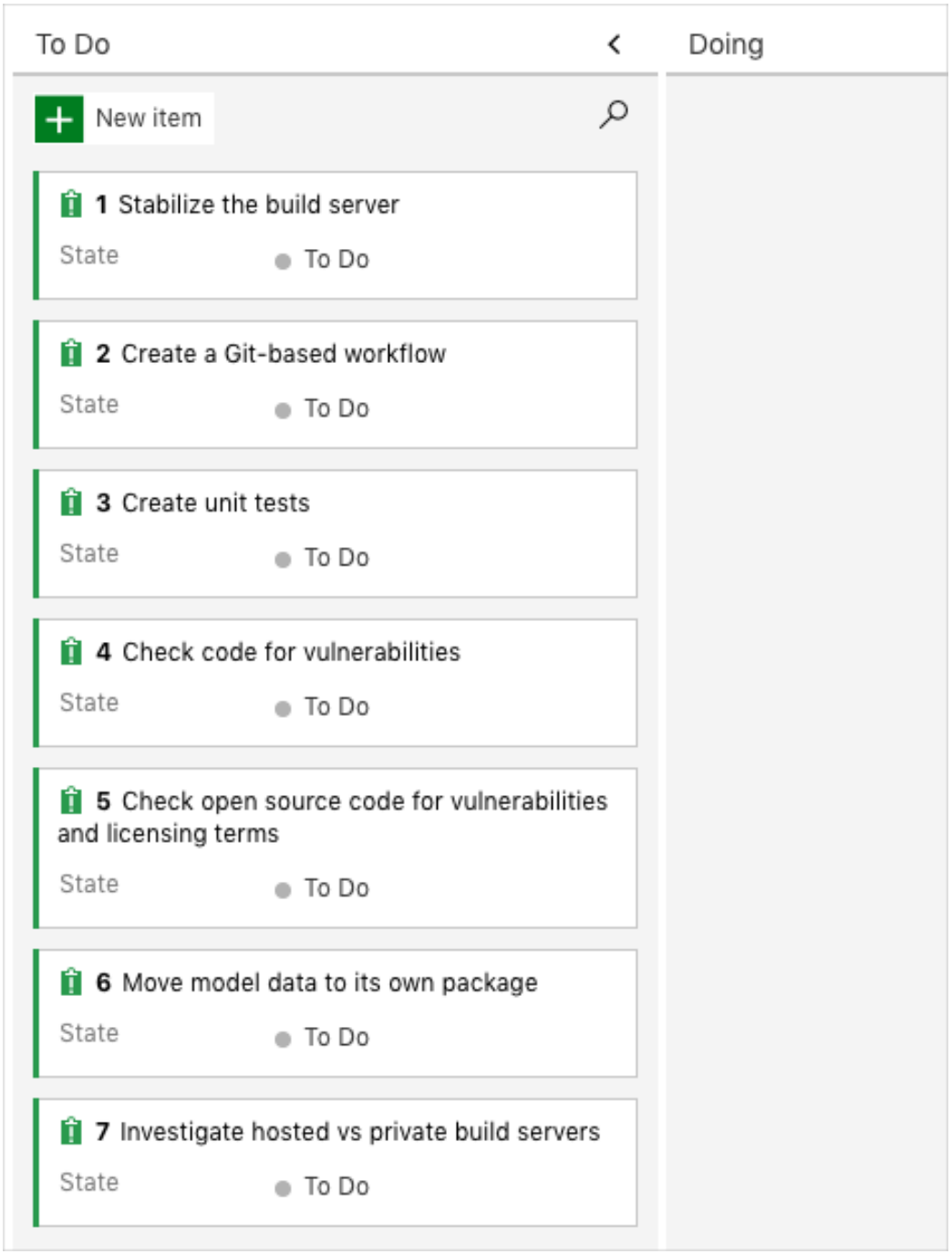


The second option gives you a dashboard where you can manage your code (it helps if you are already familiar with Visual Studio Code) and also the tasks assigned to you and your teammates.

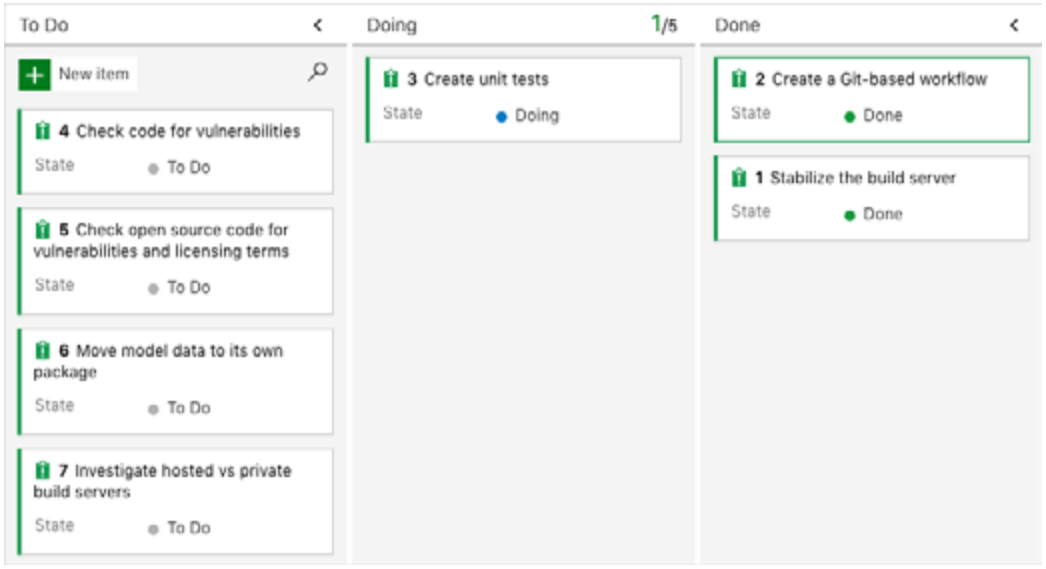
- On the **Create New Project** page, enter the project name and organization. Choose from one of the templates provided by Azure. Choose if you want to create a fork of the repository being made (this will require GitHub authentication) and hit Create Project



- From here, mention the respective tasks for different members of the DevOps team in the **To Do** menu.
- Keeping track is easy. You can change the state of the task as and when they have been assigned or completed.



You can see the state of the task by navigating to the **Boards** section.


To Do
New item
4 Check code for vulnerabilities
State To Do
5 Check open source code for vulnerabilities and licensing terms
State To Do
6 Move model data to its own package
State To Do
7 Investigate hosted vs private build servers
State To Do
Doing 1/5
3 Create unit tests
State Doing
Done
2 Create a Git-based workflow
State Done
1 Stabilize the build server
State Done

Getting Familiar with Terminologies

Azure Command Line Interface (CLI): This is a command-line interface to manage Azure resources and tools and is supported by various platforms like Windows, macOS, and Linux. An alternative is the Azure PowerShell that is only available for Windows.

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- **Cloud Computing:** The availability of computer system resources such as data storage and computation over the internet is called cloud computing.
- **Containers:** A container is a software unit that describes the code, dependencies, and requirements of an application that is used to ship and install applications on different computers.
- **Database Sharding:** It is a partitioning scheme that helps you divide your current database into smaller databases for faster and easier management.
- **DevOps:** This is a combination of people, practices, and technologies that help in faster, organized, and scalable development of products.
- **Hybrid Cloud:** This is a network that consists of virtual resources on the private cloud that are connected to private clouds. This allows the sharing of data, easy scalability and flexibility.
- **Infrastructure as a service (IaaS):** This is a customized virtual computer environment provided as a service on the internet. Microsoft Azure is an IaaS.
- **Load Balancer:** A resource that distributes the incoming traffic among various servers on the network. There are two types of load balancers: internet-facing and internal load balancer.

- **Middleware:** This is the software that lies between the operating system and the applications and processes running on it. This is responsible for the transfer of data among different resources of the system.
- **NoSQL:** NoSQL refers to the set of nonrelational database technologies. Contrary to traditional relational databases or SQL, these are capable of handling huge amounts of unstructured data as they prefer to store data as objects and models rather than tables. Hence, it is easier to apply basic CRUD (create read update delete) operations and is easy to scale.
- **Platform as a service (PaaS):** This is a computing platform engineered for a specific purpose that is delivered as a service over the internet. Heroku is an example of PaaS.
- **Resource:** This refers to any item that is part of your Azure service. Common examples are virtual machines, databases, virtual networks, etc.
- **Resource Manager Template:** This is a JSON file that helps you define the dependencies of the various resources or resource groups (a container containing related resources of an application).
- **Shared Access Signature (SAS):** This helps you limit the access to specific resources without revealing your account key.
- **Software as a service (SaaS):** Any application on the internet that need not be purchased or installed. Netflix, Facebook, and Spotify are examples of SaaS.
- **Virtual Machine (VM):** This is the software implementation of a physical computer. These are used to run different operating systems as you can spin up multiple Virtual machines on the same system
- **Virtual Network:** The connectivity between your Azure resources is called a virtual network. It is possible to fully control IP address ranges, DNS settings, and also connect the virtual network to your in-house network.

Skills Required for Azure

Although you are spared from worrying about network architecture, virtualization, and storage management, you still need to have a few skills to get used to maintaining a service hosted on Azure. Azure provides a huge collection of tools and resources to help you in the process, like:

- **Azure CLI:** This is a set of commands that are used to implement Azure tools and manage Azure resources. It can be run on almost all operating systems and even on Docker and Azure Cloud Shell. It is a must-have when working in the Azure environment.
- **Migration:** To make the migration from your servers to the Azure cloud easier, it is recommended to get used to the tools provided under the Azure Migrate hub. These include server assessment, data migration and web app migration, among many more.
- **Building Container Images:** While migrating to a different environment, it is essential for you to know how to containerize different nodes of the application as docker images and how to manage them with Kubernetes (If it is highly complex). Azure Kubernetes Service (AKS) is also a great tool provided by Azure itself.
- **Virtual Machines:** The server world is known to be Linux dominant and although this is not yet the case with cloud services right now, chances are that you will have to spin up a Linux virtual machine either after or during migration. It's good to know tools like Azure Linux Agent.
- **Azure Hypervisor:** This is used to create and run Virtual Machines on Azure. Although it is similar to the commonly used Microsoft Hyper V, it is slightly customized for the Azure platform
- **Database:** Handling databases on the cloud has a different approach. Azure offers management tools for both relational and NoSQL Databases whether they are open-source or proprietary engines. It is recommended to get used to the tools required to manage your database engine.

Get Started Now

Simplilearn has always strived to enable professionals by providing resources needed to keep up with the growing demands of the market. On the website, you can find e-books, articles, courses, and video tutorials that cover topics from different areas of technical expertise; whether it is cloud computing, software development, or cybersecurity.

The need for developers who can work on cloud services is increasing every day as businesses become serverless. And, in this competitive age, there is always a need to stand out in such scenarios. Simplilearn provides courses that are well suited for cloud pros: whether you are a beginner or an expert. Start now!

- **Azure Cloud Architect Master's Program**
- **Microsoft Certified Azure Developer Associate AZ-204 Training Course**
- **Microsoft Azure Architect Technologies**
- **Microsoft Certified Azure Administrator Associate**

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