Getting Started with MEAN, Docker, and Linux on Microsoft Azure

Microsoft Azure provides one of the best cloud platforms to hose your *Infrastructure as a Service* (IaaS) development virtual machines. This of course means it's a great place to run Windows virtual machines. But it's also a great place to run *Linux* virtual machines.

In this lab, you'll create a new Linux virtual machine using the Ubuntu distribution. You'll configure it and access it via SSH. You'll install and configure Docker and supporting tools like Node.js. And finally, you'll create a full MEAN.js development environment inside a Docker container.

There are three exercises in this lab:

1. Create your first Linux Virtual Machine
2. Install and configure Docker
3. Install Supporting Tools and Technologies
4. Install the MEAN Stack

Prerequisites

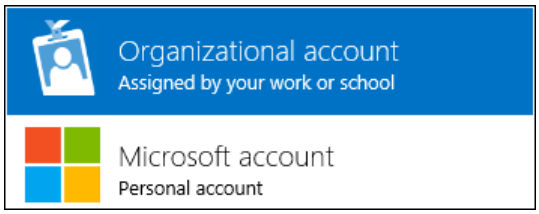
- A Microsoft Azure account
- An Internet connection
- An SSH client like PUTTY

Expected duration: 30 minutes

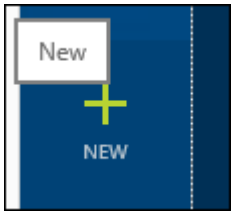
Exercise 1: Create your first Azure Mobile Service

In this exercise, you'll create your first Azure Mobile Service (AMS), using the Microsoft Azure portal.

1. Start your web browser (this walkthrough uses Internet Explorer on Windows but you could use OS/X or Linux).
2. Navigate to http://portal.azure.com/ and log in to the Azure Portal (which as of April 2015 is in preview). You'll need to choose an account that has the permissions needed to complete these labs.

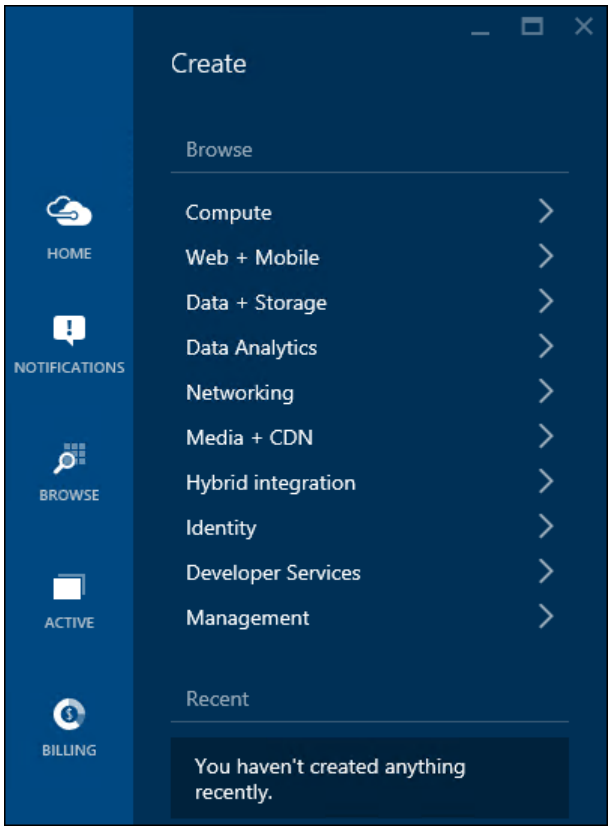


3. Once logged into the management portal, select the New (+) button at the bottom left of the screen.



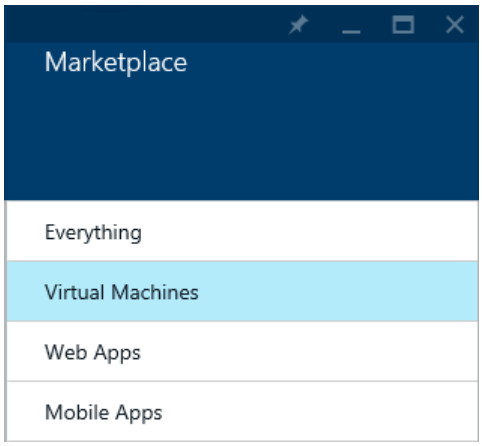
4. Next **Compute** on the **Create** blade.

   Microsoft Azure provides an almost dizzying array of products and services.

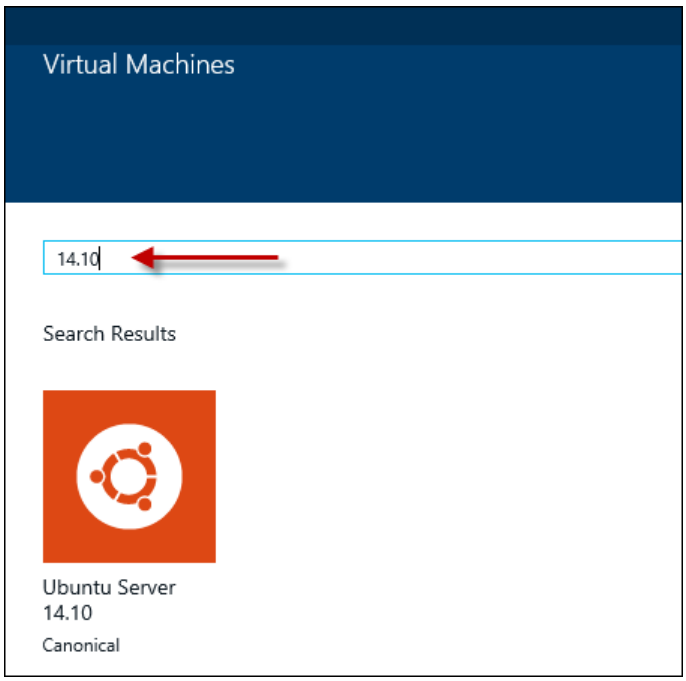


5. At the bottom of the **Compute** blade, select **Azure Marketplace**.

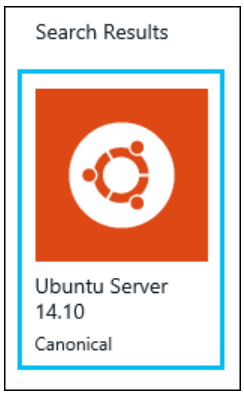
6. On the **Marketplace** blade, select **Virtual Machines**.



7. In the *Search Virtual Machines* field, type **14.10**. Azure will return a single item, Ubuntu Server 14.10 from Canonical.



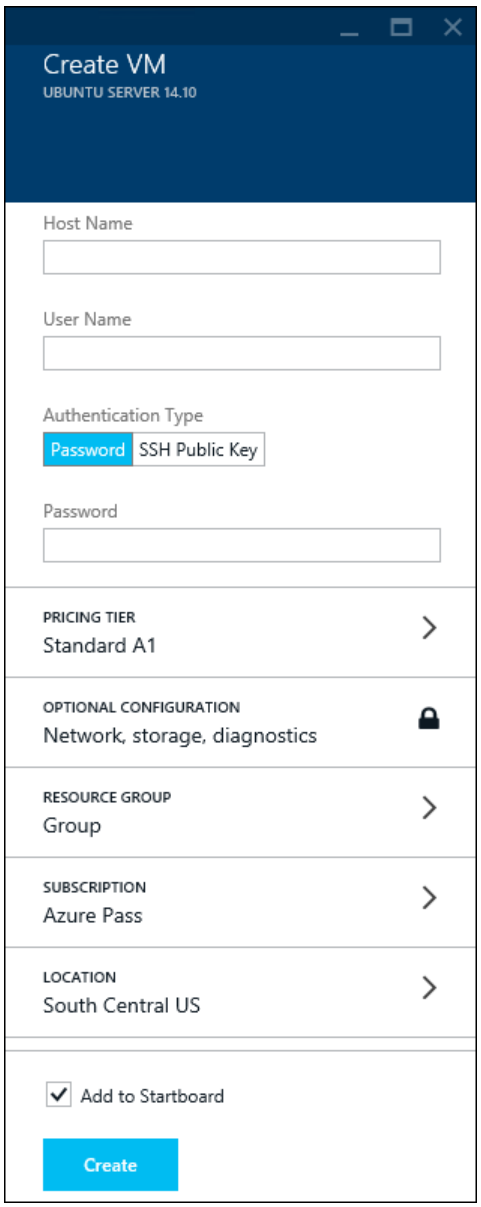
8. Select Ubuntu Server 14.10.



Azure will open a blade describing the virtual machine template.

9. Click the Create button at the bottom of the blade.

You will now define a number of properties related to your virtual machine (VM) instance on Azure. You will use the virtual machine blade to set user information, virtual machine size, and in what geo-location you want it hosted.

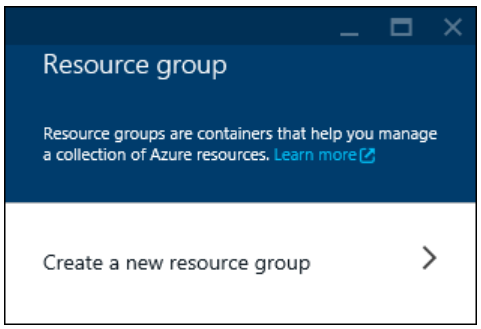


10. You'll need to provide a **Host Name** like mymeanvm. Azure will validate your name.
11. You'll then need to provide a **User Name** like vmAdmin.

    For security you can choose a password or a SSH Public Key. For this walkthrough, you'll use a password.
12. Provide a good strong password in the **Password** field.

    The next few options will open detail blades that you'll fill in as specified.
13. First, select the **Resource Group** option.

    Resource groups enable you to manage all your resources in an application together. Resource groups are enabled by the new management functionality, Azure Resource Manager. Azure Resource Manager allows you to group multiple resources as a logical group which serves as the lifecycle boundary for every resource contained within it.
14. On the **Resource group** blade, click the **Create a new resource group** option.

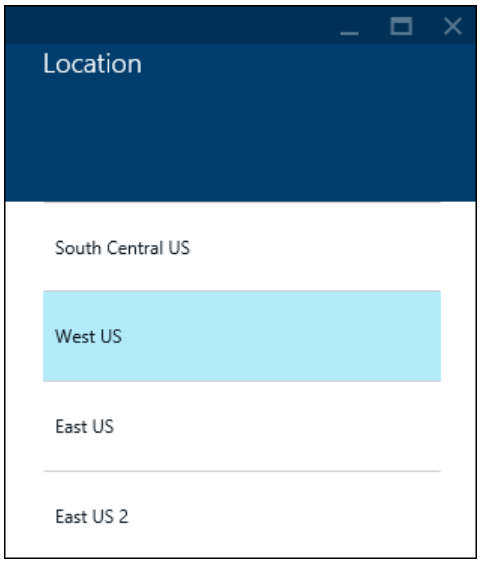


15. On the **Create resource group** blade, provide a name like meangroup and then click **OK**. Azure will close the blades and return you to the **Create VM** blade.
16. Click the Location option.

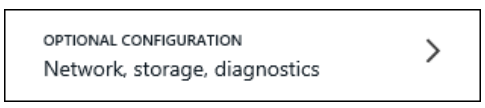
    The location can affect what services are made available. Generally, you'll want to pick the geo-location that is physically closest to you. That said, certain features like Premium Storage are only available in specific regions.

    Currently, Premium Storage is available in the following regions:

    - West US
    - East US 2
    - West Europe
    - East China
    - Southeast Asia
    - West Japan
17. On the **Location** blade, pick the region that is best for you.

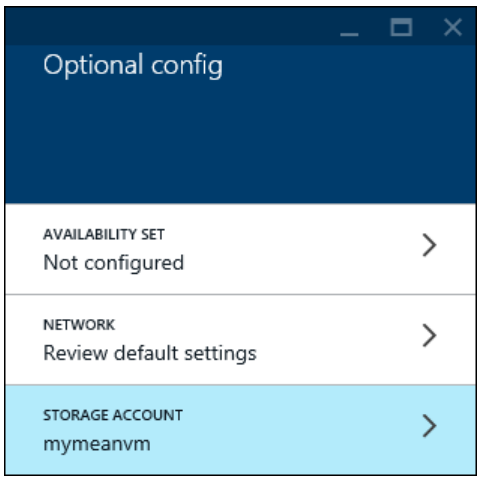


18. Click the **Option Configuration** option.



    By default, a storage account is created with the same name as your VM. If you want, you can change this.

19. On the **Optional config** blade, select the **Storage Account** option.



20. Click the **Create storage account** option and provide a name. Note the name has to be a valid DNS host name and must not conflict with other accounts. Once you've entered a name like meanvhds click **OK**.
21. Click **OK** to close the **Optional config** blade.

    A few notes about Storage Accounts.

    Your storage account specifies where you want the virtual hard disk (VHD) stored. You'll be using Blog Storage for your VHD. In particular, Azure will store it as a *page* blob. There are a number of choices related to type and redundancy. You can get lots of details at http://azure.microsoft.com/en-us/documentation/articles/storage-introduction/ but here are a few considerations.

    Locally redundant storage (LRS) maintains three copies of your data. LRS is replicated three times within a single facility in a single region. LRS protects your data from normal hardware failures, but not from the failure of a single facility.

    LRS is offered at a discount. For maximum durability, Microsoft recommends that you use geo-redundant storage, described below.

    Zone-redundant storage (ZRS) maintains three copies of your data. However this is not an option for VHDs.

    ZRS provides a higher level of durability than LRS; however, for maximum durability, we recommend that you use geo-redundant storage, described below.

    Geo-redundant storage (GRS) is enabled for your storage account by default when you create it. GRS maintains six copies of your data. With GRS, your data is replicated three times within the primary region, and is also replicated three times in a secondary region hundreds of miles away from the primary region, providing the highest level of durability. In the event of a failure at the primary region, Azure Storage will failover to the secondary region. GRS ensures that your data is durable in two separate regions.

    There is one more choice worth mentioning: *premium storage*.

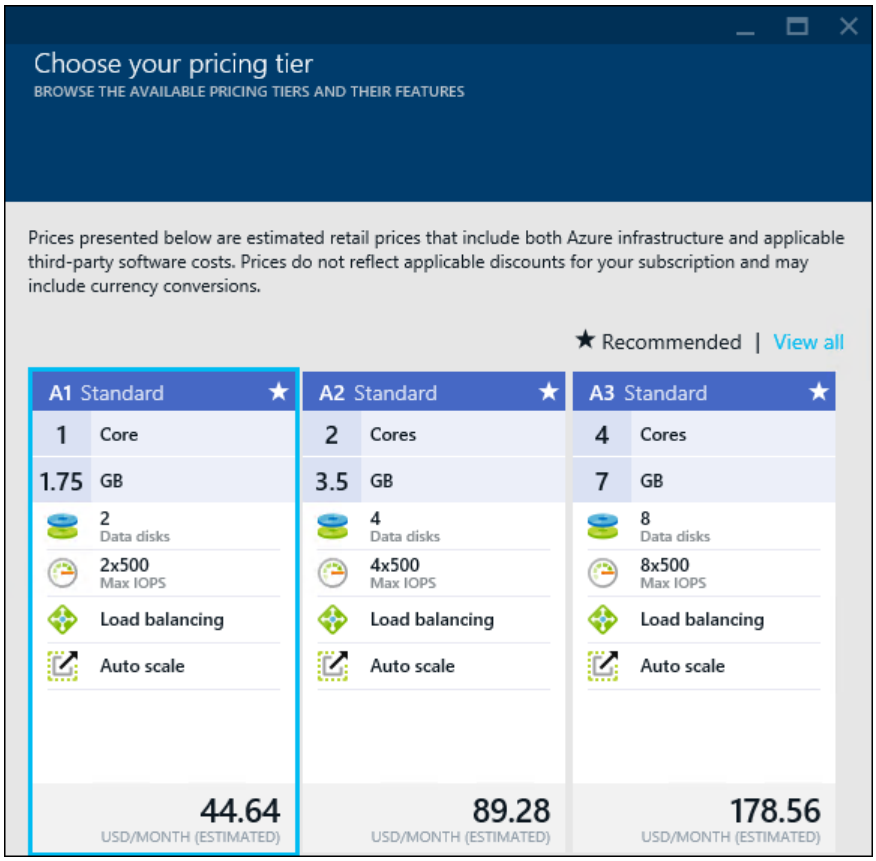
    Premium Storage is specifically designed for Azure Virtual Machine workloads requiring consistent high performance and low latency. This makes them highly suitable for I/O-sensitive SQL Server workloads. Premium Storage is currently available only for storing data on disks used by Azure Virtual Machines. Premium Storage provides SSD storage and provides the most responsive experience when using IaaS. However, this will of course cost

more. Again it's up to you. You can read more about Premium Storage at http://azure.microsoft.com/blog/2015/04/16/azure-premium-storage-now-generally-available-2/.

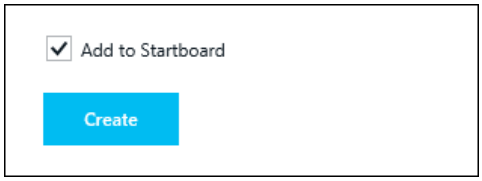
It's worth nothing as you'll see, the storage type affects the type of virtual machine you can create (number of cores, etc.). Premium Storage only supports the DS type (more on the types in a bit). If you choose a DS type machine, your storage account will be marked as Premium Storage. If you choose another type, it will be GRS. If you want to have more control, you can create the Storage Account first and then come back here. For this lab it's not necessary however.

22. Click the **Pricing Tier** to select the virtual machine type you want.

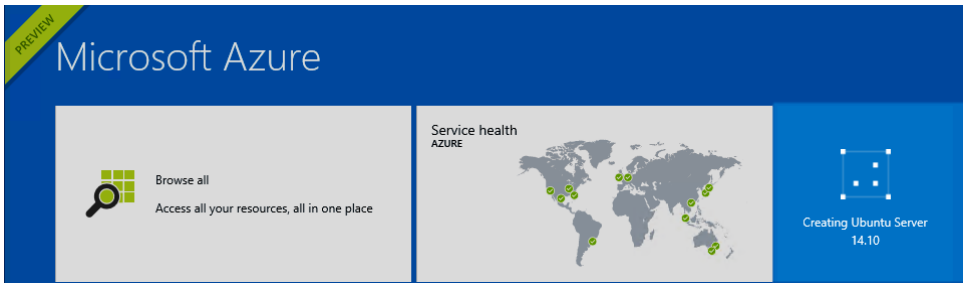
Azure provides you with a few recommended choices based on the virtual machine template you've chosen. If you had chosen a SQL Server or Oracle database hosting VM, large VMs would be specified. For this lab you can chose a very small VM, it just might be a bit slower.



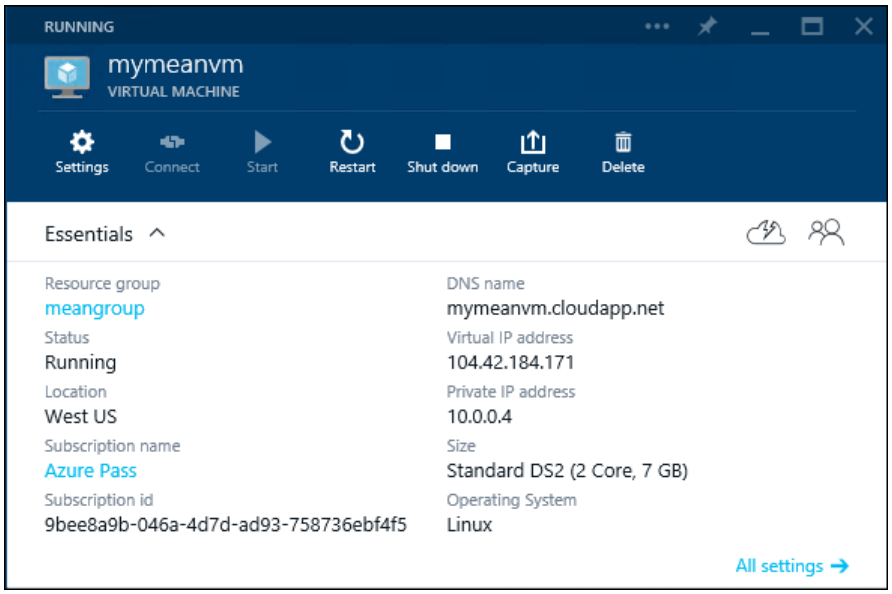
23. Feel free to choose the size that makes sense. Click View all to see other option including those with premium storage. Once you've picked your size, click **Select**.
24. At the bottom of the **Create VM** blade is the *Create* button. Right above it is an option to **Add to Startboard**. This will place a tile on your portal home page, making it easy to get to your VM to start and stop it. Leave this checked and click create.



Azure will return you to the Startboard and you will see your VM tile pulsing on the screen. It should only take a couple of minutes to create your new VM.



Once it's created, Azure will automatically open open the details blade for your VM if you've leave your Startboard open.



Using this blade you can Shut down, Start, and Restart your VM. In addition, you can get to other settings to, for example, create additional endpoints such as RDP. At this point, you're ready to connect to your virtual machine and configure Docker.

Exercise 2: Install and configure Docker

In this exercise, install and configure Docker.

1. Create an SSH connection to your virtual machine.

Exercise 3: Install Supporting Tools and Technologies

In this exercise, you install Docker Compose and Node.js with NPM.

1. If necessary, create an SSH connection to your virtual machine.

Exercise 4: Install the MEAN Stack

In this exercise, install and configure MEAN.js inside your virtual machine with Docker.

1. If necessary, create an SSH connection to your virtual machine.