



Deploy and scale Microsoft Azure Cloud Native infrastructures and applications with Red Hat Ansible Automation

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Wednesday July 15th, 2020



STUART KIRK

Azure Global Black Belt / Cloud Native
Microsoft Corporation

- Cloud Native / Open Source Technical Specialist
- Home: Ann Arbor, Michigan, Originally from Canada
- Entirety of Career in Open Source: Dell, Cisco, Red Hat
- Joined Microsoft in 2016; First RHCA at Microsoft
- Enjoys: Watching hockey (Go Leafs Go!), Cruising, Disney, Target Shooting, Rock Concerts
- Twitter: @StuartAtMSFT
- GitHub: <https://github.com/stuartatmicrosoft>
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ZIM KALINOWSKI

Senior Software Engineer
Microsoft Corporation

- Used to live in Shanghai, China, now in exile in Europe
- Currently making Ansible the ultimate tool to deploy resources on Azure. Passionate about Azure REST API.
- Before joining Microsoft worked for Nokia, Opera Software, Qualcomm and created own startup.
- Also likes American craft beer and all kinds of BBQ
- Twitter: @ZimOnAzure
- GitHub: <https://github.com/zikalino>
- LinkedIn: <https://www.linkedin.com/in/smarterphone>



JOHN YOKIM

Director, Azure Solutions Business
Microsoft Corporation

- Born, Raised and Live in Pittsburgh, PA
- Joined Microsoft in 2000
- Working on all things related to Azure since 2013
- Enjoys: Anything Outdoors – Skiing, Fly Fishing, Hiking, Biking, etc...
- LinkedIn: <https://www.linkedin.com/in/johnyokim/>
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JULES OUELLETTE

Senior Cloud Solutions Architect
Microsoft Corporation

- Lives in Saskatoon, Saskatchewan, Canada
- Helping customers deploy solutions to Azure.
- Have done a little bit of everything over 20 years in IT. Networking, integration, application development, infrastructure design, analytics.
- Part of a local "maker" community, have built 7 different 3d printers from scratch using a variety of materials (including recycled shelving!)
- Enjoys: Weightlifting in my garage, making things.
- LinkedIn: <https://www.linkedin.com/in/jules-ouellette/>
- GitHub: <https://github.com/jmo808>



CONNECTING

OBTAINING YOUR LAB DESKTOP

CONFIDENTIAL Designator

- Your lab VM is provided using a content delivery environment from Spektra Systems
- To obtain your Linux desktop you will need to register on the Spektra website
- You can access your lab VM by VNC to obtain a GUI console, or via SSH



Deploy & scale Microsoft Azure Cloud Native Infrastructures & applications with Red Hat Ansible

By: Microsoft

Welcome to **Deploy & scale Microsoft Azure Cloud Native Infrastructures & Applications with Red Hat Ansible!**

The lab content provided is in a hands-on lab format in the spirit of a formal "Hackathon". You will learn how to connect Ansible to Microsoft Azure and the concepts of third party application connectivity including the notion of service principals. You will deploy IaaS, PaaS and other Cloud Native workloads to the various different Azure solutions offerings shown below and subsequently be able to explore and manipulate the applications once they are live. As part of this lab, you will use the example playbooks found in the lab GitHub that provide the building blocks to extend your existing enterprise Ansible deployment to Azure.

The lab content will include deployment of the following Azure technologies:

- Application Gateway
- Azure Red Hat OpenShift
- Container Registry (ACR)
- CosmosDB
- Database for MySQL
- Functions (Serverless Computing)

Register Now

First Name*

Last Name*

Email*

Organization*

Country*

Microsoft or training providers may use your contact information to provide updates and special offers about Microsoft Azure and other Microsoft products and services. You can unsubscribe at any time. To learn more you can read the [Privacy Policy](#).

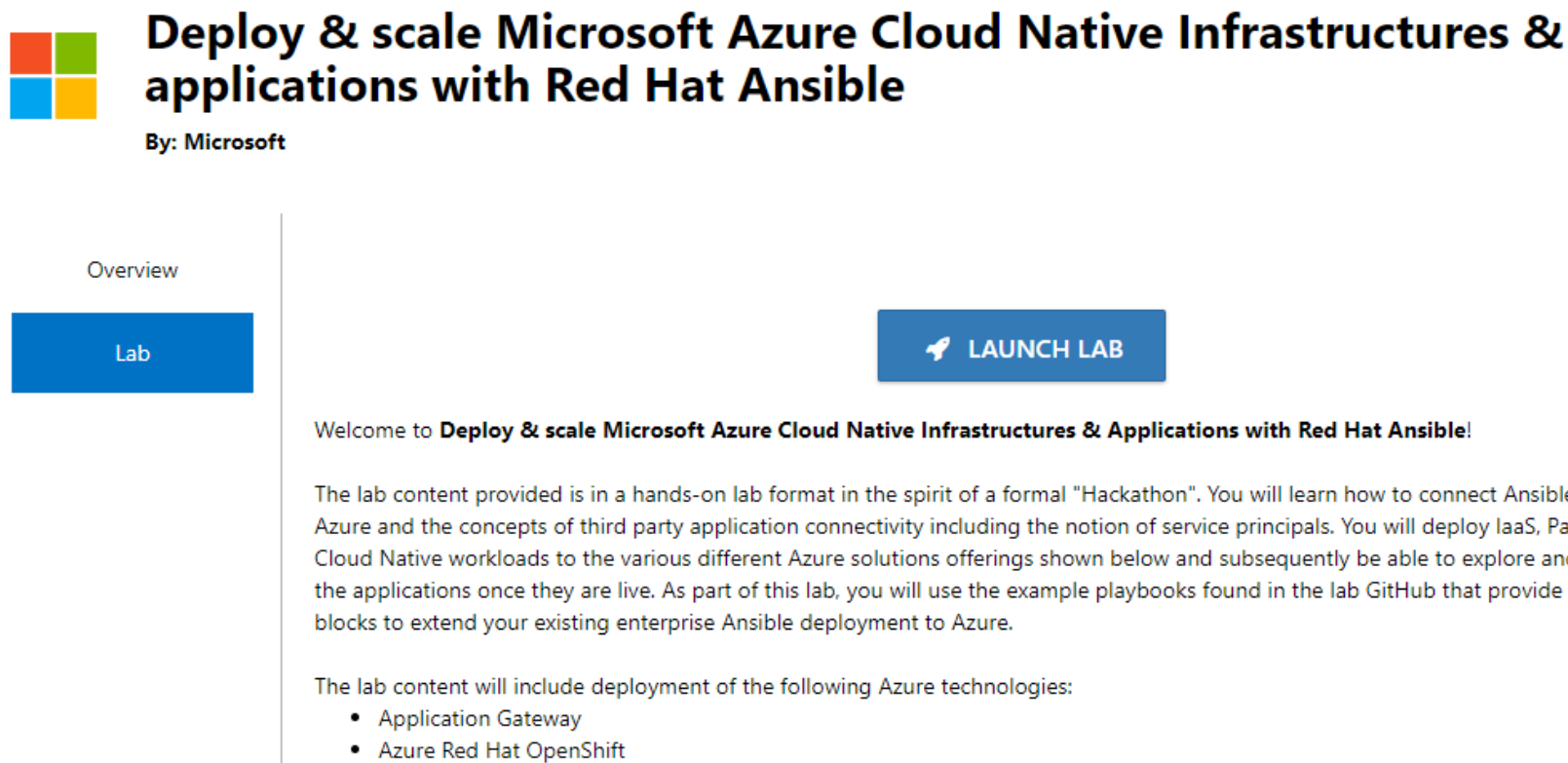
SUBMIT

<https://aka.ms/summitlab>

OBTAINING YOUR LAB DESKTOP

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- The login credential information for your lab will be available immediately
- Click the "LAUNCH LAB" button as shown:



Deploy & scale Microsoft Azure Cloud Native Infrastructures & applications with Red Hat Ansible

By: Microsoft

Overview

Lab

LAUNCH LAB

Welcome to **Deploy & scale Microsoft Azure Cloud Native Infrastructures & Applications with Red Hat Ansible!**

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The lab content will include deployment of the following Azure technologies:

- Application Gateway
- Azure Red Hat OpenShift

OBTAINING YOUR LAB DESKTOP

CONFIDENTIAL Designator

- The login credential information for your lab will be available immediately
- Click the "LAUNCH LAB" button as shown:

- For **VNC** connectivity, you will need the following:

VNC SERVER URL

PASSWORD

- For **SSH** connectivity, you will need the following:

HOST FQDN & PORT

ACCOUNT NAME & PASSWORD

- Connect to VNC SERVER URL via http / https
- All VNC & account passwords are **Microsoft**
- All other data is available on the lab VM

✓ Your On Demand Lab is ready (23 hour(s), 59 minute(s) remaining)

Environment Details Virtual Machines

Azure Credentials

Here are your credentials to login to Microsoft Azure and access the On Demand Lab

Username	odl_user_62317@msazurelabs.onmicrosoft.com	📄
Password	tcxu34HAZ*vZ	📄

Service Principal Details

Application/Client Id	91f0e59f-563c-48e0-829a-291d1a5ef950	📄
Application Display Name	https://odl_user_sp_62317	📄
Application Secret Key	pcfc84DVW*Zz	📄
Subscription Id	f9fd6f26-bbd3-4a77-a64a-e1f513a21f19	📄
Tenant Id	cefc8e7-ee30-49b8-b190-133f1daafd85	📄
Tenant Domain Name	msazurelabs.onmicrosoft.com	📄

Environment Details

Resource Group : 01-62317

VNC SERVER URL	http://master-vnc-desktop-vmip-y3jw5qknrf5yy.eastus.cloudapp.	📄
PASSWORD	Microsoft	📄

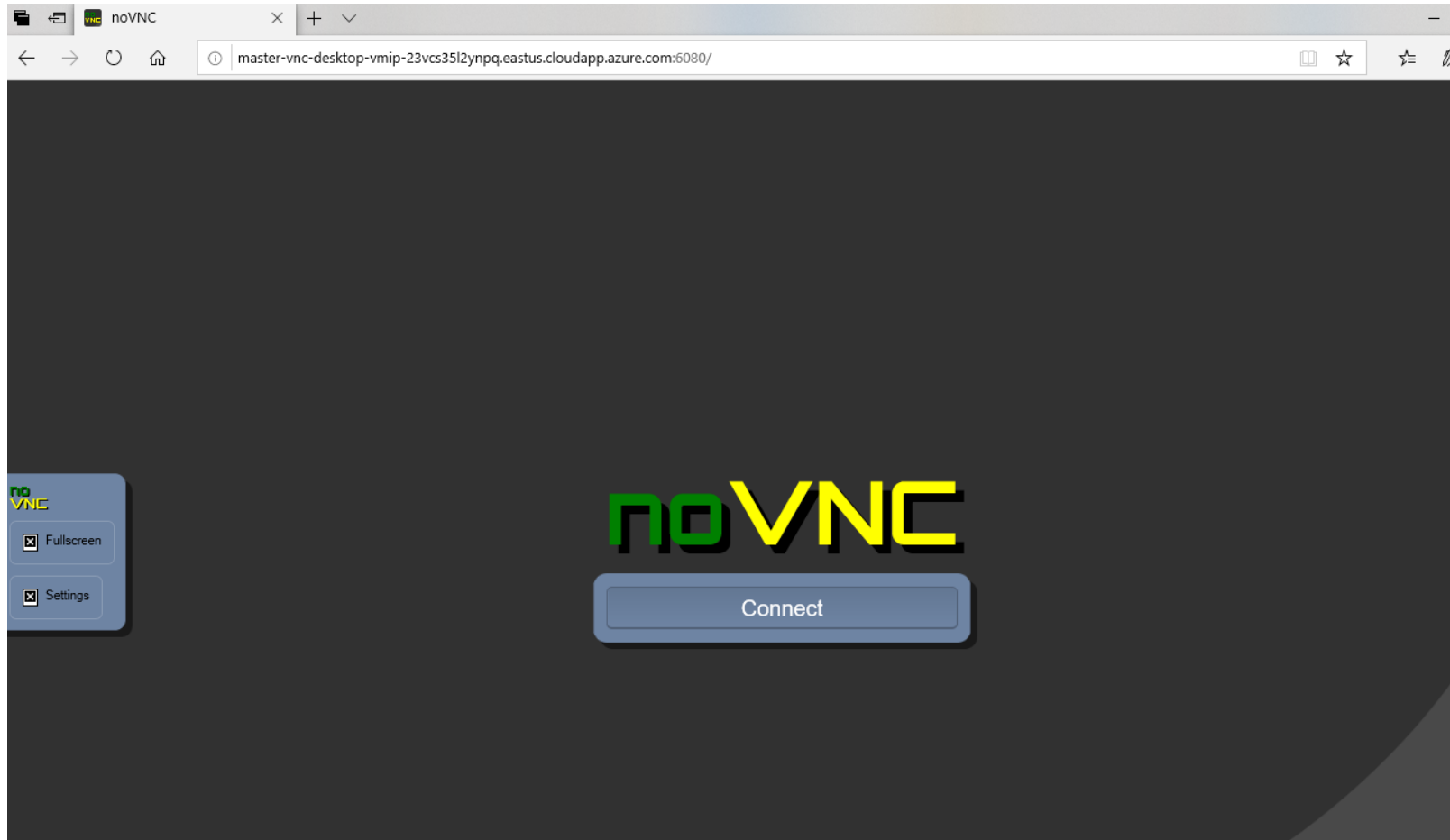
Lab Guide : <https://github.com/stuartatmicrosoft/RedHatSummit2019>

Help Document URL : <https://github.com/stuartatmicrosoft/RedHatSummit2019>

OBTAINING YOUR LAB DESKTOP WITH VNC

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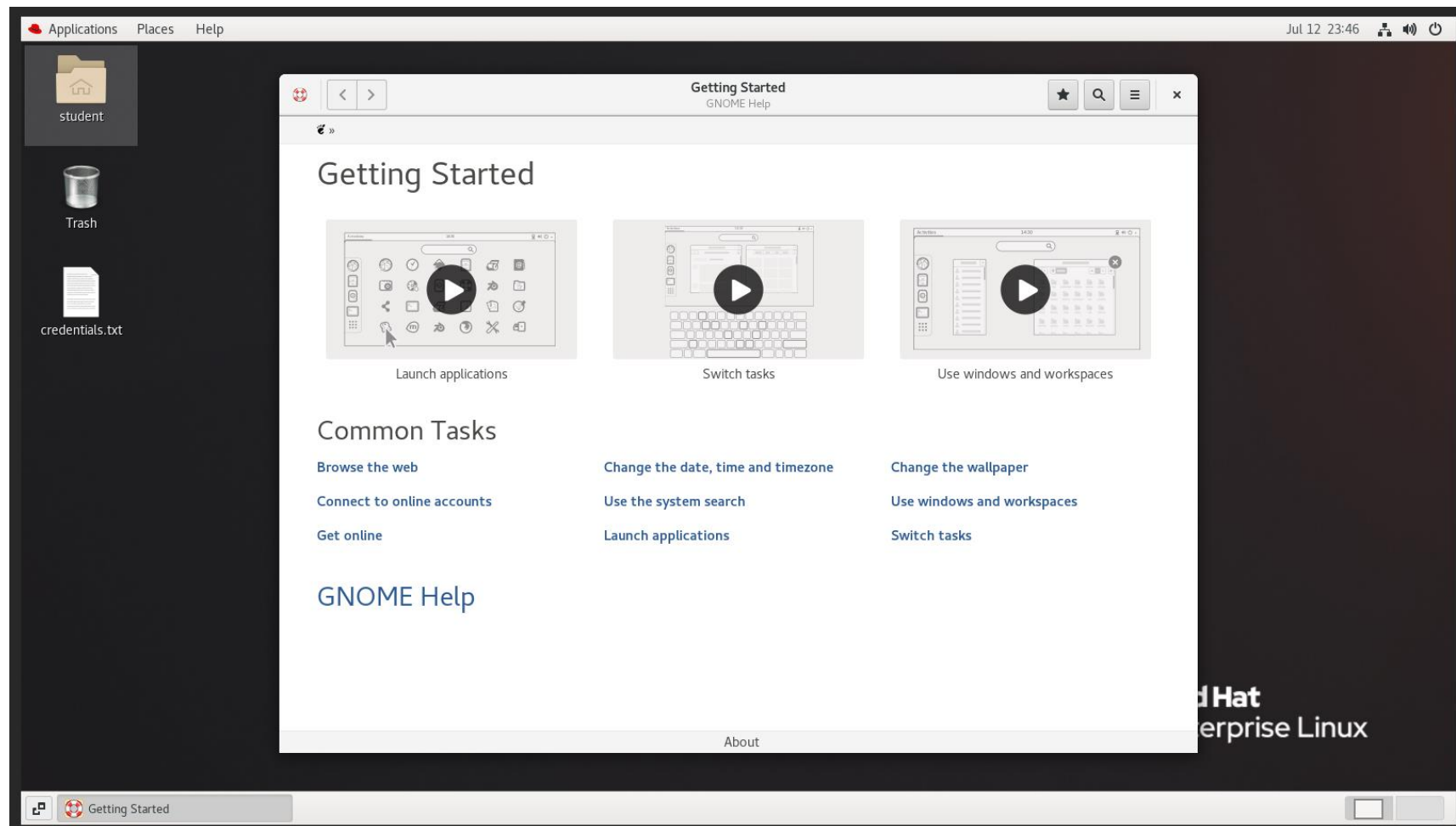
- Your VNCSERVERURL should produce a login page similar to the illustration below
- All VNC & account passwords are **Microsoft**



OBTAINING YOUR LAB DESKTOP WITH VNC

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- Your lab environment will be delivered from a RHEL 8.2, GNOME3-classic-based host
- All credential information is stored in the credentials.txt file



OBTAINING YOUR LAB DESKTOP WITH SSH

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- `ssh student@master-vnc-desktop-vmip-xxxxxxx.region.cloudapp.azure.com -p 2112`

```
[stkirk@stkirk-fedora ~]$ ssh student@master-vnc-desktop-vmip-3tobr7hzna6ri.southcentralus.cloudapp.azure.com
Warning: Permanently added 'master-vnc-desktop-vmip-3tobr7hzna6ri.southcentralus.cloudapp.azure.com' to the
list of known hosts.
Password:
Activate the web console with: systemctl enable --now cockpit.socket

This system is not registered to Red Hat Insights. See https://cloud.redhat.com/
To register this system, run: insights-client --register

Last login: Sat Apr 18 15:29:39 2020
[student@master-vnc-desktop ~]$ pip2.7 install --user ansible[azure]
Requirement already satisfied: ansible[azure] in ~/.local/lib/python2.7/site-packages
Requirement already satisfied: PyYAML in ~/.local/lib/python2.7/site-packages (from ansible[azure])
Requirement already satisfied: jinja2 in ~/.local/lib/python2.7/site-packages (from ansible[azure])
Requirement already satisfied: cryptography in ~/.local/lib/python2.7/site-packages (from ansible[azure])
Collecting azure-mgmt-storage==3.1.0; extra == "azure" (from ansible[azure])
  Downloading https://files.pythonhosted.org/packages/e8/d9/496b29857a252bc3fcc4bbda069c00-py2.py3-none-any.whl (696kB)
    100% |#####| 706kB 1.6MB/s
Collecting azure-common==1.1.11; extra == "azure" (from ansible[azure])
```


QUICK START

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The following commands, as part of the runbook, are a “quick start” to begin working on the labs

- Generate a GitHub personal access token per the instructions in the runbook
- `az login (VNC) --OR--`
- `az login -u odl_user_1234@something.onmicrosoft.com -p Pa$$w0rd! (SSH)`
- `git clone https://github.com/stuartatmicrosoft/RedHatSummit2020`
- `cd RedHatSummit2020/playbooks`

PLEASE VIEW / DOWNLOAD THE RUNBOOK AT THE GITHUB:

<https://github.com/stuartatmicrosoft/RedHatSummit2020/blob/master/lab-runbook.pdf>

API Address for Azure Red Hat OpenShift:

`https://api.lmxcn96t.eastus.aroapp.io:6443`

Please be sure you have this URL prior to executing the `lab-build.sh` script

The `lab-build.sh` script will provide you with a unique username for access to Azure Red Hat OpenShift. **Please write this down!**

Overall

- Set the default Azure Linux CLI output type to "3 - Table" by using the "az configure" command
- The Azure credentials are in the file "credentials.txt" on the desktop / in the "Desktop" directory
- DO NOT DELETE any assets in your resource group beginning with master-vnc- or you will lose your Linux VM and your lab will be over!
- Lab environments will be available for 3 hours and cannot be re-provisioned after that time
- Some labs take a long period of time to run; Feel free to move on to a second lab and work concurrent

For VNC Users

- It is recommended that you stay entirely within the noVNC environment
- If you need to access a web browser, use the Firefox web browser already loaded on your lab VM host
- Copying and pasting content in/out of the lab VM is very cumbersome

For SSH Users

- Make sure that you connect to your host using port 2112 with the username "student"
- To log in to the Azure Linux CLI you need to use the command: "az login -u odl_user_1234@something.onmicrosoft.com -p 5om3-cr4zyPa\$\$w0rd!".

LAB CONTENT OVERVIEW

THERE ARE TWO WAYS TO RUN OPENS SHIFT ON AZURE

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OpenShift Container Platform on Virtual Machines

- Deploy through <https://cloud.redhat.com/openshift>
- Self-managed on infrastructure as a service (IaaS)
- Bring your own license

Azure Red Hat OpenShift

- Deployed through the Azure Portal or the Azure CLI
- Fully-managed and supported Red Hat OpenShift platform
- Billing integrated in your Azure subscription

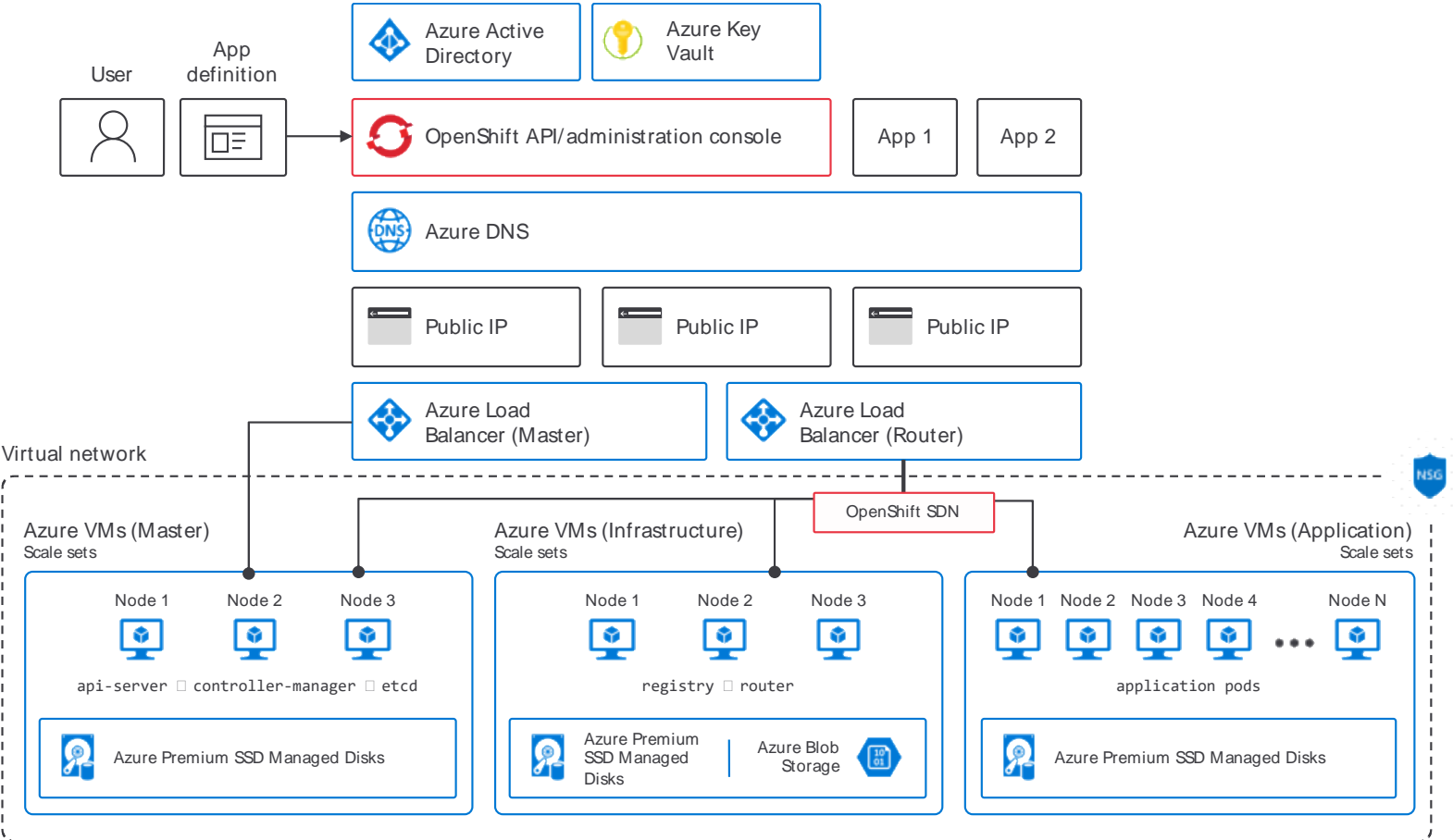
OPENSIFT CONTAINER PLATFORM ON VMs

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Responsibilities

User management	■
Project and quota management	■
Application lifecycle	■
Cluster creation	■
Cluster management	■
Monitoring and logging	■
Network configuration	■
Software and security updates	■
Platform support	■

■ Customer ■ Microsoft and Red Hat



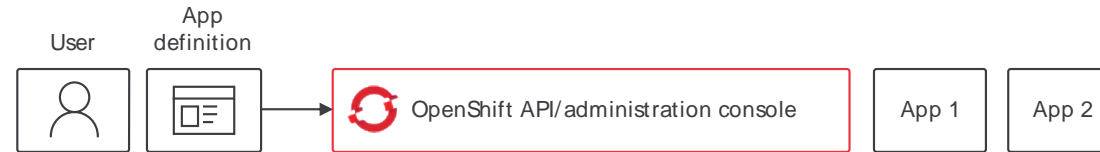
FULLY MANAGED CLUSTERS WITH AZURE RED HAT OPENSIFT

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Responsibilities

User management	■
Project and quota management	■
Application lifecycle	■
Cluster creation	■
Cluster management	■
Monitoring and logging	■
Network configuration	■
Software and security updates	■
Platform support	■

■ Customer ■ Microsoft and Red Hat



Let **Microsoft** and **Red Hat**...

Manage all your clusters

Monitor and operate your VMs

Secure your nodes

Manage environment patches

LAB OVERVIEW – Azure Red Hat OpenShift

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Summary:

Deploy various applications into an existing Azure Red Hat OpenShift cluster

Lab Goals:

- Login and obtain access to Azure Red Hat OpenShift
- Create OpenShift projects (namespaces) for the two applications to be deployed
- Deploy an application using Source-To-Image capabilities of OpenShift and monitor the output logs
- Switch projects to deploy the second application (Microsoft SQL Server 2017)
- Create an OpenShift secret to house the administrator password for the database
- Apply a persistent volume claim & configuration to deploy Microsoft SQL Server 2017

Playbooks:

aro-00-login-namespace.yml (0m12s)

aro-01-deploy-mssql-server.yml (0m10s)



LAB OVERVIEW – High Performance Computing

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Summary:

Create an Infiniband enabled HPC cluster and test intra-VM latency

Lab Goals:

- Create a master node to serve as an NFS master for the HPC compute nodes
- Create three compute nodes utilizing Azure's Infiniband VM interconnects
- Measure the latency between TCP and DAPL-based connections using Intel MPI

Playbooks:

- hpc-00-cluster-master-deploy.yml (2m59s)
- hpc-01-cluster-master-configure.yml (4m4s)
- hpc-02-cluster-compute-deploy.yml (8m44s)
- hpc-03-cluster-compute-configure.yml (3m34s)

LAB OVERVIEW – Big Data (HDInsight)

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Summary:

Deploy a platform based Big Data solution & Perform various queries

Lab Goals:

- Create an HDInsight Cluster
- Explore the resulting configuration
- Perform several manual queries on the sample data sets

Playbooks:

- `hdinsight-40-create-hdinsight.yml` (18m38s)

LAB OVERVIEW – Azure Kubernetes Service (AKS)

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Summary:

Deploy an application which uses microservices to provide various earth/climate related details

Lab Goals:

- Create a managed AKS instance in Azure
- Obtain Kubernetes credentials from Azure & merge into ~/.kube
- Create an Azure Container Registry
- Build / Tag / Push containers to Azure Container Registry using Podman
- Deploy the Kubernetes configuration files

Playbooks:

- aks-00-create-aks-cluster.yml (7m47s)
- aks-01-create-acr.yml (0m12s)
- aks-02-build-tag-push.yml (2m40s)
- aks-03-deploy-k8s.yml (0m50s)

LAB OVERVIEW – Azure Web Apps / NoSQL

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Summary:

Modernize a local infrastructure application to a platform-based service

Lab Goals:

- Containerize a NodeJS Application running locally on your desktop
- Use Azure Container Registry to store the container
- Create an Azure CosmosDB (MongoDB)
- Export data from a local MongoDB and import into Azure CosmosDB
- Create an Azure Web Application to consume the containerized application in ACR

Playbooks:

- todo-00-create-acr.yml (0m9s)
- todo-01-create-cosmosdb.yml (4m45s)
- todo-02-create-appservice-plan.yml (0m11s)
- todo-03-create-azure-webapp.yml (0m30s)

LAB OVERVIEW – Azure Functions (Serverless)

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Summary:

Run Ansible as a container-based function app on Azure. Create entire serverless pipeline triggered from GitHub, including static web page to test it using Azure Storage.

Lab Goals:

- Create function app Docker image in Azure Container Registry using ACR task
- Create function app using image from ACR
- Create a static web page utilizing function app using Azure Storage

Playbooks:

- fa-00-create-image.yml
- fa-01-create-function-app-from-acr.yml
- fa-02-create-website.yml

LAB OVERVIEW - IaaS / PaaS / Application Deploy

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Summary:

Deploy a highly available application using IaaS / PaaS / Auto Scaling

Lab Goals:

- Configuring Infrastructure and Platform services on Azure with applications
- Creating a disk image to scale the infrastructure node
- Using virtual machine scale sets and Azure application gateway for resiliency

Playbooks:

- mm-00-prerequisites.yml (16m25s)
- mm-01-vm-deploy.yml (3m24s)
- mm-02-create-mysql.yml (3m10s)
- mm-03-setup-mattermost.yml (1m44s)
- mm-04-create-vm-image.yml (1m11s)
- mm-05-vmss-create.yml (3m37s)
- mm-06-appgateway-attach.yml (6m2s)

BREAKOUT ROOMS

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Summary:

- We will have our “main” BlueJeans room to share content, live video, and as a Q&A live chat
- For attendees that need assistance with any of the lab components, please make your request in the Q&A live chat
- Depending on the depth of resolution and what is currently being discussed, it will either be answered quickly in the “main” forum, or you will be directed to one of the breakout rooms below
- One of the presenters or proctors will join you in the breakout room to work with you 1:1 to unblock you and answer any questions you have.
- Please wait until directed to join a breakout room by the moderator in the live chat

Links to Breakout Rooms:

- <https://aka.ms/summitbreakout1>
- <https://aka.ms/summitbreakout2>
- <https://aka.ms/summitbreakout3>

Don't forget to return back to the “main” BlueJeans Primetime room when you are finished in your 1:1 Breakout Room!

<https://aka.ms/ansibleazurelab>

REPLICATING YOUR OWN LAB ENVIRONMENT

REPLICATING YOUR OWN LAB ENVIRONMENT

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Replicating this environment in your own subscription is relatively simple and can be done using the Azure Linux CLI:

- `az group create -n 'rg_name' -l 'eastus'` (Pick your closest Azure Data Center)
- `az group deployment create --template-uri https://raw.githubusercontent.com/stuartatmicrosoft/RedHatSummit2020/master/provision-scripts/deploy-01.json --parameters https://raw.githubusercontent.com/stuartatmicrosoft/RedHatSummit2020/master/provision-scripts/deploy-01.parameters.json -g rg_name`
- `az vm list -d | grep master-vnc | awk '{print $6}'`
- You will need to create your own service principal to connect Ansible to Azure
- Connect to this FQDN via http or https on port 6080 or SSH to the VM on port 2112

IMPORTANT LINKS

IMPORTANT LINKS – ENJOY THE LAB !!!

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Important Links:

- Runbook: <https://github.com/stuartatmicrosoft/RedHatSummit2020/blob/master/lab-runbook.pdf>
- Obtain lab desktop: <https://aka.ms/summitlab>
- Azure Red Hat OpenShift API URL:
<https://api.lmxcn96t.eastus.aroapp.io:6443> (needed for lab-build.sh)
- Azure Red Hat OpenShift Console:
<https://console-openshift-console.apps.lmxcn96t.eastus.aroapp.io>

Links to Breakout Rooms:

- <https://aka.ms/summitbreakout1>
- <https://aka.ms/summitbreakout2>
- <https://aka.ms/summitbreakout3>

Blue Jeans Primetime “Main Forum”

<https://aka.ms/ansibleazurelab>



Red Hat
Summit

Thank you



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