#ANSIBLEFEST2019

Take Control of Containers in the Public Cloud

Stuart Kirk, Cloud Native / Open Source Black Belt
Zim Kalinowski, Senior Software Engineer

Red Hat | ANSIBLE

STUART KIRK

Cloud Native Technical Specialist
Open Source Black Belt
Microsoft Corporation

- Home: Ann Arbor, Michigan
- Entirety of Career in Open Source: Dell, Cisco, Red Hat
- Joined Microsoft & Started with Ansible in 2016
- First RHCA hired by Microsoft
- Core focus is OpenShift on Azure & OSS
- Favorite thing to do with Ansible: Extending on-premise Ansible deployments seamlessly into Microsoft Azure

- Twitter: @StuartAtMSFT
- LinkedIn: https://www.linkedin.com/in/stuartkirk

ZIM KALINOWSKI

Software Engineer
Microsoft Corporation

- Home: Shanghai, China
- Working on Open Source, previously involved mostly in Embedded Systems
- Started with Ansible in 2017
- Favorite thing to do with Ansible: new modules
- Big fan of American BBQ & Craft Beer

- Twitter: @ZimOnAzure
- LinkedIn: https://www.linkedin.com/in/smarterphone/

Housekeeping/ Prep Work!

Agenda & Playbooks

AGENDA

- Building containers with Docker
- Uploading containers to Azure Container Registry (ACR) and Docker Hub
- Running containers using Azure Container Instance (ACI)
- Using the managed Azure Kubernetes Service (AKS)
- Build Azure Red Hat OpenShift (ARO) cluster in 10 minutes
- Deploy Container to ARO using Ansible
- Other OpenShift on Azure Options

PLAYBOOKS

• 00-prereqisites.yml	Create Azure Resource Group
• 01-build-and-push-to-dockerhub.yml	Build ARO Container & Push to Dockerhub
• 02-build-acr-image.yml	Build ACR, Container & Connect to GitHub
• 03-create-container-instance.yml	Create Azure Container Instance
• ***04-aks-create.yml (Housekeeping)***	Create Azure Kubernetes Service cluster
• ***05-cosmosdb-deploy.yml (Housekeeping)***	Create Azure CosmosDB for MongoDB
• 06-aks-deploy.yml	Deploy Voting App definition to AKS
• 07-create-aro.yml	Create Azure Red Hat OpenShift cluster
• 08-aro-deploy.yml	Deploy container to ARO

Let’s Start the Demonstrations!

Container Ecosystems & Azure Red Hat OpenShift

CONTAINER ECOSYSTEMS IN AZURE

App Service

Deploy web apps or APIs using containers in a PaaS environment

Service Fabric

Modernize .NET applications to microservices using Windows Server containers

Kubernetes Service

Scale and orchestrate Linux containers using Kubernetes

Container Instance

Elastically burst from your Azure Kubernetes Service (AKS) cluster

Azure Red Hat OpenShift

Deploy a fully-managed OpenShift cluster with ARO or choose to run OpenShift on IaaS

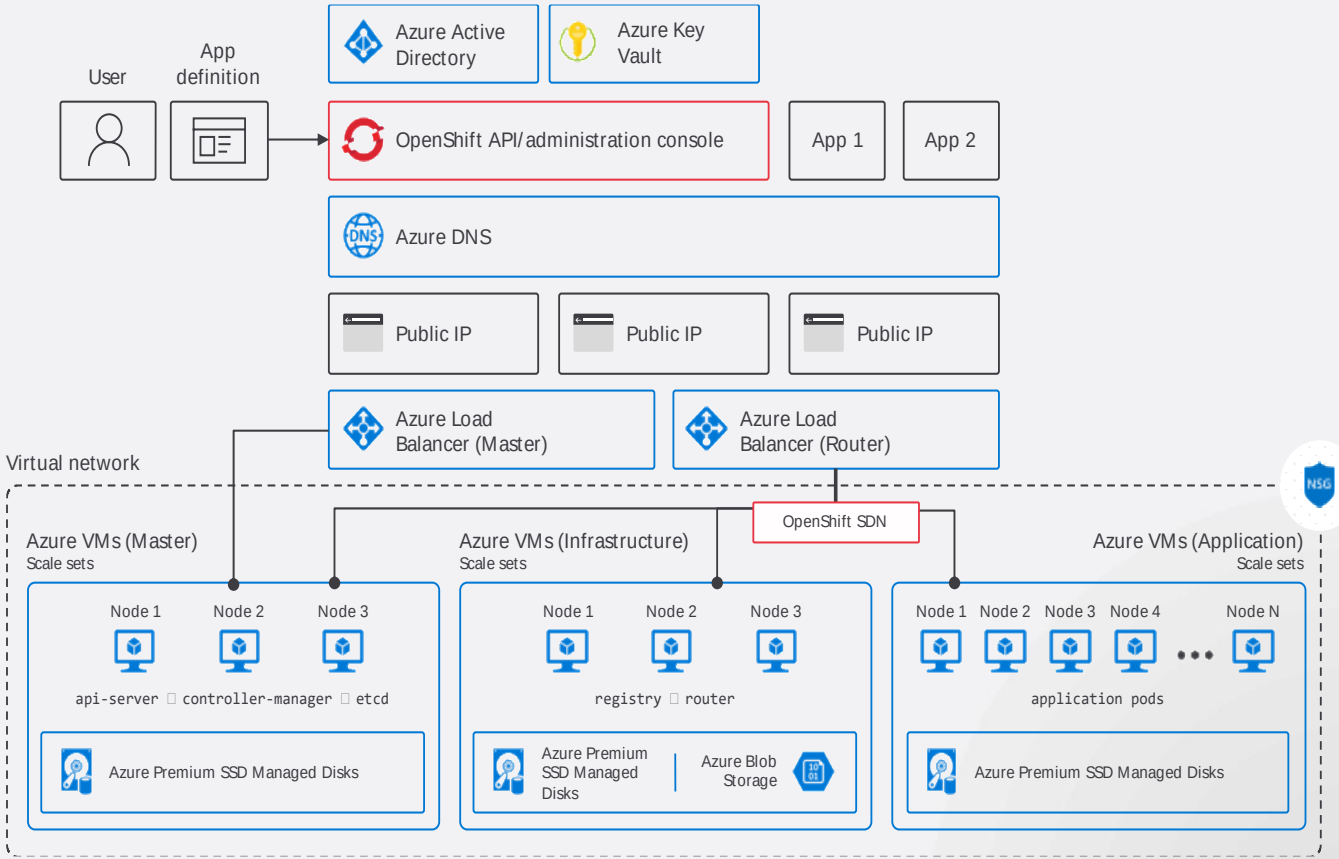
Azure Container Registry

Docker Hub

RUNNING YOUR OWN OPENSHIFT IN AZURE (IaaS)

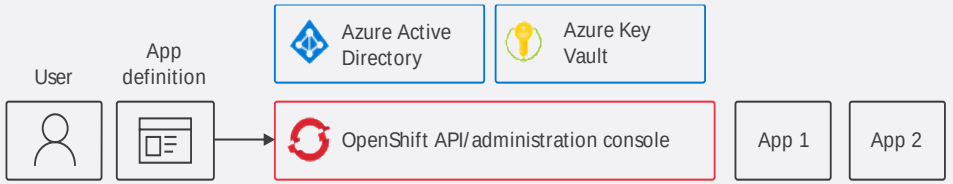
Responsibilities

User management	Customer
Project and quota management	Customer
Application lifecycle	Customer
Cluster creation	Customer
Cluster management	Customer
Monitoring and logging	Customer
Network configuration	Customer
Software and security updates	Customer
Platform support	Microsoft and Red Hat



SIMPLIFY CLUSTER OPS WITH AZURE REDHAT OPENSHIFT

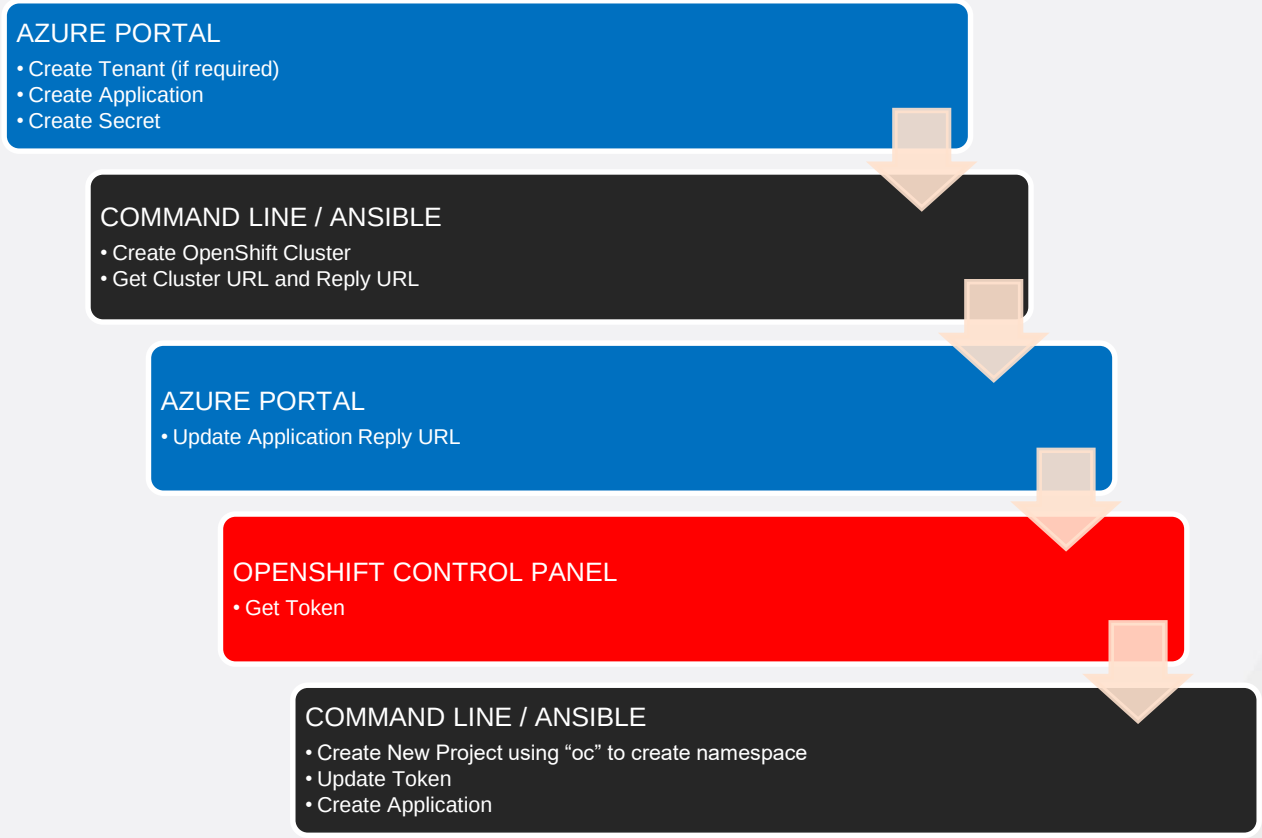
Responsibilities	
User management	Customer
Project and quota management	Customer
Application lifecycle	Customer
Cluster creation	Microsoft and Red Hat
Cluster management	Microsoft and Red Hat
Monitoring and logging	Microsoft and Red Hat
Network configuration	Microsoft and Red Hat
Software and security updates	Microsoft and Red Hat
Platform support	Microsoft and Red Hat



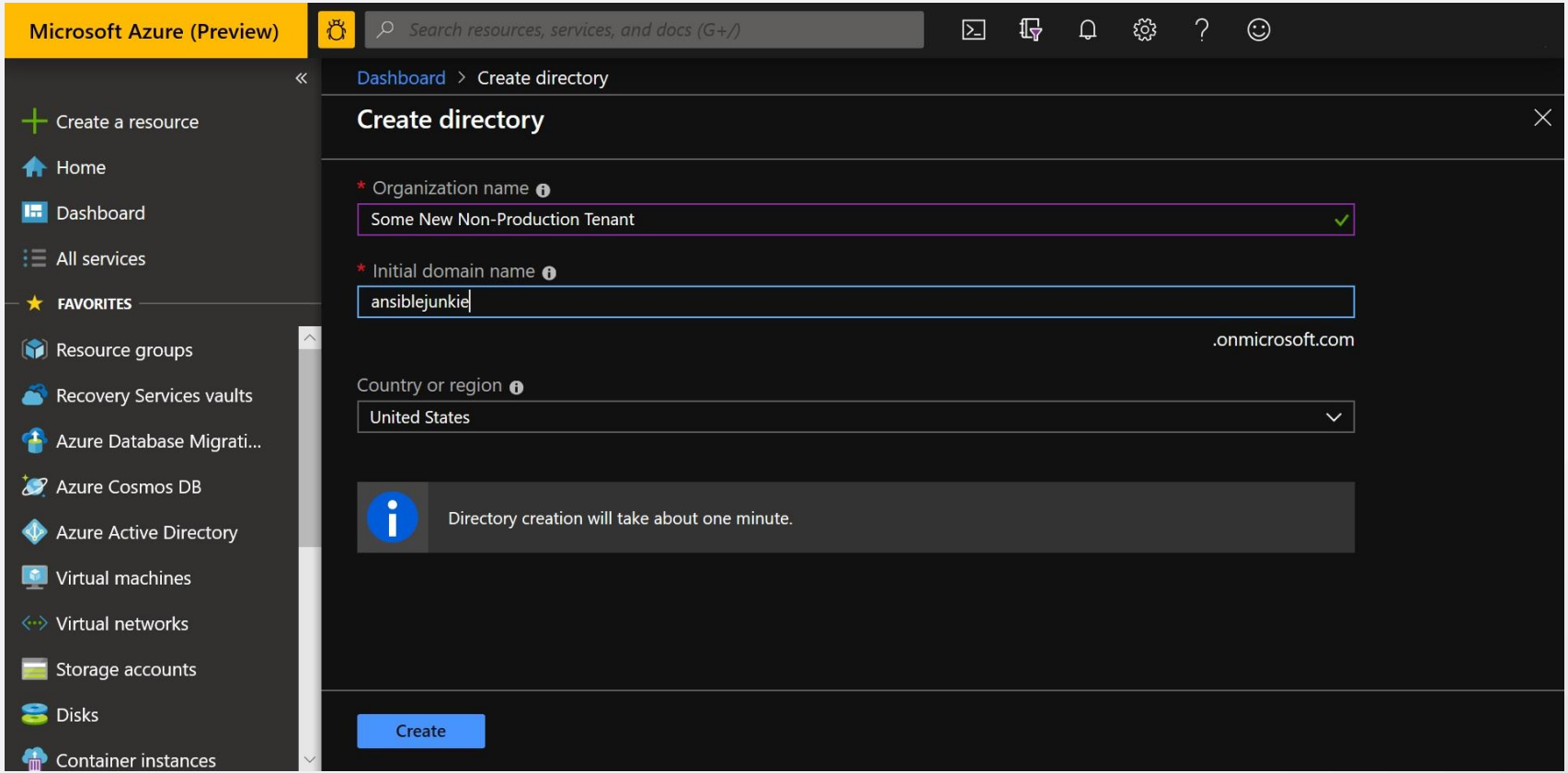
Let Microsoft and Red Hat…

- Manage all your clusters
- Monitor and operate your VMs
- Secure your nodes
- Manage environment patches

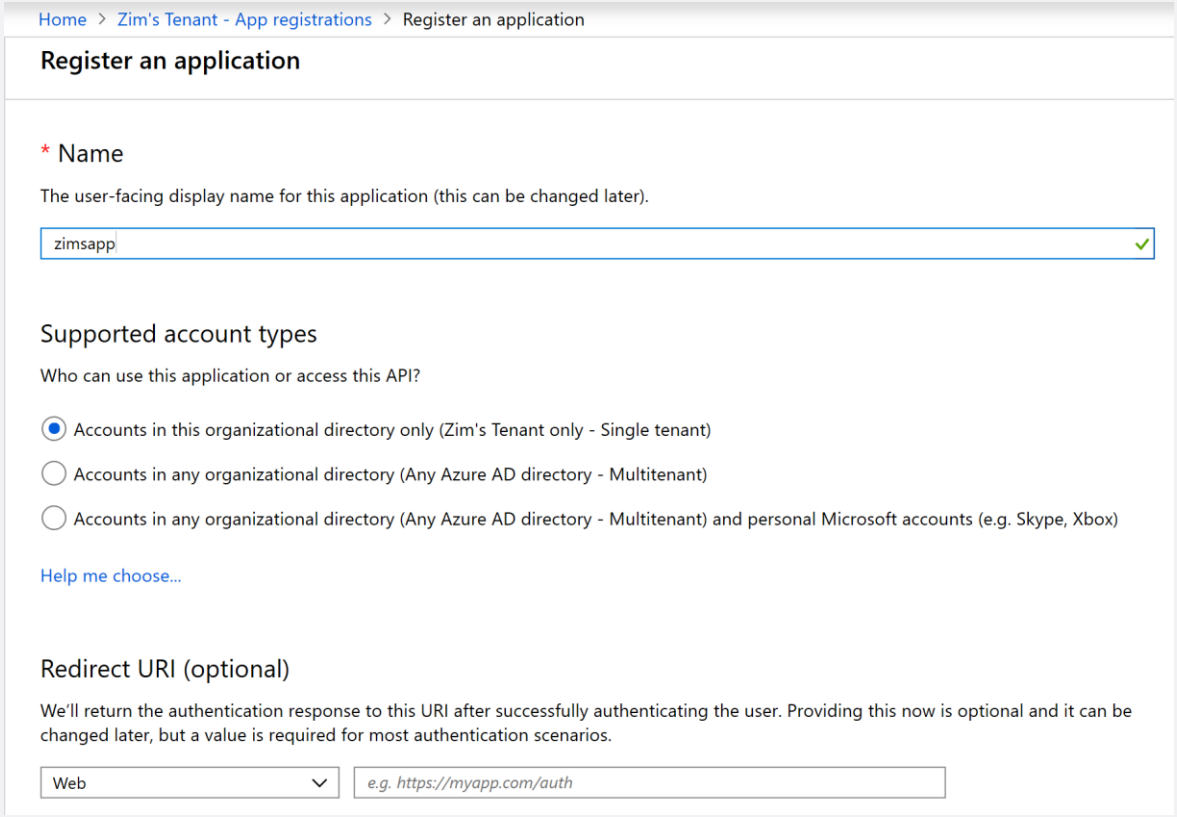
Setting Up OpenShift



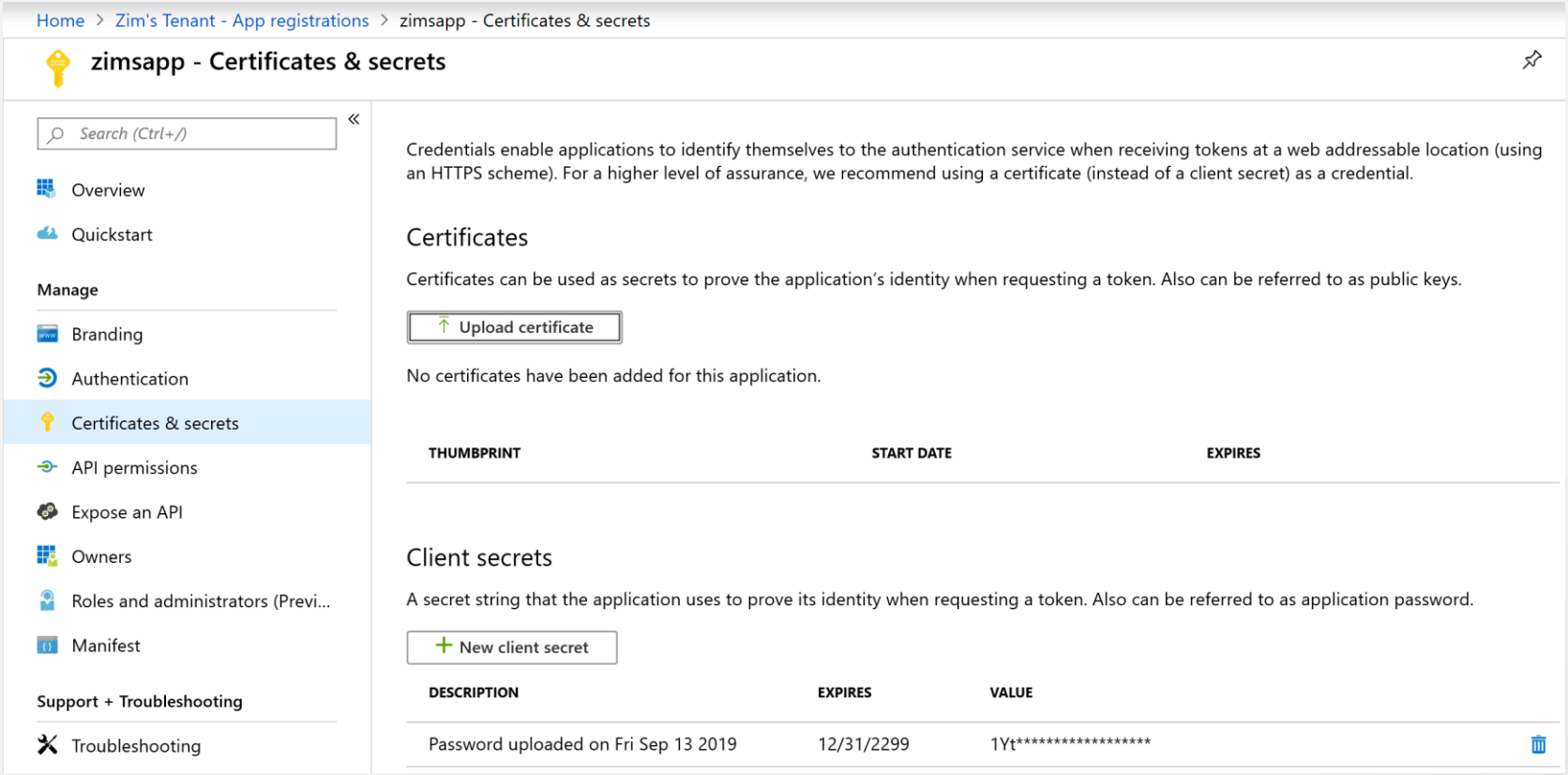
CREATE NEW TENANT FOR OPENSHIFT



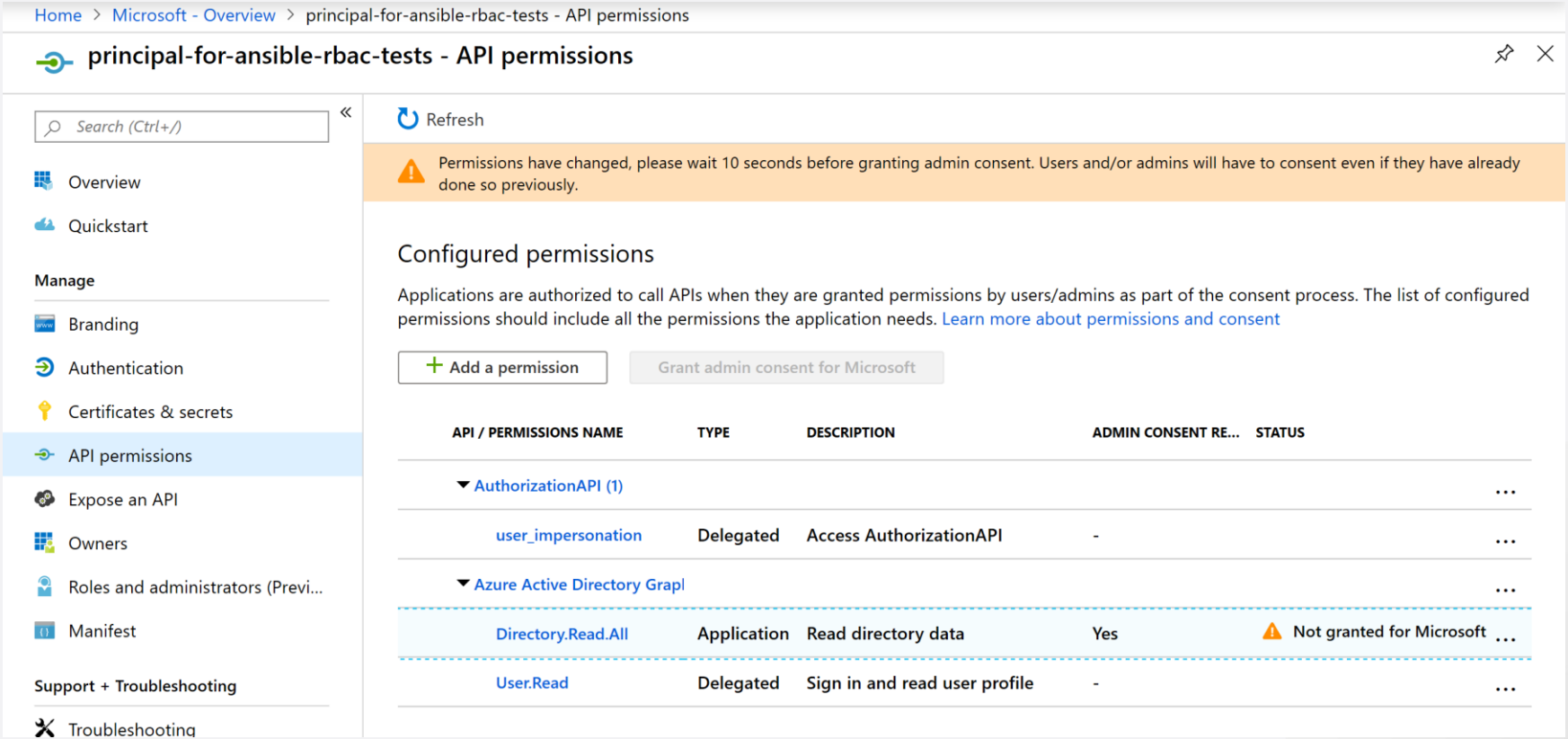
CREATE APPLICATION



CREATE SECRET



Setting RBAC Permissions for OpenShift



OTHER OPENSHIFT ON AZURE OPTIONS

OpenShift 3.x (IaaS)

- Build with Azure ARM templates –OR-
- Build with Ansible
- https://github.com/Microsoft/openshift-container-platform
- az group deployment create -g ocp3-iaas --template-file openshift-iaas-deploy.json --parameters openshift-iaas-deploy.parameters.json

OpenShift 4.x (IaaS)

- Build with Azure CLI
- Use custom installer provided by Red Hat
- https://bit.ly/2mEqLz6
- https://github.com/openshift/installer/blob/master/docs/user/azure/README.md
- https://cloud.redhat.com/openshift/install/azure/installer-provisioned

Replicating the environment in your Azure subscription

PREPARING THE ANSIBLE VM

Create Azure Resource Group

- az group create -l eastus -n ansibleatl

Create Virtual Machine

- az vm create -g ansibleatl -n ansibleatl --public-ip-address-dns-name ansibleatl --image OpenLogic:CentOS-LVM:7-LVM:7.6.20190130 --authentication-type password --accelerated-networking true --size Standard_D2_v2 --admin-username ansibleatl

Open Network Security Group to allow port 2112 (alternate SSH port)

- az network nsg rule create -g ansibleatl --nsg-name ansibleatlNSG --name allow-ssh2112 --description "Allow SSH Port 2112" --access Allow --protocol Tcp --direction Inbound --priority 110 --source-address-prefix "*" --source-port-range "*" --destination-address-prefix "*" --destination-port-range "2112"

INSTALLING ANSIBLE & THE AZURE MODULES

- sudo pip install --upgrade pip
- sudo pip install ansible==2.8.5
- sudo pip install ansible[azure]
- sudo pip install docker
- sudo pip install --ignore-installed kubernetes
- sudo pip install openshift

```
[root@ansibleatl ~]# pip install ansible[azure]
DEPRECATION: Python 2.7 will reach the end of its life on January 1st, 2020. Please upgrade your Python as Python 2.7 won
Python 2 support in pip, can be found at https://pip.pypa.io/en/latest/development/release-process/#python-2-support
Requirement already satisfied: ansible[azure] in /usr/lib/python2.7/site-packages (2.8.5)
Requirement already satisfied: jinja2 in /usr/lib64/python2.7/site-packages (from ansible[azure]) (2.10.1)
Requirement already satisfied: PyYAML in /usr/lib64/python2.7/site-packages (from ansible[azure]) (3.10)
Requirement already satisfied: cryptography in /usr/lib64/python2.7/site-packages (from ansible[azure]) (2.7)
Collecting packaging (from ansible[azure])
  Downloading https://files.pythonhosted.org/packages/ec/22/630ac83e8f8a9566c4f88038447ed9e16e6f10582767a01f31c769d9a71e/
Collecting requests[security] (from ansible[azure])
  Downloading https://files.pythonhosted.org/packages/51/bd/23c926cd341ea6b7dd0b2a00aba99ae0f828be89d72b2190f27c11d4b7fb/
     |████████████████████████████████| 61kB 19.8MB/s
Collecting azure-cli-core==2.0.35 (from ansible[azure])
  Downloading https://files.pythonhosted.org/packages/ee/81/561473d6614d15f450eba6b7c8e0e1fbbaf34bf117fe77c1188010870e24/
     |████████████████████████████████| 92kB 26.7MB/s
Collecting azure-cli-nspkg==3.0.2 (from ansible[azure])
  Downloading https://files.pythonhosted.org/packages/7c/94/cf884b92a870422f02c3f1f86573d04d5cc1abdc2ac51b8419c7ee2e2a00/
```

CREATING A SERVICE PRINCIPAL & CONNECTING TO AZURE

- az account list
- az ad sp create-for-rbac --name="stkirk-ansiblefest" --role="Contributor" --scopes="/subscriptions/x"

- echo "export AZURE_CLIENT_ID=" >> $HOME/.bashrc
- echo "export AZURE_SECRET=" >> $HOME/.bashrc
- echo "export AZURE_SUBSCRIPTION_ID=" >> $HOME/.bashrc
- echo "export AZURE_TENANT=" >> $HOME/.bashrc

```
[stkirk@stkirk-fedora ~]$ az ad sp create-for-rbac --name="stkirk-ansiblefest" --role="Contributor" --scopes="/subscriptions/wh7e5gd8-92h4-93f7-q8d4-t56295hf73bb"
AppId                                 DisplayName         Name                        Password                              Tenant
------------------------------------  ------------------  --------------------------  ------------------------------------  ------------------------------------
52f8ba96-21rq-7265-z383-e6ee22d6j8ea  stkirk-ansiblefest  http://stkirk-ansiblefest  72962831-2720-4hew-y297-11812e9a8f00  07f720fe-11r4-58er-84be-2d7az071ye00
```

- source $HOME/.bashrc

OTHER ANSIBLE MODULES FOR AZURE

- Availability Sets
- Azure Container Instance (ACI)
- Azure Container Registry (ACR)
- Azure Function App
- Azure Key Vault
- Azure Kubernetes Service (AKS)
- Azure Red Hat OpenShift (ARO)
- Creating System Images
- Load Balancers
- Network Security Groups (NSGs)
- SQL / MySQL / PostgreSQL (PaaS Services)
- Virtual Machine Extension
- Virtual Machine Scale Sets (VMSS)

- Azure REST API

USEFUL LINKS

Ansiblefest 2019 GitHub:
- https://www.github.com/stuartatmicrosoft/Ansiblefest2019

Execution Script:
- https://github.com/stuartatmicrosoft/Ansiblefest2019/blob/master/execution-script.sh

Azure Modules:
- https://github.com/ansible/ansible/tree/devel/lib/ansible/modules/cloud/azure

Visual Studio Code Extension:
- https://marketplace.visualstudio.com/items?itemName=vscoss.vscode-ansible

Azure Preview Modules:
- https://galaxy.ansible.com/Azure/azure_preview_modules/

USEFUL LINKS

Azure Playbook Samples
- https://github.com/Azure-Samples/ansible-playbooks

Ansible Labs / Stuart's GitHub
- https://github.com/Microsoft/AnsibleLabs
- https://github.com/stuartatmicrosoft

IRC
- #ansible-azure (Freenode)
- https://webchat.freenode.net/?channels=ansible-azure

Help us by giving us feedback:
https://aka.ms/ansiblefest2019

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THANK YOU

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twitter.com/ansible

Survey
https://aka.ms/ansiblefest2019