



Azure CLI



About me

- Justin VanWinkle
- Very early hire of Switchboard Live
 - <https://switchboard.live>
 - Theoretical Title: Doer of What Needs to be Done
 - Actual Titles:
 - Software Developer
 - Interim Infrastructure Lead
- Lover of containerization



Switchboard & Azure

- **Joined Switchboard when infrastructure was very young**
 - All apps on Azure App Services
 - Great for early stages!
 - Our specific needs required something more
- **Set up our automations**
 - Builds
 - Deployments <- Azure CLI simplifies
 - Tasks <- these steps
- **Revamped critical parts of infrastructure**
 - Dynamic Scalability <- Made possible
 - Self healing <- by Azure
 - Regional redundancies & failovers <-

Overview

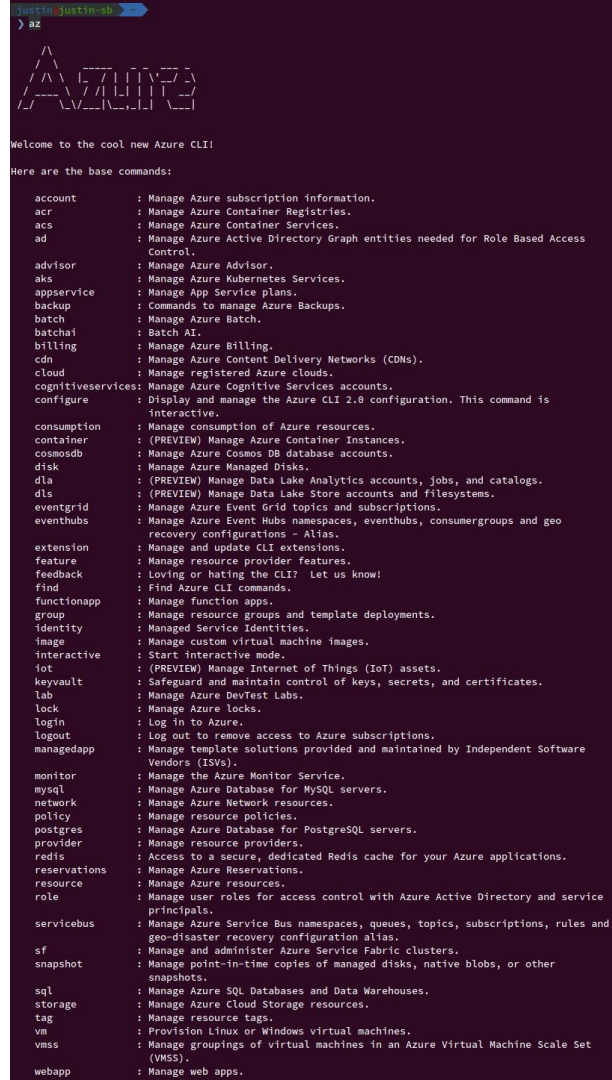
- **Azure CLI**
 - How to navigate
 - Deploying singletons
 - Deploying entire infrastructure
 - Azure Resource Manager Templates
 - Template Deployments
 - Post-deployment configuration with Cloud-Init
- **Using Make for sanity**
- **Demo - Docker Swarm on Azure**

Azure CLI

- Great tool for managing resources on Azure.
- Performs actions via Azure APIs.
- Contains functionality Azure Portal lacks.

Availability:

- Windows, MacOS, Linux
- Docker
- Azure Cloud Shell



Azure CLI - Jam Packed!

```
feedback      : Loving or hating the CLI?  Let us know!  
find          : Find Azure CLI commands.
```

How often do you see these in a CLI tool?

Azure CLI - Find

A powerful tool

- Returns relevant commands
- Great descriptions

```
justin@justin-sb ~  
> az find -q scale  
az batchai cluster auto-scale`  
    Set auto-scale parameters for a cluster.  
  
az aks scale`  
    Scale the node pool in a managed Kubernetes cluster.  
  
az vmss create`  
    Create an Azure Virtual Machine Scale Set.  
    For an end-to-end tutorial, see  
    https://docs.microsoft.com/azure/virtual-machine-scale-sets/virtual-machine-scale-sets-linux-create-cli.  
  
az acs scale`  
    Change the private agent count of a container service.  
  
az vmss scale`  
    Change the number of VMs within a VMSS.  
  
az batch pool autoscale disable`  
    Disables automatic scaling for a pool.  
  
az vmss delete`  
    Deletes a VM scale set.  
  
az monitor autoscale rule`  
    Manage autoscale scaling rules.  
    For more information on autoscaling, visit:  
    https://docs.microsoft.com/en-us/azure/monitoring-and-diagnostics/monitoring-understanding-autoscale-settings  
  
az monitor autoscale rule create`  
    Add a new autoscale rule.  
    For more information on autoscaling, visit:  
    https://docs.microsoft.com/en-us/azure/monitoring-and-diagnostics/monitoring-understanding-autoscale-settings  
  
az redis update`  
    Scale or update settings of a Redis cache.
```

Azure CLI - Deploying a Resource

Deploying a resource is simple:

```
justin@justin-sb > az vm create -n MyLinuxVM -g MyResourceGroup --image UbuntuLTS
```

Great for quick one-off deployments.

Azure CLI - Deploying Multiple Resources

Problem: “az <product> create ...”

- Creates 1 item at a time
- Configuration commonly required after deploy

Solution: “az group deployment create ...”

- Deploy entire infrastructure in single command
- Post-deploy configuration not necessary

```
az group deployment create \  
  --template-file ../templates/cluster.json \  
  --parameters @parameters/cluster.json \  
  --resource-group $(RESOURCE_GROUP) \  
  --name cli-$(LOCATION) \  
  --output table \  
  --
```

Azure CLI - Templates

- Version Controllable
- Highly Configurable
- Produces consistent duplications of infrastructure

```
{
  "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
  "contentVersion": "",
  "parameters": {  },
  "variables": {  },
  "resources": [  ],
  "outputs": {  }
}
```

Azure CLI - Parameters

- Data that is variable between deployments
- Sensitive data
- Anything you wouldn't want to version
- Dynamically generated
 - I use a python script to generate this
 - There are OSS alternatives

What is “managerCustomData”?

- Base-64 encoded Cloud-Init Config
- Post-Deployment Configuration Script
- Cloud-Init (<http://cloud-init.org>)

```
{
  "adminUsername": {
    "value": ""
  },
  "managerCount": {
    "value": 3
  },
  "managerCustomData": {
    "value": ""
  },
  "managerSize": {
    "value": "Standard_DS2_v2_Promo"
  },
  "saType": {
    "value": "Standard_LRS"
  },
  "environment": {
    "value": "production"
  },
  "location": {
    "value": "eastus"
  }
}
```

Azure CLI + Cloud Init



Cloud-Init performs post-deploy configuration actions

- You specify configuration
- Azure passes Cloud-Init configs to new VM
- When you scale, each new VM runs Cloud-Init config
- VM is up and ready to serve in minutes - identical to the last

Azure CLI + Make

AZ CLI is Often verbose

Makefiles to the rescue!

- Reduce ceremony
- Use in CI/CD pipeline
- Version Controllable

There are alternatives if you prefer

```
chaos-monkey:
```

```
az vmss list-instances \
  --resource-group $(RESOURCE_GROUP) \
  --name $(VMSS_NAME) \
  --query [].instanceId \
  --output tsv \
| shuf \
| xargs -I{} az vmss restart \
  --resource-group $(RESOURCE_GROUP) \
  --name $(VMSS_NAME) \
  --instance-id {} \
  --output table
```

```
list-endpoints:
```

```
az network public-ip list \
  --resource-group $(RESOURCE_GROUP) \
  --query '[].{dnsSettings:dnsSettings.fqdn}' \
  --output table
```

Azure CLI + Make

+1 for Make - Tab autocompletion!

```
justin@justin-sb ~/w/s/d/p/eastus  master : *  
> make  
-- make targets --  
build-nginx-proxy          deploy-nginx-proxy          deploy-staging-cloud-api  
chaos-monkey               deploy-production-accounts  deploy-staging-dev-api  
clean                     deploy-production-cloud-api  docker-login  
deploy-cert-distributor    deploy-production-dev-api    keys  
deploy-cluster            deploy-resource-group        kill-cert-distributor  
deploy-monitor            deploy-staging-accounts      kill-monitor  
-- make variables --  
SSH_KEY                    SSH_KEY_FILES
```

Recommendation:



Azure CLI - Demo

- **Deploy Application in Docker Swarm on Azure under 10 minutes.**
 - Deploy infrastructure
 - Set up Swarm visualizer (A management tool)
 - Deploy replicated application

Based on <https://github.com/rcarmo/azure-docker-swarm-cluster>

Demo

Questions?

Twitter: @jclayvan

Email: justin@switchboard.live

Switchboard Live: <https://switchboard.live>