Full Stack Azure Development

#### Preamble

(What are we doing)

#### First Epic

1. Containerization, Orchestration & Initial Web Application
   1. Deploy VM to Azure with Terraform to create workspace
      1. Services:
         1. Azure VM
         2. Azure Key Vault
         3. Azure Virtual Network – through Marketplace
         4. Azure Virtual Network Interface
         5. Azure Security Group, firewall rules
         6. Azure IAM: user accounts & roles
         7. Azure Service Principal
         8. Azure Resource Groups
         9. Azure Cost Management & Billing: Budget Alerts
         10. Azure Monitoring: VM metrics/alerts
   2. Configure backend services
      1. Create Virtual Network with Marketplace via Portal UI
      2. Create Network Interface via Azure CLI (Local machine)
      3. Create security groups via Portal UI
      4. Create Resource Groups via Portal UI
      5. Create Service Provider via Azure CLI (Local machine)
      6. Provision Users with IAM via Portal UI
   3. Configure workspace with Docker & Kubernetes
      1. Create Dockerfile and build image for containers in the workspace VM
      2. Create Kubernetes spec for creating deployment of application
   4. Application deployment
      1. Serve as Proof of Concept
      2. Deploy Bulletin Board application via Kubernetes
      3. Demonstrate interaction of Docker & Kubernetes pods
      4. Demonstrate interaction with application via browser
   5. Configure supporting services via Portal UI
      1. Setup billing alarm for usage
      2. Setup Auto shutdown (failsafe to remember to shut things down!)
      3. Setup metric alarms for VM usage: Storage, CPU and/or others
   6. Testing the stack
      1. Bring pods up and down
      2. Test metric alarms for proper response (email/text)

#### Sprint Plan

1. Configure Backend Service
   1. Objectives:
      1. Create Backlog Document
      2. Define deliverables & configuration details; add to backlog
      3. Setup all backend Services
      4. Document steps to create services
      5. Create/deploy VM with Terraform specification
      6. Update Backlog; burn-down list if necessary
2. Configure workspace with Docker & Kubernetes
   1. Objectives:
      1. Define deliverables & configuration details; update backlog
      2. Create Docker & Kubernetes specifications
      3. Upload application
      4. Run specifications (iterative with sprint 3
      5. Troubleshoot and resolve issues
      6. Document activity steps
      7. Update backlog; burn-down list if necessary
3. Application Deployment:
   1. Objectives
      1. Check burn-down list for remaining deployment actions on Docker/Kubernetes; Resolve outstanding deliverables
      2. Complete application deployment (iterative with Sprint 2)
      3. Test application usage
      4. Document activity steps
4. Configure supporting services & Test
   1. Objectives
      1. Complete any burn-down items from previous sprints
      2. Create supporting services
      3. Test Kubernetes deploy/redeploy
      4. Ensure application stability after redeploying
      5. Test any Alarms
      6. Document activity steps
      7. Complete documentation & submit Sat, 13 June before midnight

#### Process Documentation

# Sprint #1

|  |  |  |
| --- | --- | --- |
| **Activity** | **Specification** | **Status** |
| Create Resource Group | Name: UMLfullStackrg |  |
| Create User | Add user: developer |  |
| Install Azure CLI |  |  |
| Update User roles |  |  |
| Create Key Vault |  |  |
| Create Service Principal |  |  |
| Upload PEM to Key Vault |  |  |
| Test SP login |  |  |
| Create Net Security Group | Allow for traffic against the VM, expose only needed ports |  |
| Create virtual network | Name: umlnet |  |
| Create NICs |  |  |
| Create & Deploy Terraform |  |  |
| Test VM functionality & Access |  |  |

# Sprint #2

|  |  |  |
| --- | --- | --- |
| **Activity** | **Specification** | **Status** |
| Upload application code |  |  |
| Create Dockerfile |  |  |
| Build Docker image |  |  |
| Configure kubectl |  |  |
| Create Kubernetes spec |  |  |
| Bring up pods with docker images |  |  |
| Troubleshoot, iterate if necessary – document issues! |  |  |

# Sprint #3

|  |  |  |
| --- | --- | --- |
| **Activity** | **Specification** | **Status** |
| Complete any burn down tasks for deployments |  |  |
| Complete any deployment actions |  |  |
| Test App |  |  |

# Sprint #4

|  |  |  |
| --- | --- | --- |
| **Activity** | **Specification** | **Status** |
| Setup billing alerts |  |  |
| Setup metric alerts |  |  |
| Test stability of Kubernetes redeployment |  |  |
| Test alarms |  |  |
| Ensure all backlog tasks are complete |  |  |
| Complete project documentation & submit |  |  |