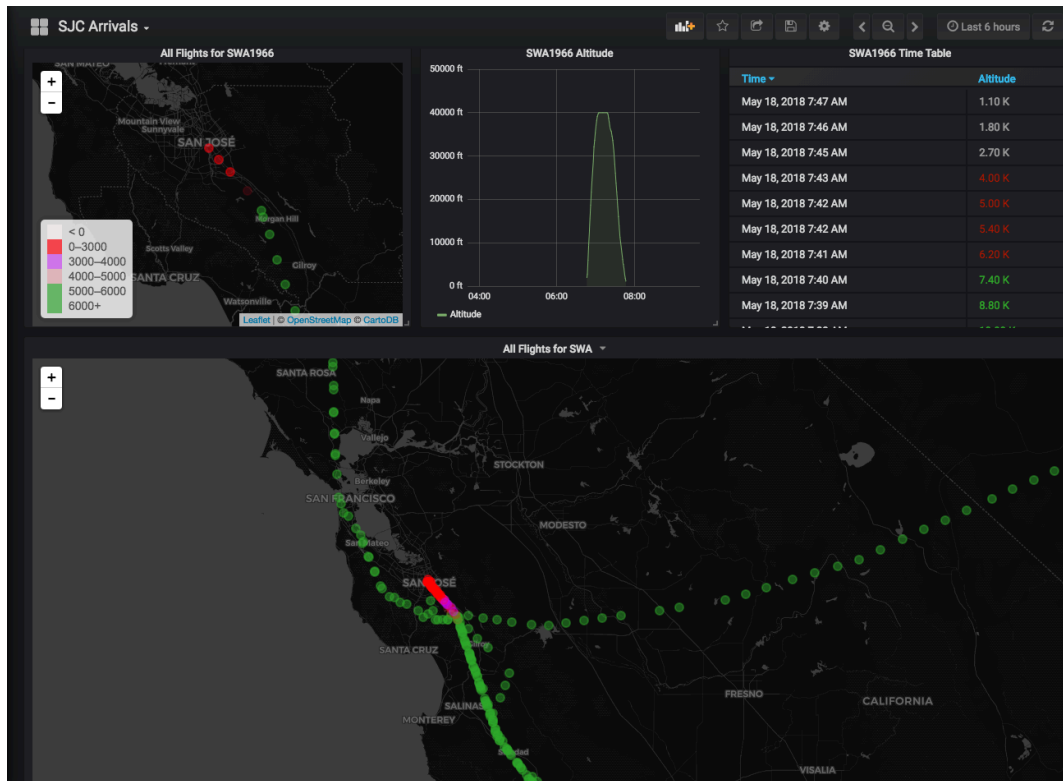
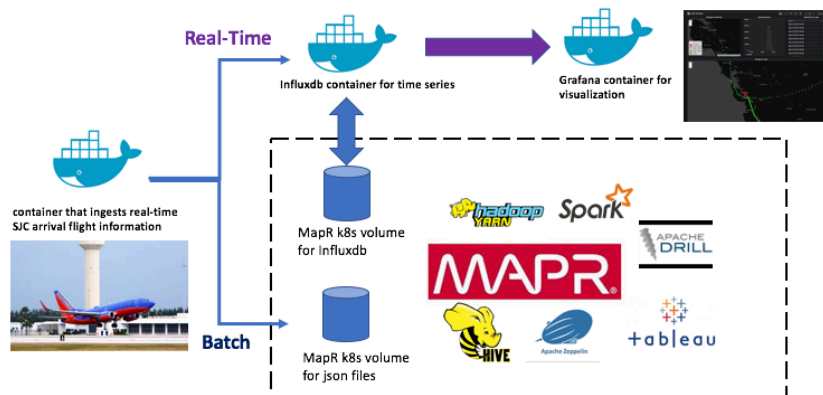


Instructions on setting up SJC arrival flights monitoring with Azure Kubernetes Service (AKS) and MapR Data Fabric



This demo provides the steps to setup a real-time monitoring system for San Jose Airport (SJC) arrival flights on AKS using MapR Data Fabric for Kubernetes as the storage. It shows the flight tracks, flight numbers and altitudes of flights. Below is the architecture and data flow of the system.

Demo (SJC Arrival Flights Tracking)



Step 1: Create a MapR Sandbox on Azure

Go to <https://tinyurl.com/y8q645xz>, fill out the form and record your resource group name and login name and password. You will have a VM named 'mapr0' in the resource group in about 20 minutes. Click on 'mapr0' and record the IP address of it. You will need it to login later.

Step 2: Create a AKS K8 cluster

Go to the Azure portal: <https://portal.azure.com>, select "Kubernetes Service", then create a K8s cluster. The K8s cluster has to be in the same resource group as the MapR Sandbox in Step 1 above.

Create Kubernetes cluster

Basics Networking Monitoring Tags Review + create

Azure Kubernetes Service (AKS) manages your hosted Kubernetes environment, making it quick and easy to deploy and manage containerized applications without container orchestration expertise. It also eliminates the burden of ongoing operations and maintenance by provisioning, upgrading, and scaling resources on demand, without taking your applications offline. [Learn more about Azure Kubernetes Service](#)

PROJECT DETAILS

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

* Subscription Demo_and_marketplace_offering_dev

* Resource group ☐ Create new ☒ Use existing **Check 'Use existing' and select the resource group for MapR Sandbox**
jsunaks0508

CLUSTER DETAILS

* Kubernetes cluster name jsunaks0510 ✓

* Region East US

* Kubernetes version 1.9.6

* DNS name prefix jsunaks0510 ✓

AUTHENTICATION

* Service principal (new) default service principal
[Config my service principal](#)

SCALE

The number and size of nodes in your cluster. For production workloads, at least 3 nodes are recommended for resiliency. For development or test workloads, only one node is required. You will not be able to change the node size after cluster creation, but you will be able to change the number of nodes in your cluster after creation. [Learn more about scaling in Azure Kubernetes Service](#)

* Node size Standard D4s v3 (4 vcpus, 16 GB memory) ✓
[Change size](#)

* Node count ☐ ☒ 3

[Review + create](#) **Next: Networking >** [Download a template for automation](#)

Select advanced networking configuration and use the same VNET "MapRSandboxVnet" as MapR Sandbox. Fill out the address range and DNS IP as described in screenshot below.

It is recommended to change the VM size to Standard D4s v3 for better performance, click 'Next Networking' when done.

You can enable HTTP application routing and choose between two networking options: "Basic" or "Advanced".

- **"Basic"** networking creates a new VNet for your cluster using default values.
- **"Advanced"** networking allows clusters to use a new or existing VNet with customizable addresses. Application pods are connected directly to the VNet, which allows for native integration with VNet features.

[Learn more about networking in Azure Kubernetes Service](#)

HTTP application routing ⓘ ☒ No ☐ Yes

Network configuration ⓘ ☐ Basic ☒ Advanced

* Virtual network ⓘ

MapRSandboxVnet

[Create new](#)

* Subnet ⓘ

MapRSandboxSubnet

[Create new](#)

* Kubernetes service address range ⓘ

10.1.0.0/24

 ✓

* Kubernetes DNS service IP address ⓘ

10.1.0.10

 ✓

* Docker Bridge address ⓘ

172.17.0.1/16

 ✓

Click 'Advanced' and select MapRSandboxVnet

Review + create

« Previous: Basics

Next: Monitoring »

[Download a template for automation](#)

Basics Networking Monitoring Tags Review + create

BASICS

| | |
|-------------------------|-----------------|
| Subscription | [REDACTED] |
| Resource group | jsunaks0508 |
| Kubernetes cluster name | jsunaks0510 |
| Region | East US |
| Kubernetes version | 1.9.6 |
| DNS name prefix | jsunaks0510 |
| Node count | 3 |
| Node size | Standard_D4s_v3 |

NETWORKING

| | |
|-----------------------------------|-------------------|
| HTTP application routing | No |
| Network configuration | Advanced |
| Virtual network | MapRSandboxVnet |
| Subnet | MapRSandboxSubnet |
| Kubernetes service address range | 10.1.0.0/24 |
| Kubernetes DNS service IP address | 10.1.0.10 |
| Docker Bridge address | 172.17.0.1/16 |

MONITORING

| | |
|-----------------------------|-----------------------------|
| Enable container monitoring | Yes |
| Log Analytics workspace | DefaultWorkspace-[REDACTED] |

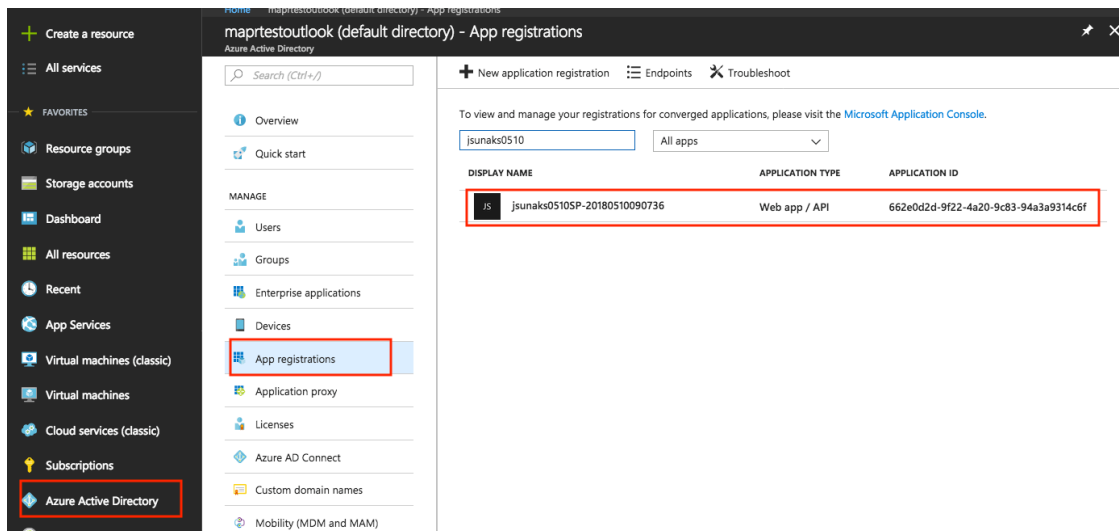
Create

« Previous: Tags

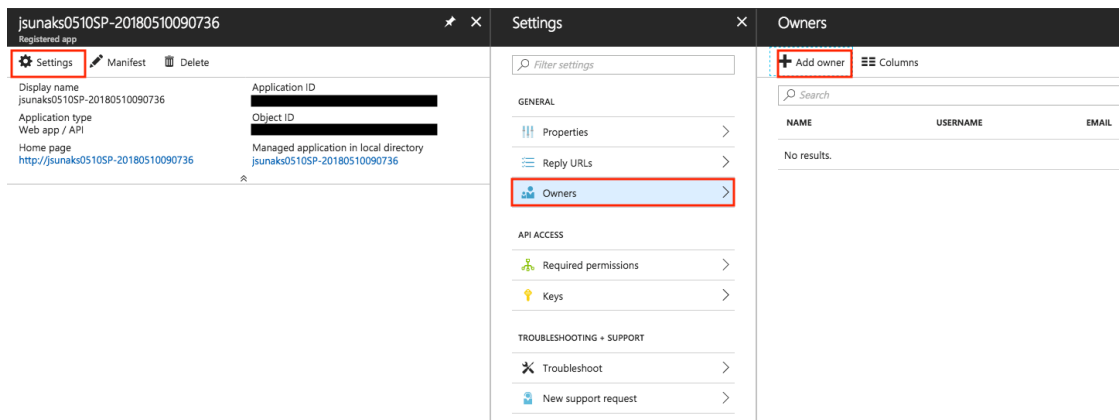
[Download a template for automation](#)

Step 3: Change AKS service principal role and owner so it can create load balancer in the VNET

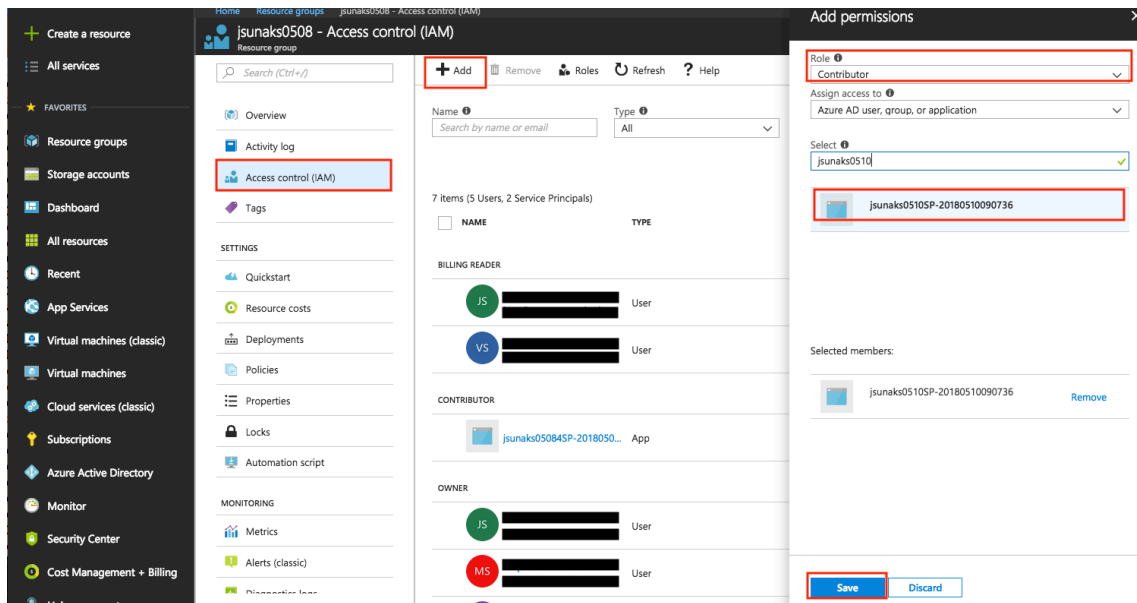
Find the service principal name created by AKS by going to 'Azure Active Directory' -> 'App registrations' and search for the SP name, typically it has a form like this: <resource group name>SP-<number string>, e.g. jsunaks0510SP-20180510090736.



Select the service principal, click on 'Settings' -> 'Owners' -> 'Add owner', then search for your login name and add



Now we need to assign a 'contributor' role to the service principal by going to the resource group created in Step 1, click on 'Access control (IAM)' -> 'Add' -> 'Role' -> 'Contributor' -> add the service principal name -> 'Save'



Step 4: Install Azure Cli Tool

login to Sandbox using the IP address, username and password as recorded in Step 1,
sudo to become root

```
#curl -L https://raw.githubusercontent.com/maprpartners/SJC/master/config-azcli | bash
```

Follow the instructions to login to your Azure account

use "az account set" if you have multiple subscriptions,

use "az aks list" to find out K8s cluster name from Step 2 if you forgot

Step 5: Configure K8s client on MapR Sandbox

In the MapR Sandbox as root:

```
#git clone https://github.com/maprpartners/SJC.git
```

```
#cd SJC
```

Now we configure K8s

```
#bash config-k8s
```

"kubectl get node -o wide" to verify it is working

Step 6: Install MapR Data Fabric for K8s volume plugin

```
#bash inst_mapr_plugin
```

kubectl get pod --all-namespaces to verify, you should see mapr-kdfplugin-xxx daemon set running on each K8s slave

Step 7: Deploy the SJC flight monitoring demo

```
#bash run
```

When completed, the script will provide a URL for you to look at the Demo
d an award-winning filesystem all at your disposal.