Azure Discovery with Micro Focus UCMDB

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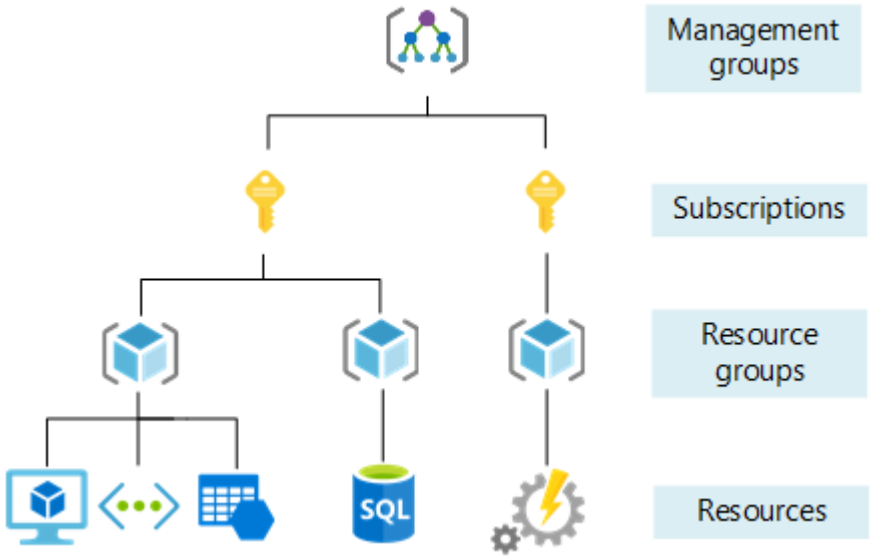
Agenda

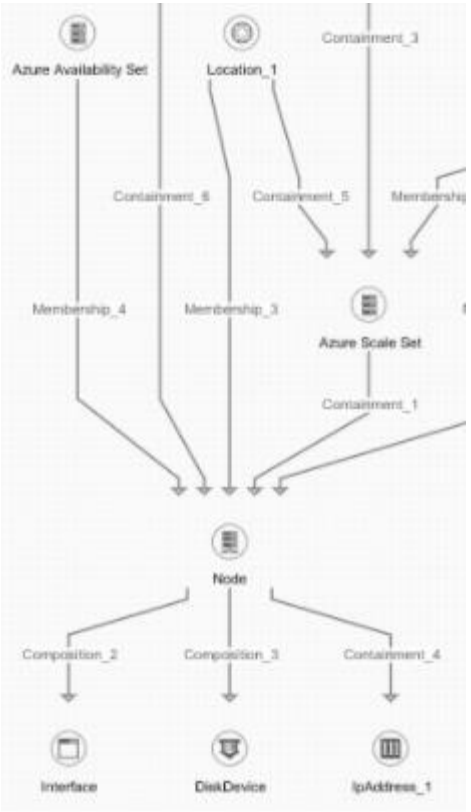
- Azure Services
  - Azure Services – gaps (and Micro Focus UCMDB)
- What is a Configuration Management Database (CMDB)?
- Why CMDB?
  - Meeting the real world
- Micro Focus Universal CMDB – Azure Discovery
- Wrap-up and questions

Azure Services

Azure Services
Gaps

- No centralized way of viewing resources as a topology





Source: https://docs.microfocus.com/itom/Universal_Discovery_Content_Pack:2020.08/MSAzureTplgy

Source: https://docs.microsoft.com/en-us/azure/cloud-adoption-framework/ready/azure-setup-guide/organize-resources?tabs=AzureManagementGroupsAndHierarchy

Azure Services
Gaps

- Business relevant resources located in multiple places
  - Different cloud provider
  - On premise
  - Sensitive information

- Need for a common abstraction
- Need for another data model

Azure Services
Gaps

- Deleted resources
  - Attributes of deleted resource are no longer available
  - Re-creation with the same name
- Updated resources

- Azure Activity Log

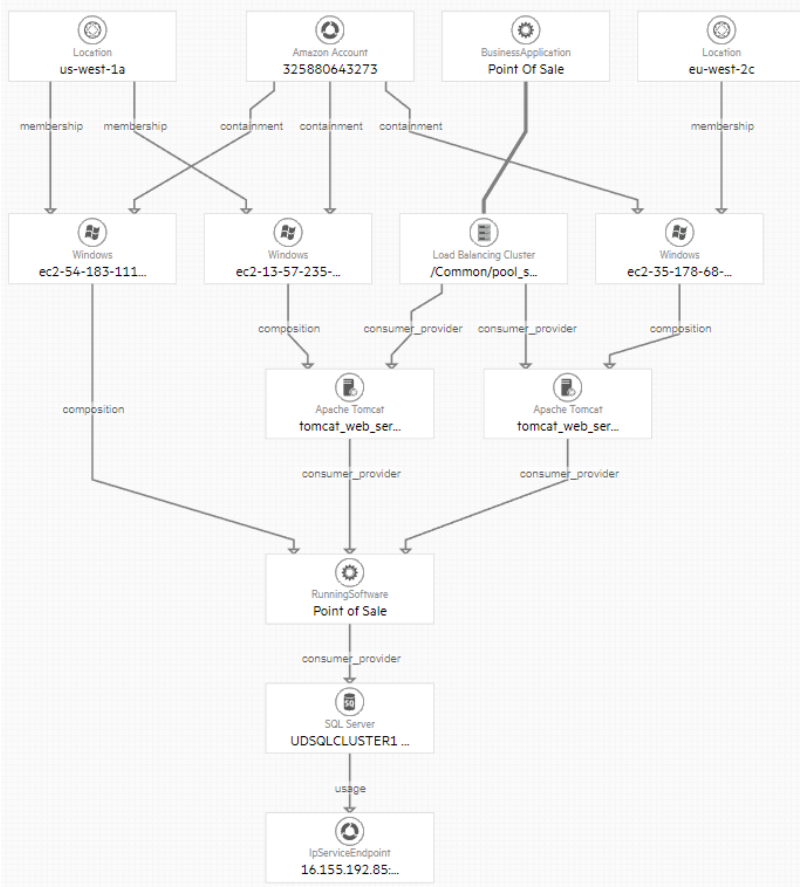
What is a CMDB?

What is a CMDB?

- CMDB = Configuration Management Database
- Used by an organization to store information about
  - Infrastructure
  - Software
  - Applications
  - Network
  - Storage
  - People and roles
  - Other assets

What is a CMDB?

- **Configuration Item (CI)**
  - Entity that holds data like name, ownership, importance, creation time, etc.
  - CI Type
  - Organized in a topology
  - Identified by key attributes and links
  - Updated through *reconciliation*



Why CMDB?

Why CMDB?

- Customer with multi-cloud: Azure, Google, on premise
- Banking
  - Lots of regulations
  - Lots of security policies
  - High SLAs

Why CMDB

Meeting the real world – Case study 1

- Multi/hybrid cloud environment
- Possible problems:
  - One service runs on multiple clouds
    - Management: what's the budget for that?
    - What's the whole infrastructure?
  - Different Clouds have different data models

Why CMDB

Meeting the real world – Case study 2

- Reorganizing the infrastructure
- Possible problems:
  - Resources were not tracked on creation
    - Who created it?
    - What is it used for?
  - Different Services use resources from the same scope
    - What other functionalities are impacted?
  - How do I track and manage complex changes?

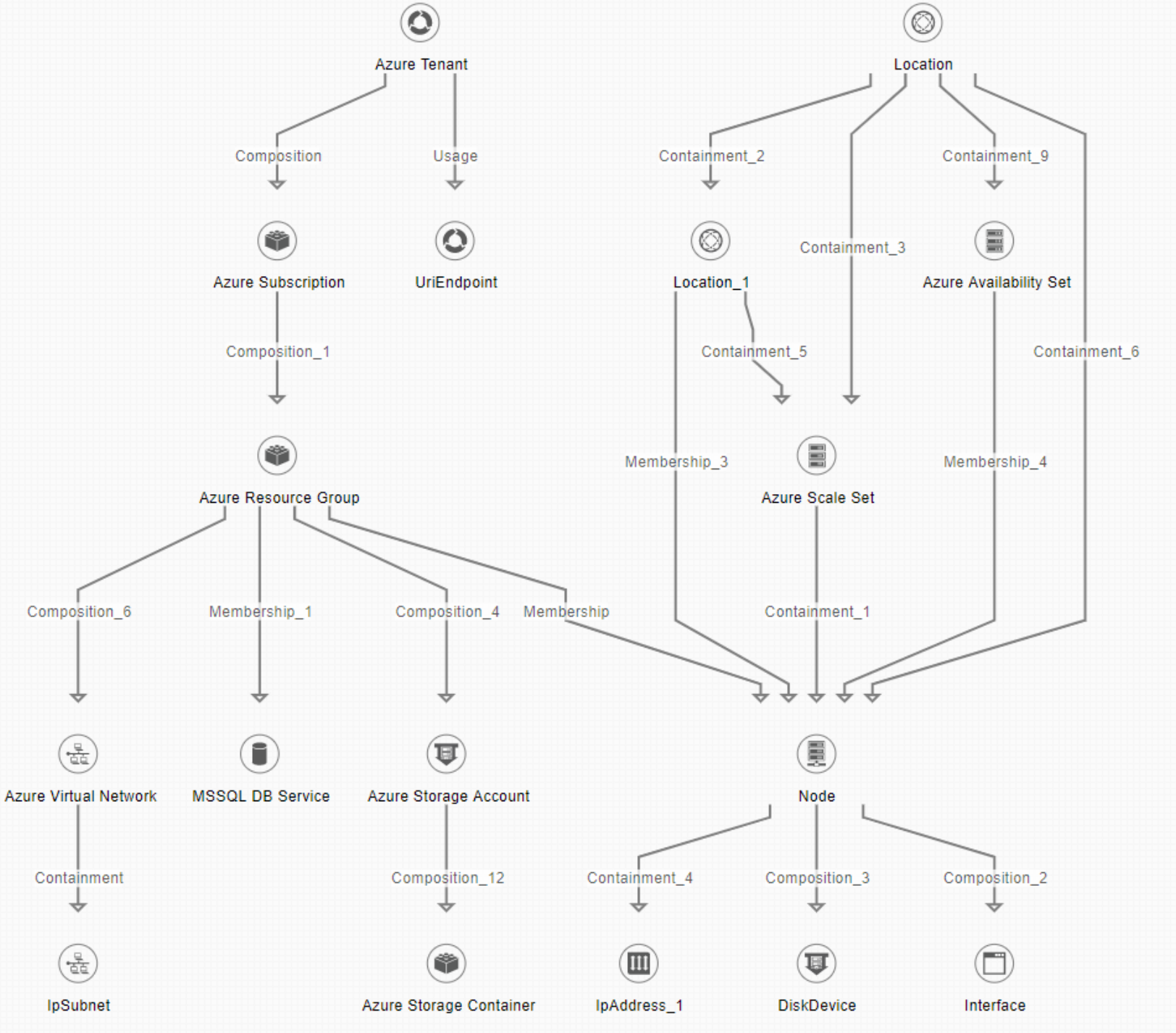
Why CMDB?
Meeting the real world

- Multiple source data reconciliation
- Single source of truth
- Cloud migration
- Change and incident management
- Impact analysis
- Better visibility of cost

Micro Focus UCMDB – Azure Discovery

Azure Discovery

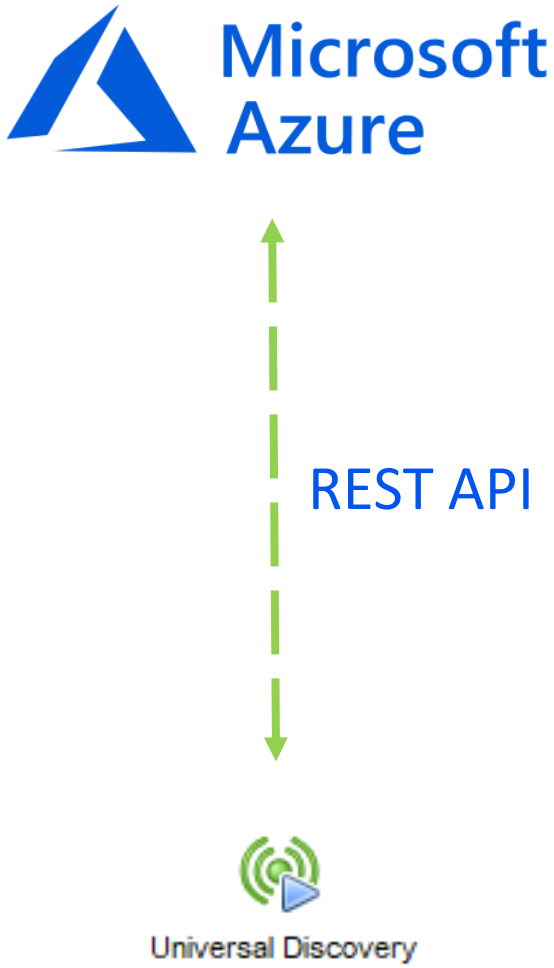
- Azure Cloud data to UCMDB
  - **Logical Resources:** Tenant, Subscription, Resource Group, Location
  - **Compute Resources:** VM, Scale Set, AKS, App Service Environment
  - **Storage Resources:** Storage Account, Storage Container, Disk
  - **Networking Resources:** Virtual Network, Network Interface, Public/Private Ips, Network Security Group, Subnet
  - **Other Services:** Event Hub, Cosmos DB, SQL DB , Key Vault


Azure Tenant
Location
Composition
Usage
Containment_2
Containment_9
Azure Subscription
UriEndpoint
Location_1
Containment_3
Azure Availability Set
Composition_1
Containment_5
Containment_6
Membership_3
Membership_4
Azure Resource Group
Azure Scale Set
Composition_6
Membership_1
Composition_4
Membership
Containment_1
Azure Virtual Network
MSSQL DB Service
Azure Storage Account
Node
Containment
Composition_12
Containment_4
Composition_3
Composition_2
IpSubnet
Azure Storage Container
IpAddress_1
DiskDevice
Interface

Azure Discovery mechanism

- Job/process

- Uses REST API
- Logs in Azure Tenant to retrieve resources



Azure Discovery

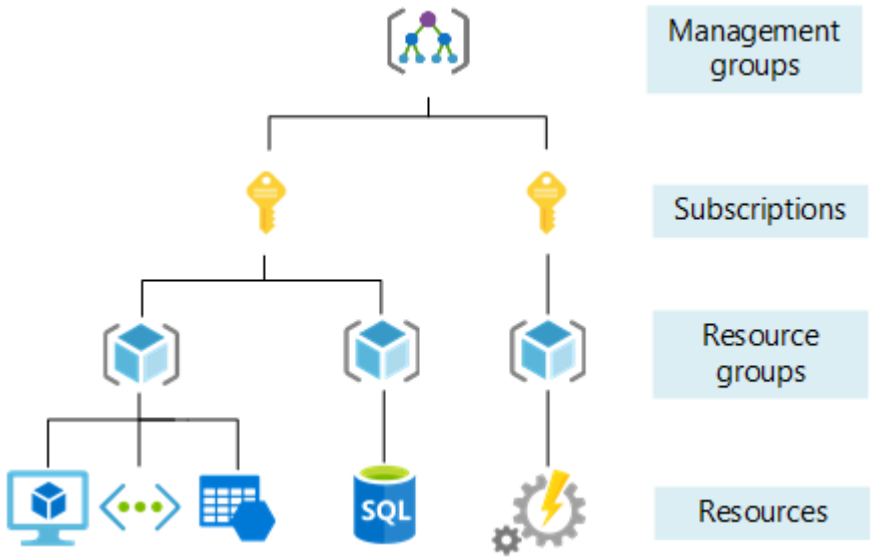
- Approaches
  1. Full discovery
  2. Event based discovery

Azure Discovery

Full discovery

- Retrieves all resources
- Heavy network traffic

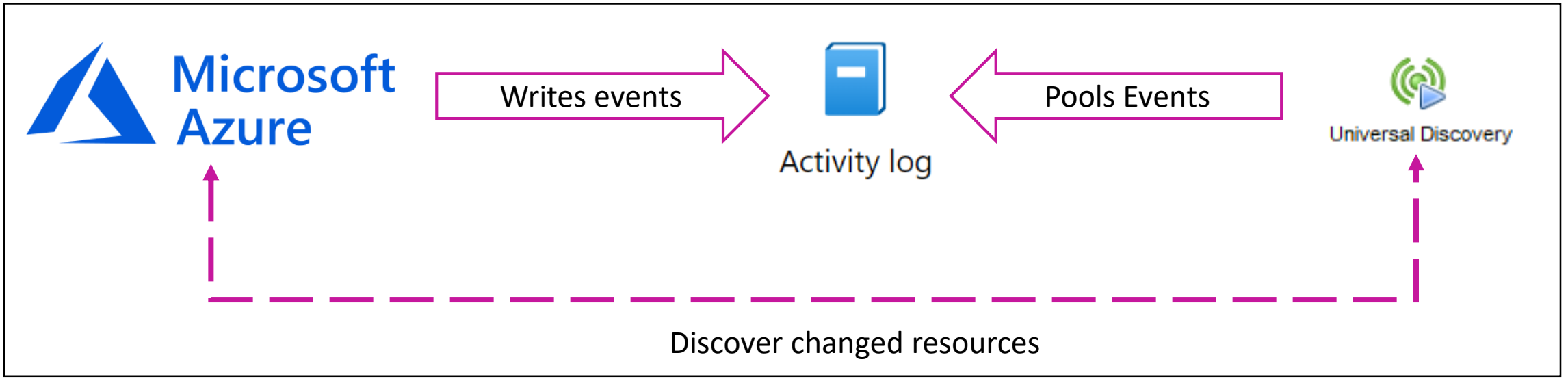
- Steps
  - Connect to Azure Tenant
  - Query all Subscriptions – for each Subscription
    - Query all Resource Groups – for each Resource Group
      - Query all resources
      - Map resources to UCMDB data model objects



Azure Discovery

Event based discovery

- Retrieves only the changes



- Needs to be backed by Full discovery regularly

Azure Discovery

Challenges & Solutions (our favorite)

- Azure Resource Id vs VM Id


```
"name": "myVM",
"id": "/subscriptions/{subscription-id}/resourceGroups/myResourceGroup/providers/Microsoft.Compute/virtualMachines/myVM",
"type": "Microsoft.Compute/virtualMachines",
"location": "West US",
"tags": {
  "myTag1": "tagValue1"
},
"properties": {
  "vmId": "0f47b100-583c-48e3-a4c0-aefc2c9bbcc1",
  "hostGroup": {
    "id": "/subscriptions/{subscription-id}/resourceGroups/myResourceGroup/providers/Microsoft.Compute/hostGroups/myHostG
  },
  "hardwareProfile": {
    "vmSize": "Standard_D2s_v3"
  },
  "storageProfile": {
    "imageReference": {
      "publisher": "MicrosoftWindowsServer",
      "offer": "WindowsServer",
      "sku": "2016-Datacenter",
      "version": "latest"
    },
    "osDisk": {
      "osType": "Windows",
      "name": "myOsDisk",
      "createOption": "FromImage",
      "caching": "ReadWrite",
      "managedDisk": {
        "storageAccountType": "Premium_LRS",
        "id": "/subscriptions/{subscription-id}/resourceGroups/myResourceGroup/providers/Microsoft.Compute/disks/myOsDisk
      },
      "diskSizeGB": 30
    },
    "dataDisks": []
  },
  "osProfile": {
    "computerName": "myVM",
    "adminUsername": "admin",
    "windowsConfiguration": {
      "provisionVMAgent": true,
      "enableAutomaticUpdates": false
    },
    "secrets": []
  },
  "networkProfile": {
    "networkInterfaces": [
      {
        "id": "/subscriptions/{subscription-id}/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkInterfa
      }
    ]
  },
  "provisioningState": "Succeeded"
}
```

Azure Discovery

Challenges & Solutions (our favorite)

- VM can be deleted and recreated with the same name in the same Resource Group, but other configuration

- Problem: we should have 2 different VMs in UCMDB, instead attributes are flipping for the original one
  - One that will be delete through aging
  - One that will keep getting touched

- Partial solution: use event based discovery
- Solution: add VM Id to reconciliation

Azure Discovery

Challenges & Solutions

- Azure Kubernetes Service Discovery creates duplicate VMs

- 2 Discovery Jobs
  - Azure Discovery – returns the corresponding VMs using Azure Resource Id
  - AKS Discovery – returns the corresponding VMs using K8s

- *Workaround: generate VM Ids from AKS Discovery from Cluster Id*

Azure Discovery

Challenges & Solutions

- Azure event based discovery might miss time intervals
  - *Possible solution: resource versioning*

Operation name	Status	Time	Time stamp
New recommendation is available	Active	2 hours ago	Tue Sep 22 2020 13:35:50 GMT+0300 (Eastern European Summer Time)
Delete Virtual Machine	Succeeded	3 hours ago	Tue Sep 22 2020 13:00:12 GMT+0300 (Eastern European Summer Time)
Delete Virtual Machine	Started	3 hours ago	Tue Sep 22 2020 12:50:02 GMT+0300 (Eastern European Summer Time)
Delete Virtual Machine	Accepted	3 hours ago	Tue Sep 22 2020 12:50:02 GMT+0300 (Eastern European Summer Time)
Delete Virtual Machine	Succeeded	3 hours ago	Tue Sep 22 2020 12:50:10 GMT+0300 (Eastern European Summer Time)
Delete Virtual Machine	Succeeded	3 hours ago	Tue Sep 22 2020 13:00:03 GMT+0300 (Eastern European Summer Time)
Delete Virtual Machine	Succeeded	3 hours ago	Tue Sep 22 2020 13:00:04 GMT+0300 (Eastern European Summer Time)
Health Event Updated	Updated	5 hours ago	Tue Sep 22 2020 10:36:16 GMT+0300 (Eastern European Summer Time)
Health Event Updated	Updated	5 hours ago	Tue Sep 22 2020 10:24:33 GMT+0300 (Eastern European Summer Time)

Azure Discovery

Challenges & Solutions

- Keeping a standard for all Cloud Discovery jobs

- Azure discovery does not bring all information needed (e.g. Software Installed, Running processes)
  - *Solution – Complement Azure Discovery with other UCMDB tools*
    - Running Azure Cloud Discovery
    - Running Host Discovery

Azure Discovery

Challenges & Solutions

- Data flip-flop between Azure Discovery & Host Discovery
  - *Solution – Populate attributes only using one process or add prioritization*

- Azure does not support some functionalities
  - E.g. changing the host name directly from the host
  - *Problem – VMs are not reconciled*

Questions?

Thank you!

Azure Discovery

Challenges & Solutions

- REST call fails
  - What is the expected behavior?
- Not enough information for reconciliation
  - *Problem: creation of duplicates for the same VM*

Why CMDB?

Why CMDB

Meeting the real world – Case study 3

- Cloud migration/transition
- Possible problems:
  - Same SLA?
  - Same setup?
  - What if I mess up something?
    - How do I make sure I don’t mess up something?

Why CMDB

Meeting the real world – Case study 4

- Organization X has some sensitive data that needs to be stored, tracked
- Possible problems:
  - No automated way to retrieve data
  - Assume we have a way to get sensitive data
    - How do we link it to the rest of data?

Why CMDB
Meeting the real world – case study 5

- Organization X's infrastructure grew in the last years
- Possible problems
  - Someone changes a resource version.
    - What will this change impact?
    - Who do I need to talk to find out?
    - Is he/she out of office?