Cloud Velocity: Accelerating Innovation through Smarter DevOps | Azure

Intellus Summit 2025

20/05/2025

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Speakers

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Agenda

- Introduction on Etex
- As-was situation
- Technical introduction
- Set up the basis
- Acceleration through reusability
- Where are we now?
- Future aspirations

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Introduction on Etex

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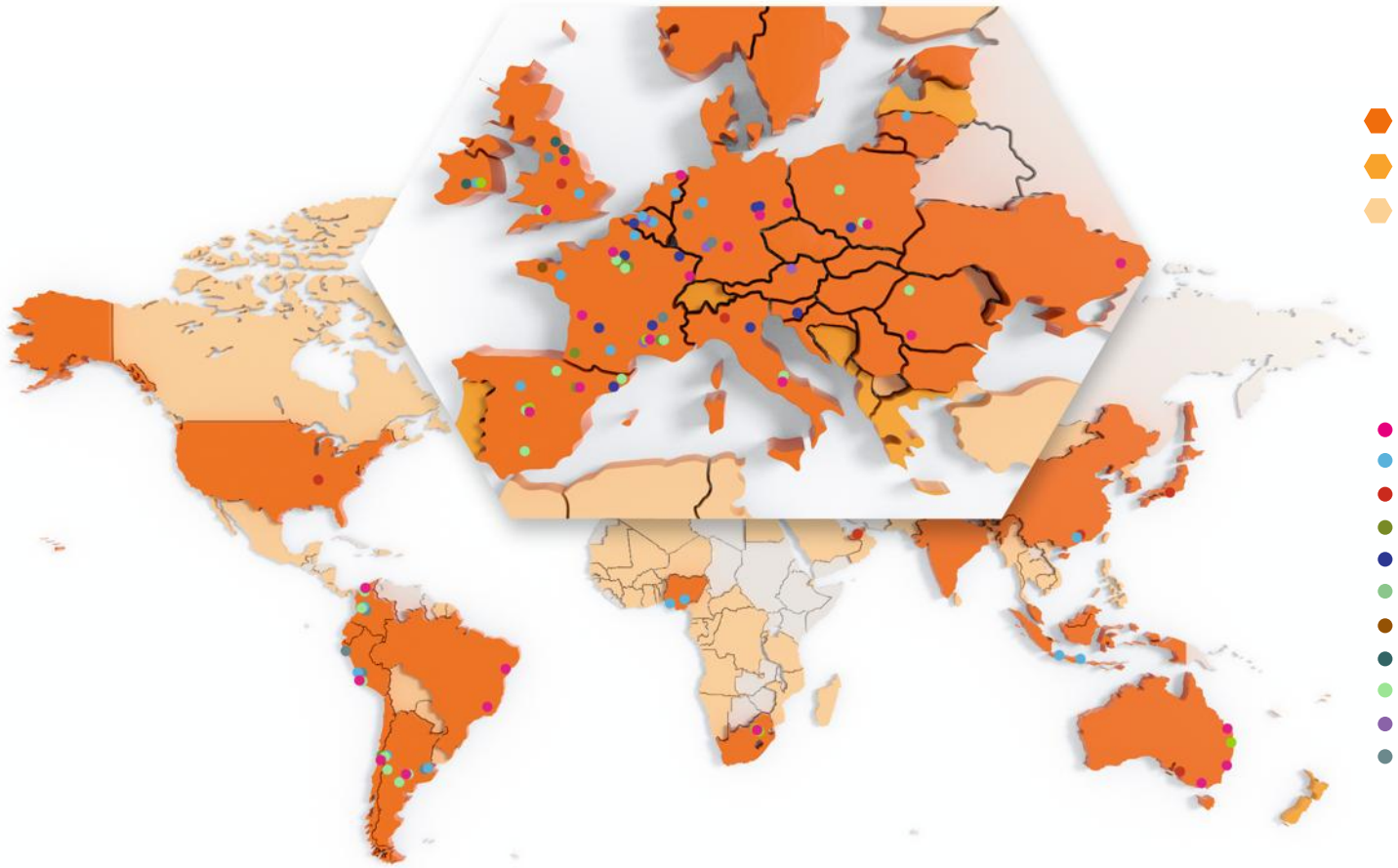
An international industrial company

Selective presence • Local anchorage • Major employer



- Operating country
- Other country with teammates
- Export country

- Plasterboard
- Fibre Cement
- Passive fire Protection & High performance insulation
- Quarries
- Insulation
- Plaster & compounds
- Timber framing
- Steel framing
- Metal profiles
- ITC
- Other

> 13,500
Teammates

45
Operating Countries

> 160
Sites: plants, quarries, offices

5
Innovation & Technology Centres

EUR 3,714
Million revenue

As soon as the Russian invasion of Ukraine started, Etex took a firm position by looking at all options to exit Russia, which is currently ongoing. This was carried out by putting Etex's Russian activities on a standalone basis and stopping fibre cement export activities there.

CEDRAL DURLOCK EQUITONE

Eternit Gyplac Kalsi

PLADUR Promat SINIAT

Superboard URSA

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Our main brands

Across divisions

Foundation Team Introduction

The Etex MDP Foundational Core Principles

- **Cost-efficient, standardized infrastructure** that prevents duplication and waste
- **A secure, well-governed environment** that ensures compliance and trust
- **Self-service and automation** that enable teams to move faster and focus on insights
- A **manufacturing-driven approach to data** that treats it as a product

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As-was situation

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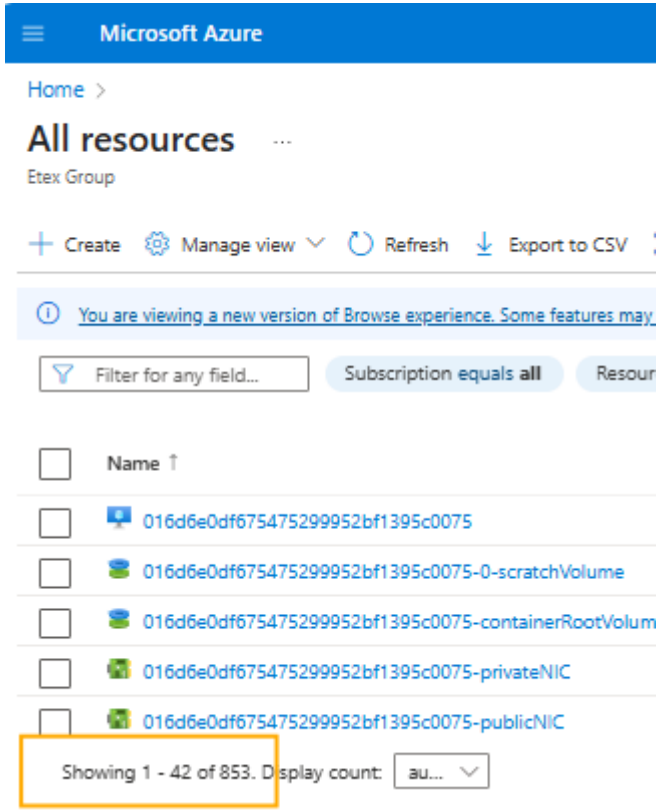
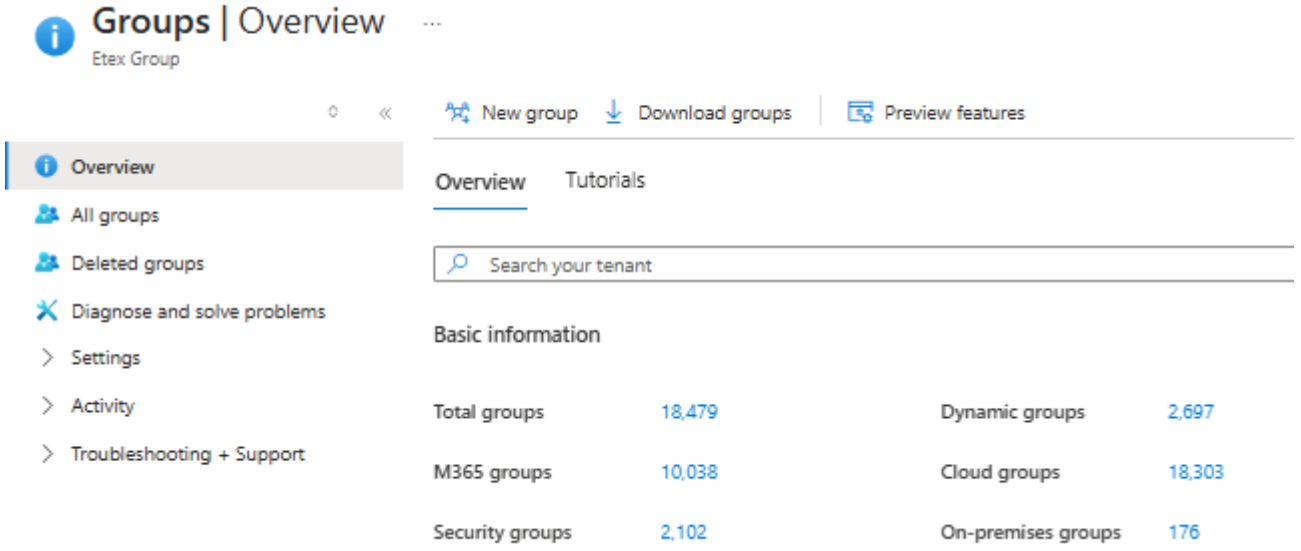
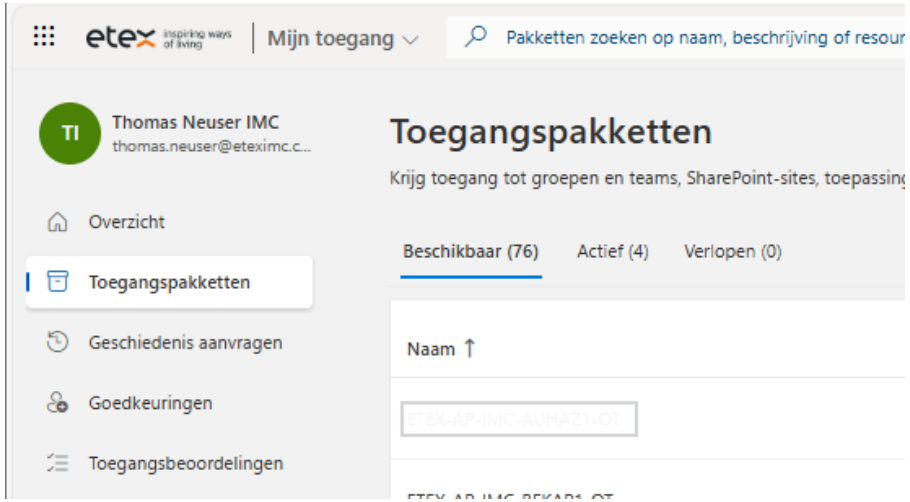
No greenfield deployment…







Different Personas

Data Engineer

How can I effectively deploy my data products?

Data Scientist

How can I effectively deploy my Data Science applications?

Analytics Engineer

How do I create and deploy a self-service data product?

Business Consumer

What Data Can I access?
Who do I need to ask for additional access?

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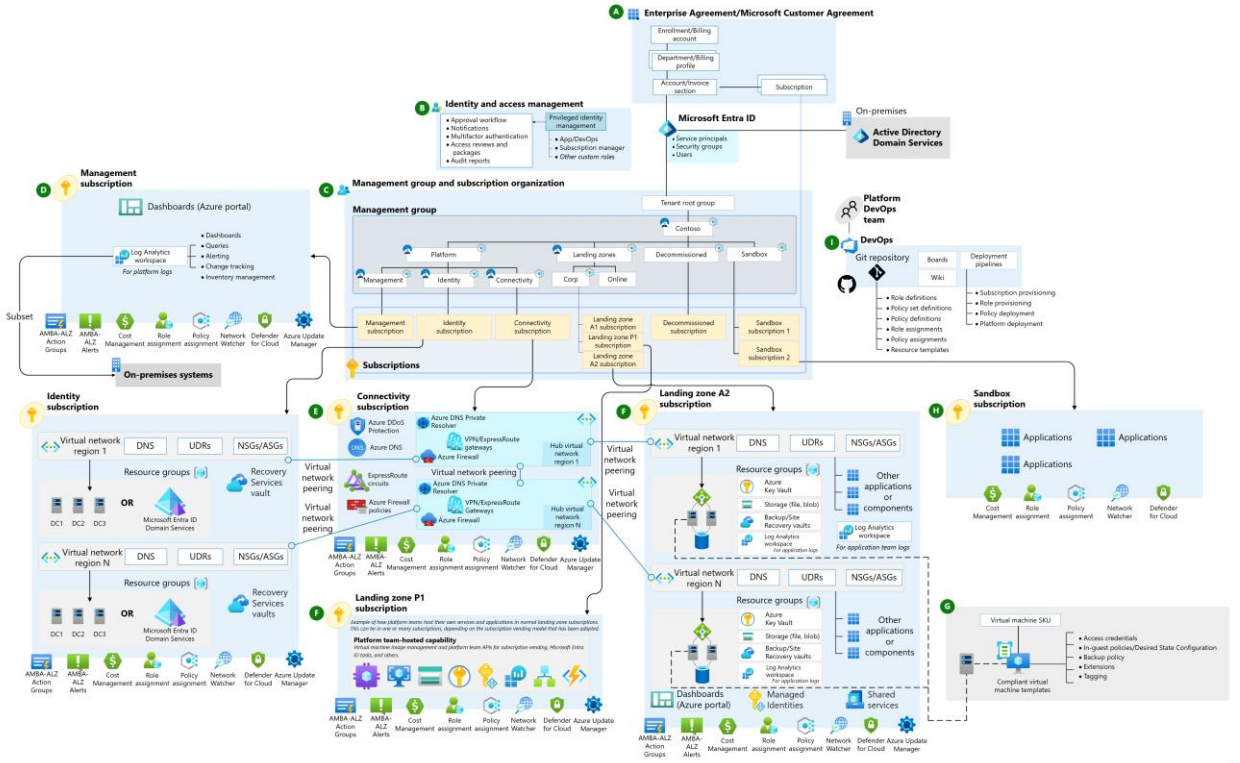
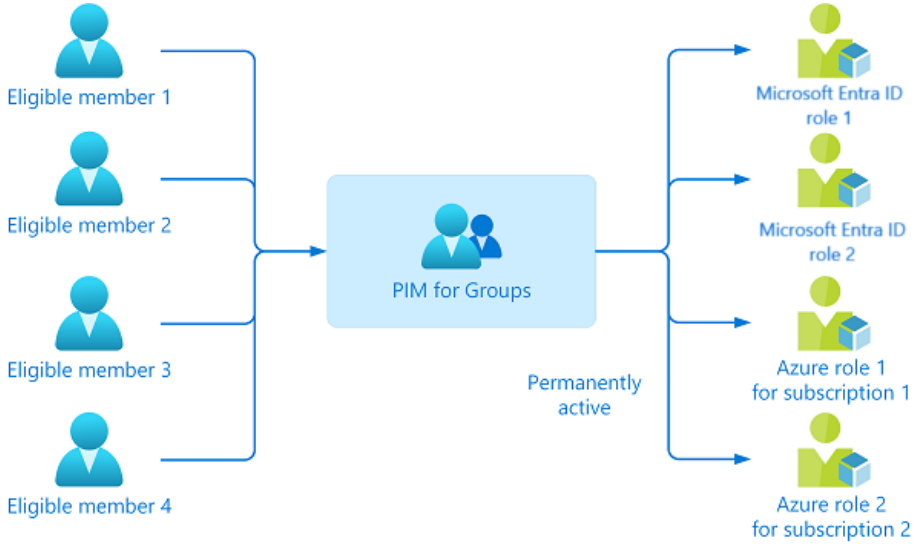
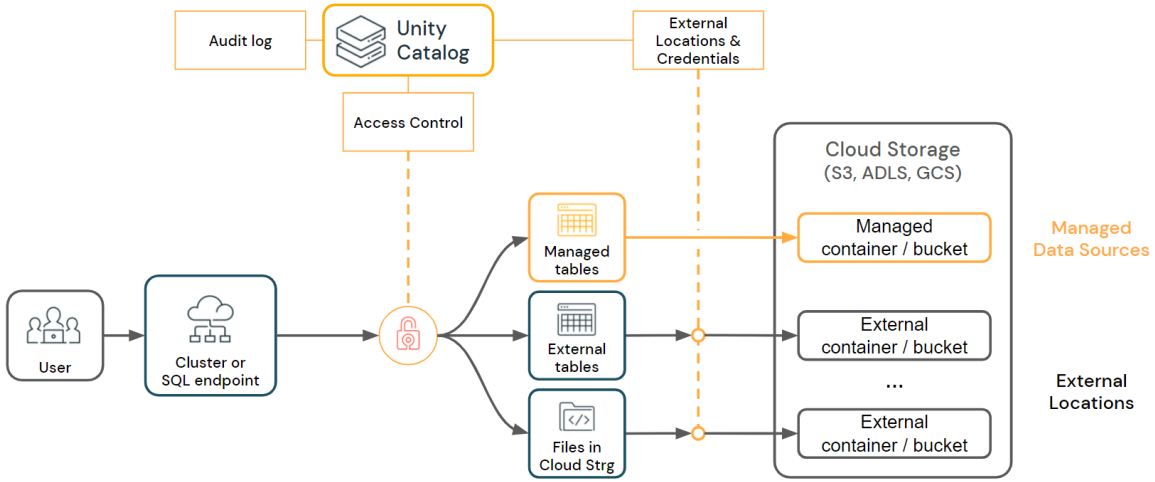
A lot of ideas…







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Solution: MDP Framework 2.0

The idea behind MDP framework 2.0 is:

- To streamline the access management
- To avoid duplicate users or groups
- To follow LPA (Least Privilege Access)
- To separate access groups based on the personas, domain and access types
- Get rid of click-ops
- Standardized resource deployment across the various environments

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Technical introduction

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Cloud Velocity: Accelerating Innovation through Smarter DevOps

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Cloud Velocity: Accelerating Innovation through Smarter DevOps

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Cloud Velocity: Accelerating Innovation through Smarter DevOps

- Cloud platform by Microsoft
- Hosts several services that are used by data engineers/analysts/scientist to perform data operations

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Cloud Velocity: **Accelerating Innovation** through Smarter DevOps

Terraform

Azure Pipelines

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Cloud Velocity: **Accelerating Innovation** through Smarter DevOps

- Infrastructure (IaC) framework by HashiCorp
- Multi-cloud/multi-services
- IaC: declarative state of your infra environment within code

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Cloud Velocity: **Accelerating Innovation** through Smarter DevOps

Azure Pipelines

- Part of the Azure DevOps services suite
- Used for automation of validation and deployments
- “EaC”: Everything as Code for reusability

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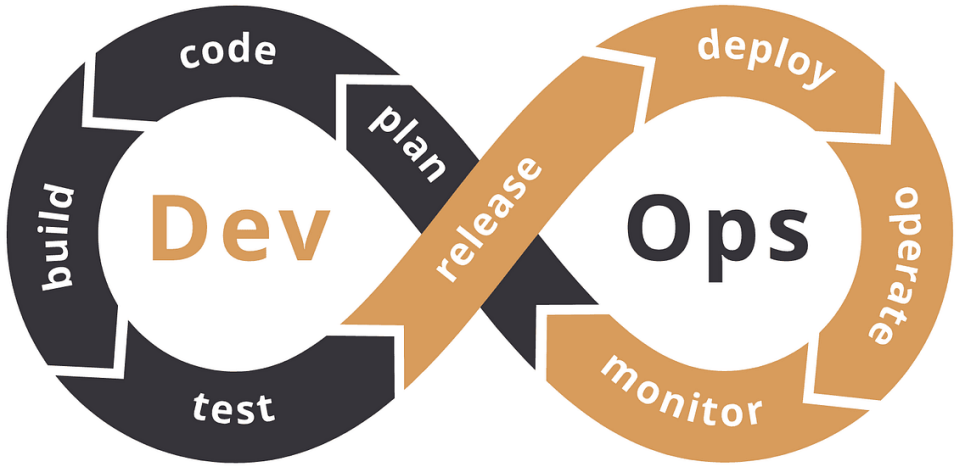
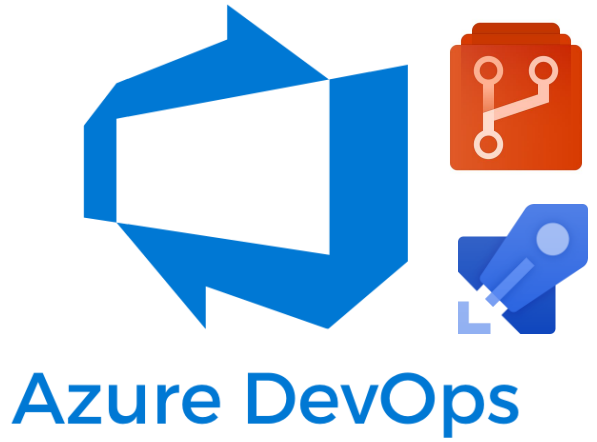
Cloud Velocity: Accelerating Innovation through **Smarter DevOps**





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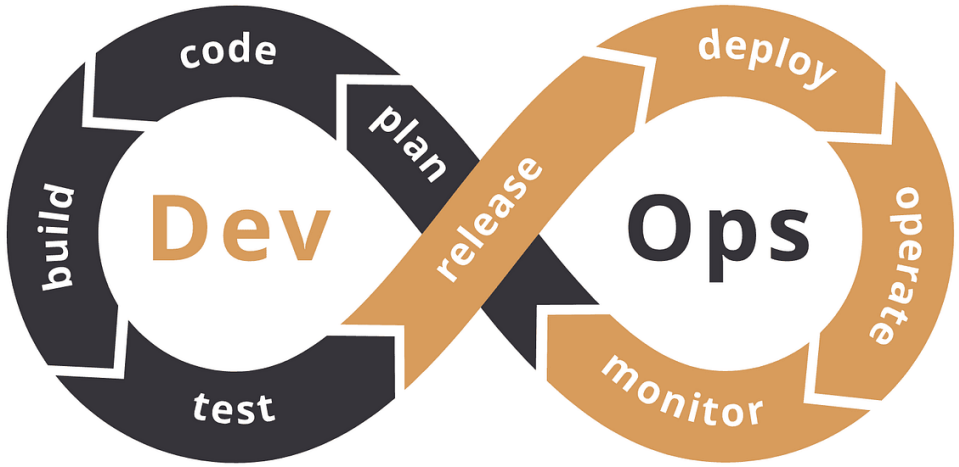
Cloud Velocity: Accelerating Innovation through **Smarter DevOps**



- Bridges Development and Operations, enabling faster & more reliable software delivery
- Automated & standardized workflows, consistent integration, testing & deployment

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Cloud Velocity: Accelerating Innovation through **Smarter DevOps**

- Azure DevOps
- Suite consisting of multiple services for development & project management
- Azure Repos
- Azure Pipelines
- Azure Boards
- Test Plans
- Artifacts

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Set the basis

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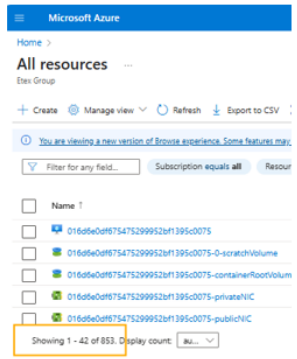
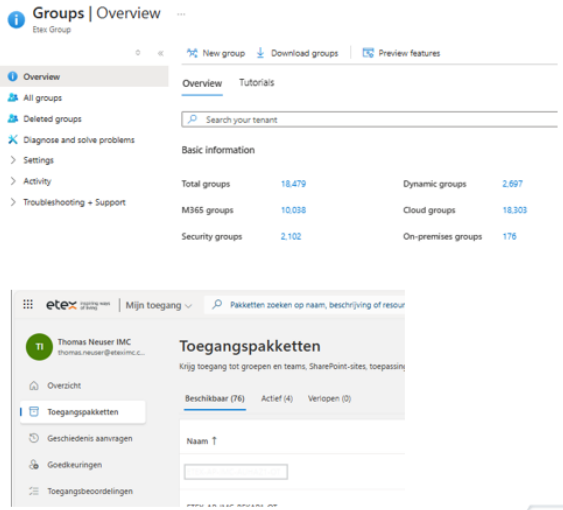
Set the basis

No greenfield deployment…





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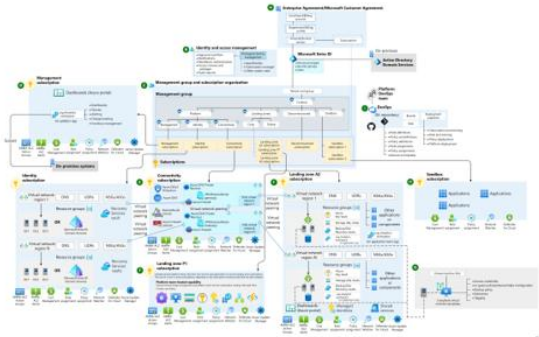
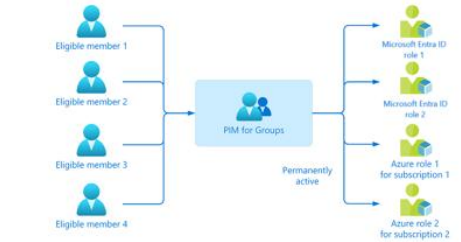
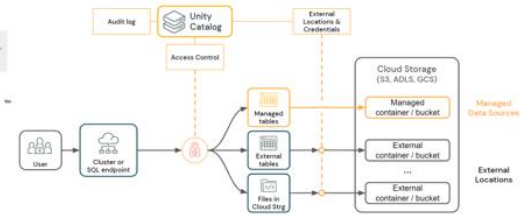
A lot of ideas…







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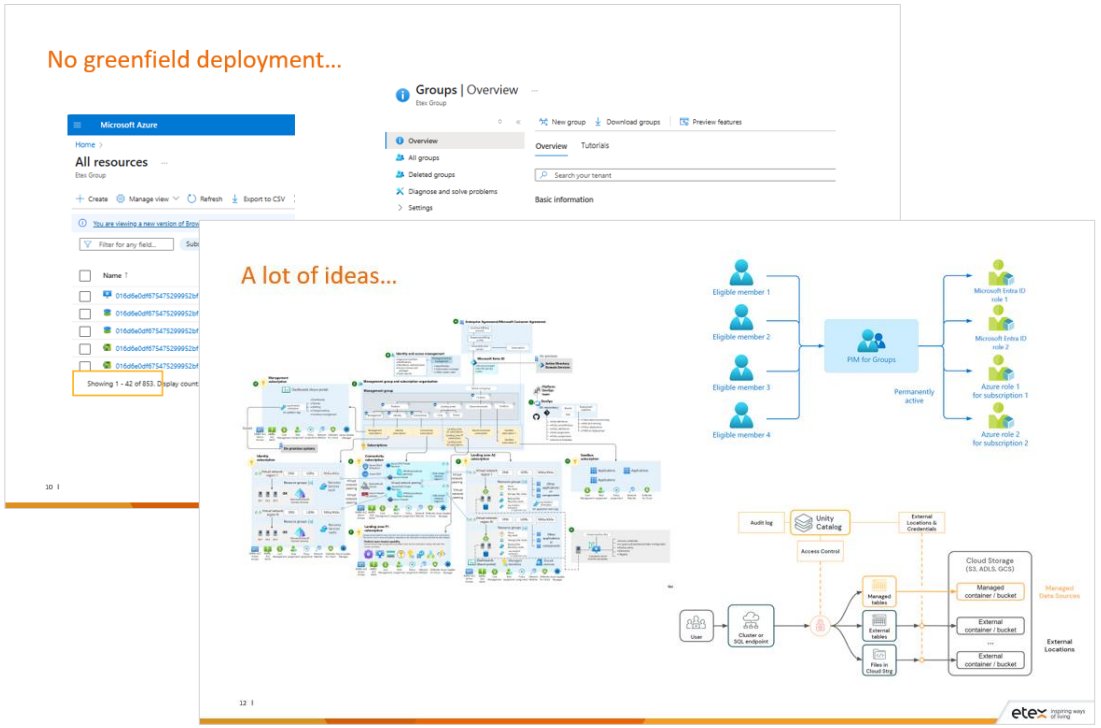
Set the basis

Work is needed in different areas with possible technical scope overlap

The required work was split up in use cases

To enable/support deployments for those use cases, **a base layer is needed**



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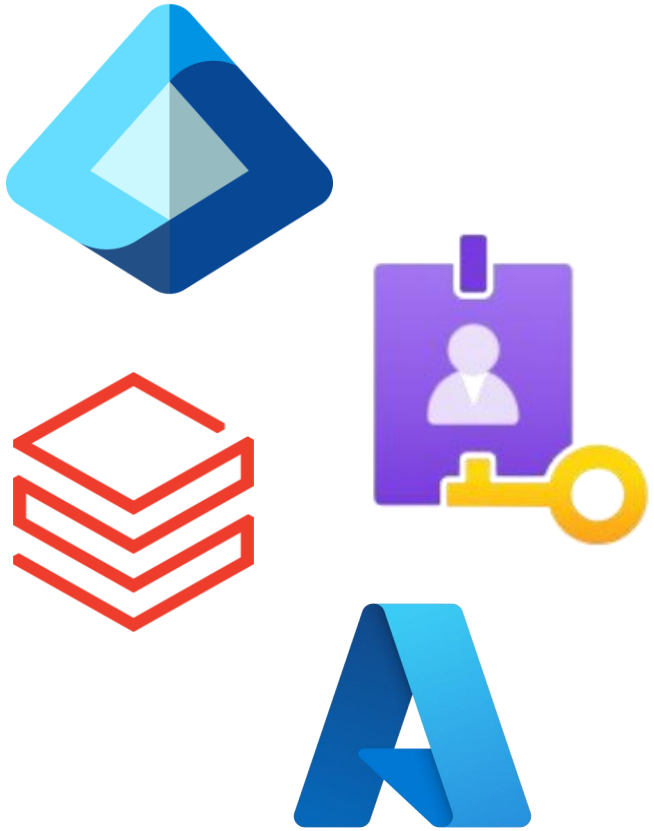
Set the basis: conceptual idea



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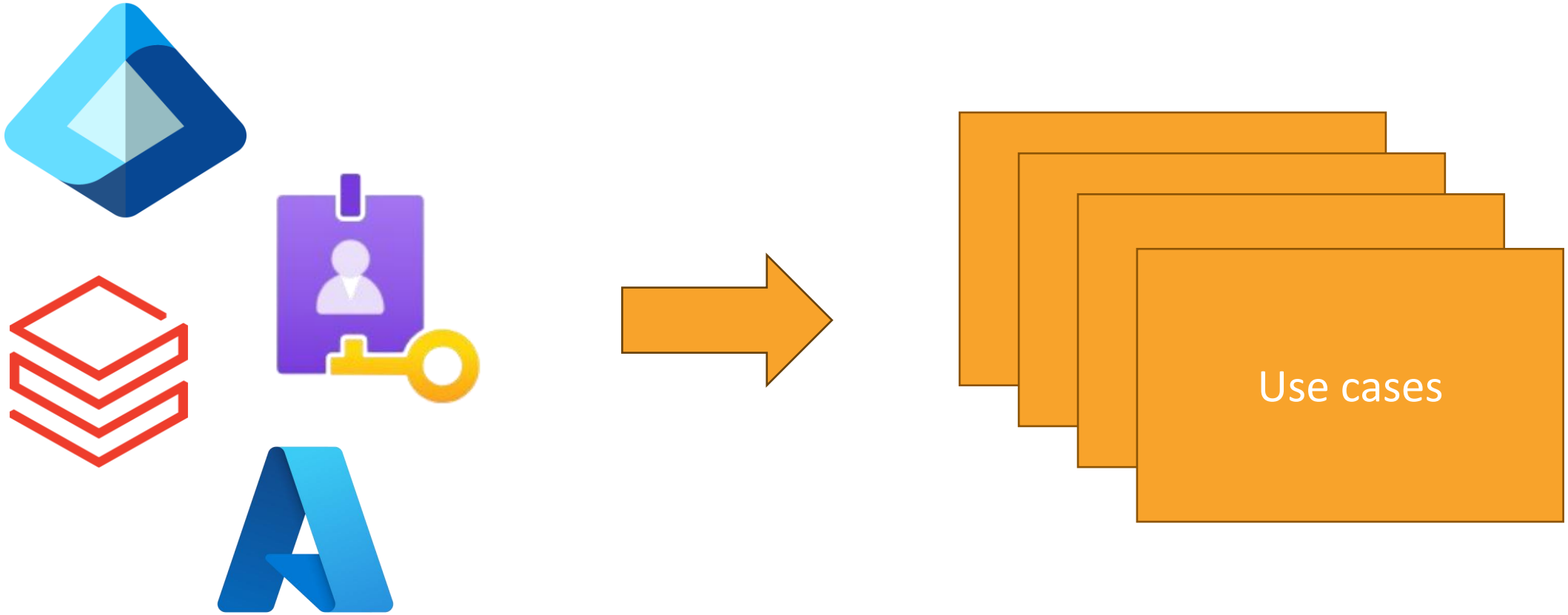
Set the basis: conceptual idea



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Set the basis: conceptual idea

- We need multiple Azure resources across different environments
- We need security groups and policies to manage and govern permissions for different teams
- We need Unity Catalog objects(catalogs, schemas, etc.) for different teams

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Set the basis: conceptual idea

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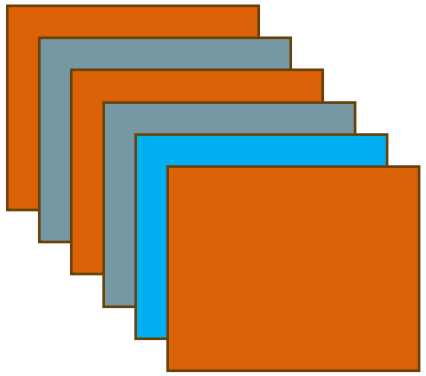
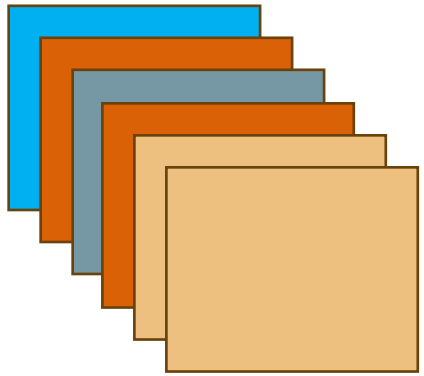
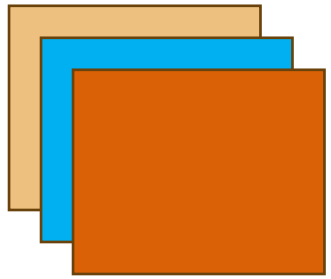
UC 1



UC 2



UC 3



Resource within Azure, Databricks, Unity Catalog, Entra ID, …

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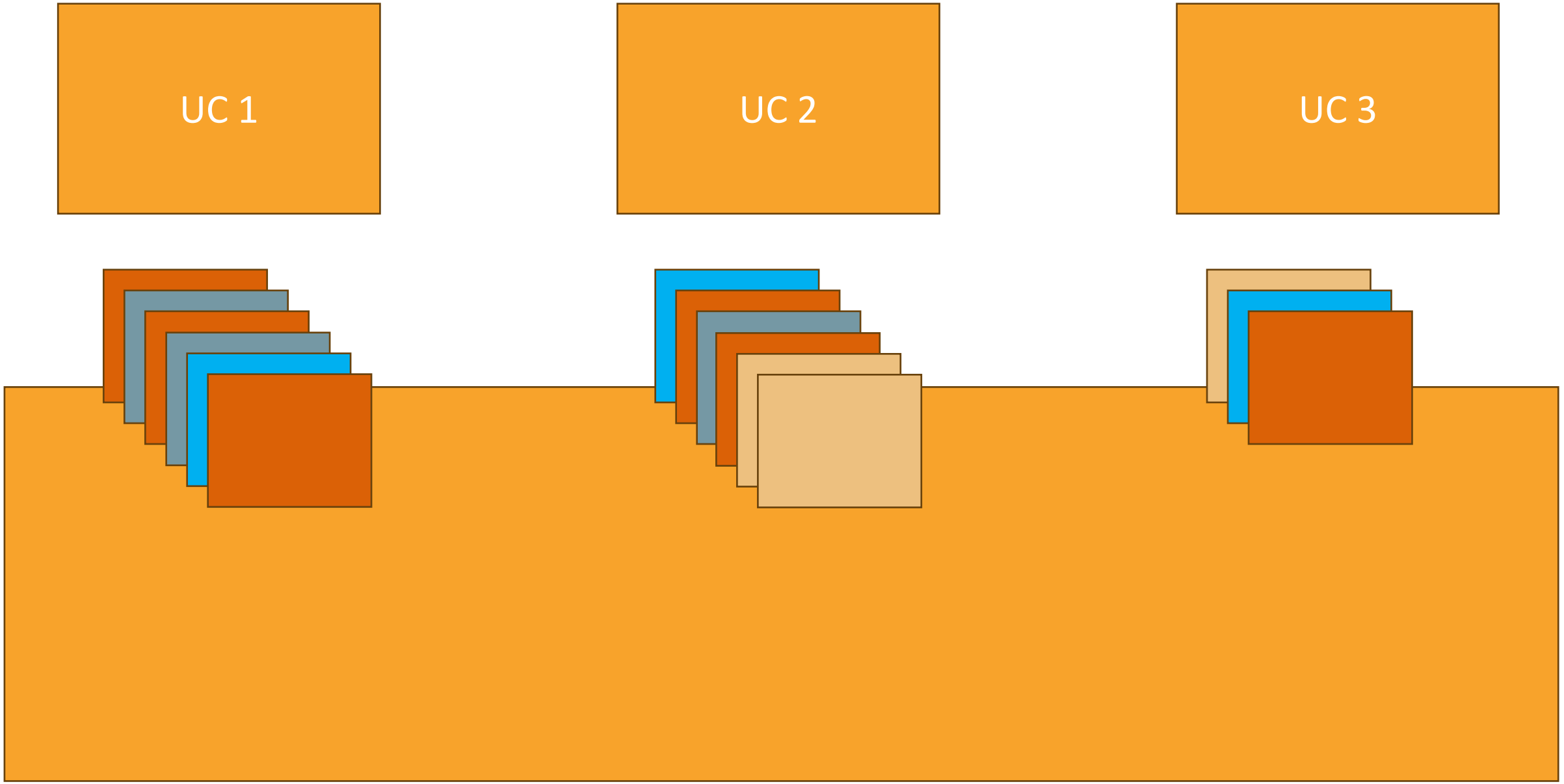

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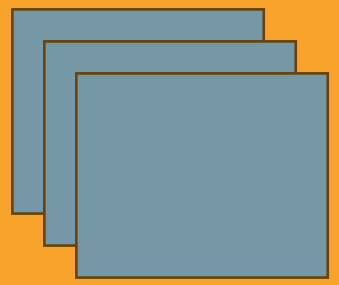
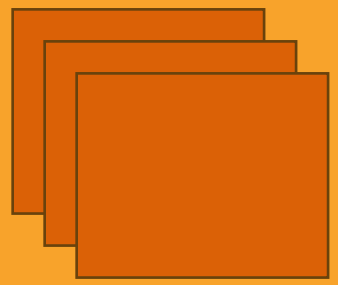
UC 1

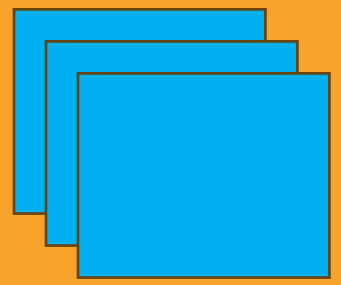
UC 2

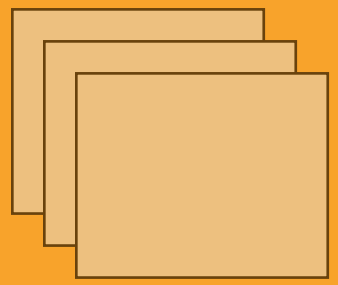
UC 3

Base layer with Terraform modules









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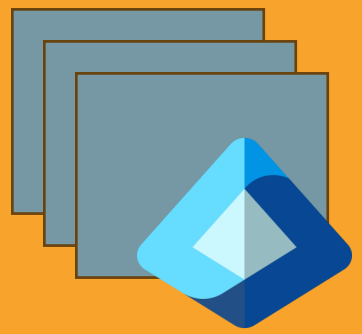
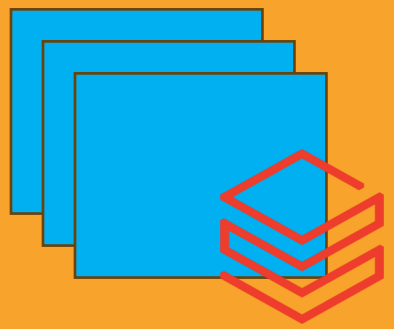
UC 1

UC 2

UC 3

Base layer with Terraform modules





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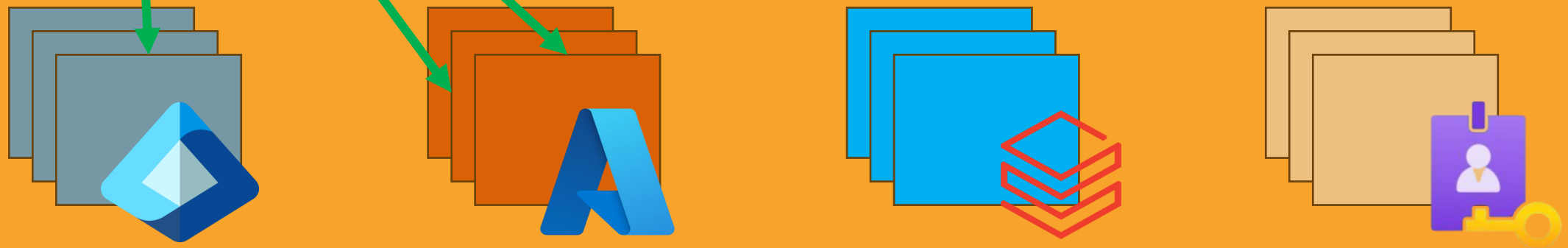
UC 1

UC 2

UC 3

Base layer with Terraform modules



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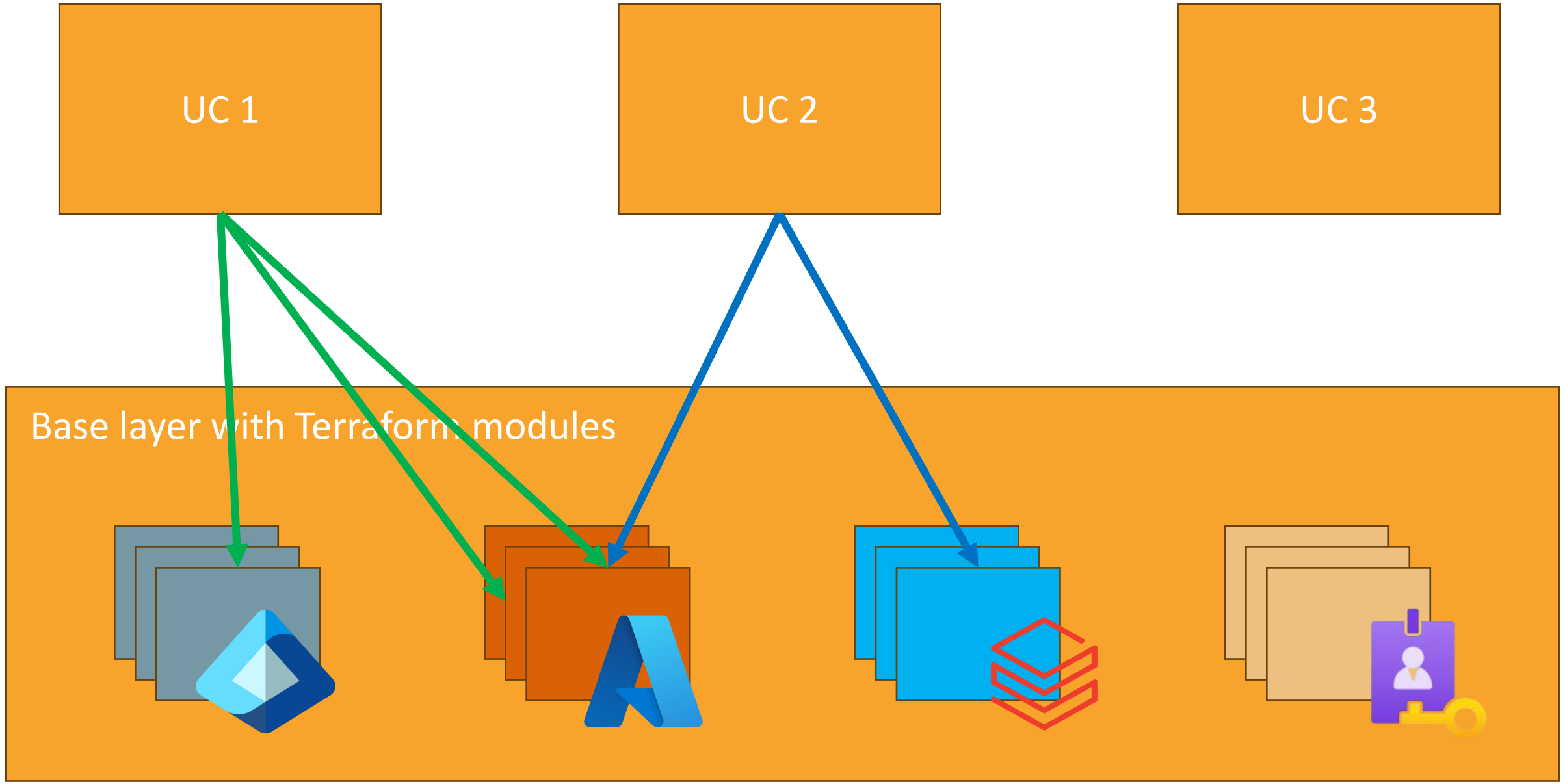

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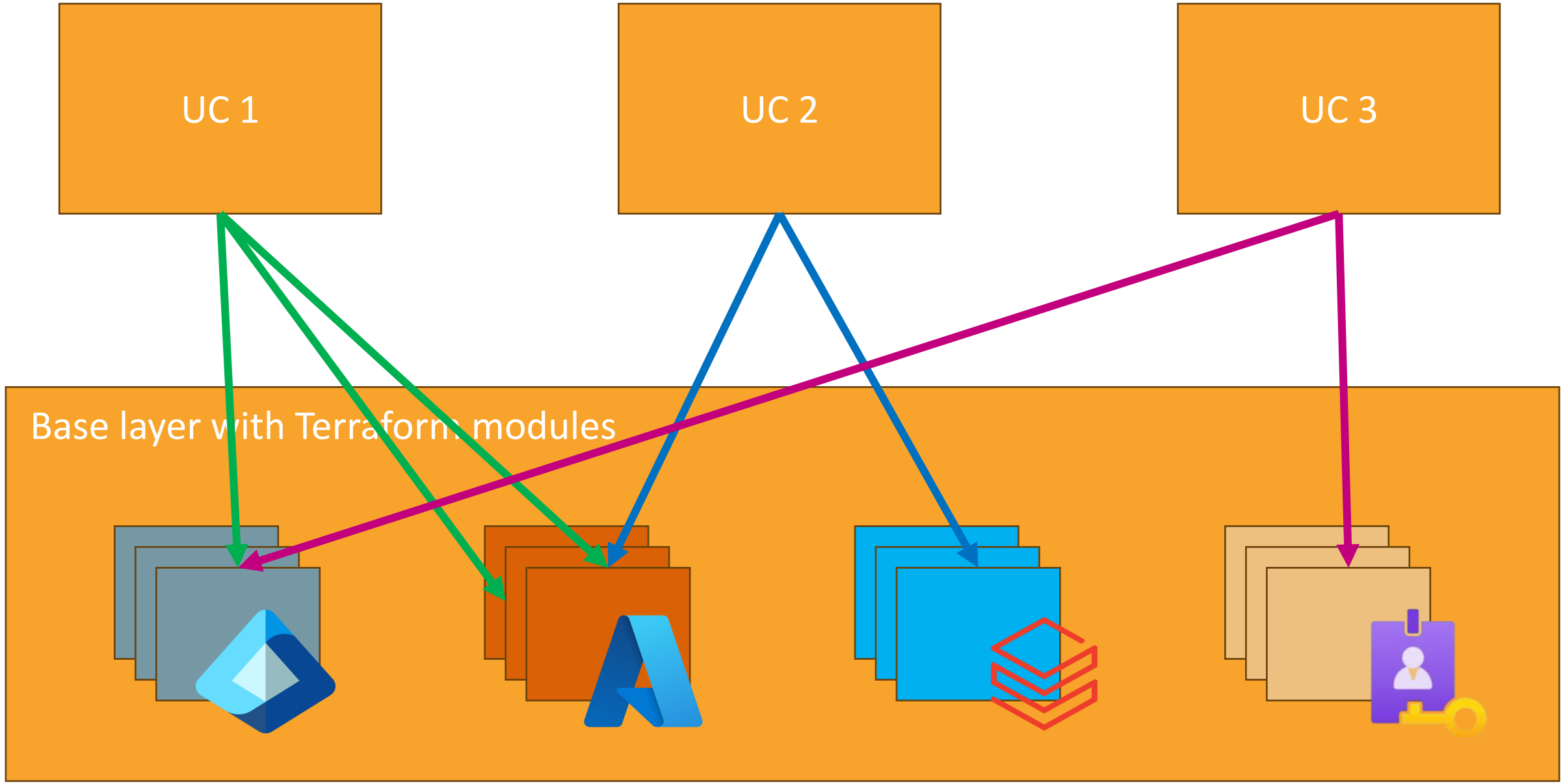

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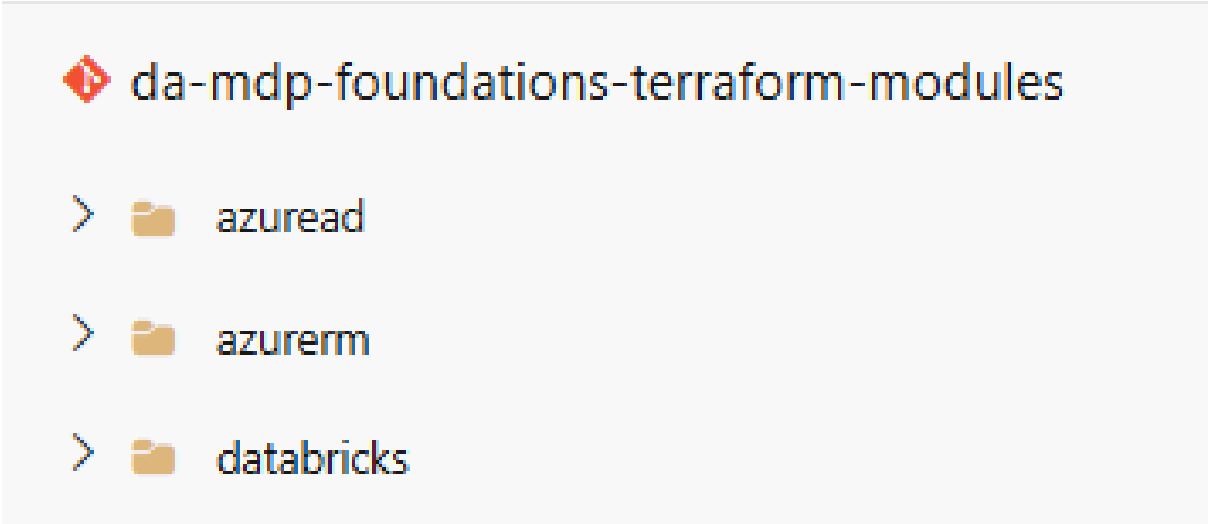
In practice



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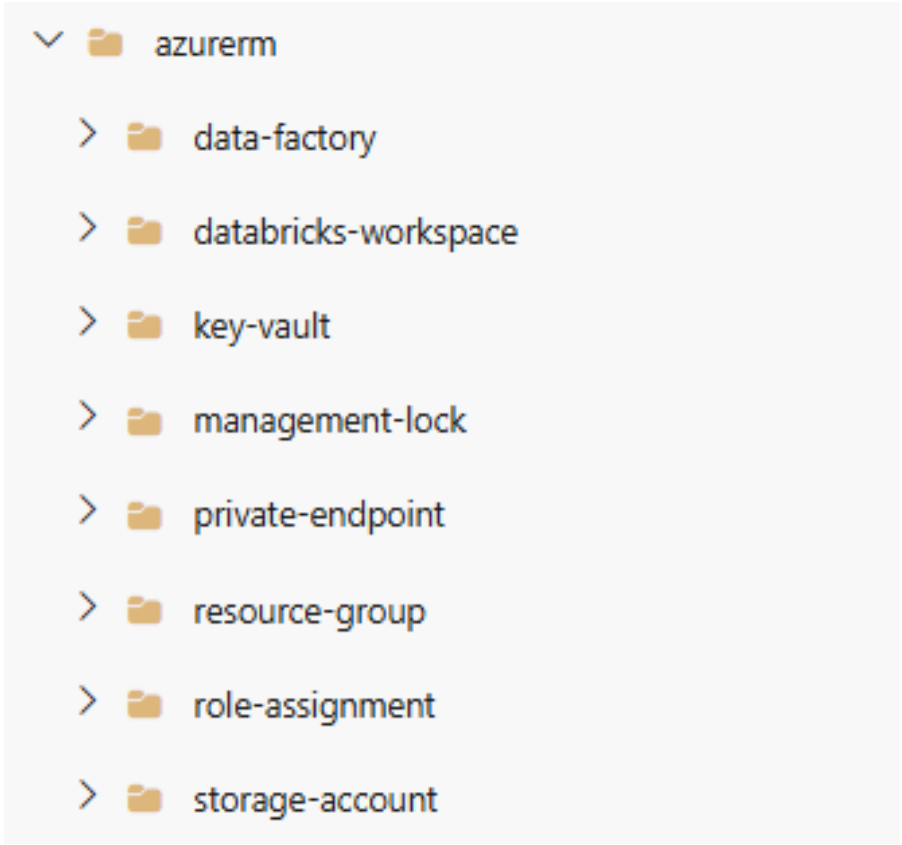
In practice



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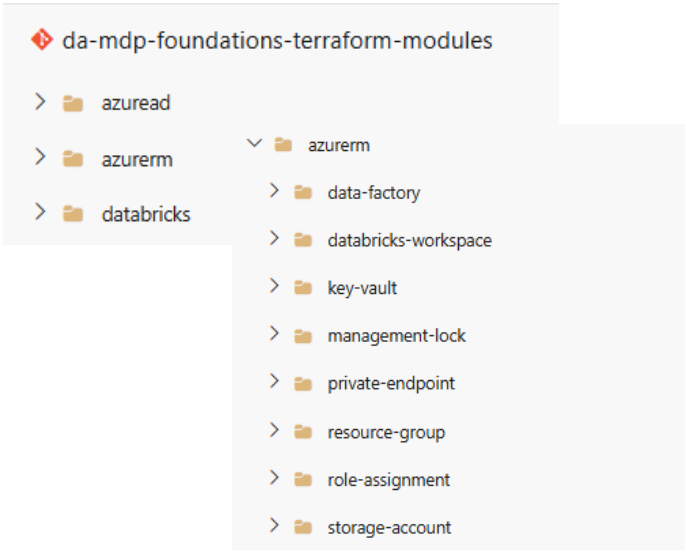
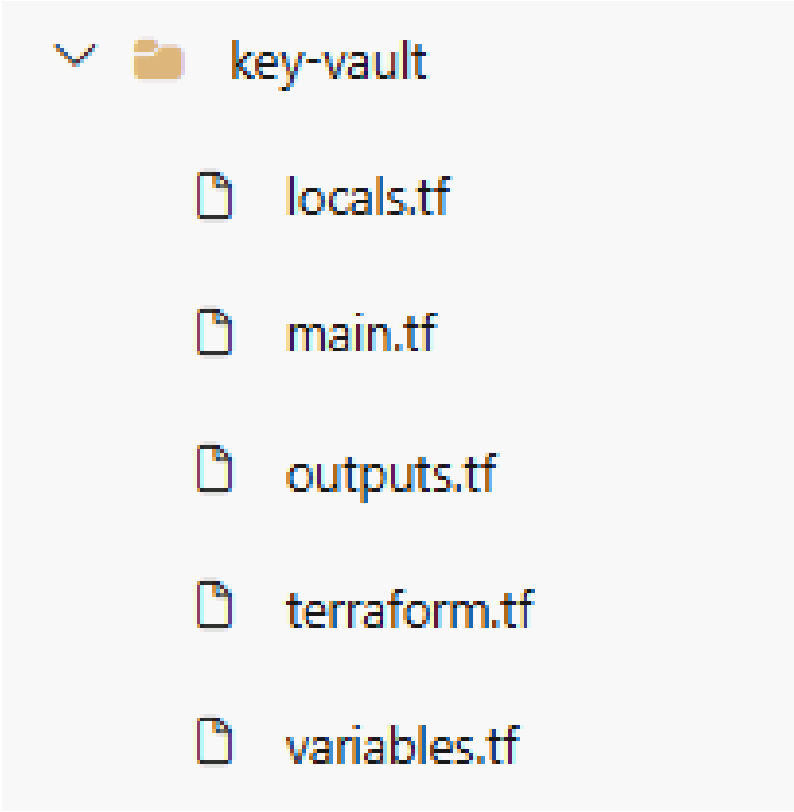
In practice





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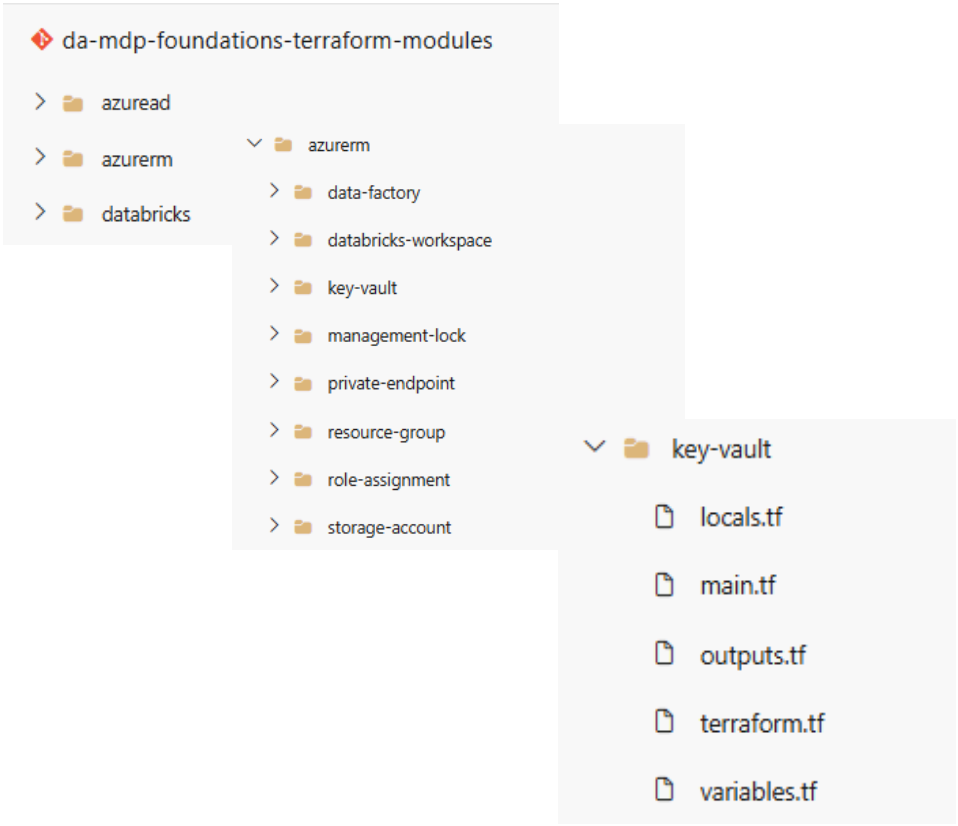
In practice




```hcl
resource "azurerm_key_vault" "key_vault" {
  name                       = var.name
  location                   = var.location
  resource_group_name        = var.resource_group_name
  tenant_id                  = var.tenant_id
  purge_protection_enabled = var.purge_protection_enabled

  sku_name                       = var.sku_name
  public_network_access_enabled = var.public_network_access_enabled
  enable_rbac_authorization     = var.enable_rbac_authorization

  dynamic "network_acls" {
    for_each = var.default_action_kv_fw == "Deny" ? [1] : []
    content {
      bypass                     = var.bypass_kv_fw
      default_action             = var.default_action_kv_fw
      ip_rules                   = var.ip_rules_fw
      virtual_network_subnet_ids = var.subnet_ids_fw
    }
  }
}

resource "azurerm_key_vault_access_policy" "access_policy" {
  count                   = length(var.access_policies)
  key_vault_id            = azurerm_key_vault.key_vault.id
  tenant_id               = var.access_policies[count.index].tenant_id
  object_id               = var.access_policies[count.index].object_id
  secret_permissions      = var.access_policies[count.index].secret_permissions
  key_permissions         = var.access_policies[count.index].key_permissions
  certificate_permissions = var.access_policies[count.index].certificate_permissions
}

resource "azurerm_key_vault_secret" "secret" {
  count        = length(var.secrets)
  name         = var.secrets[count.index].name
  value        = var.secrets[count.index].placeholder
  key_vault_id = azurerm_key_vault.key_vault.id
  lifecycle {
    ignore_changes = [value]
  }
}

```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Module versioning

- Modules are used by different use cases at the same time
- Still, development is possible when new module features are needed for a certain use case
- Use case need to refer to a certain instance of the module, so that its use remains stable

→ Module **versioning** is needed

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Module versioning

key-vault

- **v1.0.0**
  (23-01-2025) PR #24882 - add modules - Adding first version of the module
- **v1.1.0**
  (23-01-2025) PR #24883 - Add kv output name & vault uri - Add name & vault uri output fo...
- **v1.1.1**
  (24-01-2025) PR #24961 - update wiki page - Change output
- **v1.2.0**
  (27-01-2025) PR #24965 - uncomment outputs - Add outputs
- **v1.2.1**
  (27-01-2025) PR #24966 - fix naming - update naming
- **v1.3.0**
  (27-01-2025) PR #24967 - add outputs - Add relevant output
- **v1.4.0**
  (30-01-2025) PR #25101 - KV module finalization - Update & finalize KV module with possi...
- **v1.5.0**
  (24-03-2025) PR #25813 - remove rbac functionality on module itself - Remove RBAC resour...

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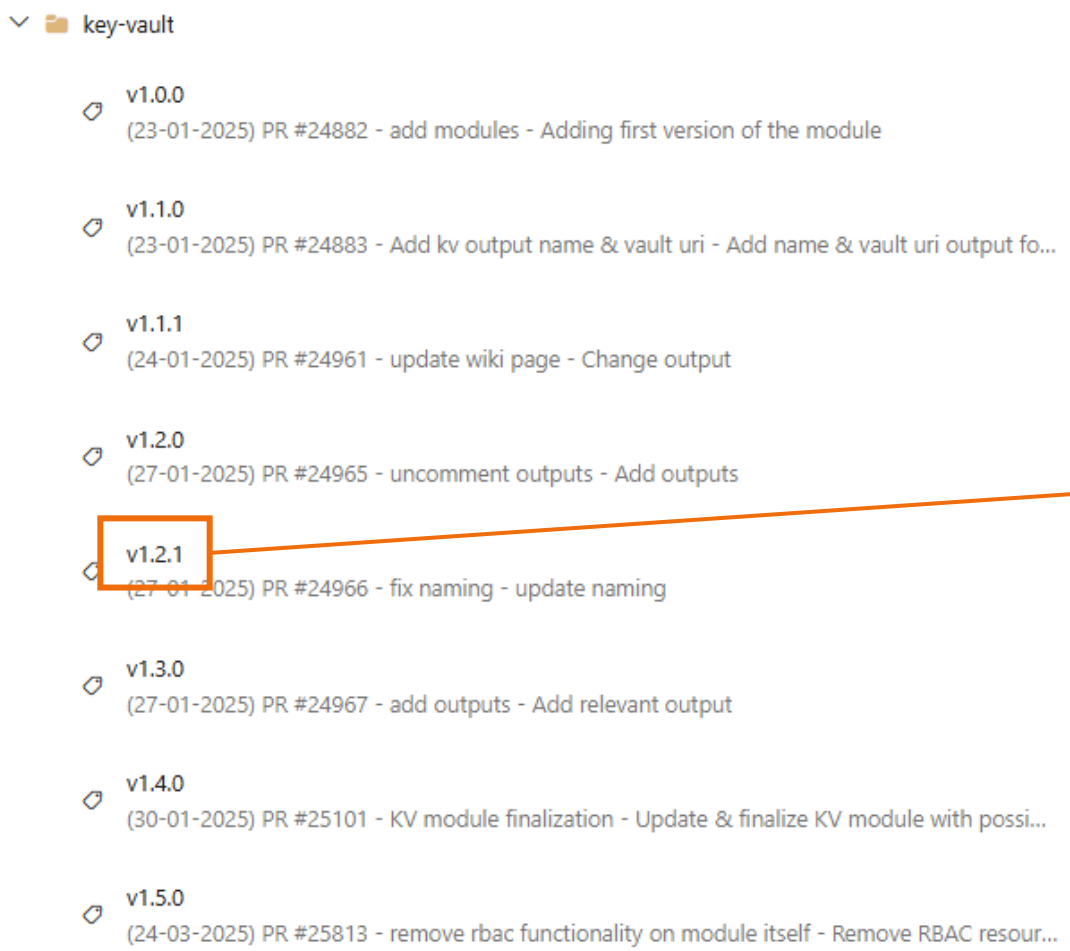
Module versioning



Semantic versioning:
v[major].[minor].[patch]

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Module versioning

```
module "mdp_key_vaults" {
  for_each            = local.input_map_mdp_key_vaults
  source              = "git::https://etexit.visualstudio.com/Modern%20data%20platform/_git/da-mdp-foundations-terraform-modules?ref=azurerm/key-vault/v1.5.0"
  name                = each.key
```

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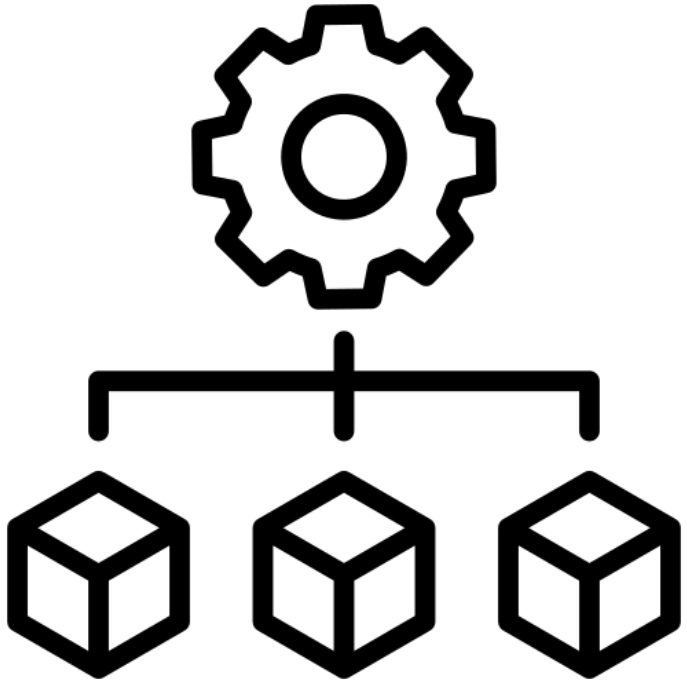
Automation for modules



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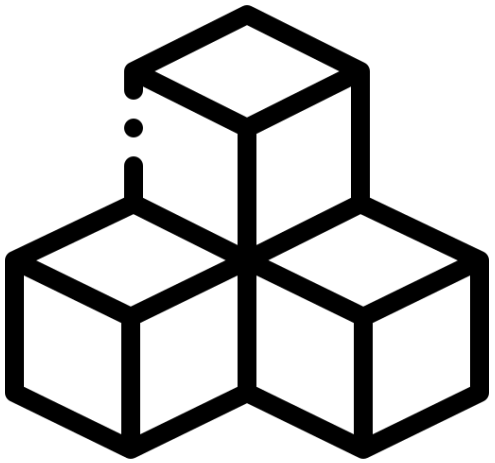
Automation for modules



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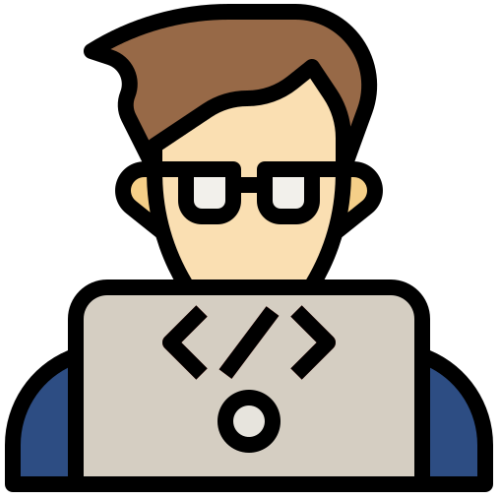
Automation for modules



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Automation for modules

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Automation for modules

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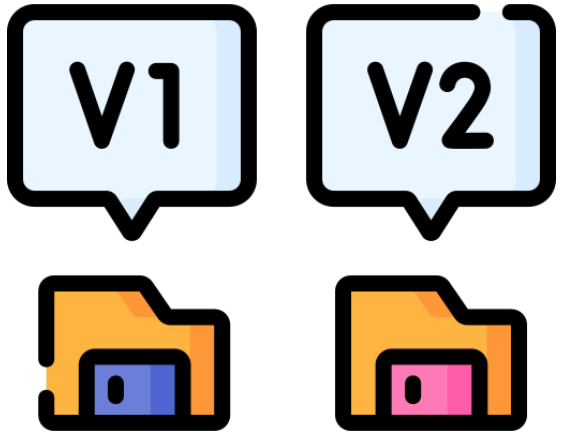
Automation for modules



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Automation for modules

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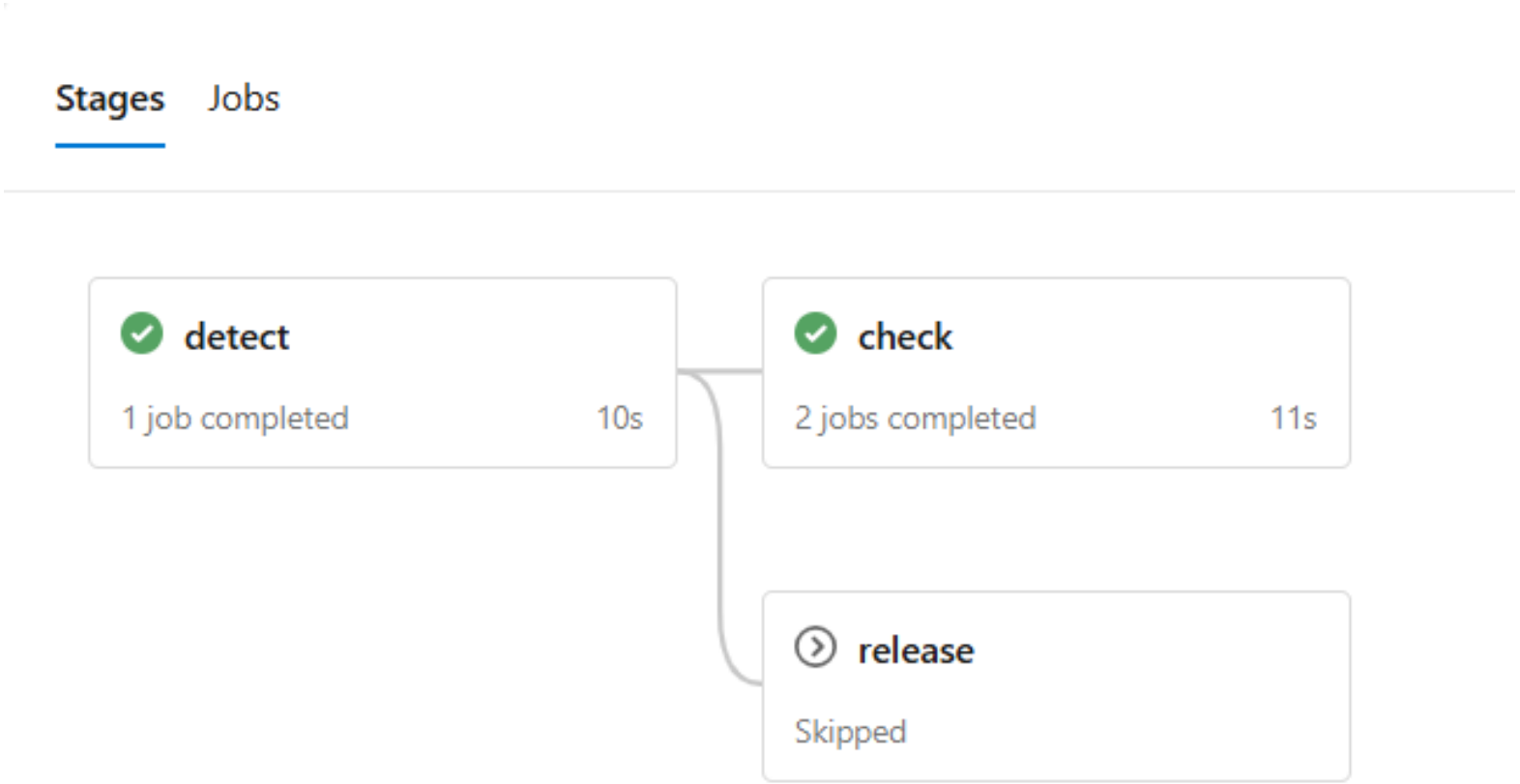
Module versioning pipelines

Module pipeline: validation part



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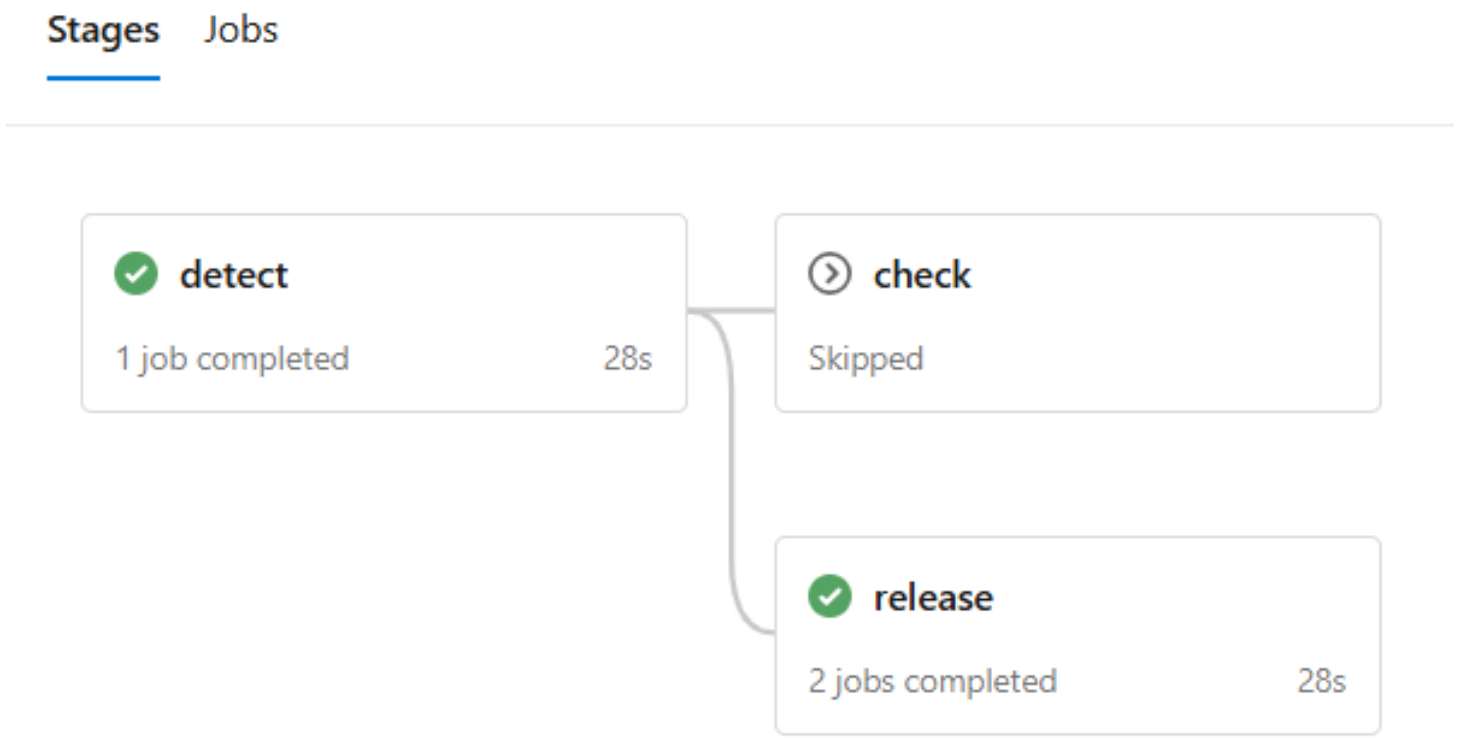
Module versioning pipelines

Module pipeline: deployment part



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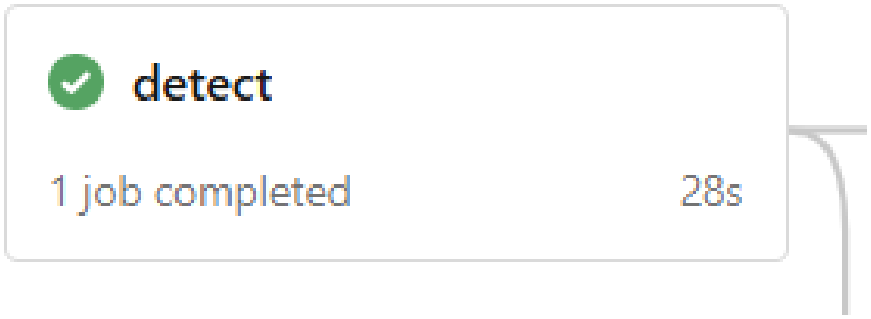
Module versioning pipelines: detect



- Check PR labels on update type (major/minor/patch)
- Check which module has been created/changed
- Create release plan

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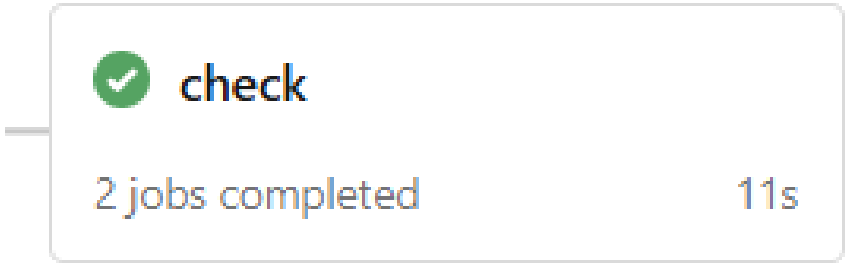
Module versioning pipelines: check



- Perform linter check
- Perform TF format check
- Perform TF validate check

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Module versioning pipelines: release

- Tag and publish new module version
- Generate and publish version documentation in WIKI

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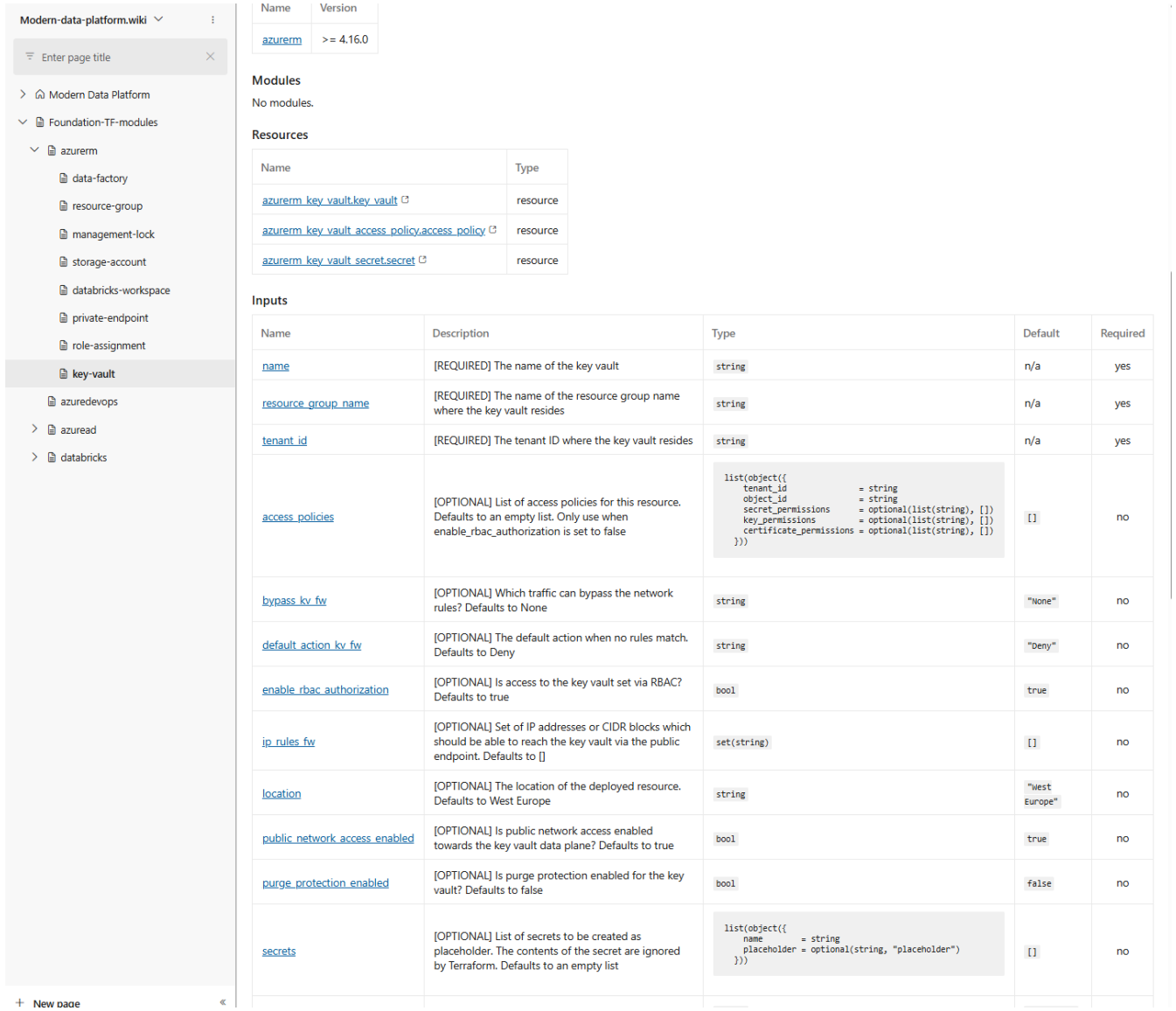
Documentation



Name	Version
azurerm	>= 4.16.0

Modules

No modules.

Resources

Name	Type
azurerm_key_vault.key_vault	resource
azurerm_key_vault_access_policy.access_policy	resource
azurerm_key_vault_secret.secret	resource

Inputs

Name	Description	Type	Default	Required
name	[REQUIRED] The name of the key vault	`string`	n/a	yes
resource_group_name	[REQUIRED] The name of the resource group name where the key vault resides	`string`	n/a	yes
tenant_id	[REQUIRED] The tenant ID where the key vault resides	`string`	n/a	yes
access_policies	[OPTIONAL] List of access policies for this resource. Defaults to an empty list. Only use when enable_rbac_authorization is set to false	`list(object({ tenant_id = string object_id = string secret_permissions = optional(list(string), []) key_permissions = optional(list(string), []) certificate_permissions = optional(list(string), []) }))`	`[]`	no
bypass_kv_fw	[OPTIONAL] Which traffic can bypass the network rules? Defaults to None	`string`	`"None"`	no
default_action_kv_fw	[OPTIONAL] The default action when no rules match. Defaults to Deny	`string`	`"Deny"`	no
enable_rbac_authorization	[OPTIONAL] Is access to the key vault set via RBAC? Defaults to true	`bool`	`true`	no
ip_rules_fw	[OPTIONAL] Set of IP addresses or CIDR blocks which should be able to reach the key vault via the public endpoint. Defaults to []	`set(string)`	`[]`	no
location	[OPTIONAL] The location of the deployed resource. Defaults to West Europe	`string`	`"West Europe"`	no
public_network_access_enabled	[OPTIONAL] Is public network access enabled towards the key vault data plane? Defaults to true	`bool`	`true`	no
purge_protection_enabled	[OPTIONAL] Is purge protection enabled for the key vault? Defaults to false	`bool`	`false`	no
secrets	[OPTIONAL] List of secrets to be created as placeholder. The contents of the secret are ignored by Terraform. Defaults to an empty list	`list(object({ name = string placeholder = optional(string, "placeholder") }))`	`[]`	no

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Acceleration through reusability

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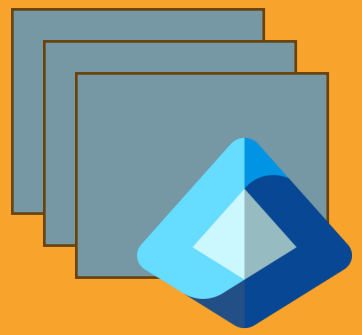
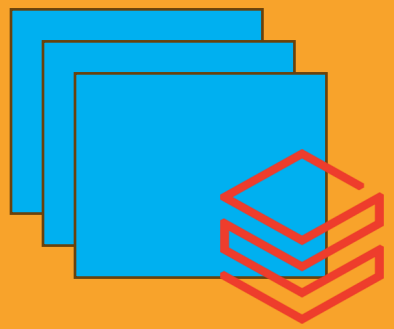
Base layer with Terraform modules





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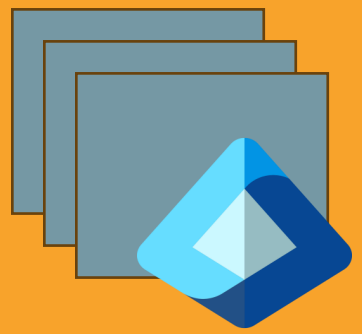
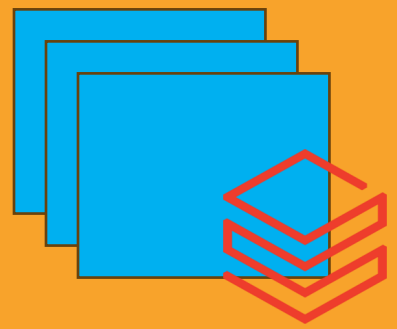
UC 1

UC 2

UC 3

Base layer with Terraform modules





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UC 1

UC 2

UC 3

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Translating areas of work into use cases: use case identification

- Determination of scope: what will be deployed/managed by IaC?
- Break scope down in smaller parts of resources/services belonging together: **use cases**
- Grouping depends on:
  - Target platform, practical integration/implementation
  - Deployment strategy

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Use cases

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Use cases

iam

azure-resources

rbac

dbx-account-settings

databricks-compute

unity-catalog

databricks-security

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Use cases

iam

azure-resources

rbac

dbx-account-settings

databricks-compute

unity-catalog

databricks-security

…

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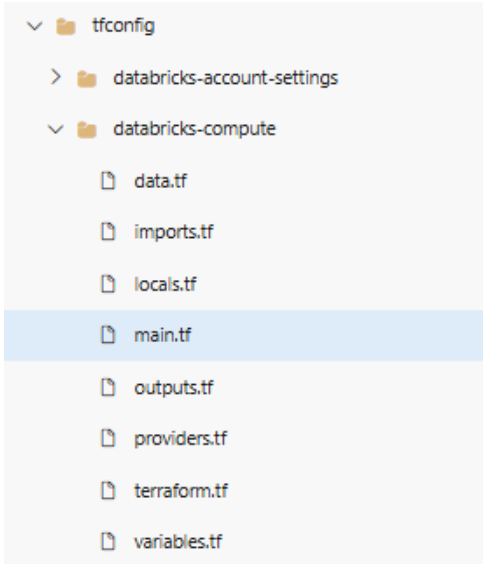
In practice




```hcl
module "sql_warehouses" {
  for_each          = local.input_map_sql_warehouses
  source            = "git::https://etexit.visualstudio.com/Modern%20data%20platform/_git/da-mdp-foundations-terraform-modules?ref=databricks/sql-warehouse/v1.1.1"
  name              = each.key
  auto_stop_mins    = each.value.auto_stop_mins
  cluster_size      = each.value.cluster_size
  enable_photon     = each.value.enable_photon
  min_num_clusters  = each.value.min_num_clusters
  max_num_clusters  = each.value.max_num_clusters
  tags = merge(
    var.general_tags,
    each.value.tags
  )
  enable_serverless_compute = each.value.enable_serverless_compute
  warehouse_type            = each.value.warehouse_type
  sql_wh_permissions        = each.value.sql_wh_permissions
}

module "interactive_clusters" {
  for_each                        = local.input_map_interactive_clusters
  source                          = "git::https://etexit.visualstudio.com/Modern%20data%20platform/_git/da-mdp-foundations-terraform-modules?ref=databricks/interactive-cluster/v1.1.0"
  name                            = each.key
  spark_version                   = each.value.spark_version
  spark_version_long_term_support = each.value.spark_version_long_term_support
  enable_autoscale                = each.value.enable_autoscale
  node_type                       = each.value.node_type
  driver_node_type                = each.value.driver_node_type
  min_num_workers                 = each.value.min_num_workers
  max_num_workers                 = each.value.max_num_workers
  num_workers                     = each.value.num_workers
  auto_stop_mins                  = each.value.auto_stop_mins
  tags = merge(
    var.general_tags,
    each.value.tags
  )
  cluster_permissions = each.value.cluster_permissions
}
```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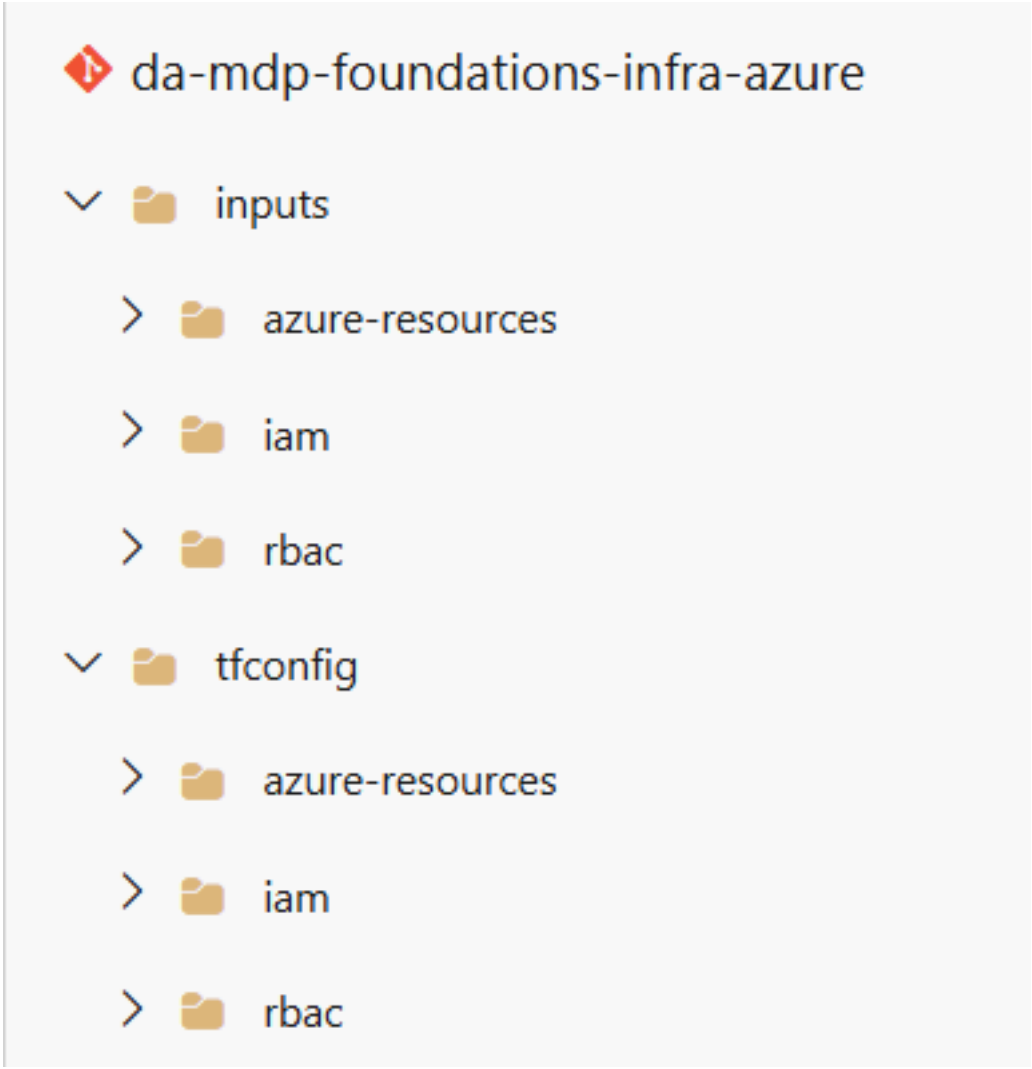
Use cases: input vs. config

- Inputs: *changes what will be deployed*
- Config: *changes how it will be deployed*



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Use cases

Config

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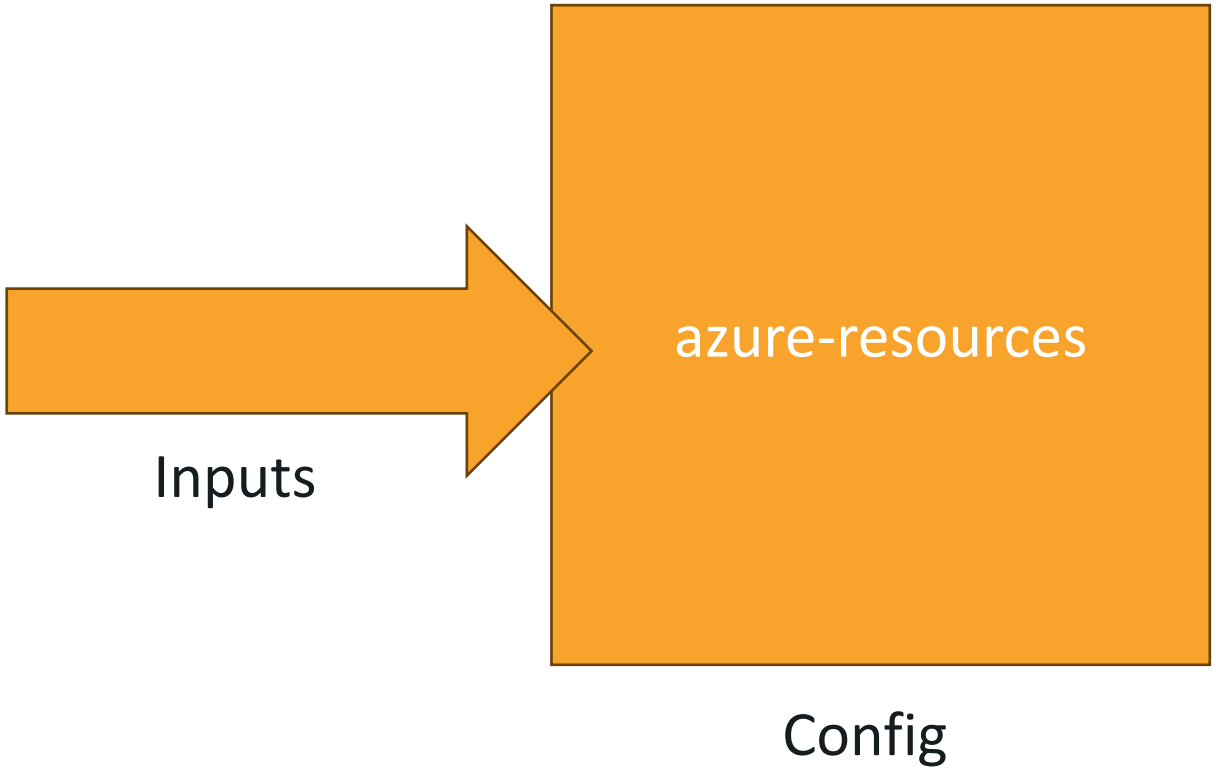
Use cases



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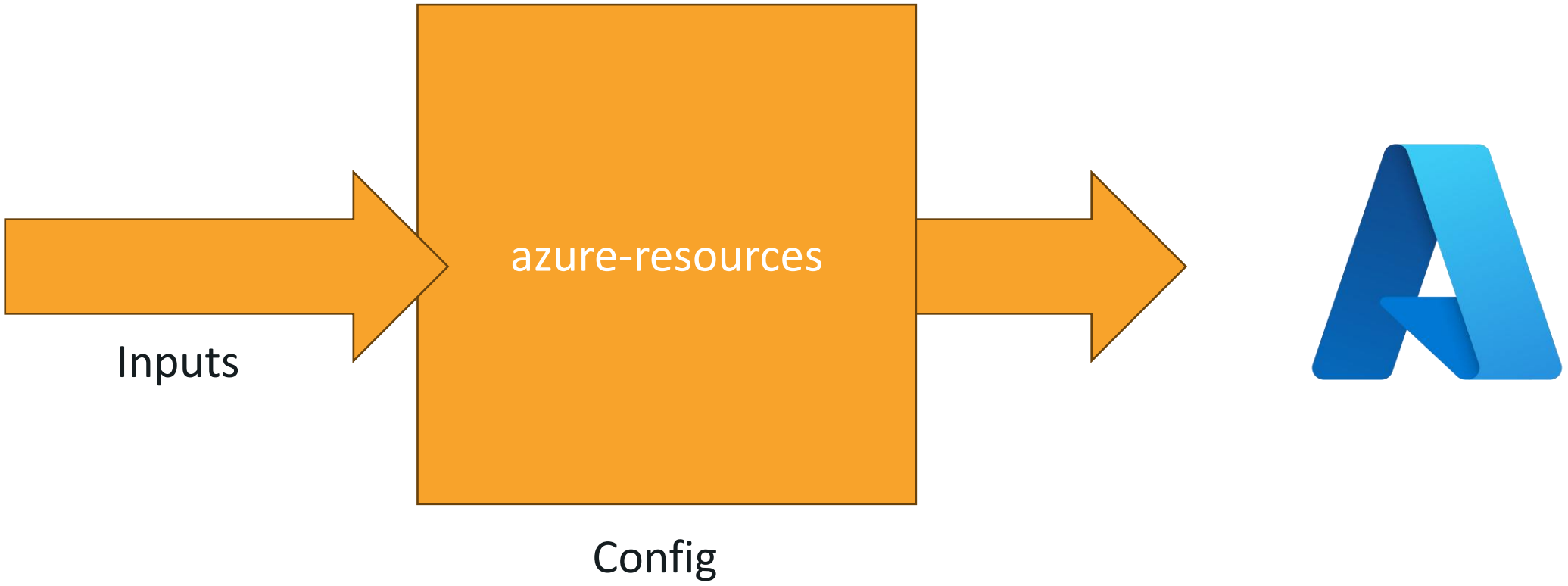
Use cases



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Use cases: automation

Per use case:

- Automated deployments
- Inter-use case independent deployments
- Versioning

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Use cases: versioning

- Modules: *semantic versioning*
- Use cases: other approach for versioning

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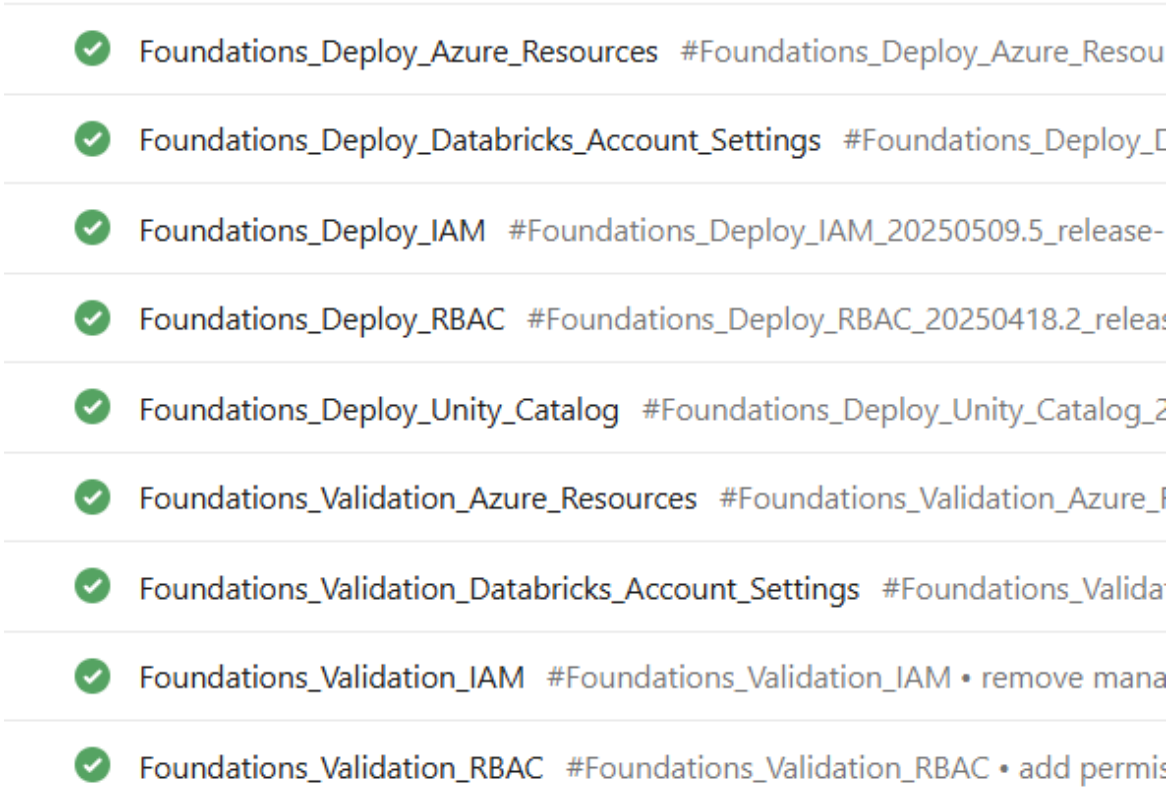
Use cases: independent automated deployments

- Each use case:
  - *Validation pipeline*
  - *Deployment pipeline*

- Pipelines are triggered based on:
  - Branch, PR
  - File path



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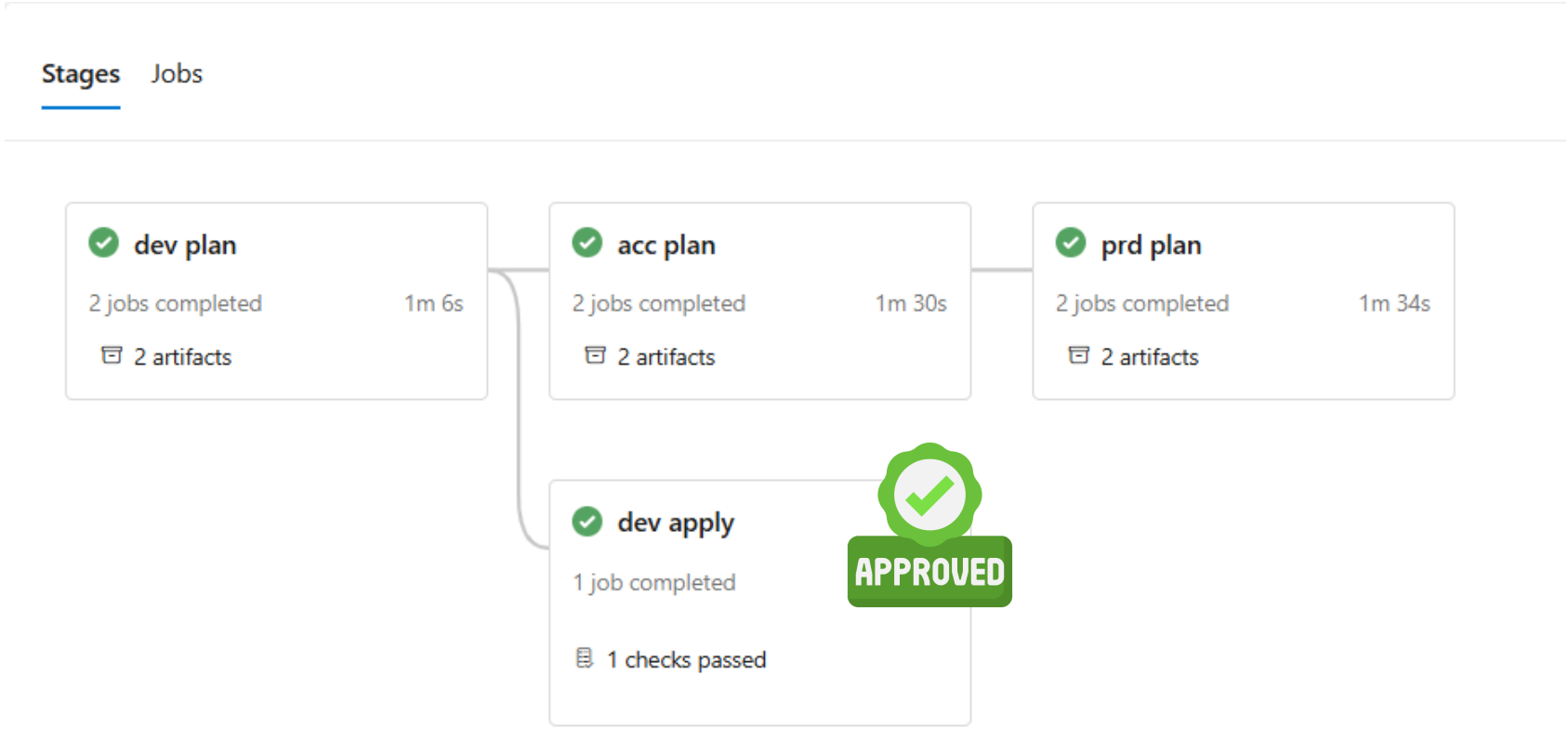
Use cases: validation pipeline



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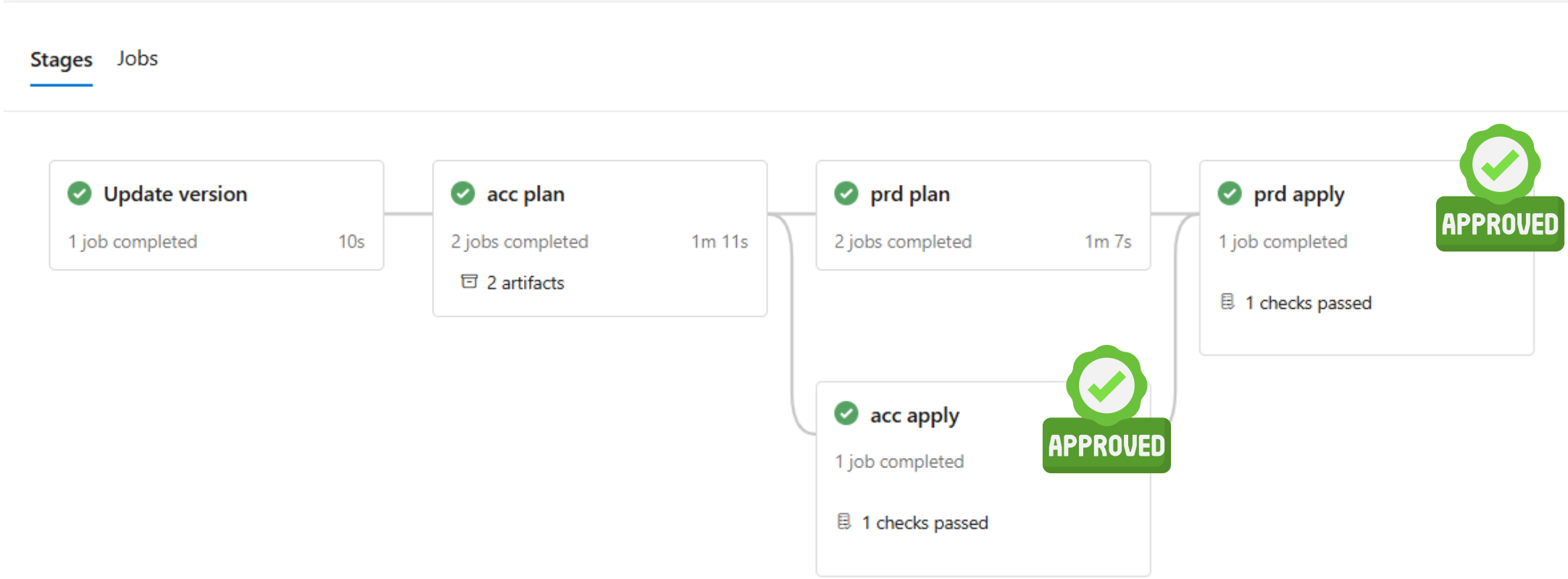
Use cases: deployment pipeline



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Where are we now?

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Where are we now?

- Baseline (framework) is set up
  - Modules
  - Use cases

- Foundations team is now using framework
  - Extra resources → via inputs
  - New use cases / architecture changes → via config

- Standardize way of working now that initial development is done

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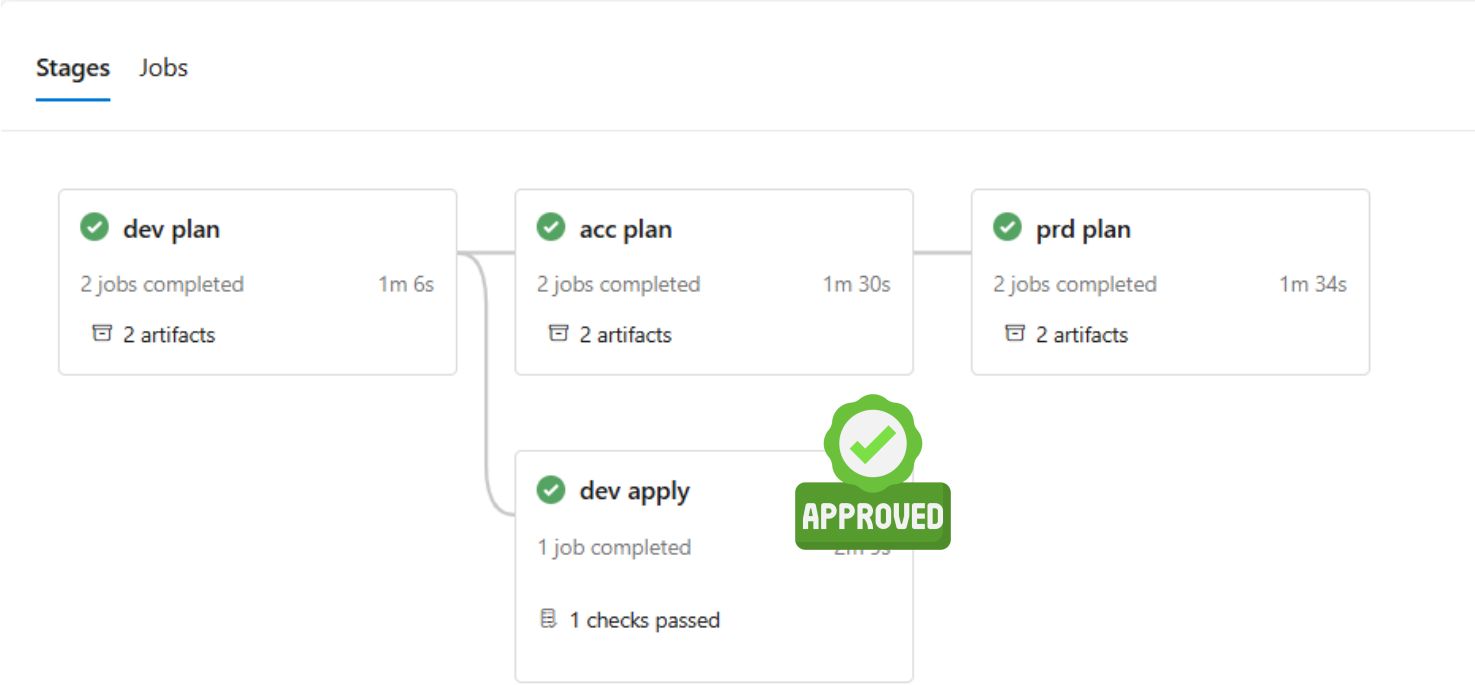
Standardized way of working

- Having *guardrails* in place for development
  - Deployment approvals via environments



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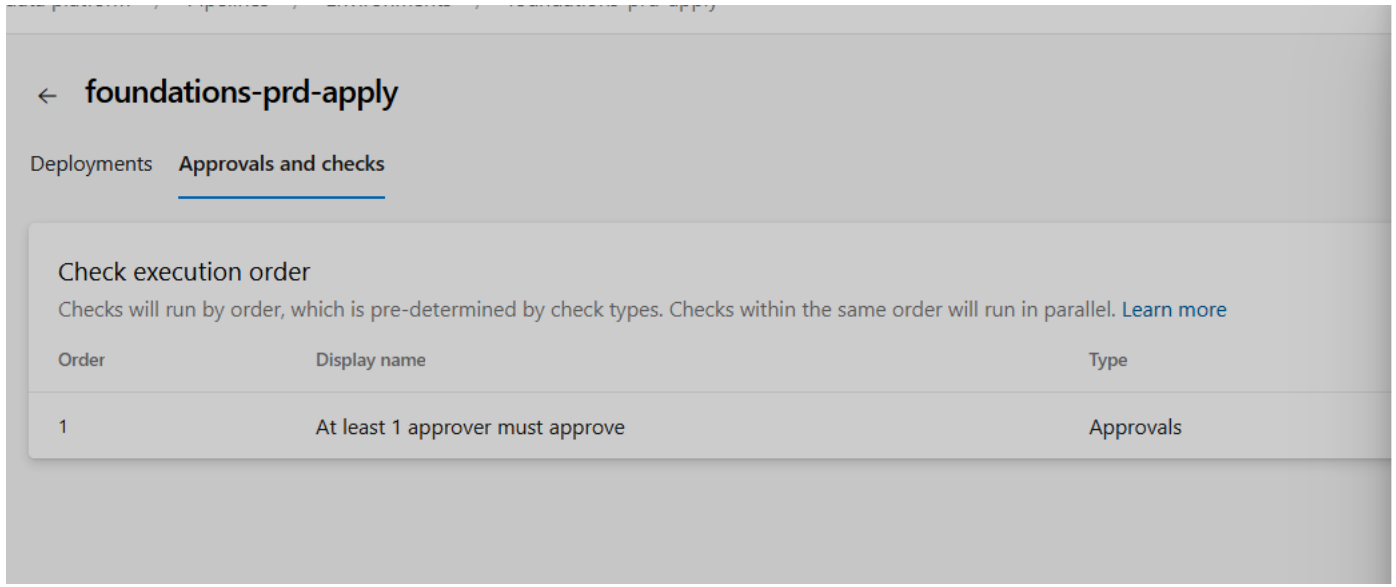

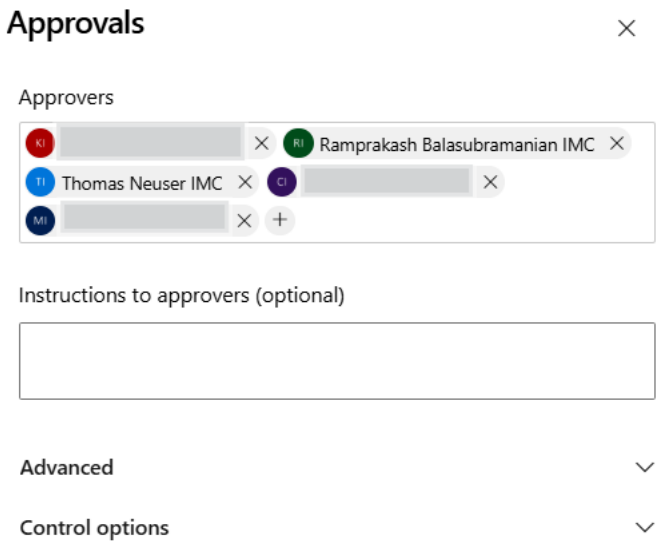

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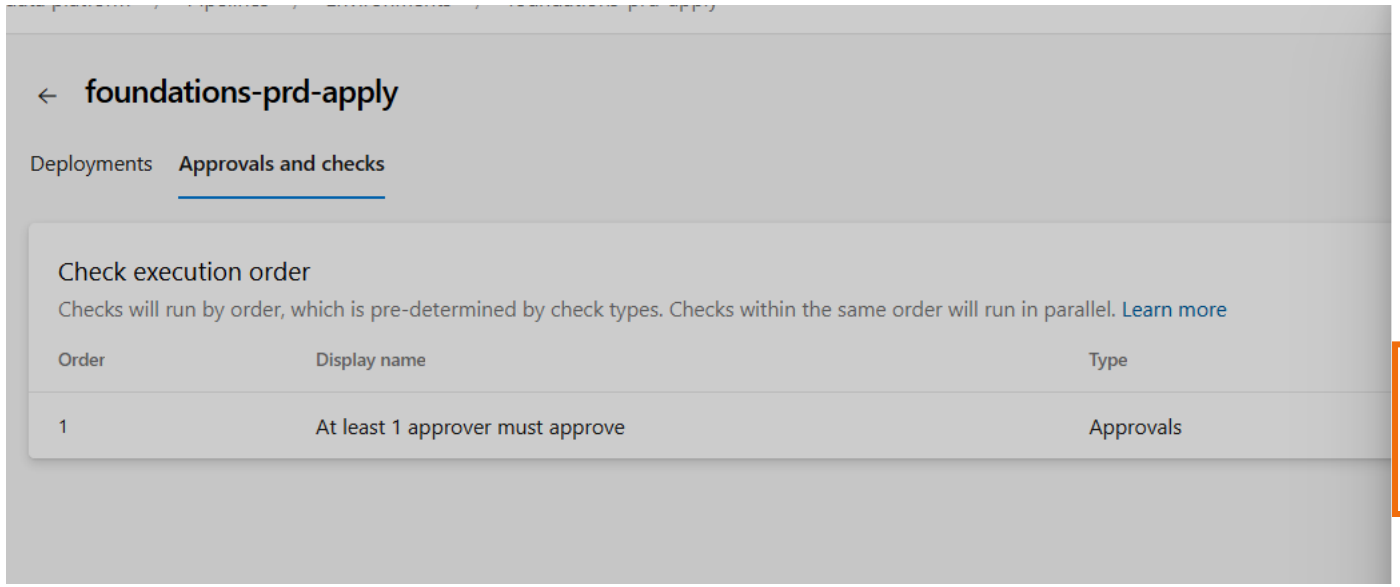

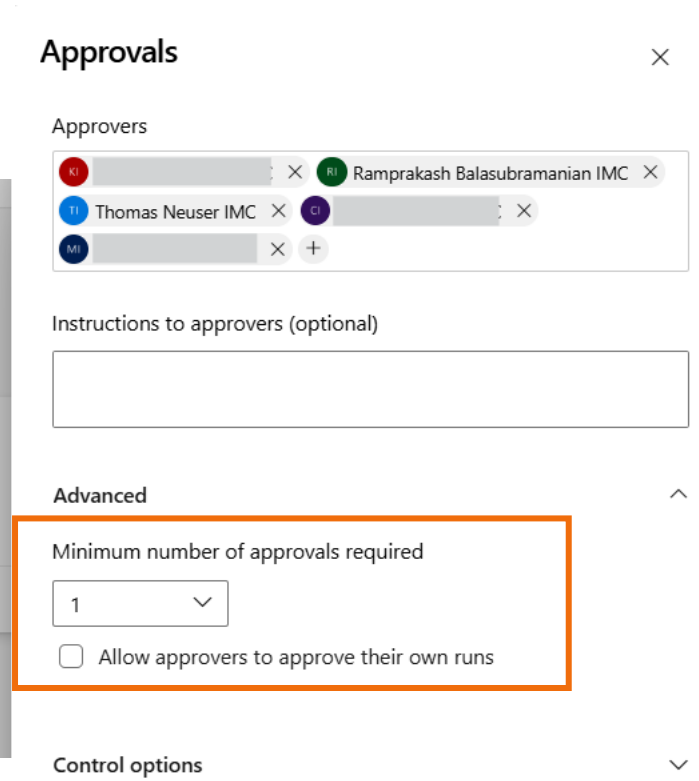

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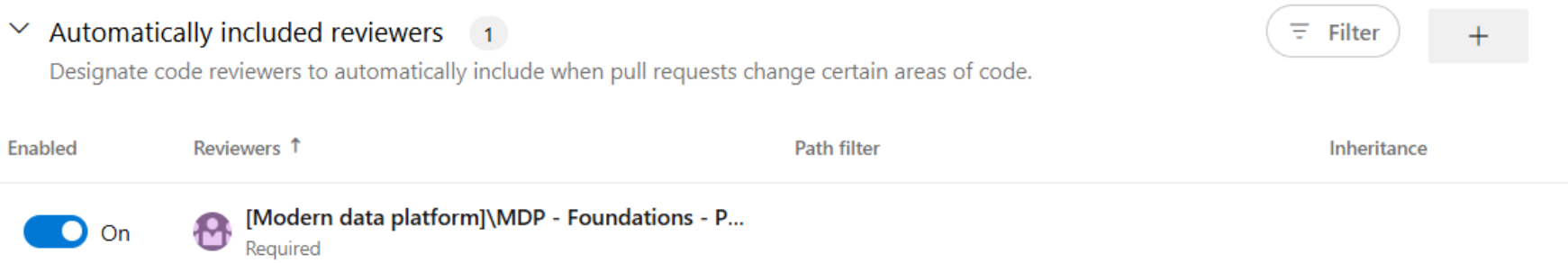
Standardized way of working

- Having *guardrails* in place for development
  - Pull request validation checks via policies: *Required reviewers*



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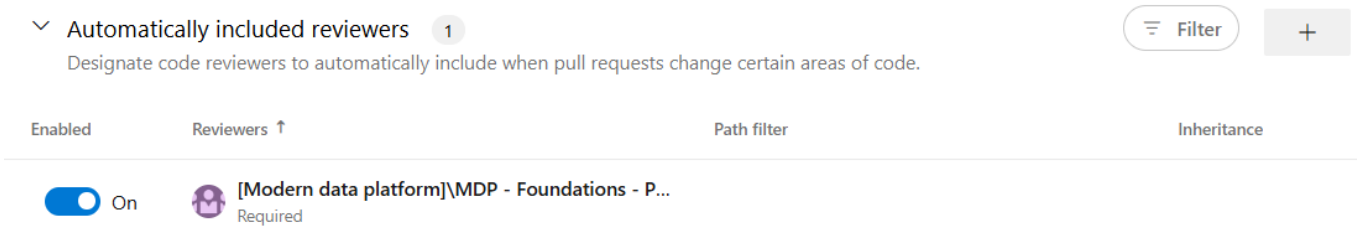

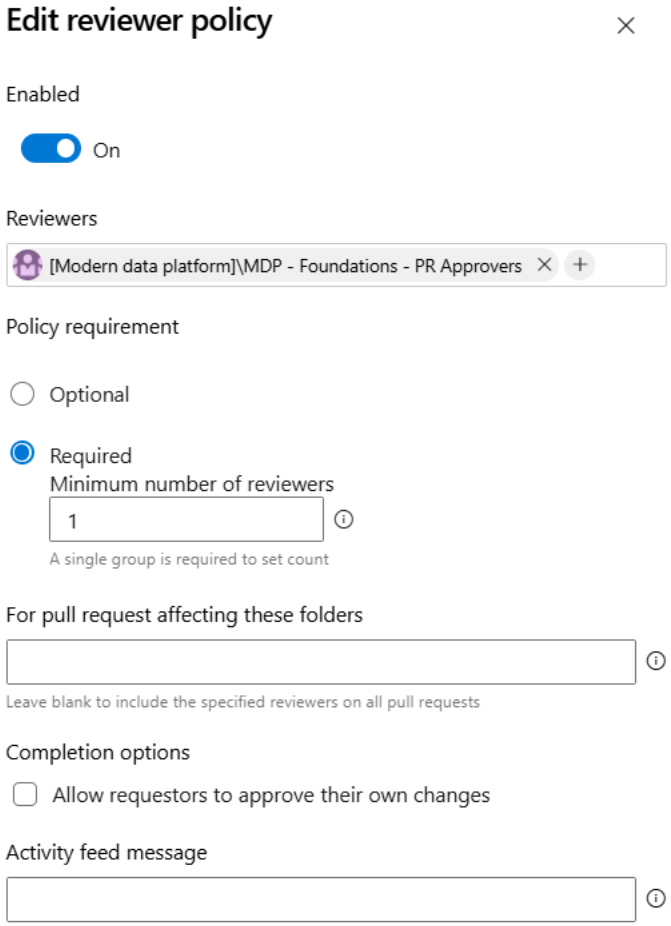

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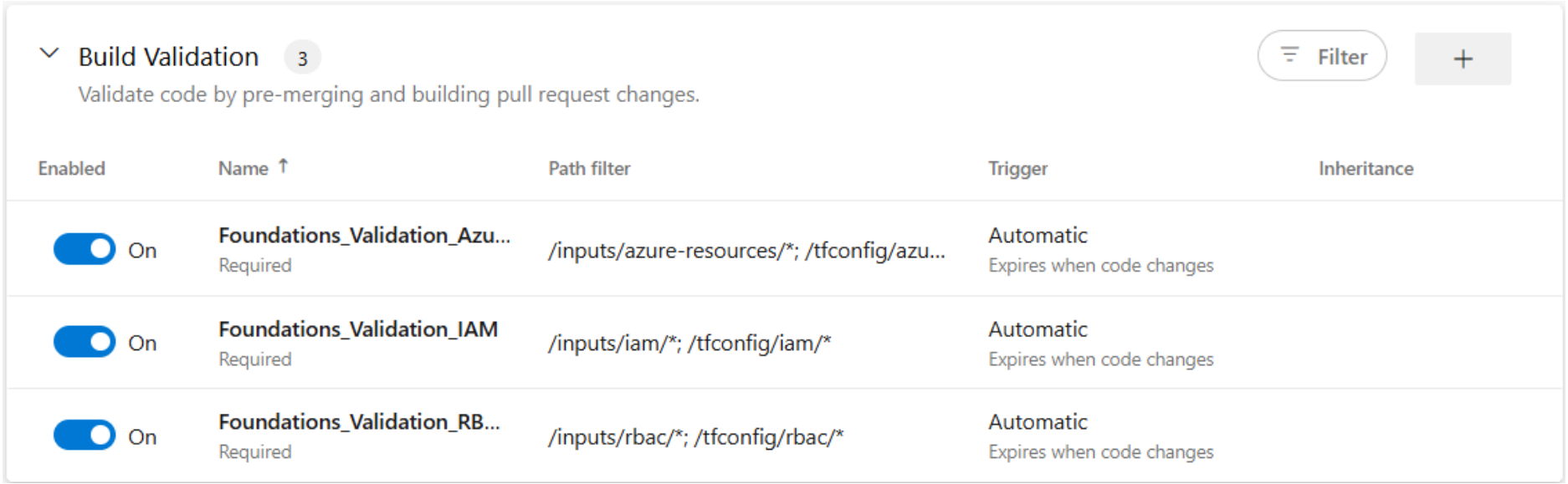
Standardized way of working

- Having *guardrails* in place for development
  - Pull request validation checks via policies:
    Build validation pipelines



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Standardized way of working

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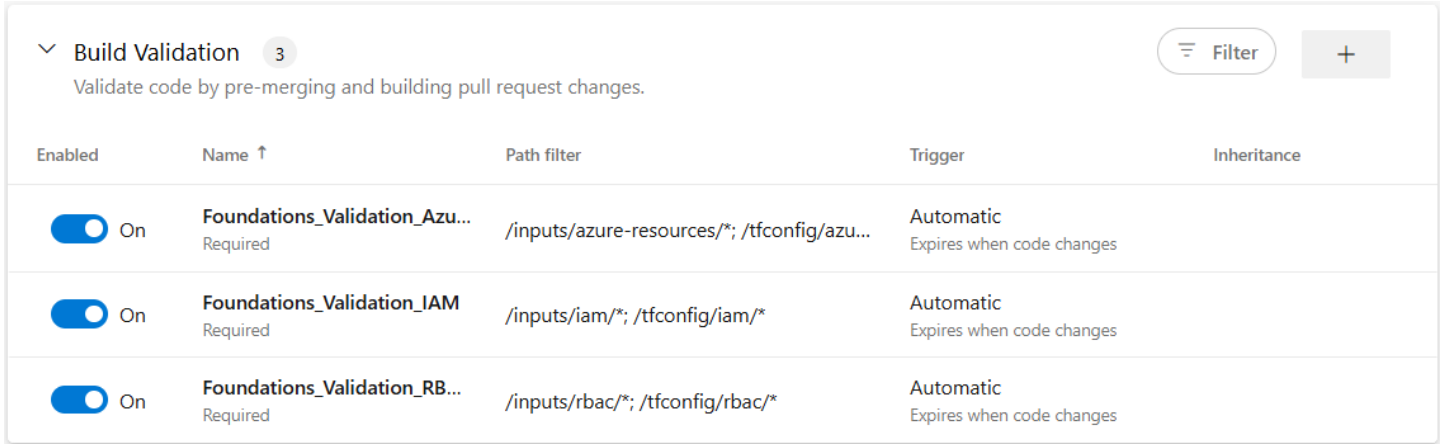

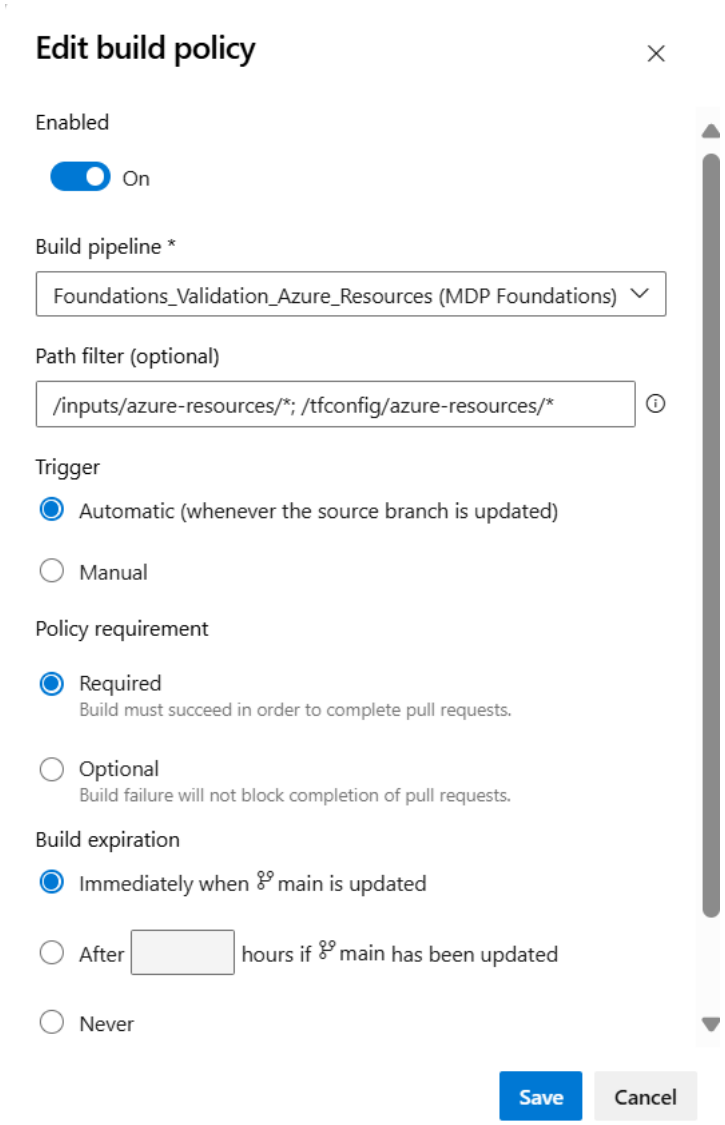

Solution impact

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Impact & added value

- Clean-up and added governance to all related platforms
  - Enforcing naming convention
  - Govern permissions
  - Get rid of “click-ops”
  - Standardization across deployments

- Acceleration of deployments because of the base layer with TF modules

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Future aspirations

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Future aspirations

- Further incorporation of the already existing platform components into IaC
- Expand the scope of managed IaC resources (new use cases, new platforms)
- Move towards self-service Infra-as-Code (2 phases)

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Future aspirations

- Further incorporation of the already existing platform components into IaC
- Expand the scope of managed IaC resources (new use cases, new platforms)
- **Move towards self-service Infra-as-Code (2 phases)**

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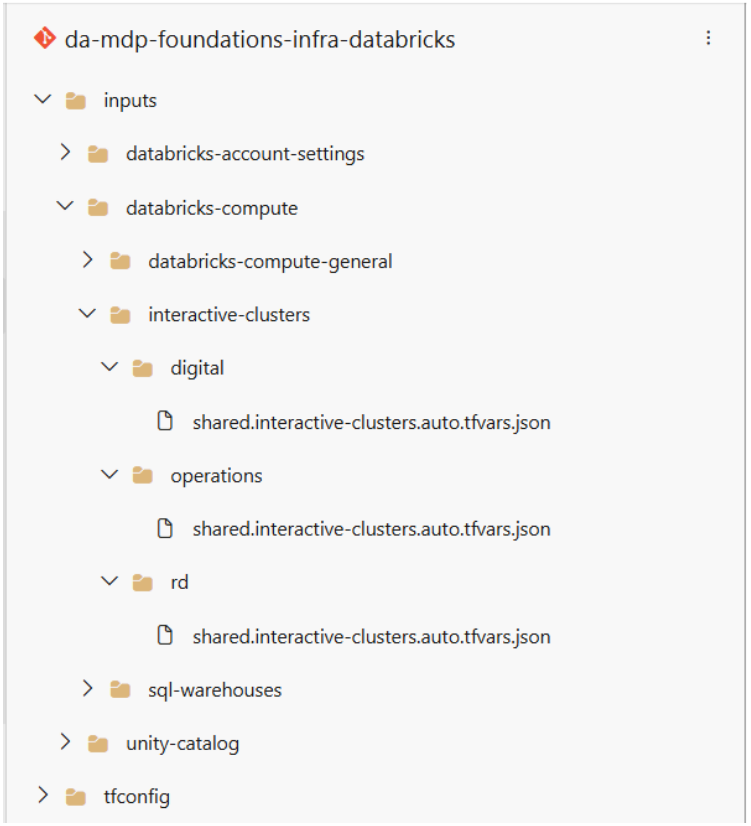
Self-service Infra-as-Code (phase 1): goal

Enable technical teams to tweak IaC inputs via our repository



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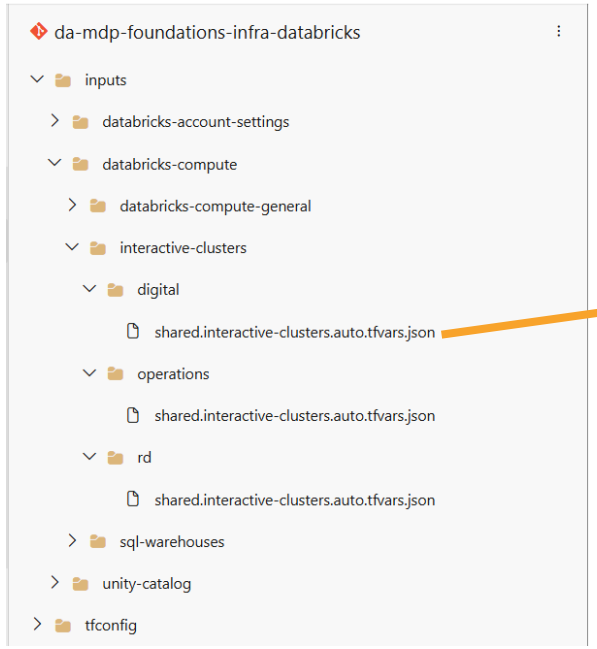
Self-service Infra-as-Code (phase 1): goal

Enable technical teams to tweak IaC inputs via our repository




```
{
    "interactive_clusters": [
        {
            "domain": "dig",
            "subdomain": "placeholder",
            "use_case": "pbi",
            "index": "01",
            "spark_version": null,
            "spark_version_long_term_support": true,
            "enable_autoscale": true,
            "node_type": "Standard_DS3_v2",
            "driver_node_type": "Standard_DS3_v2",
            "min_num_workers": 1,
            "max_num_workers": 2,
            "num_workers": 1,
            "auto_stop_mins": 15,
            "cluster_permissions": [
                {
                    "principal_type": "GROUP",
                    "principal_name": "GROUP_NAME",
                    "permission_level": "CAN_ATTACH_TO"
                }
            ],
            "tags": {
                "UseCase": "Placeholder",
                "Domain": "Placeholder",
                "Subdomain": "Placeholder",
                "Description": "Placeholder",
                "BusinessOwner": "Placeholder"
            }
        }
    ]
}
```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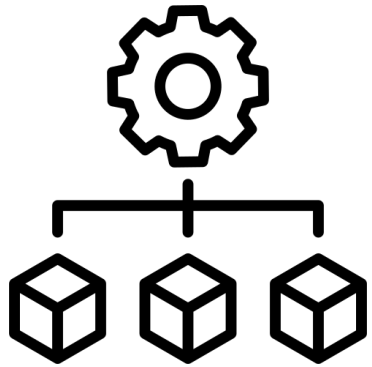
Self-service Infra-as-Code (phase 1): flow



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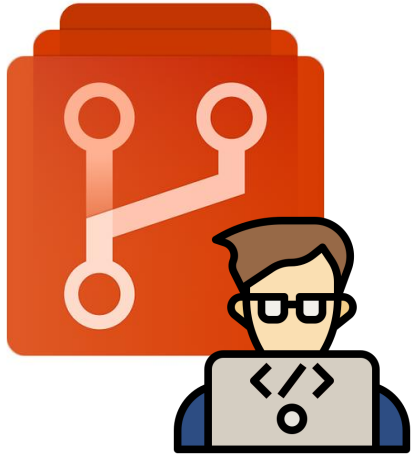
Self-service Infra-as-Code (phase 1): flow



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Self-service Infra-as-Code (phase 1): flow

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Self-service Infra-as-Code (phase 1): flow

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Self-service Infra-as-Code (phase 1): downsides

- Teams have to be technical and code savvy to add resources
- Foundations team have to check the code for possible mistakes, involves (a lot of) manual work

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Self-service Infra-as-Code (phase 2): goal

Enable (technical) teams to tweak IaC inputs via Service desk/GUI application

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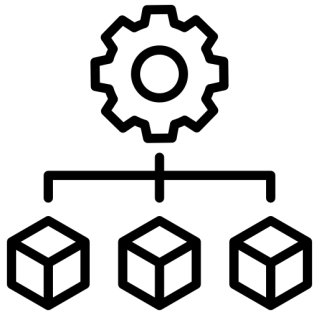
Self-service Infra-as-Code (phase 2): flow



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Self-service Infra-as-Code (phase 2): flow

TOPdesk

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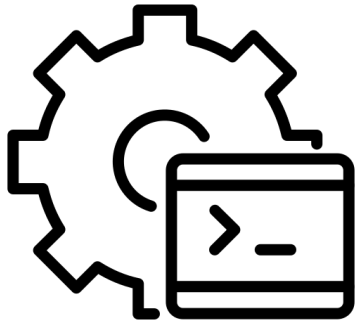
Self-service Infra-as-Code (phase 2): flow



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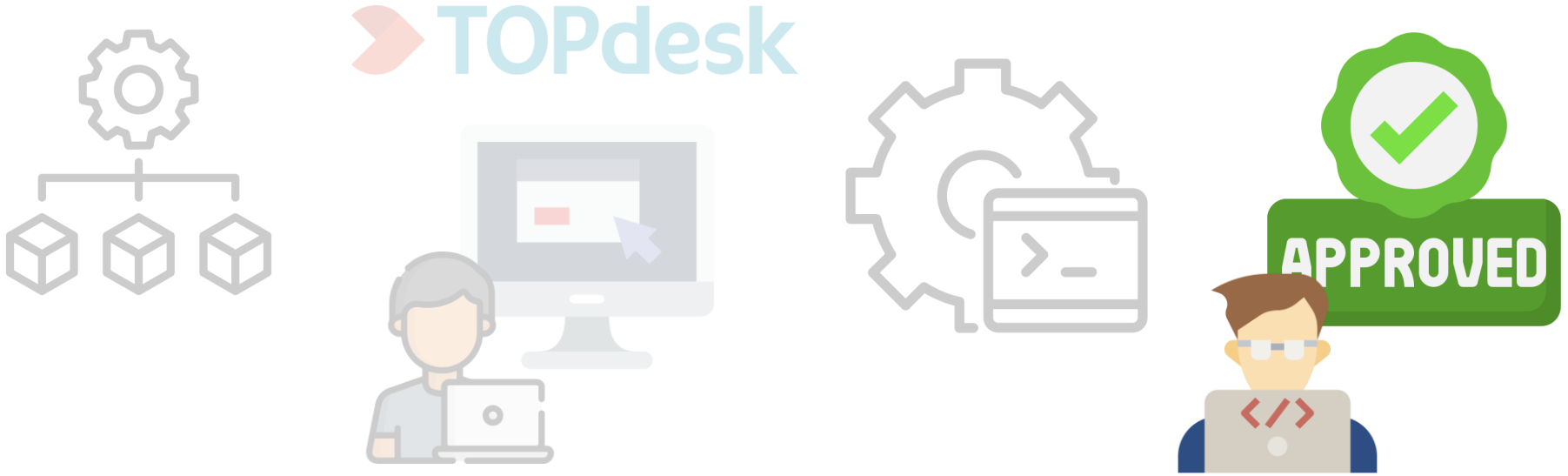
Self-service Infra-as-Code (phase 2): flow



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Self-service Infra-as-Code (phase 2): flow

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Self-service Infra-as-Code (phase 2): upsides

- No direct code tweaking is needed anymore
- Addition of needed code is handled automatically and put in the right place
- Less error prone
- PR review becomes less work intensive, validation can happen within the application's GUI

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That’s a wrap, your thoughts?

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Thank you

Ramprakash Balasubramanian

Thomas Neuser

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