Bicep: Infrastructure as Code for the Azure Cloud

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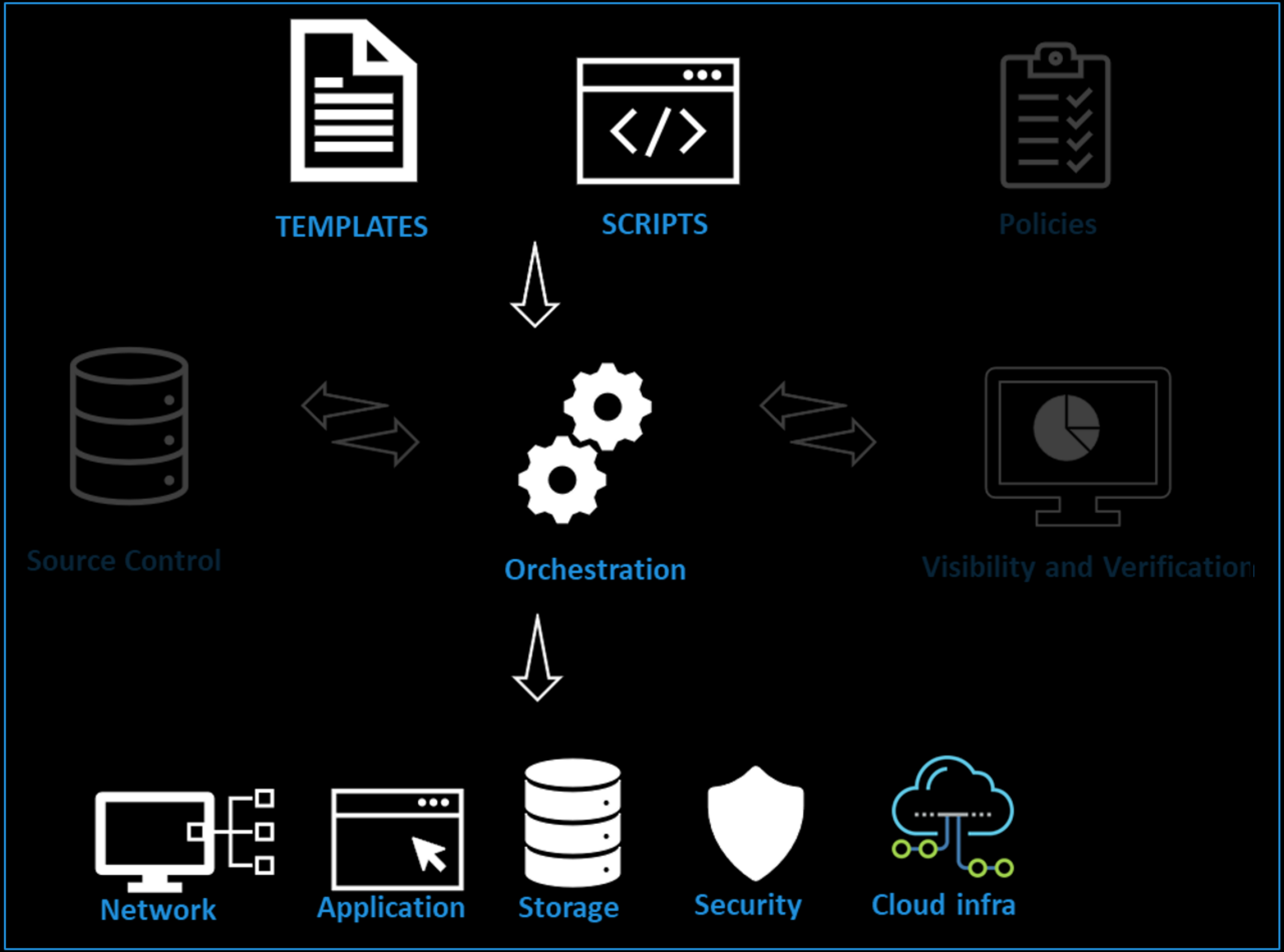
Introduction to IaC

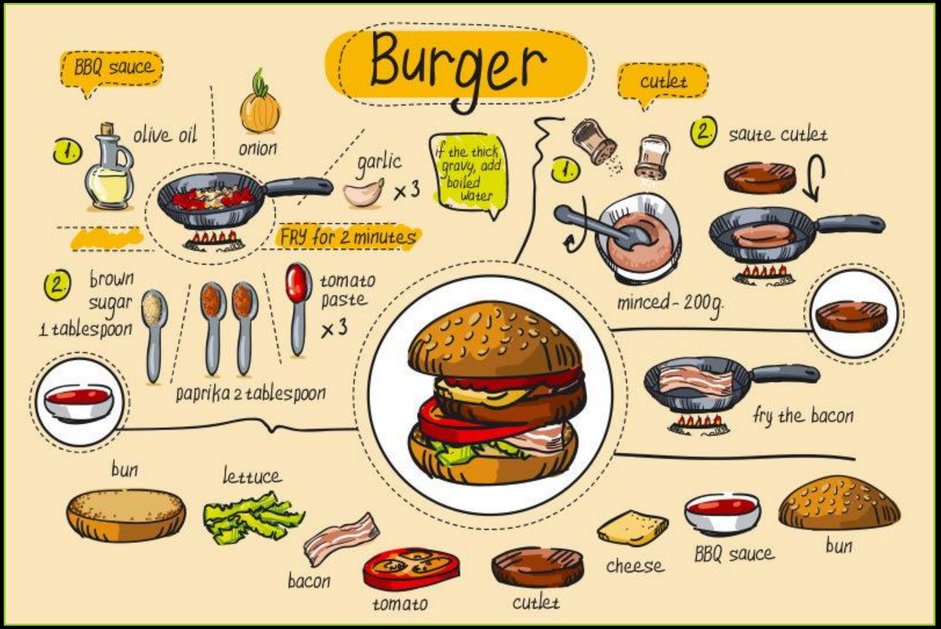
"..the process of provisioning infrastructure resources similar to how software is deployed."

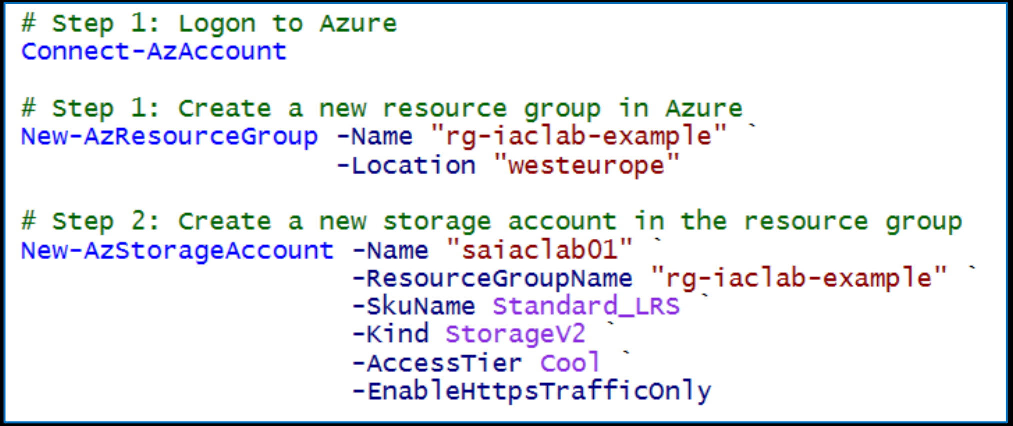


Imperative code

You execute a sequence of commands, in a specific order, to reach an end configuration.

This process defines what the code should accomplish, and it defines how to accomplish the task like a step-by-step instruction manual.



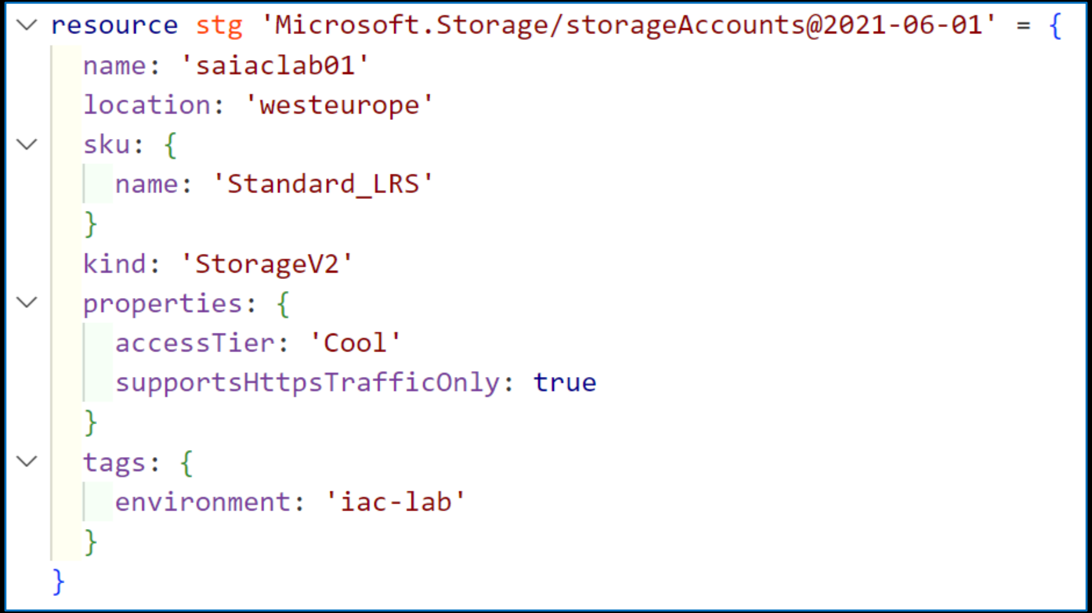


```
# Step 1: Logon to Azure
Connect-AzAccount

# Step 1: Create a new resource group in Azure
New-AzResourceGroup -Name "rg-iaclab-example" `
                    -Location "westeurope"

# Step 2: Create a new storage account in the resource group
New-AzStorageAccount -Name "saiaclab01" `
                     -ResourceGroupName "rg-iaclab-example" `
                     -SkuName Standard_LRS `
                     -Kind StorageV2 `
                     -AccessTier Cool `
                     -EnableHttpsTrafficOnly
```

Declarative code

You specify only the end configuration. The code doesn't define how to accomplish the task.

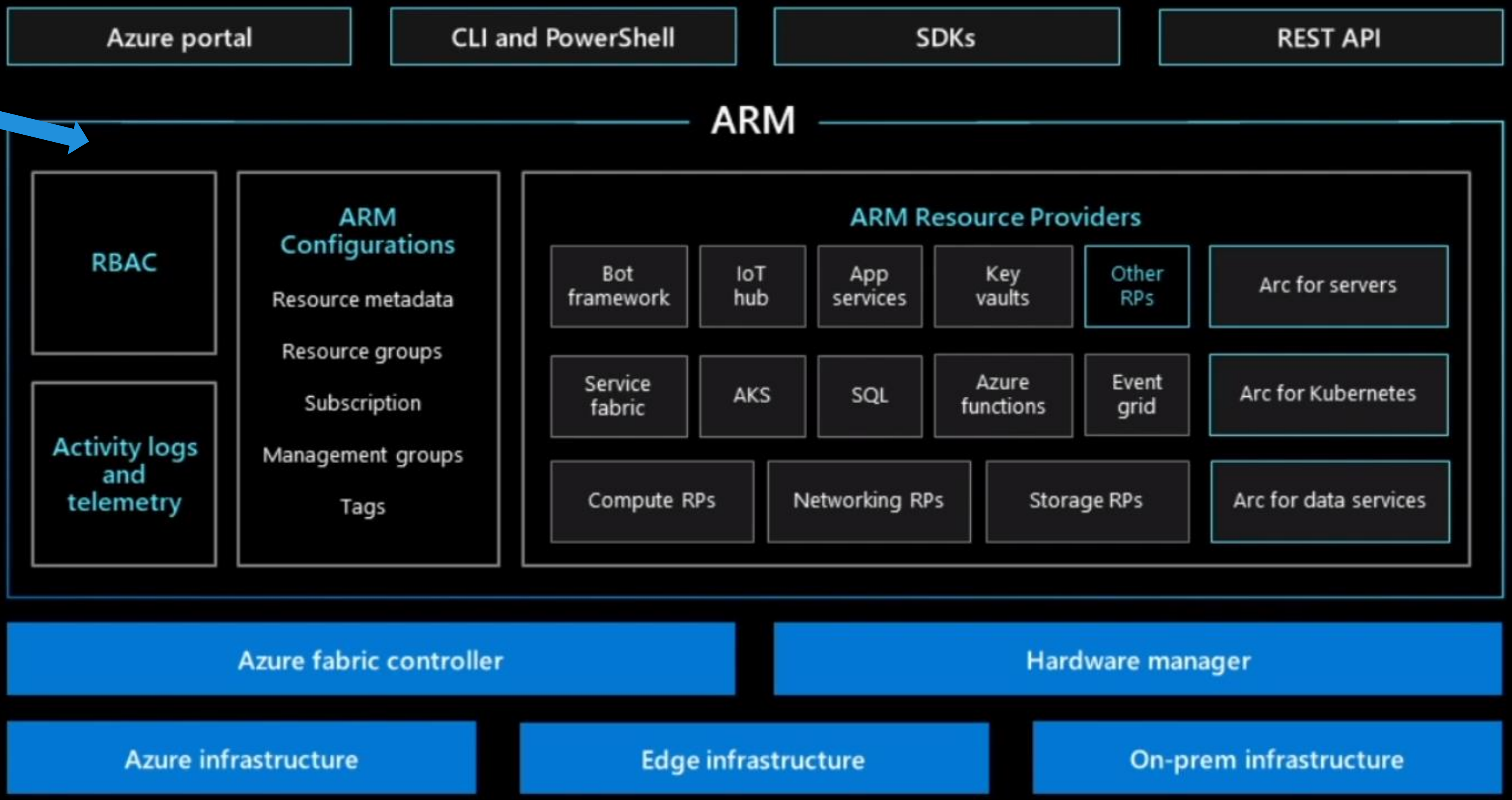
Like ordering from a menu.



```
resource stg 'Microsoft.Storage/storageAccounts@2021-06-01' = {
  name: 'saiaclab01'
  location: 'westeurope'
  sku: {
    name: 'Standard_LRS'
  }
  kind: 'StorageV2'
  properties: {
    accessTier: 'Cool'
    supportsHttpsTrafficOnly: true
  }
  tags: {
    environment: 'iac-lab'
  }
}
```

Azure Resource Manager

ARM Template



Azure portal

CLI and PowerShell

SDKs

REST API

ARM

RBAC

Activity logs and telemetry

ARM Configurations

Resource metadata

Resource groups

Subscription

Management groups

Tags

ARM Resource Providers

Bot framework

IoT hub

App services

Key vaults

Other RPs

Arc for servers

Service fabric

AKS

SQL

Azure functions

Event grid

Arc for Kubernetes

Compute RPs

Networking RPs

Storage RPs

Arc for data services

Azure fabric controller

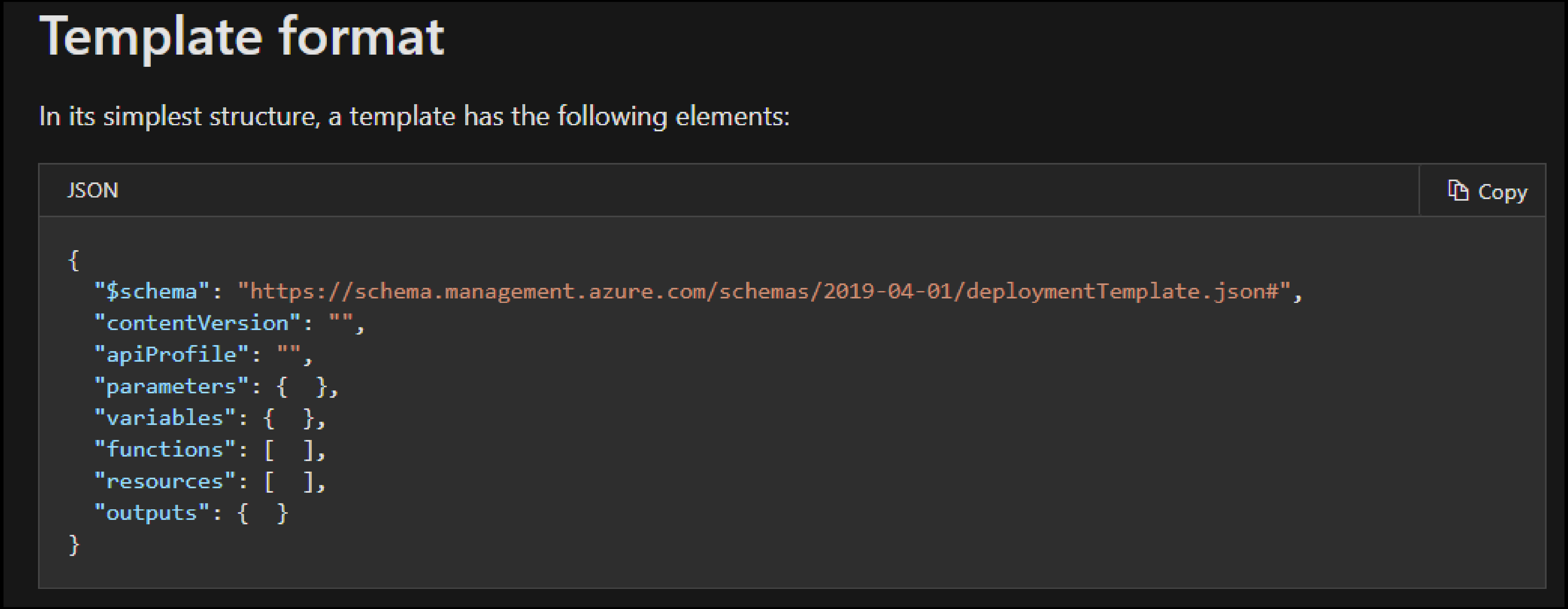
Hardware manager

Azure infrastructure

Edge infrastructure

On-prem infrastructure

Infrastructure as code

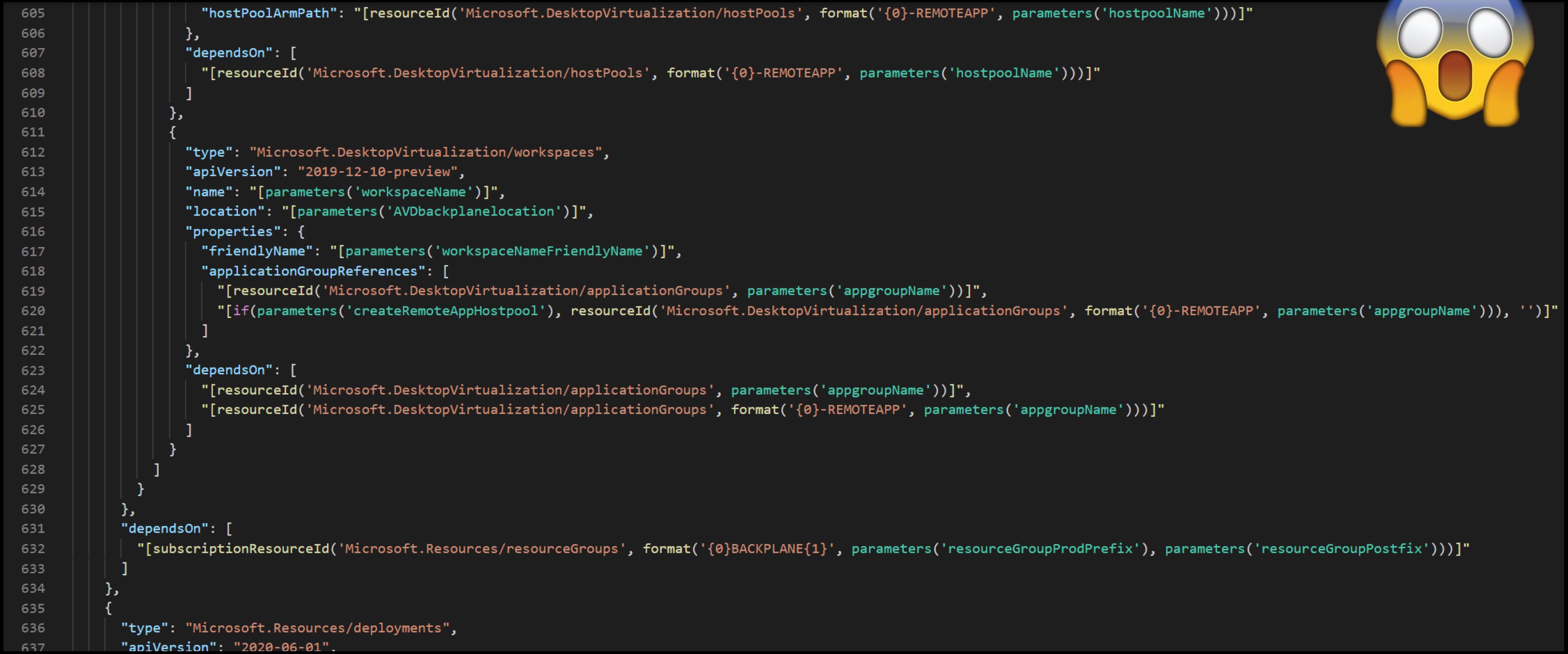


Template format

In its simplest structure, a template has the following elements:

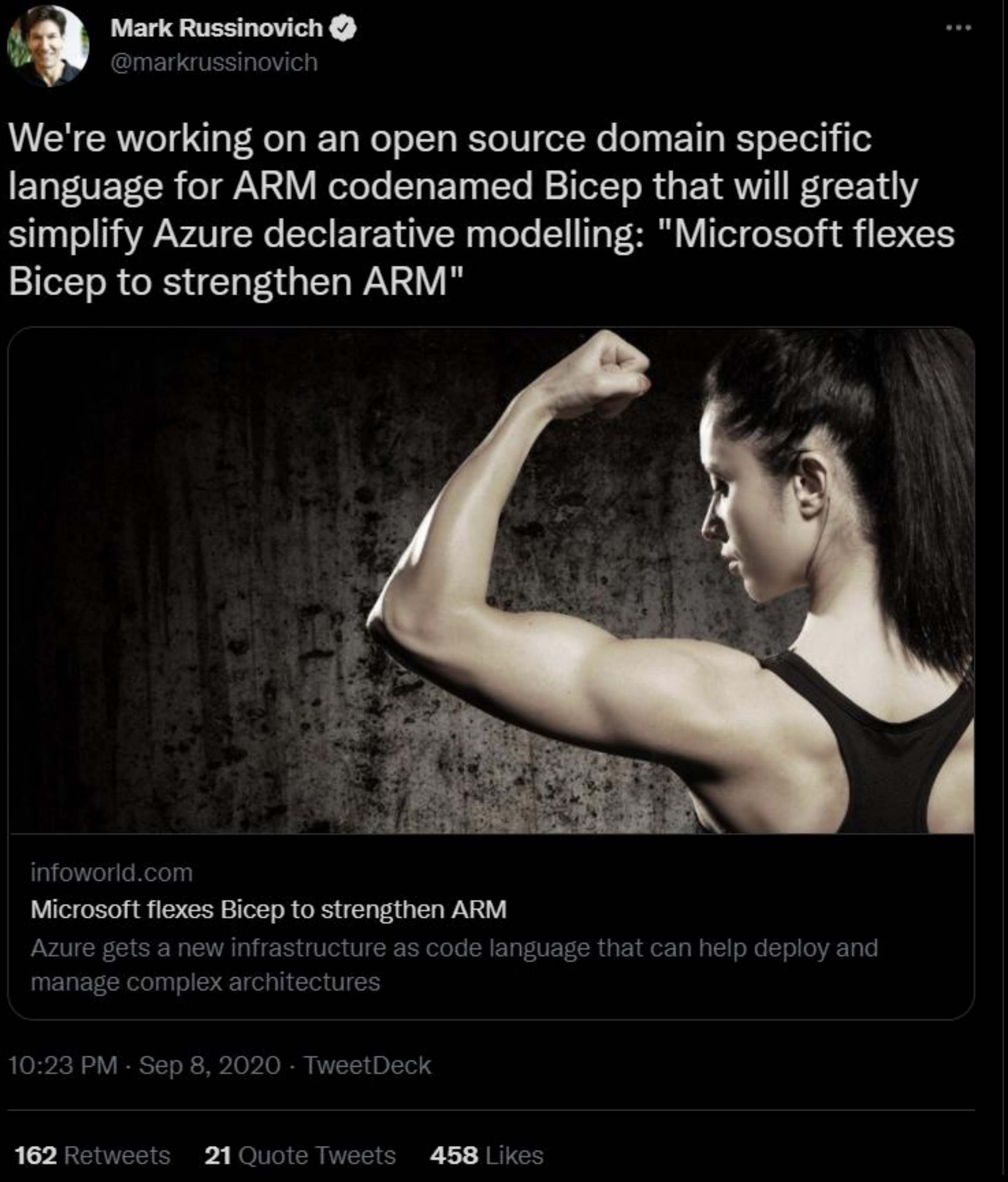
```json
{
  "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
  "contentVersion": "",
  "apiProfile": "",
  "parameters": {  },
  "variables": {  },
  "functions": [  ],
  "resources": [  ],
  "outputs": {  }
}
```

ARM Template complexity



```
                "hostPoolArmPath": "[resourceId('Microsoft.DesktopVirtualization/hostPools', format('{0}-REMOTEAPP', parameters('hostpoolName')))]"
              },
              "dependsOn": [
                "[resourceId('Microsoft.DesktopVirtualization/hostPools', format('{0}-REMOTEAPP', parameters('hostpoolName')))]"
              ]
            },
            {
              "type": "Microsoft.DesktopVirtualization/workspaces",
              "apiVersion": "2019-12-10-preview",
              "name": "[parameters('workspaceName')]",
              "location": "[parameters('AVDbackplanelocation')]",
              "properties": {
                "friendlyName": "[parameters('workspaceNameFriendlyName')]",
                "applicationGroupReferences": [
                  "[resourceId('Microsoft.DesktopVirtualization/applicationGroups', parameters('appgroupName'))]",
                  "[if(parameters('createRemoteAppHostpool'), resourceId('Microsoft.DesktopVirtualization/applicationGroups', format('{0}-REMOTEAPP', parameters('appgroupName'))), '')]"
                ]
              },
              "dependsOn": [
                "[resourceId('Microsoft.DesktopVirtualization/applicationGroups', parameters('appgroupName'))]",
                "[resourceId('Microsoft.DesktopVirtualization/applicationGroups', format('{0}-REMOTEAPP', parameters('appgroupName')))]"
              ]
            }
          ]
        }
      },
      "dependsOn": [
        "[subscriptionResourceId('Microsoft.Resources/resourceGroups', format('{0}BACKPLANE{1}', parameters('resourceGroupProdPrefix'), parameters('resourceGroupPostfix')))]"
      ]
    },
    {
      "type": "Microsoft.Resources/deployments",
      "apiVersion": "2020-06-01",
```

Project ‘Bicep’



Mark Russinovich
@markrussinovich

We're working on an open source domain specific language for ARM codenamed Bicep that will greatly simplify Azure declarative modelling: "Microsoft flexes Bicep to strengthen ARM"

infoworld.com
Microsoft flexes Bicep to strengthen ARM
Azure gets a new infrastructure as code language that can help deploy and manage complex architectures

10:23 PM · Sep 8, 2020 · TweetDeck

162 Retweets **21** Quote Tweets **458** Likes

What is Bicep?

"..Bicep is a Domain Specific Language (DSL) for deploying Azure resources declaratively. It aims to drastically simplify the authoring experience with a cleaner syntax and better support for modularity and code re-use. Bicep is a transparent abstraction over ARM and ARM templates.

What is Bicep?

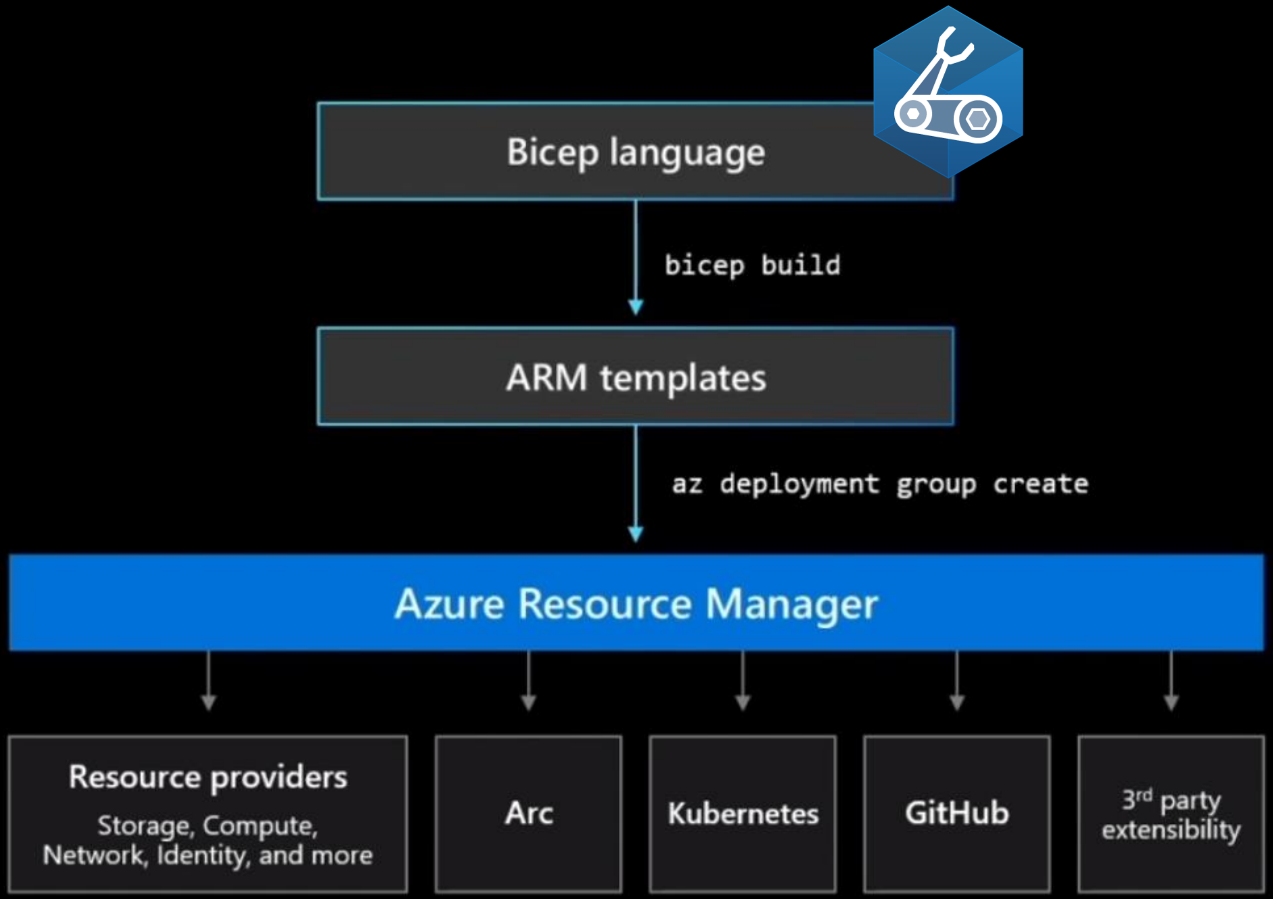
Simple declarative language to provision infrastructure to Azure.

Intuitive
Easy to read and to author

Transpiles to ARM Templates
Leverage ARM template knowledge and investments

Modular
Abstract common blocks of code into reusable parts

Open Source
Transparency and community



Bicep language

`bicep build`

ARM templates

`az deployment group create`

Azure Resource Manager

Resource providers
Storage, Compute, Network, Identity, and more

Arc

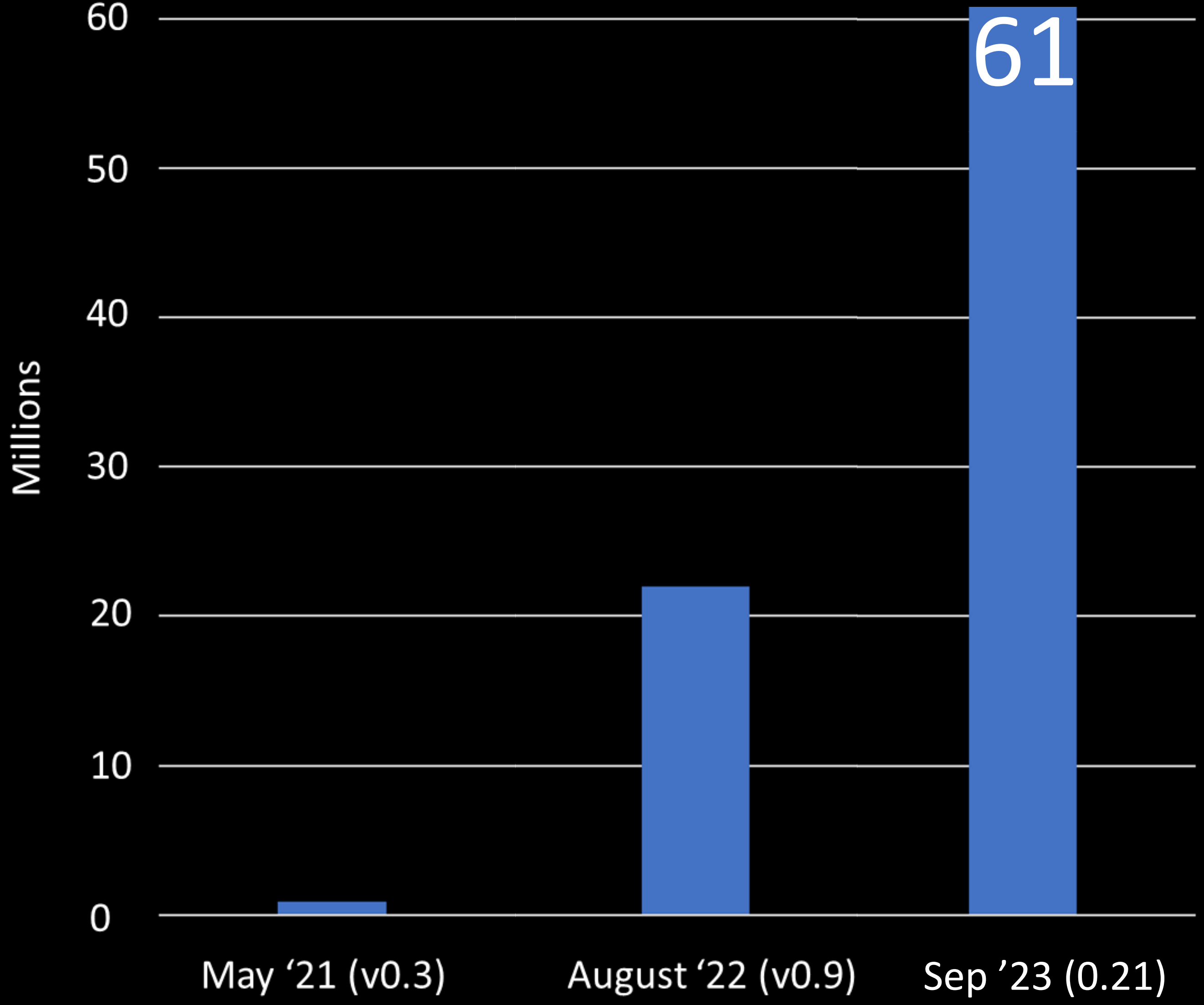
Kubernetes

GitHub

3rd party extensibility

How is Bicep being adopted?

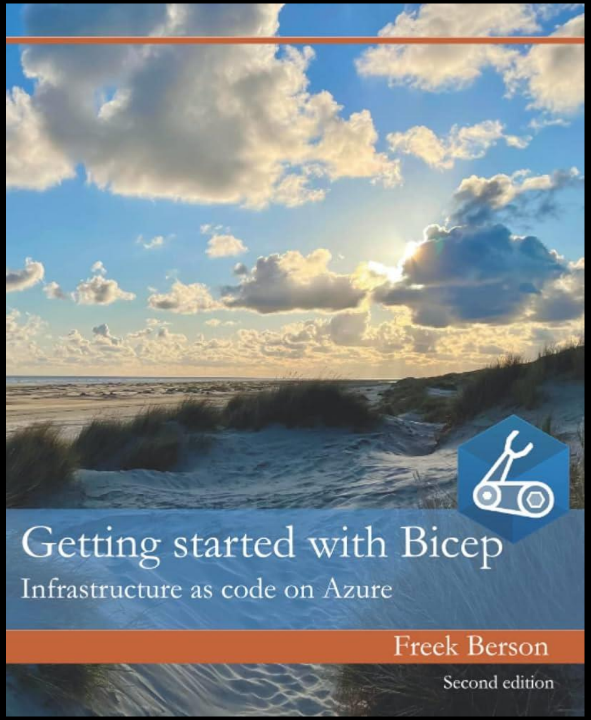
Number of resources deployed using Bicep in last 30 days



Demo

Call to action!

- Bicep MS Docs:
  Aka.ms/bicep
- Bicep Monthly Community call
  surveymonkey.com/r/ARMnews
- Bicep GitHub location
  github.com/Azure/bicep
- Bicep Learning path
  docs.microsoft.com/en-us/azure/azure-resource-manager/bicep/learn-bicep



THANK YOU!

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