Introduction to Bicep 💪

Intro

- Background

- Other Tools

- Resources

- Demo

- Summary

What is Bicep?

Bicep is a domain-specific language (DSL) that uses declarative syntax to deploy Azure resources.

Comparison to other tools

Bicep

Uses the Resource Manager API, As soon as a resource provider introduces new resources types and API versions, you can use them in your Bicep file

✅ Cleaner DSL than ARM
✅ Idempontent
✅ Stateless
❌ Does NOT support AzureAD
❌ Only works for Azure

Comparison to other tools

az-cli / Powershell

✅ Low barrier to entry

✅ Supports AzureAD

❌ Not Idempontent

❌ Terrible to source control

❌ az-cli is constantly changing

❌ Only works for Azure

Comparison to other tools

ARM

✅ Azure default tool

❌ Does NOT support AzureAD

❌ Complex DSL (JSON), generally monolithic

❌ Limited logic

❌ Horrible to version control & diff

❌ Only works for Azure

ARM Sample

```json
{
  "name": "ubuntuVM1",
  "type": "Microsoft.Compute/virtualMachines",
  "apiVersion": "2019-07-01",
  "location": "[resourceGroup().location]",
  "properties": {
    "hardwareProfile": {
      "vmSize": "Standard_A2_v2"
    },
    "osProfile": {
      "computerName": "ubuntuVM1",
      "adminUsername": "adminUsername",
      "adminPassword": "adminPassword123"
    },
    "storageProfile": {
      "imageReference": {
        "publisher": "Canonical",
        "offer": "UbuntuServer",
        "sku": "16.04-LTS",
        "version": "latest"
      },
      "osDisk": {
        "name": "ubuntuVM1-OSDisk",
        "caching": "ReadWrite",
        "createOption": "FromImage"
      }
    },
```

Comparison to other tools

Terraform

✅ Cleaner DSL (HCL) than ARM

✅ Idempontent

✅ Multiple Platform Providers

✅ Works with AzureAD

⁉️ Stateful

❌ Questionable Support, often lags for Azure

Terraform Sample

```
resource "azurerm_linux_virtual_machine" "example" {
  name                            = "ubuntuVM1"
  resource_group_name             = azurerm_resource_group.example.name
  location                        = azurerm_resource_group.example.location
  size                            = "Standard_F2"
  admin_username                  = "adminUsername"
  admin_password                  = "adminPassword123"
  disable_password_authentication = false

  network_interface_ids = [
    azurerm_network_interface.example.id,
  ]

  os_disk {
    caching              = "ReadWrite"
    storage_account_type = "Standard_LRS"
  }

  source_image_reference {
    publisher = "Canonical"
    offer     = "UbuntuServer"
    sku       = "16.04-LTS"
    version   = "latest"
  }
}
```

Testing & Applying Changes

Deployment What-If

```
az deployment group what-if --mode Incremental ...
```

Deployment Create

```
az deployment group create --mode Incremental ...
```

Modes ⚠️

1. Complete
2. Incremental

Basic Bicep Resource

```
resource dnsZoneDemo 'Microsoft.Network/dnsZones@2018-05-01' = {
  name: 'bicep.shawinnes.com'
  location: 'global'
}
```

Nested Resources

```
resource dnsZoneDemo 'Microsoft.Network/dnsZones@2018-05-01' = {
  name: 'bicep.shawinnes.com'
  location: 'global'

  resource dnsARecord 'A' = {
    name: '@'
    properties: {
      TTL: 3600
      ARecords: [
        {
          ipv4Address: '127.0.0.1'
        }
      ]
    }
  }
}
```

Existing Resources

```
resource dnsZone 'Microsoft.Network/dnsZones@2018-05-01' existing = {
  name: 'bicep.shawinnes.com'
}

resource dnsRecord 'Microsoft.Network/dnsZones/A@2018-05-01' = {
  parent: dnsZone
  name: 'blog'
  properties: {
    TTL: 3600
    ARecords: [
      {
        ipv4Address: '127.0.0.1'
      }
    ]
  }
}
```

Outputs

```
resource dnsZone 'Microsoft.Network/dnsZones@2018-05-01' existing = {
  name: 'bicep.shawinnes.com'
}

output NameServers array = dnsZoneDemo.properties.nameServers
```

Parameters

```
@allowed([
  'blog'
  'www'
  'mail'
])
param record string

resource dnsZoneDemo 'Microsoft.Network/dnsZones@2018-05-01' = {
  name: 'bicep.shawinnes.com'
  location: 'global'

  resource dnsARecord 'A' = {
    name: record
    properties: {
      TTL: 3600
      ARecords: [
        {
          ipv4Address: '127.0.0.1'
        }
      ]
    }
  }
}
```

Loops

```
param servers object = {
  srv01: {
    name: 'srv01'
    address: '10.0.1.1'
    enabled: true
  }
  srv02: {
    name: 'srv02'
    address: '10.0.1.2'
    enabled: false
  }
}

resource dnsZone 'Microsoft.Network/dnsZones@2018-05-01' existing = {
  name: 'bicep.shawinnes.com'
}

resource dnsRecord 'Microsoft.Network/dnsZones/A@2018-05-01' = [for server in items(servers): if (server.value.enabled) {
  parent: dnsZone
  name: server.key // or server.value.name
  properties: {
    TTL: 3600
    ARecords: [
      {
        ipv4Address: server.value.address
      }
    ]
  }
}]
```

Scopes

- Tenant

- Subscription

- Management Group

- Resource Group

Links

- VS Code Plugins

https://docs.microsoft.com/en-us/azure/azure-resource-manager/bicep/overview