CLOUD CAMP
MODERN CLOUD EDITION

EMPOWERING INFRASTRUCTURE AS CODE ON AZURE USING BICEP

NOVEMBER 16TH 2021
BROUGHT TO YOU ONLINE

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Getting started with Bicep
Infrastructure as code on Azure

This book is your guide to mastering Bicep! It contains practical solutions and examples to help you jump start your journey towards infrastructure as code on Azure!

"…This book by Freek Berson, is a great introduction to Bicep that will appeal to both new infrastructure as code users as well as existing ARM Template users as it incrementally builds on key concepts…"

Mark Russinovich
Azure CTO and Technical Fellow
Microsoft

"…I can't think of too many other people I'd want to learn Bicep from. Freek has been teaching Bicep to the community ever since the project started and has clearly honed his craft! Freek does a great job of detailing the "what" and the "how" of Bicep— from the absolute basics to complex, real-world examples— but also contextualizing the "why"…"

Alex Frankel
Program Manager
Microsoft

Covered in this book:
- ✓ Introduction to ARM templates and Infrastructure as Code
- ✓ Bicep CLI and VSCode Extension
- ✓ Deploying Bicep files to Azure, including template specs
- ✓ Understanding the Bicep file structure
- ✓ Basic concepts of variables, parameters, tags, decorators, expressions, and symbolic names
- ✓ More advanced topics like dependencies, loops, conditions, target scopes, modules, and nesting
- ✓ Boosting your authoring experience with snippets, scaffolding, and linter
- ✓ Real-life examples, the Bicep PowerShell module, and the Bicep Visualizer

Freek Berson is a Cloud Solutions Architect with a specialization in Application and Desktop delivery using remoting technologies. He has a long track record in the Remote Desktop Services (RDS) space and has been awarded Microsoft Most Valuable Professional (MVP) since 2011. He mostly focusses on Azure Virtual Desktop (AVD) and Remote Desktop Services with a strong focus on the Azure Cloud.

Freek actively engages with the community. He speaks at various international conferences around the world.

He coauthored the book "RDS - The Complete Guide" and authored the free e-books "Azure Virtual Desktop Handbook: Security Fundamentals" and "Azure Virtual Desktop Migration Guide for Remote Desktop Services".

Freek developed an interest in Infrastructure as Code for the Azure Cloud since 2017. He got hooked to Bicep since its inception and has been an enthusiastic evangelist, sharing his knowledge and contributing to the community.

ISBN 9798520579762
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Getting started with Bicep - Infrastructure as code on Azure

Getting started with Bicep
Infrastructure as code on Azure
Freek Berson

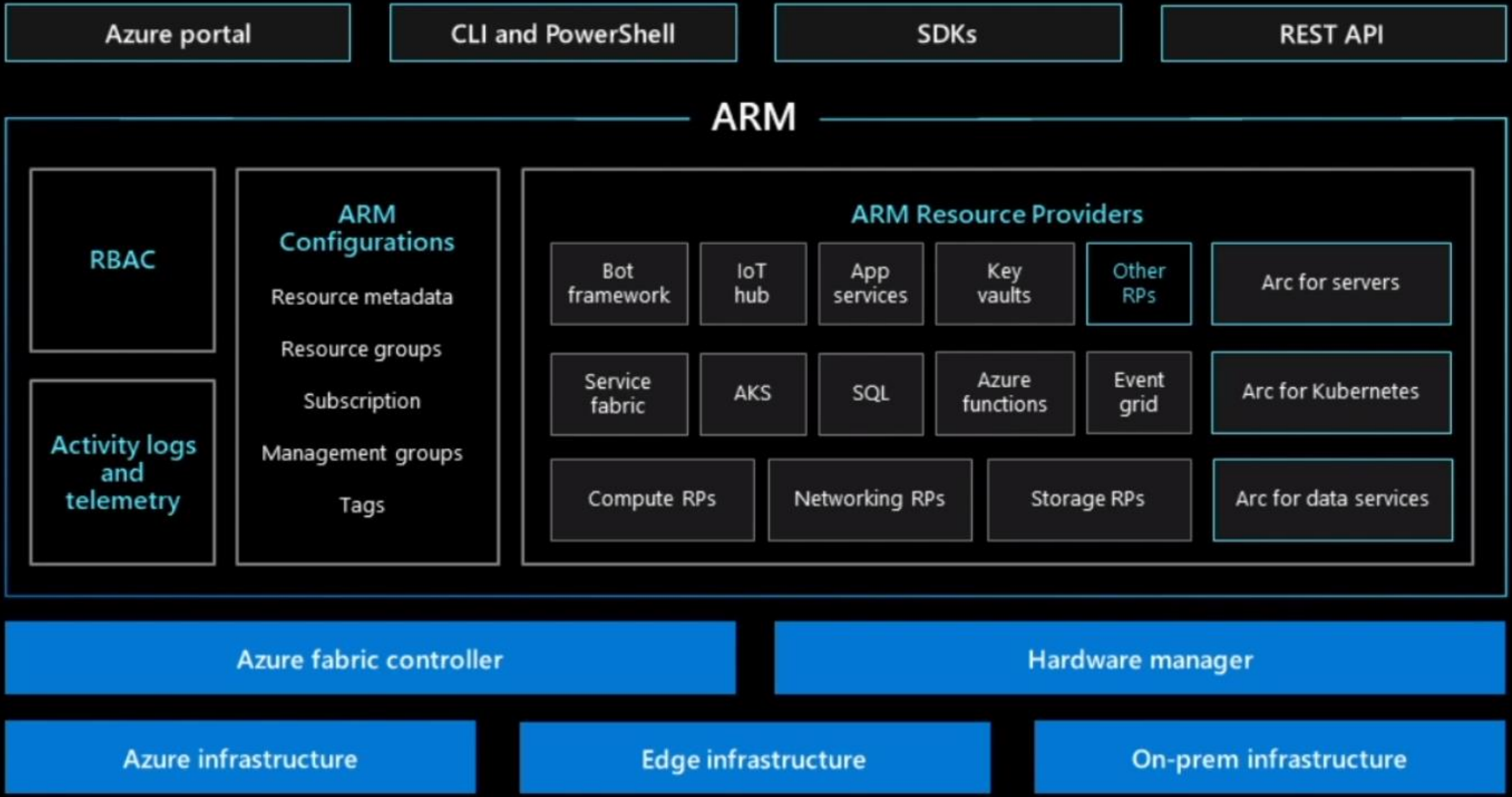
Agenda

Bicep architecture

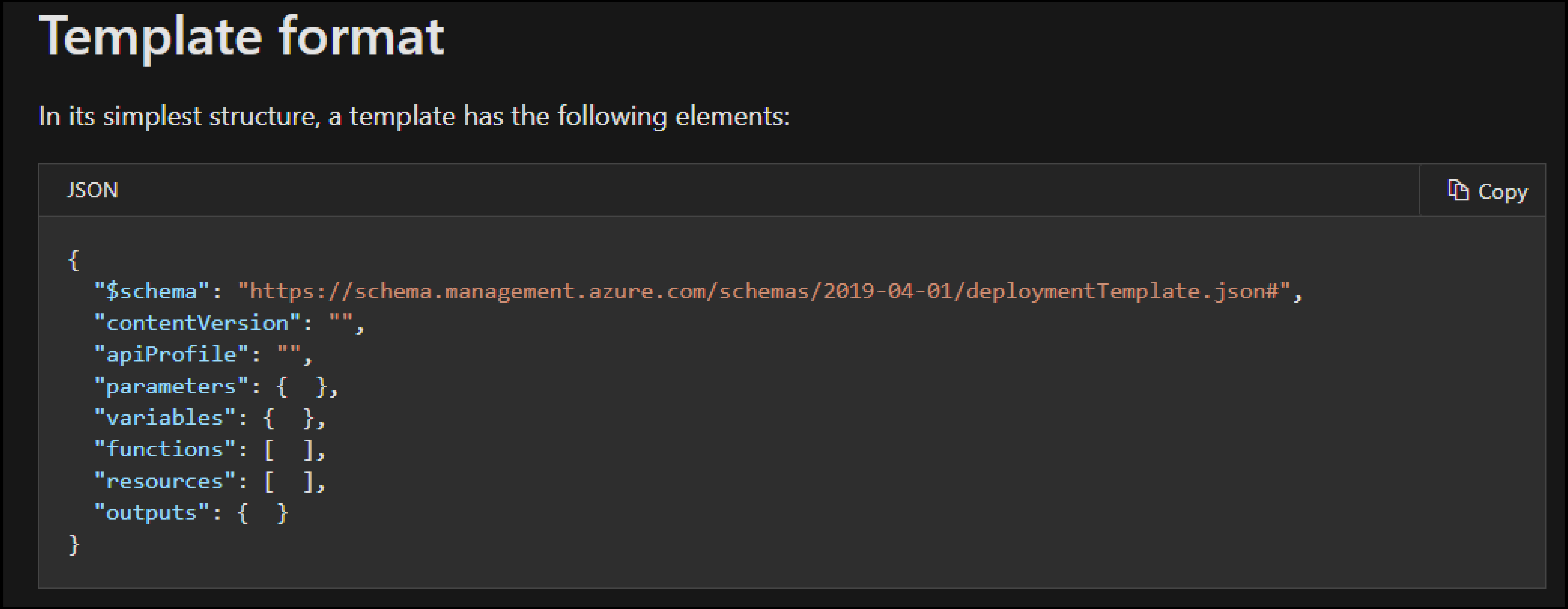
Demos, demos, demos

Roadmap & call to actions

Azure Resource Manager



ARM Template



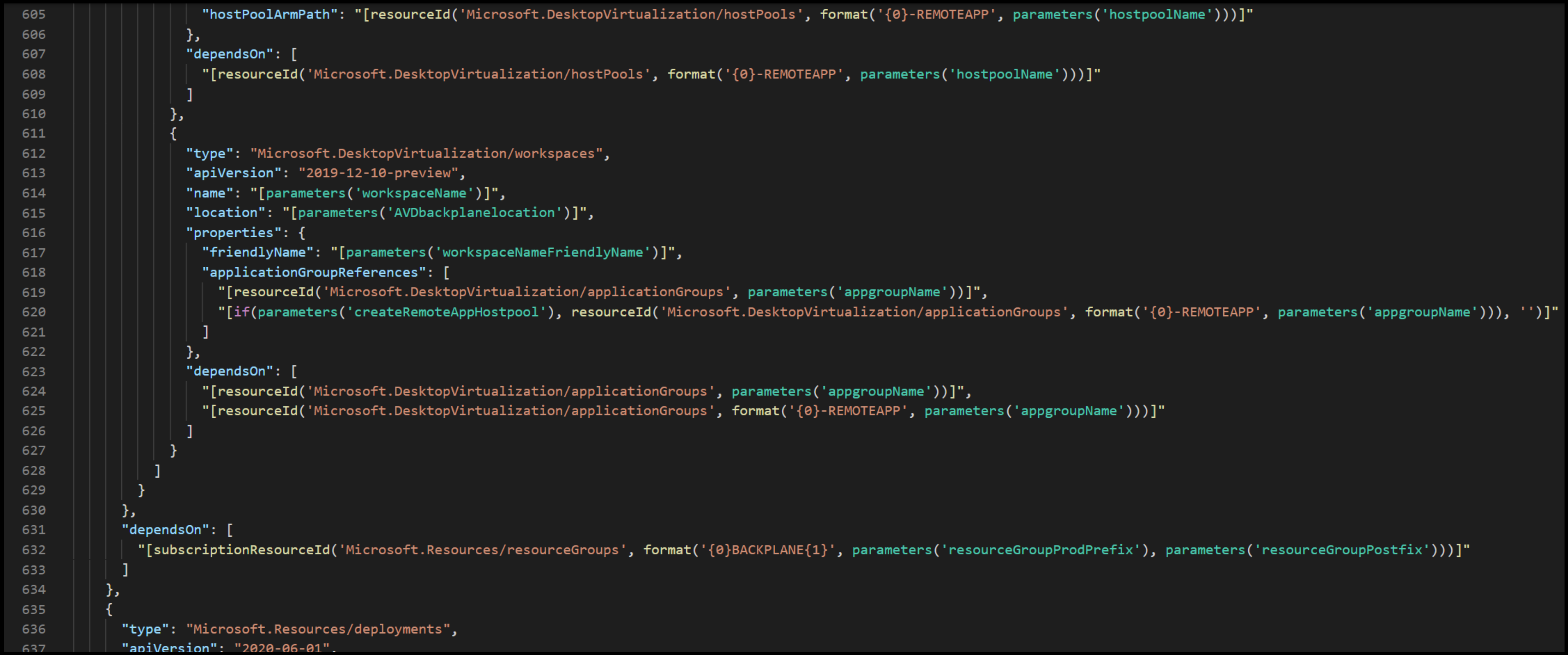
Template format

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

JSON Copy

```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",
```

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.

'Bicep'

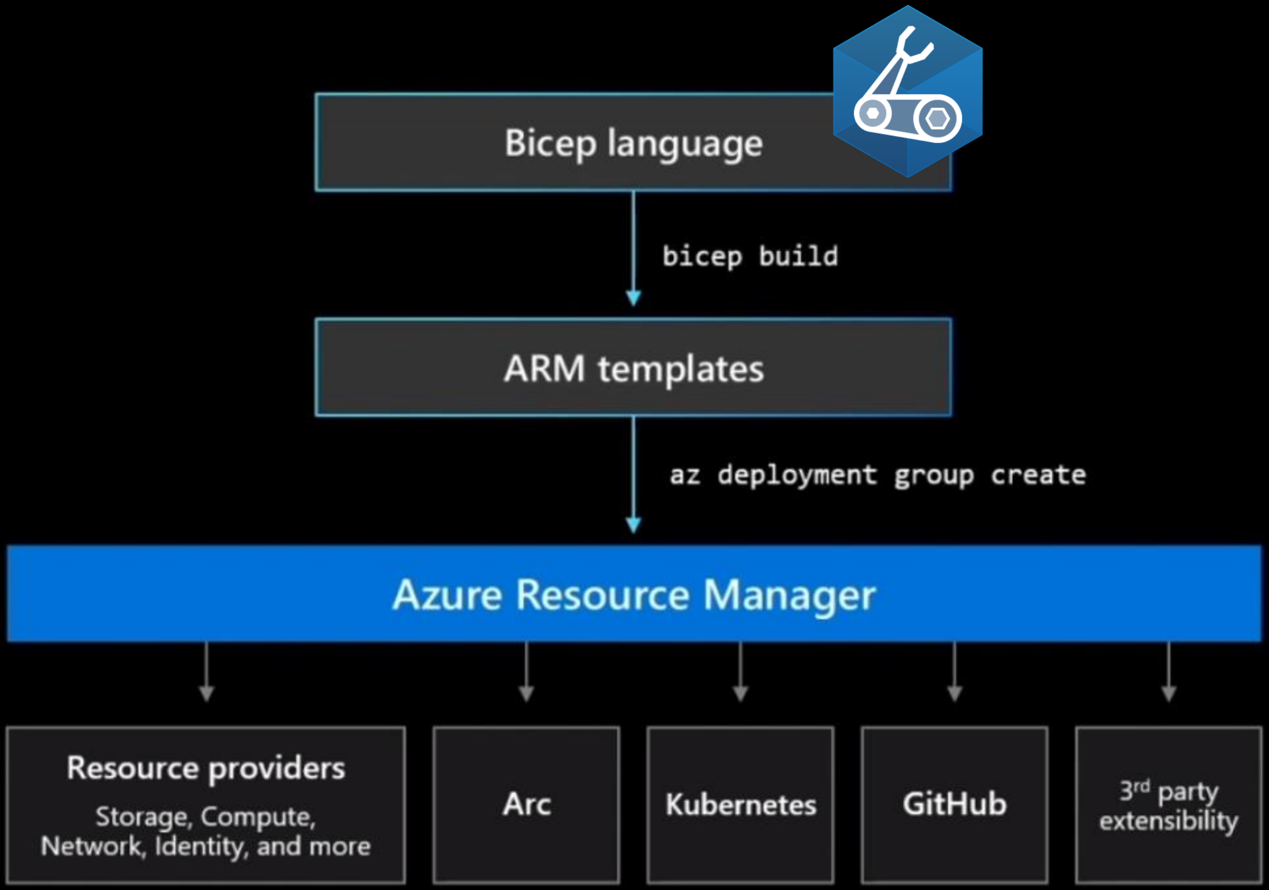
Simple declarative language to provision infrastructure to Azure.

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



Demos, demos, demos

Road map

Current release: CLI version 0.4.1008

Or the nightly release for all dare devils! ☺

github.com/Azure/bicep/blob/main/docs/installing-nightly.md

v0.1

(aug '20)

Alpha Release available on August 31st

v0.2

(Oct '20)

- VSCode Intellisense
- Support for modules

v0.3

(March '21)

- Loops
- Conditionals
- Decompiler
- Production usage

v0.4

- Quality release
- Learn module
- Linter (TTK successor)
- Snippets & resource scaffolding
- Merging ARM Quickstarts & bicep
- IncludeFile() support

NOV '21

v0.5

- Public & private Module Registry
- Linter vNext
- Passing resource to module
- LoadTextContent(…)

Feb 2022

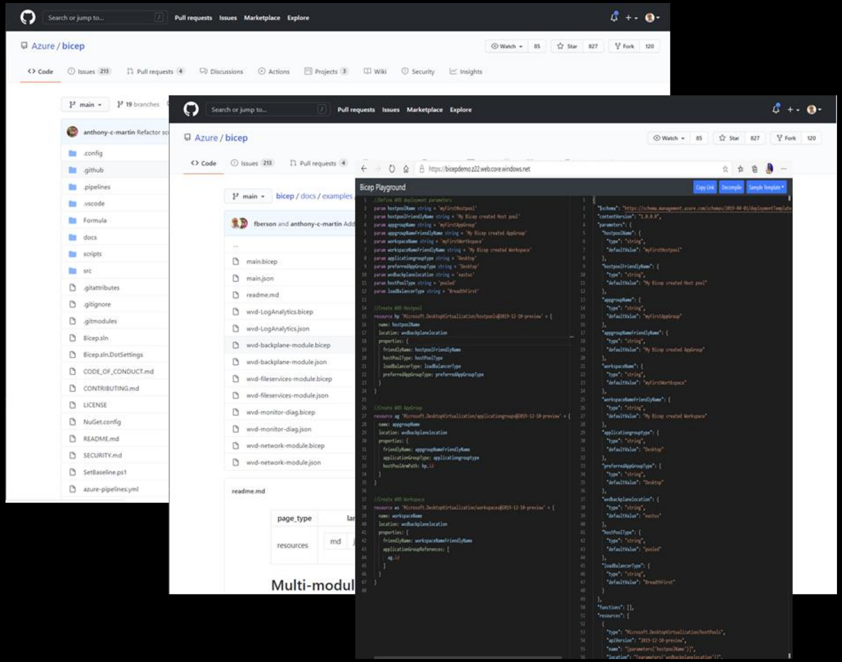
V1.0

- Strict change policy
- Separate type & core updates
- Bicep Extensibility preview

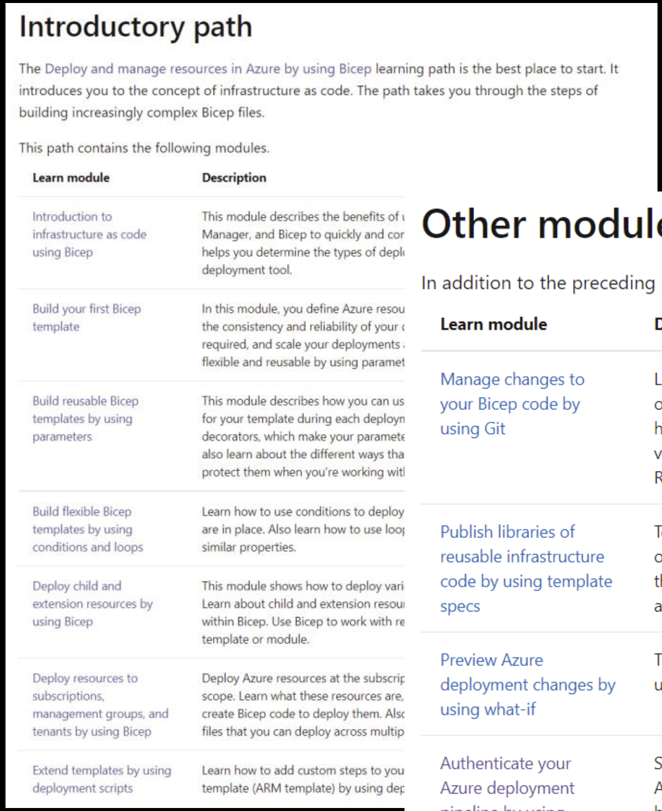
Call to actions:

Install guides, tutorials, example code & playgrounds!

aka.ms/bicep



Aka.ms/learnbicep

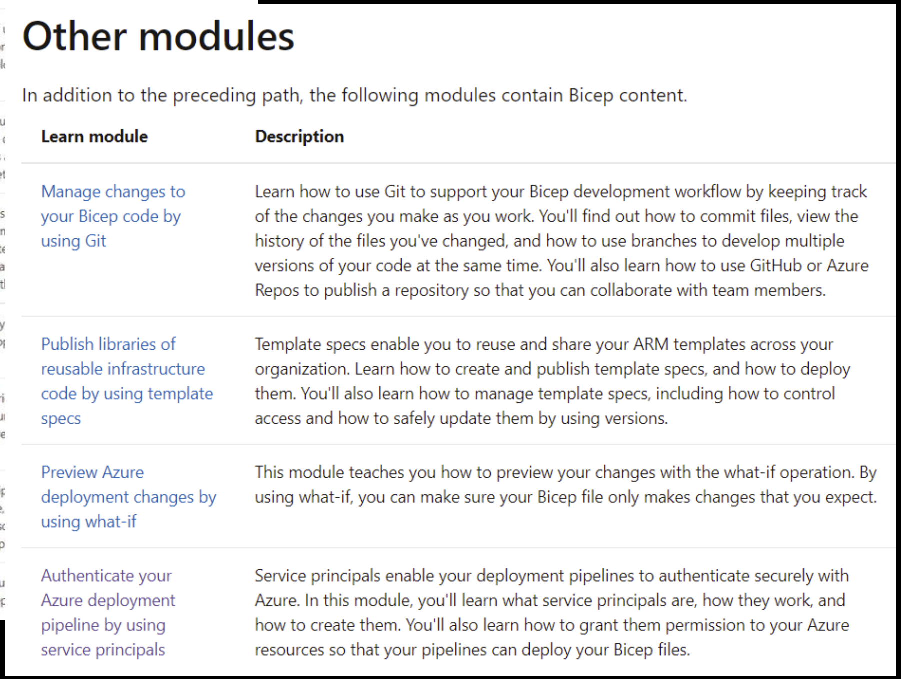


Introductory path

The Deploy and manage resources in Azure by using Bicep learning path is the best place to start. It introduces you to the concept of infrastructure as code. The path takes you through the steps of building increasingly complex Bicep files.

This path contains the following modules.

Learn module	Description
Introduction to infrastructure as code using Bicep	This module describes the benefits of u Manager, and Bicep to quickly and cor helps you determine the types of depl deployment tool.
Build your first Bicep template	In this module, you define Azure resou the consistency and reliability of your d required, and scale your deployments flexible and reusable by using paramet
Build reusable Bicep templates by using parameters	This module describes how you can us for your template during each deploy decorators, which make your paramete also learn about the different ways tha protect them when you're working wit
Build flexible Bicep templates by using conditions and loops	Learn how to use conditions to deploy are in place. Also learn how to use loop similar properties.
Deploy child and extension resources by using Bicep	This module shows how to deploy vari Learn about child and extension resou within Bicep. Use Bicep to work with re template or module.
Deploy resources to subscriptions, management groups, and tenants by using Bicep	Deploy Azure resources at the subscrip scope. Learn what these resources are, create Bicep code to deploy them. Also files that you can deploy across multip
Extend templates by using deployment scripts	Learn how to add custom steps to you template (ARM template) by using dep



Other modules

In addition to the preceding path, the following modules contain Bicep content.

Learn module	Description
Manage changes to your Bicep code by using Git	Learn how to use Git to support your Bicep development workflow by keeping track of the changes you make as you work. You'll find out how to commit files, view the history of the files you've changed, and how to use branches to develop multiple versions of your code at the same time. You'll also learn how to use GitHub or Azure Repos to publish a repository so that you can collaborate with team members.
Publish libraries of reusable infrastructure code by using template specs	Template specs enable you to reuse and share your ARM templates across your organization. Learn how to create and publish template specs, and how to deploy them. You'll also learn how to manage template specs, including how to control access and how to safely update them by using versions.
Preview Azure deployment changes by using what-if	This module teaches you how to preview your changes with the what-if operation. By using what-if, you can make sure your Bicep file only makes changes that you expect.
Authenticate your Azure deployment pipeline by using service principals	Service principals enable your deployment pipelines to authenticate securely with Azure. In this module, you'll learn what service principals are, how they work, and how to create them. You'll also learn how to grant them permission to your Azure resources so that your pipelines can deploy your Bicep files.