COGNITION
LEARN IT. KNOW IT. SHARE IT.

Azure Automation fun

met ARM Templates & PowerShell

mijn DevOps Cloud avonturen

Esther Barthel

Experts Live Netherlands

About Esther

- **20 years of Technical Consulting**
  - Solutions Architect at **cognition IT**
  - Design | Implement | Troubleshooting
- **Community programs**
  - Citrix Technology Professional (CTP)
  - Microsoft Most Valuable Professional (MVP)
  - CUGC Women in Tech Mentorship program leader
- **DevOps, automation**
  - REST APIs | JSON | PowerShell

@virtues_IT
http://nl.linkedin.com/in/ebarthel
http://www.virtues.it

Agenda

- Azure IaaS
- ARM Templates
  - JSON formatting
  - Az PowerShell
- Azure Automation
  - Runbooks based on PowerShell
  - Hybrid Workers
- Demo

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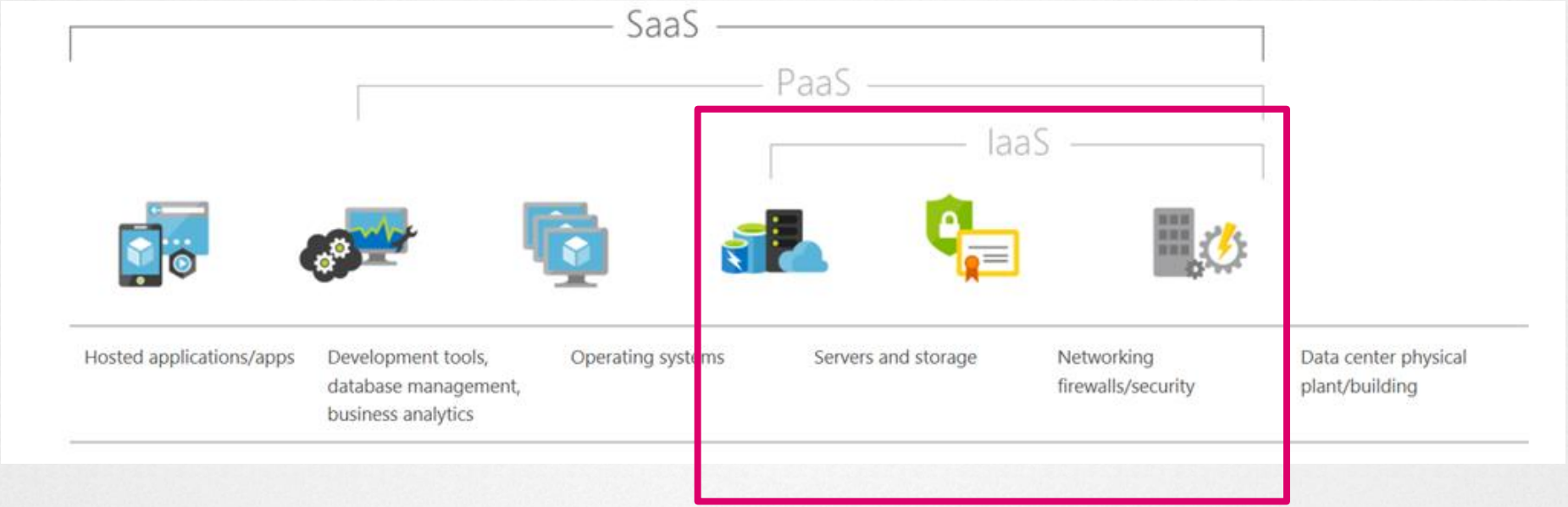
Azure IaaS

Services & Objects

Azure IaaS


SaaS
PaaS
IaaS
Hosted applications/apps
Development tools, database management, business analytics
Operating systems
Servers and storage
Networking firewalls/security
Data center physical plant/building

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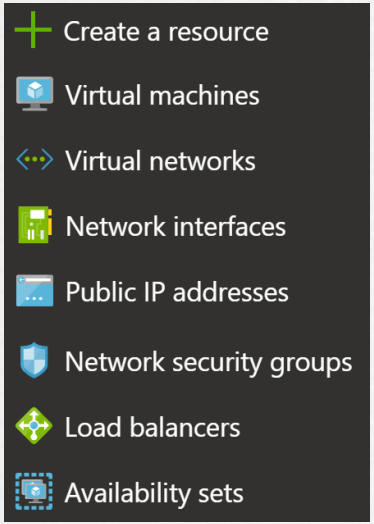
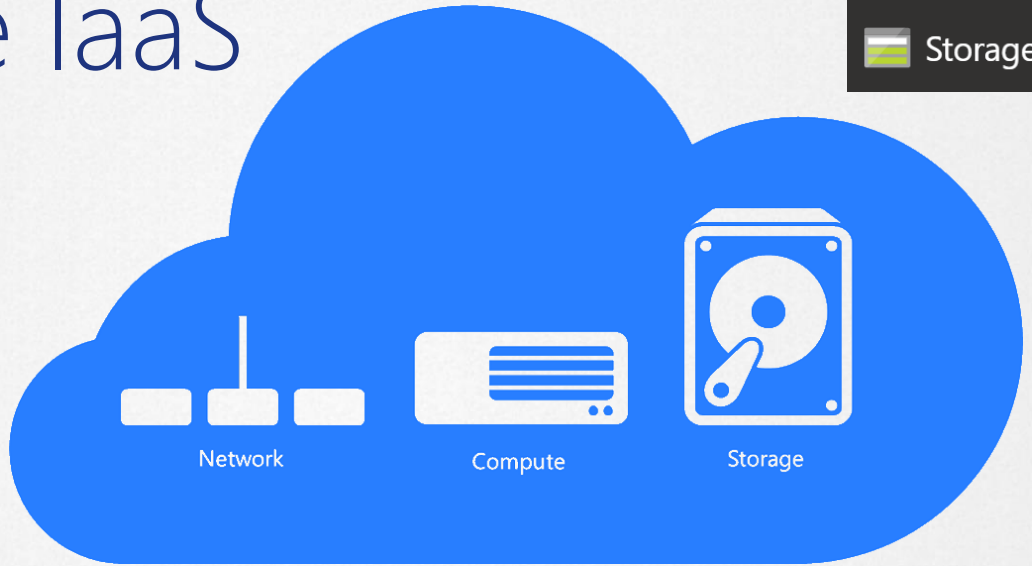
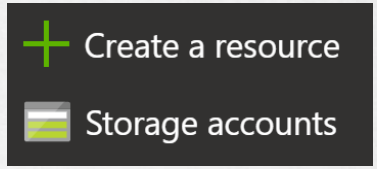
Azure IaaS







Family	Description
A-series	cost-effective, general purpose compute
D(S) -series	cost-effective, general purpose compute (faster CPU and local SSD)
F(s)-series	best value compute capability per core, lower memory footprint
G(S)-series	highest memory footprint
H-series	very high end workloads (eg CFD)
N-series	GPU-enabled. NV for visualisation, NC for compute

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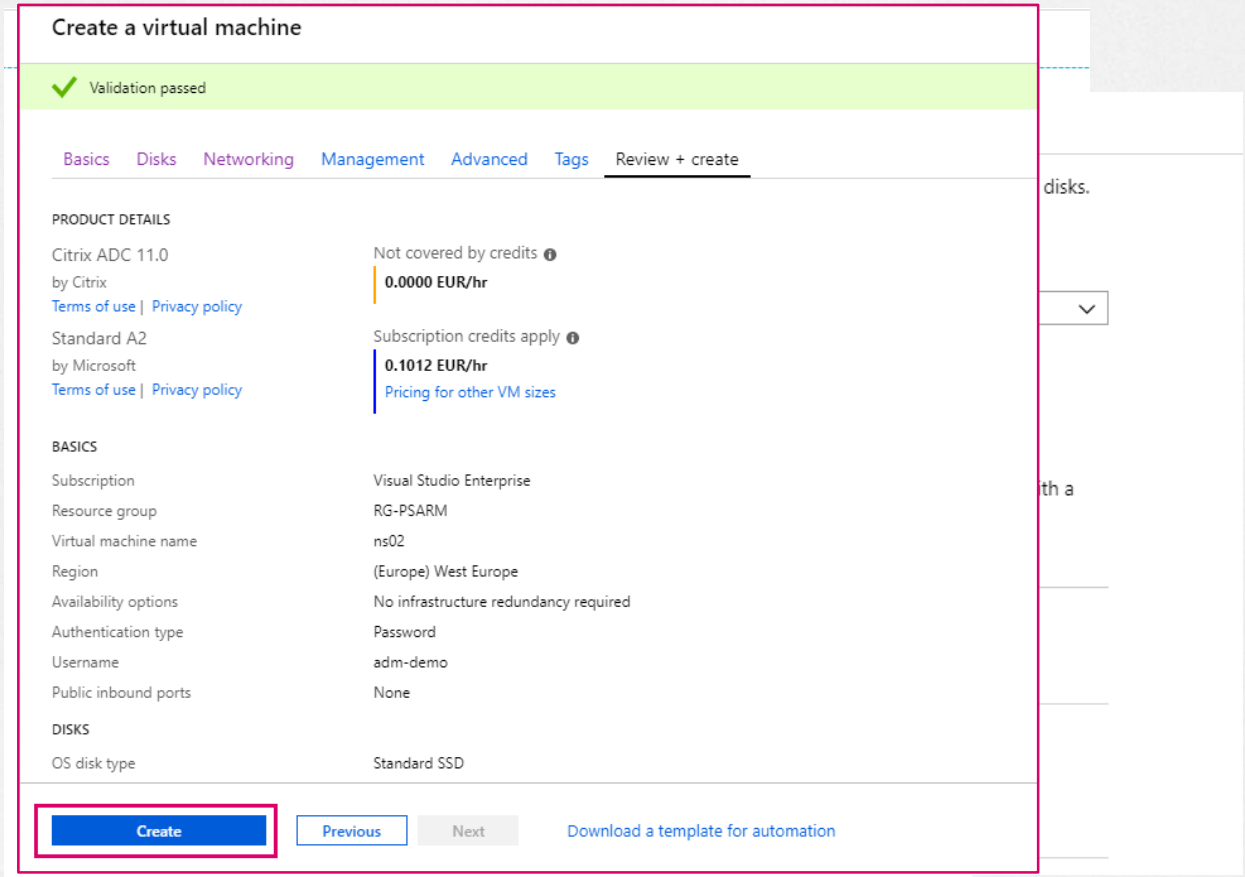
Azure IaaS



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ARM Templates

JSON & Expressions

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ARM Template

… structure of an **Azure Resource Manager template**.

The template consists of **JSON** and expressions that you can use to construct values for your deployment.

sources: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-authoring-templates
https://docs.microsoft.com/en-us/azure/templates/ (Reference Guide!)

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JavaScript Object Notation (JSON)

Syntax rules

- data is in **name/value pairs**

A name/value pair consists of a field name (in double quotes), followed by a colon, followed by a value:

Example

```
"name":"John"
```

JavaScript Object Notation (JSON)

Syntax rules

- data is separated by **commas**

Example

```
{
"employee":{ "name":"John", "age":30, "city":"New York" }
}
```

JavaScript Object Notation (JSON)

Syntax rules

- curly braces {} hold **objects**

Example

```
{
"employee":{ "name":"John", "age":30, "city":"New York" }
}
```

JavaScript Object Notation (JSON)

Syntax rules

- square brackets [] hold **arrays**

Example

```
[ "Ford", "BMW", "Fiat" ]
```

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JavaScript Object Notation (JSON)

Nested Arrays in JSON Objects

Values in an array can also be another array, or even another JSON object:

Example

```
myObj = {
    "name":"John",
    "age":30,
    "cars": [
        { "name":"Ford", "models":[ "Fiesta", "Focus", "Mustang" ] },
        { "name":"BMW", "models":[ "320", "X3", "X5" ] },
        { "name":"Fiat", "models":[ "500", "Panda" ] }
    ]
}
```

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ARM Template

Template format

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

JSON Copy

```
{
    "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
    "contentVersion": "",
    "parameters": {  },
    "variables": {  },
    "functions": [  ],
    "resources": [  ],
    "outputs": {  }
}
```

sources: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-authoring-templates
https://docs.microsoft.com/en-us/azure/templates/ (Reference Guide!)

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ARM Template

```
{
    "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
    "contentVersion": "",
    "parameters": {
        "<parameter-name>" : {
            "type" : "<type-of-parameter-value>",
            "defaultValue": "<default-value-of-parameter>",
            "allowedValues": [ "<array-of-allowed-values>" ],
            "minValue": <minimum-value-for-int>,
            "maxValue": <maximum-value-for-int>,
            "minLength": <minimum-length-for-string-or-array>,
            "maxLength": <maximum-length-for-string-or-array-parameters>,
            "metadata": {
                "description": "<description-of-the parameter>"
            }
        }
    },
    "variables": {
        "<variable-name>": "<variable-value>",
        "<variable-object-name>": {
            <variable-complex-type-value>
        },
        "<variable-object-name>": {
            "copy": [
        },
        "copy": [
    },
    "functions": [
      {
        "namespace": "<namespace-for-your-function>",
        "members": {
          "<function-name>": {
            "parameters": [
              {
                "name": "<parameter-name>",
                "type": "<type-of-parameter-value>"
              }
            ],
            "output": {
              "type": "<type-of-output-value>",
              "value": "<function-expression>"
            }
          }
        }
      }
    ],
    "resources": [
      {
          "condition": "<boolean-value-whether-to-deploy>",
          "apiVersion": "<api-version-of-resource>",
          "type": "<resource-provider-namespace/resource-type-name>",
          "name": "<name-of-the-resource>",
          "location": "<location-of-resource>",
          "tags": {
              "<tag-name1>": "<tag-value1>",
              "<tag-name2>": "<tag-value2>"
          },
          "comments": "<your-reference-notes>",
          "copy": {
              "name": "<name-of-copy-loop>",
              "count": "<number-of-iterations>",
              "mode": "<serial-or-parallel>",
              "batchSize": "<number-to-deploy-serially>"
          },
          "dependsOn": [
              "<array-of-related-resource-names>"
          ],
          "properties": {
              "<settings-for-the-resource>",
              "copy": [
                  {
                      "name": ,
                      "count": ,
                      "input": {}
                  }
              ]
          },
          "resources": [
              "<array-of-child-resources>"
          ]
      }
    ],
    "outputs": {
        "<outputName>" : {
            "type" : "<type-of-output-value>",
            "value": "<output-value-expression>"
        }
    }
}
```

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ARM Template

Quickstart: Create and deploy Azure Resource Manager templates by using the Azure portal

07-09-2018 • 10 minuten om te lezen • Medewerkers

Learn how to create your first Azure Resource Manager template by generating one using the Azure portal, and how to edit and deploy the template from the portal.

sources: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-manager-quickstart-create-templates-use-the-portal

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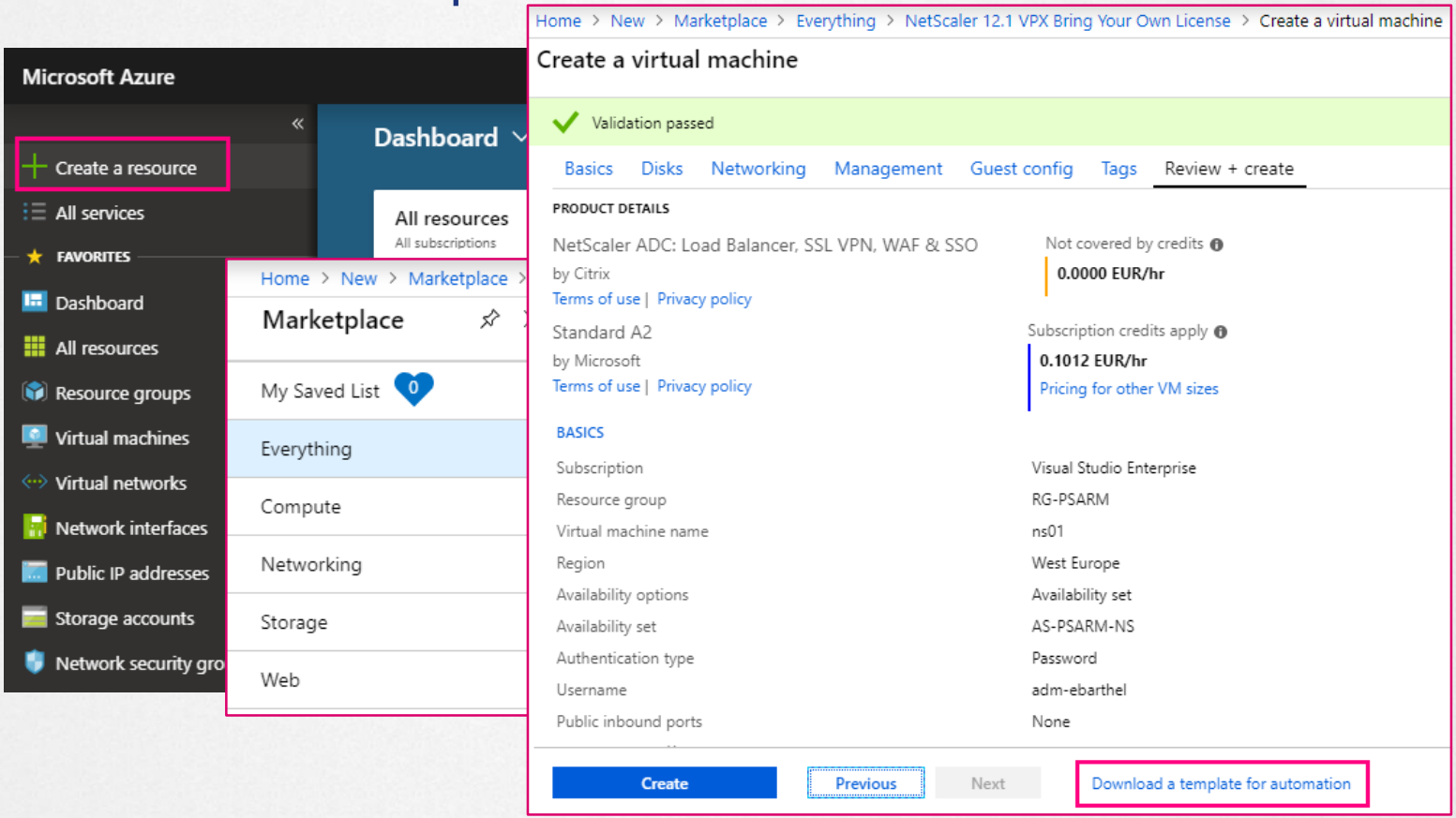
ARM Template



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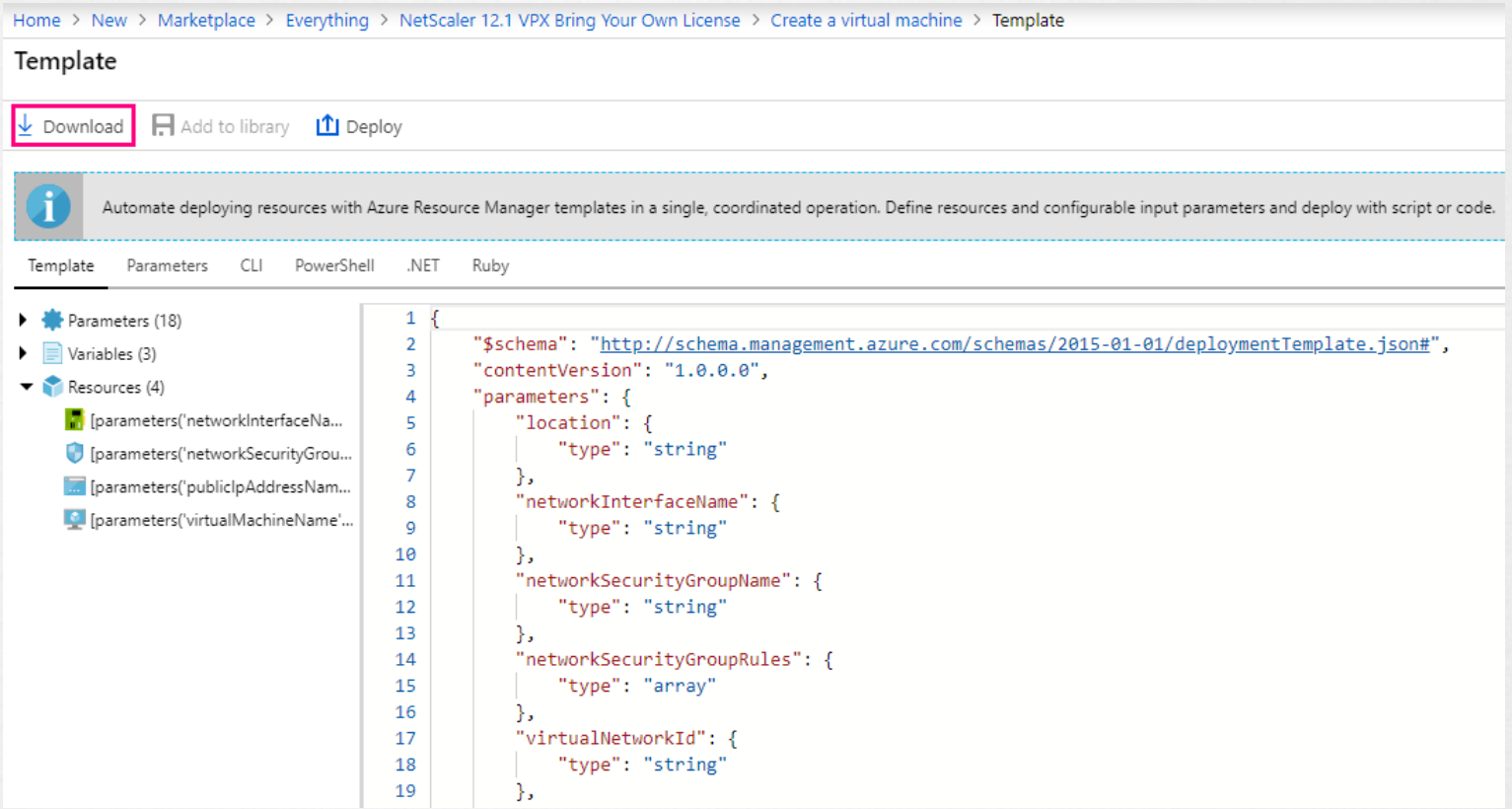
ARM Template



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ARM Template

```
{
    "$schema": "http://schema
    "contentVersion": "1.0.0.
    "parameters": {
        "location": {
            "type": "string",
            "defaultValue": "
        },
    "variables": {
        "vnetId": "[resourceId(
        "subnetRef1": "[concat(
        "subnetRef2": "[concat(
        "nic1Name": "[concat(pa
        "nic2Name": "[concat(pa
        "nsg1Id": "[resourceId(
        "nsg2Id": "[resourceId(
        "PIPName": "[concat(par
    },
    "outputs": {
        "adminUsername": {
            "type": "string",
            "value": "[parameters('adminUsername')]"
        },
        "adminPassword": {
            "type": "string",
            "value": "[parameters('adminPassword')]"
        },
        "virtualMachineName": {
            "type": "string",
            "value": "[parameters('virtualMachineName')]"
        }
    }
    "resources": [
        {
            "name": "[variables('nic1Name')]",
            "type": "Microsoft.Network/NetworkInterfaces",
            "apiVersion": "2016-09-01",
            "location": "[resourceGroup().location]",
            "dependsOn": [
                "[concat('Microsoft.Network/virtualNetworks/', parameters('virtualNetworkName'))]"
            ],
            "properties": {
                "ipConfigurations": [
                    {
                        "name": "NSIP",
                        "properties": {
                            "subnet": {
                                "id": "[variables('subnetRef1')]"
                            },
                            "privateIPAllocationMethod": "Dynamic",
                            "primary" : true
                        }
                    },
": "SNIP-Backend",
erties": {
subnet": {
    "id": "[variables('subnetRef1')]"
,
privateIPAllocationMethod": "Dynamic",
primary" : false
ityGroup": {
ariables('nsg1Id')]"
        },
```

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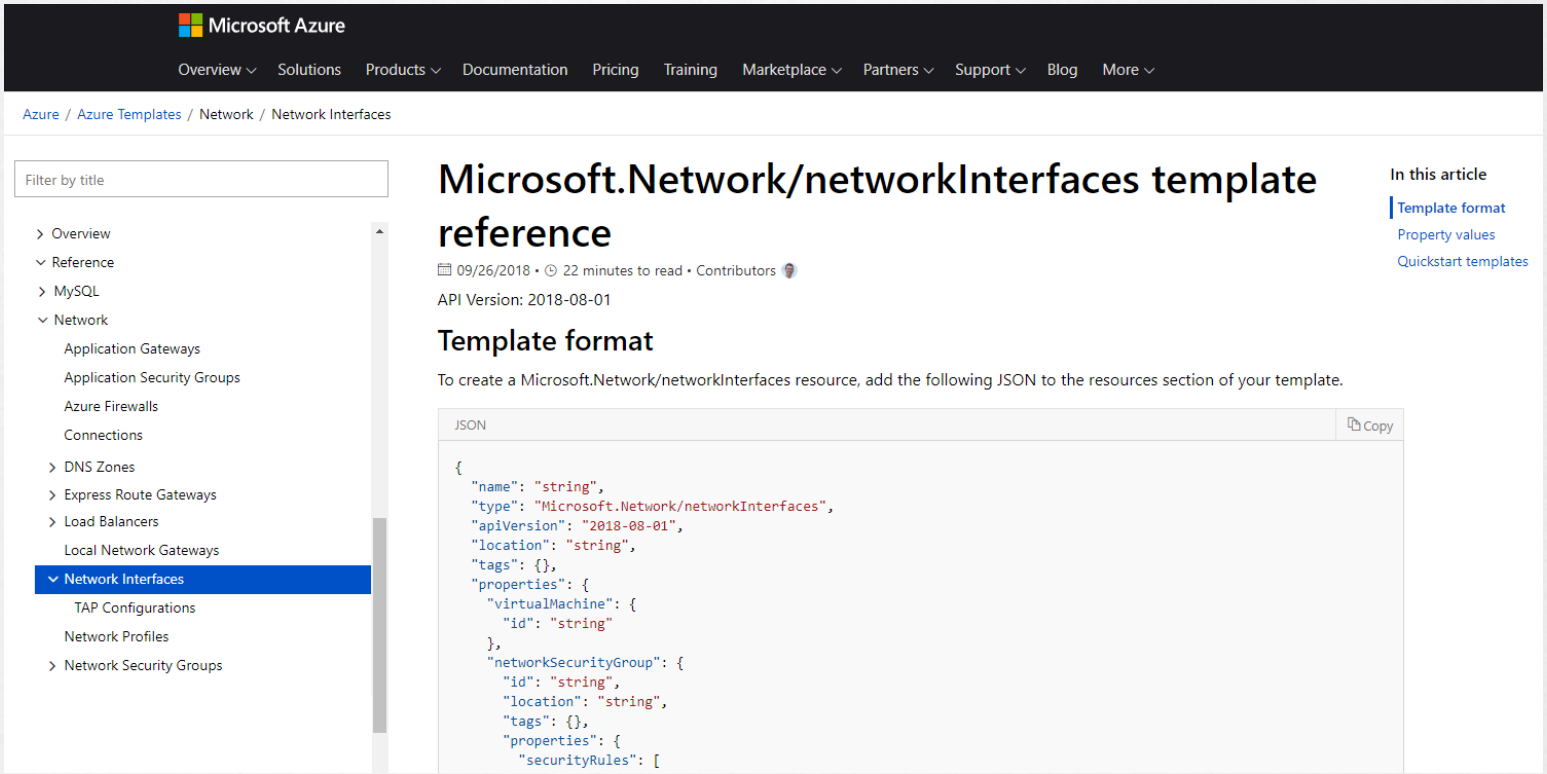
ARM Template



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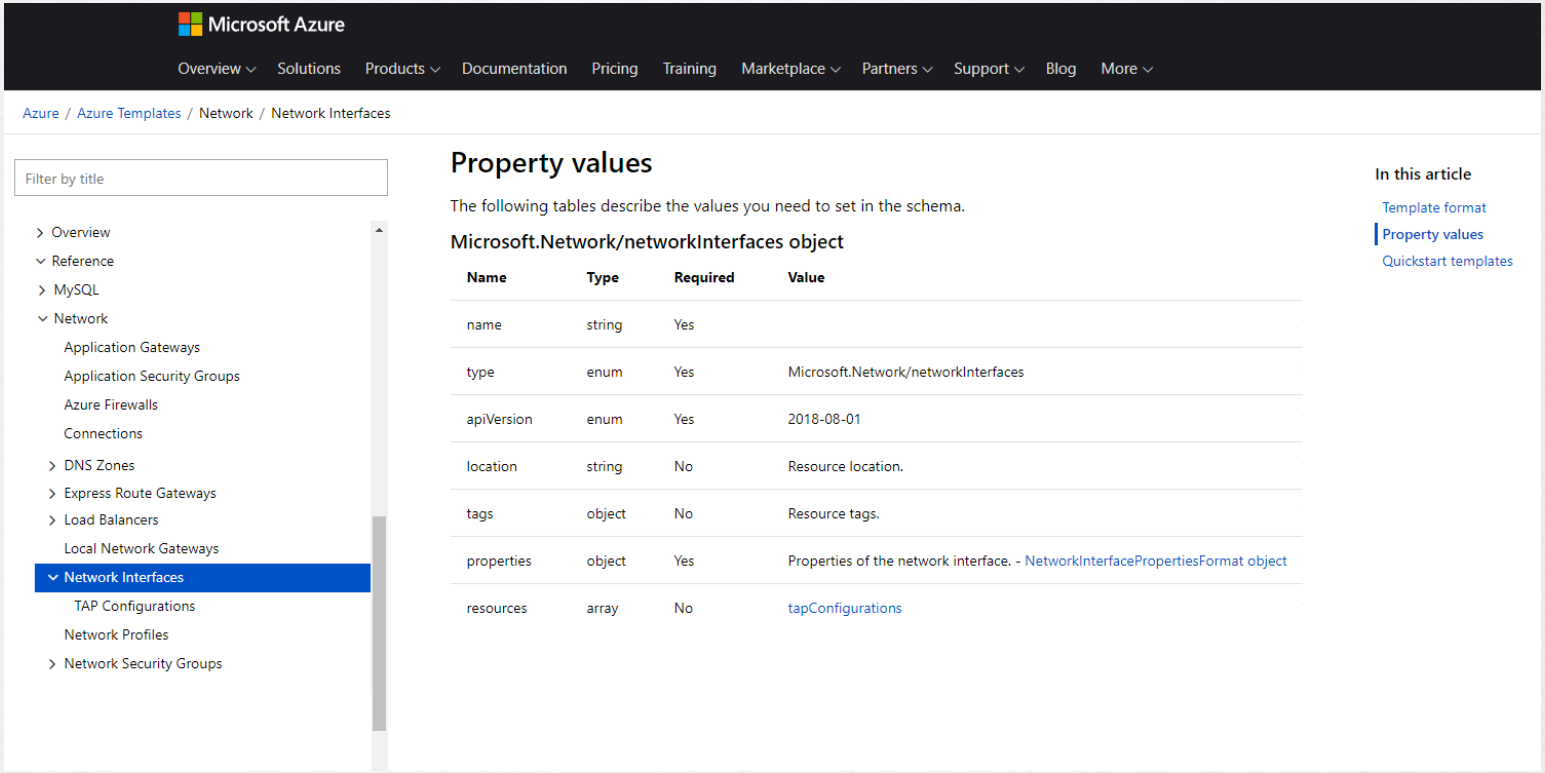
ARM Template



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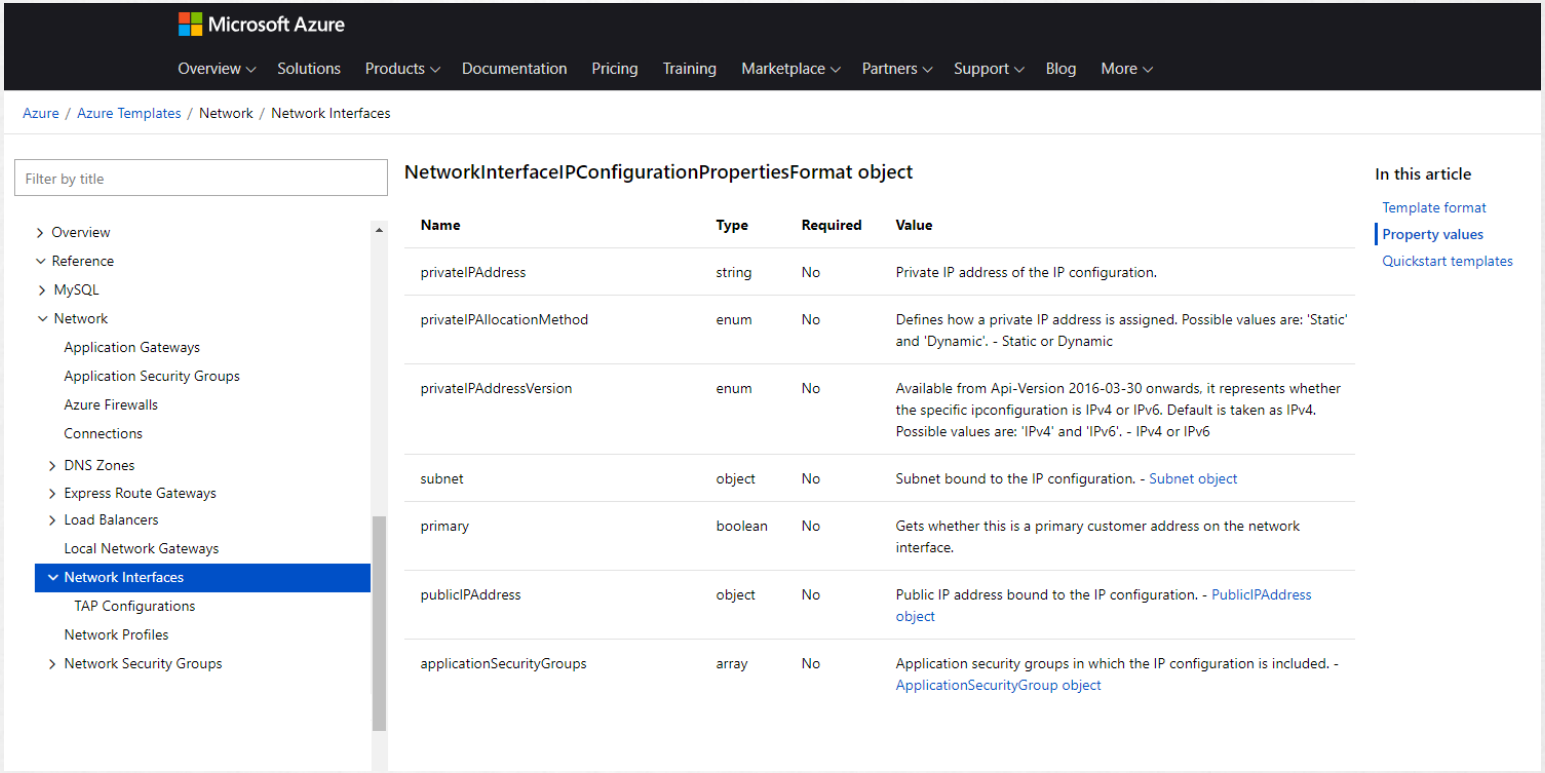
ARM Template



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ARM Template

```
{
    "name": "[variables('nic2Name')]",
    "type": "Microsoft.Network/networkInterfaces",
    "apiVersion": "2016-09-01",
    "location": "[resourceGroup().location]",
    "dependsOn": [
        "[concat('Microsoft.Network/publicIpAddresses/', variables('PIPName'))]",
        "[concat('Microsoft.Network/virtualNetworks/', parameters('virtualNetworkName'))]"
    ],
    "properties": {
        "ipConfigurations": [
            {
                "name": "VIP-NSG-Public",
                "properties": {
                    "subnet": {
                        "id": "[variables('subnetRef2')]"
                    },
                    "privateIPAllocationMethod": "Dynamic",
                    "primary" : false,
                    "publicIpAddress": {
                        "id": "[resourceId('Microsoft.Network/publicIpAddresses', variables('PIPName'))]"
                    }
                }
            },
```

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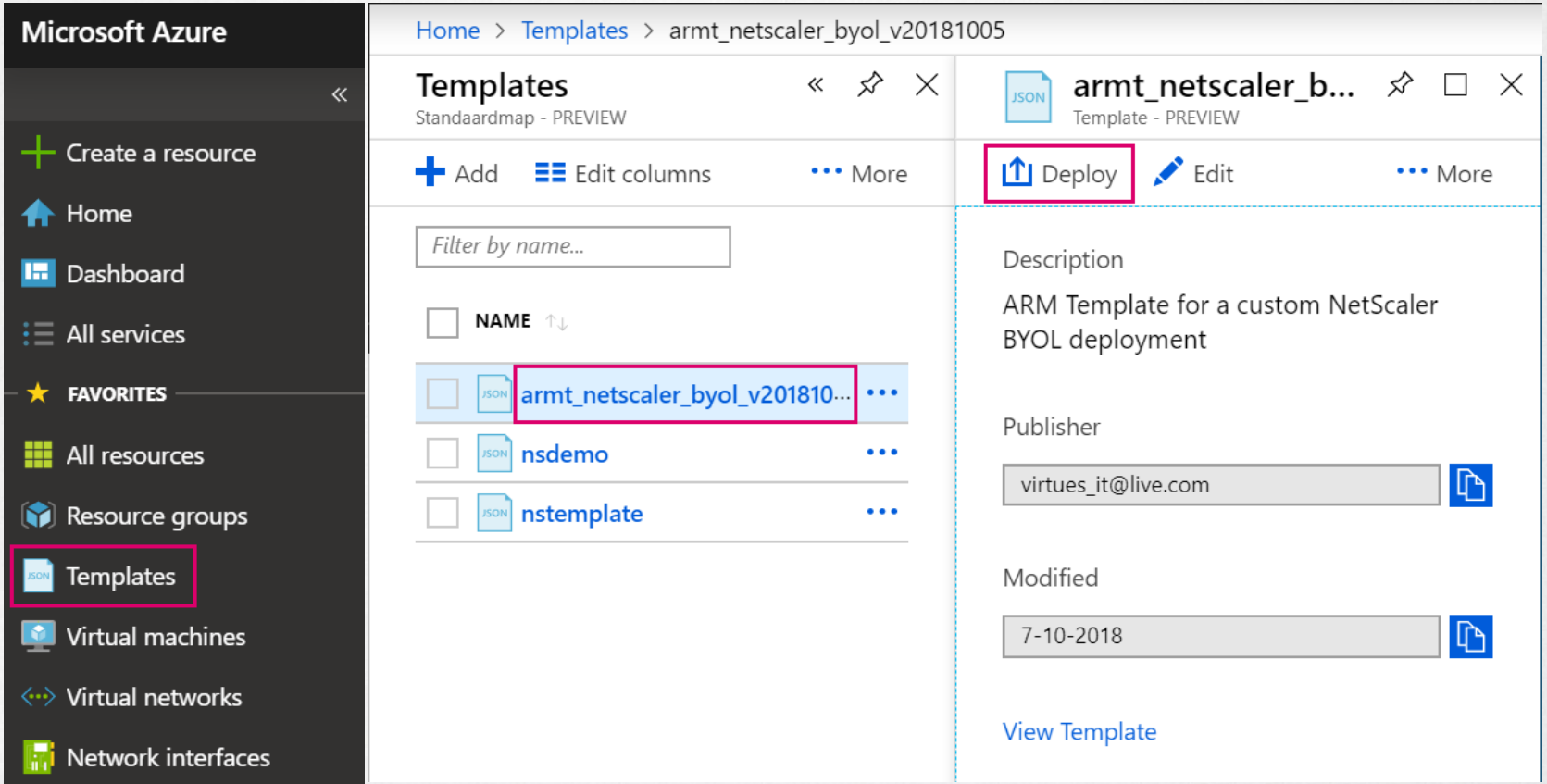
ARM Template



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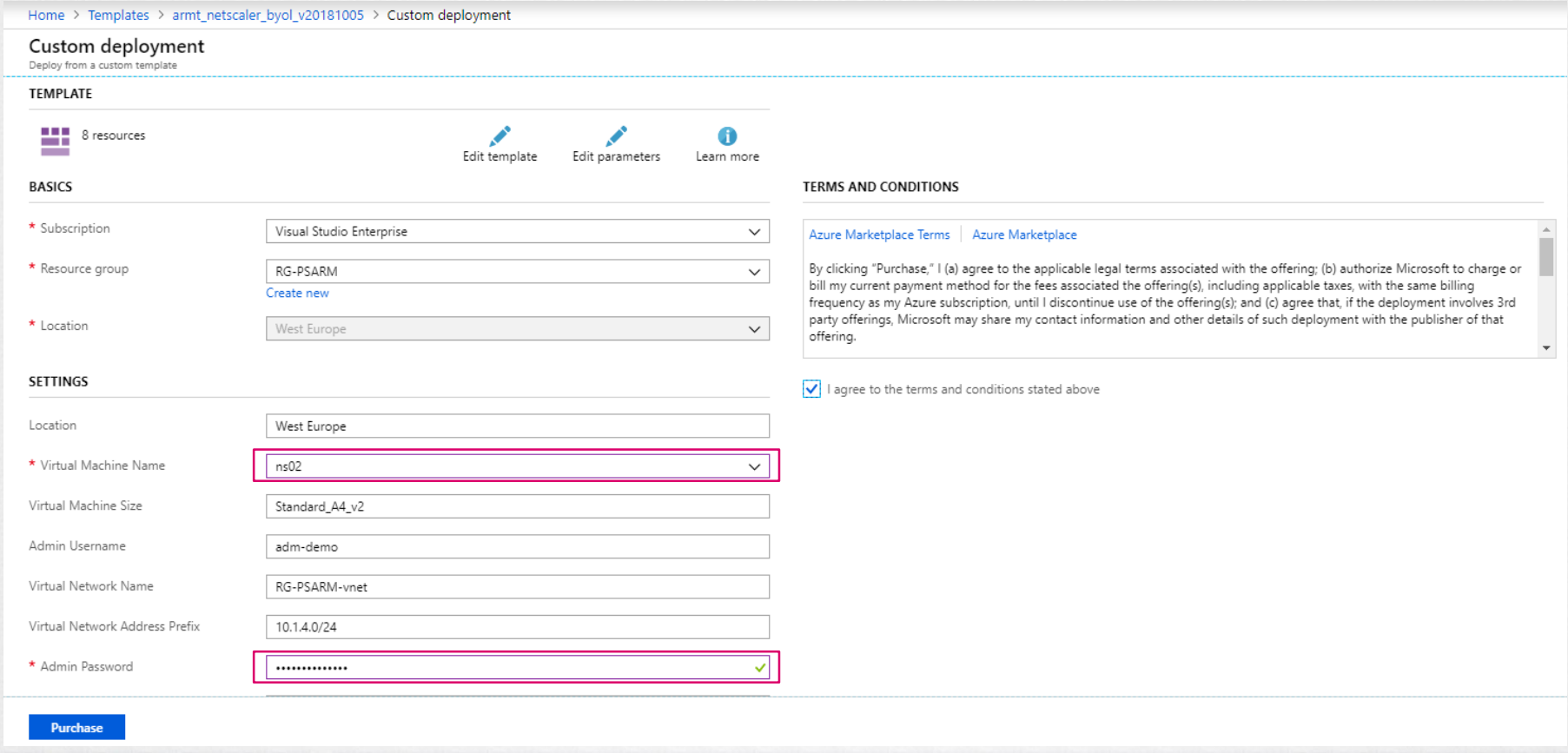
ARM Template



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ARM Template

Your deployment is underway

Check the status of your deployment, manage resources, or troubleshoot deployment issues. Pin this page to your dashboard to easily find it next time.

Deployment name: virtues_it_live.com.armt_netscaler_byol_v20181005
Subscription: Visual Studio Enterprise
Resource group: RG-PSARM

DEPLOYMENT DETAILS (Download)

Start time: 7-10-2018 13:59:31
Duration: 55 seconds
Correlation ID: 8d2f1098-fa8c-48c3-abe2-3989bdf2cf5c

RESOURCE	TYPE	STATUS	OPERATION DETAILS
ns02-nic1	Microsoft.Network/NetworkInterfaces	Created	Operation details
ns02-nic2	Microsoft.Network/networkInterfaces	Created	Operation details
ns02-PIP	Microsoft.Network/publicIpAddresses	OK	Operation details
nsg-ns-external	Microsoft.Network/networkSecurityGro...	OK	Operation details
nsg-ns-internal	Microsoft.Network/networkSecurityGro...	OK	Operation details
RG-PSARM-vnet	Microsoft.Network/virtualNetworks	OK	Operation details
AS-PSARM-NS	Microsoft.Compute/AvailabilitySets	OK	Operation details

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ARM Template

Your deployment is complete

Check the status of your deployment, manage resources, or troubleshoot deployment issues. Pin this page to your dashboard to easily find it next time.

Deployment name: virtues_it_live.com.armt_netscaler_byol_v20181005
Subscription: Visual Studio Enterprise
Resource group: RG-PSARM

DEPLOYMENT DETAILS (Download)

Start time: 7-10-2018 13:59:31
Duration: 4 minutes 46 seconds
Correlation ID: 8d2f1098-fa8c-48c3-abe2-3989bdf2cf5c

RESOURCE	TYPE	STATUS	OPERATION DETAILS
ns02	Microsoft.Compute/virtualMachines	OK	Operation details
ns02-nic1	Microsoft.Network/NetworkInterfaces	Created	Operation details
ns02-nic2	Microsoft.Network/networkInterfaces	Created	Operation details
ns02-PIP	Microsoft.Network/publicIpAddresses	OK	Operation details
nsg-ns-external	Microsoft.Network/networkSecurityGro...	OK	Operation details
nsg-ns-internal	Microsoft.Network/networkSecurityGro...	OK	Operation details
RG-PSARM-vnet	Microsoft.Network/virtualNetworks	OK	Operation details
AS-PSARM-NS	Microsoft.Compute/AvailabilitySets	OK	Operation details

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Az

Azure PowerShell Module

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Az

Install the Azure PowerShell module

12/13/2018 • 4 minutes to read • Contributors

This article tells you how to install the Azure PowerShell modules using PowerShellGet. These instructions work on Windows, macOS, and Linux platforms. For the Az module, currently no other installation methods are supported.

Requirements

Azure PowerShell works with PowerShell 5.1 or higher on Windows, or PowerShell Core 6.x and later on all platforms. If you aren't sure if you have PowerShell, or are on macOS or Linux, install the latest version of PowerShell Core.

Install the Azure PowerShell module

```
PS C:\Users\hwadmin> Install-Module -Name Az

PS C:\Users\hwadmin> Get-InstalledModule -Name Az

Version    Name                                Repository           Description
-------    ----                                ----------           -----------
2.1.0      Az                                  PSGallery            Microsoft Azure PowerShell - Cmdlets to manage resources in Azure. This module is compatible with WindowsPowerShell and PowerShell Core....


PS C:\Users\hwadmin>
```

macOS or Linux):

PowerShell — Copy — Try It

```
Install-Module -Name Az -AllowClobber
```

If you don't have access to administrator privileges, you can install for the current user by adding the `-Scope` argument.

PowerShell — Copy — Try It

```
Install-Module -Name Az -AllowClobber -Scope CurrentUser
```

sources: https://docs.microsoft.com/en-us/powershell/azure/install-az-ps?view=azps-2.2.0

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Az

Install the Azure PowerShell module

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```
PS C:\Users\hwadmin> Install-Module -Name Az

PS C:\Users\hwadmin> Get-InstalledModule -Name Az

Version    Name                                Repository
-------    ----                                ----------
2.1.0      Az                                  PSGallery


PS C:\Users\hwadmin>
```

prefix the Install-Module cmdlet with **PowerShellGet** to prevent errors

macOS or Linux):

PowerShell — Copy — Try It

```
Install-Module -Name Az -AllowClobber
```

If you don't have access to administrator privileges, you can install for the current user by adding the `-Scope` argument.

PowerShell — Copy — Try It

```
Install-Module -Name Az -AllowClobber -Scope CurrentUser
```

sources: https://docs.microsoft.com/en-us/powershell/azure/install-az-ps?view=azps-2.2.0

DEVOPS &
AUTOMATION

Az

```
Current Installed Modules:

Version    Name                                Repository           Description
-------    ----                                ----------           -----------
2.1.0      Az                                  PSGallery            Microsoft Azure PowerShell - Cmdlets to manage resources in Azure. This module is compatible with WindowsPowerShell and PowerShell Core....
1.5.2      Az.Accounts                         PSGallery            Microsoft Azure PowerShell - Accounts credential management cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.1      Az.Aks                              PSGallery            Microsoft Azure PowerShell - Azure managed Kubernetes cmdlets for Windows PowerShell and PowerShell Core....
1.1.0      Az.AnalysisServices                 PSGallery            Microsoft Azure PowerShell - Analysis Services cmdlets for Windows PowerShell and PowerShell Core....
1.1.0      Az.ApiManagement                    PSGallery            Microsoft Azure PowerShell - Api Management service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.0      Az.ApplicationInsights              PSGallery            Microsoft Azure PowerShell - Application Insights management cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core.  Creates and ma...
1.2.2      Az.Automation                       PSGallery            Microsoft Azure PowerShell - Automation service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.0      Az.Batch                            PSGallery            Microsoft Azure PowerShell - Batch service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.0      Az.Billing                          PSGallery            Microsoft Azure PowerShell - Billing service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.2.0      Az.Cdn                              PSGallery            Microsoft Azure PowerShell - CDN service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.1      Az.CognitiveServices                PSGallery            Microsoft Azure PowerShell - Cognitive Services management cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core. Creates and manag...
2.1.0      Az.Compute                          PSGallery            Microsoft Azure PowerShell - Compute service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core.  Manages virtual machines, host...
1.0.1      Az.ContainerInstance                PSGallery            Microsoft Azure PowerShell - Container Instance cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.1      Az.ContainerRegistry                PSGallery            Microsoft Azure PowerShell - Container Registry service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.1      Az.DataFactory                      PSGallery            Microsoft Azure PowerShell - Data Factory service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.0      Az.DataLakeAnalytics                PSGallery            Microsoft Azure PowerShell - Data Lake Analytics in Windows PowerShell and PowerShell Core....
1.2.1      Az.DataLakeStore                    PSGallery            Microsoft Azure PowerShell - Azure Data Lake Store cmdlets in Windows PowerShell and PowerShell Core....
1.0.0      Az.DeploymentManager                PSGallery            PowerShell .Net Core Microsoft Azure PowerShell - Deployment Manager cmdlets for Azure Resource Manager....
1.0.0      Az.DevTestLabs                      PSGallery            Microsoft Azure PowerShell - DevTest Labs service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.0      Az.Dns                              PSGallery            Microsoft Azure PowerShell - DNS service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.1      Az.EventGrid                        PSGallery            Microsoft Azure PowerShell - Event Grid service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.0      Az.EventHub                         PSGallery            Microsoft Azure PowerShell - Event Hubs service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.0      Az.FrontDoor                        PSGallery            Microsoft Azure PowerShell - Front Door service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
2.0.0      Az.HDInsight                        PSGallery            Microsoft Azure PowerShell - HDInsight service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.0      Az.IotHub                           PSGallery            Microsoft Azure PowerShell - IoT Hub service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.2.0      Az.KeyVault                         PSGallery            Microsoft Azure PowerShell - Key Vault service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.2.1      Az.LogicApp                         PSGallery            Microsoft Azure PowerShell - Logic Apps cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.0      Az.MachineLearning                  PSGallery            Microsoft Azure PowerShell - Machine Learning Web Services cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.0      Az.MarketplaceOrdering              PSGallery            Microsoft Azure PowerShell - Marketplace Ordering agreements service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.0      Az.Media                            PSGallery            Microsoft Azure PowerShell - Media service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.2.1      Az.Monitor                          PSGallery            Microsoft Azure PowerShell - Monitor service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.8.1      Az.Network                          PSGallery            Microsoft Azure PowerShell - Networking service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.0      Az.NotificationHubs                 PSGallery            Microsoft Azure PowerShell - Notification Hubs cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.2.0      Az.OperationalInsights              PSGallery            Microsoft Azure PowerShell - Operational Insights service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core.
1.1.0      Az.PolicyInsights                   PSGallery            Microsoft Azure PowerShell - Azure Policy Insights cmdlets for Windows PowerShell and PowerShell Core. Allows querying policy evaluation events and compli...
1.1.0      Az.PowerBIEmbedded                  PSGallery            Microsoft Azure PowerShell - Power BI Embedded service management cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core.  Creates a...
1.4.0      Az.RecoveryServices                 PSGallery            Microsoft Azure PowerShell - Recovery Services cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.1.0      Az.RedisCache                       PSGallery            Microsoft Azure PowerShell - Redis Cache service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.1      Az.Relay                            PSGallery            Microsoft Azure PowerShell - Relay service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.4.0      Az.Resources                        PSGallery            Microsoft Azure PowerShell - Azure Resource Manager and Active Directory cmdlets in Windows PowerShell and PowerShell Core.  Manages subscriptions, tenant...
1.1.0      Az.ServiceBus                       PSGallery            Microsoft Azure PowerShell - Service Bus service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.1      Az.ServiceFabric                    PSGallery            Microsoft Azure PowerShell - Service Fabric cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.2      Az.SignalR                          PSGallery            Microsoft Azure PowerShell - Azure SignalR service commands for Windows PowerShell and PowerShell Core....
1.10.0     Az.Sql                              PSGallery            Microsoft Azure PowerShell - SQL service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.3.0      Az.Storage                          PSGallery            Microsoft Azure PowerShell - Storage service data plane and management cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core.  Crea...
1.0.0      Az.StreamAnalytics                  PSGallery            Microsoft Azure PowerShell - Stream Analytics service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.0.1      Az.TrafficManager                   PSGallery            Microsoft Azure PowerShell - Traffic Manager service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
1.2.1      Az.Websites                         PSGallery            Microsoft Azure PowerShell - App Service (Web Apps) service cmdlets for Azure Resource Manager in Windows PowerShell and PowerShell Core....
```

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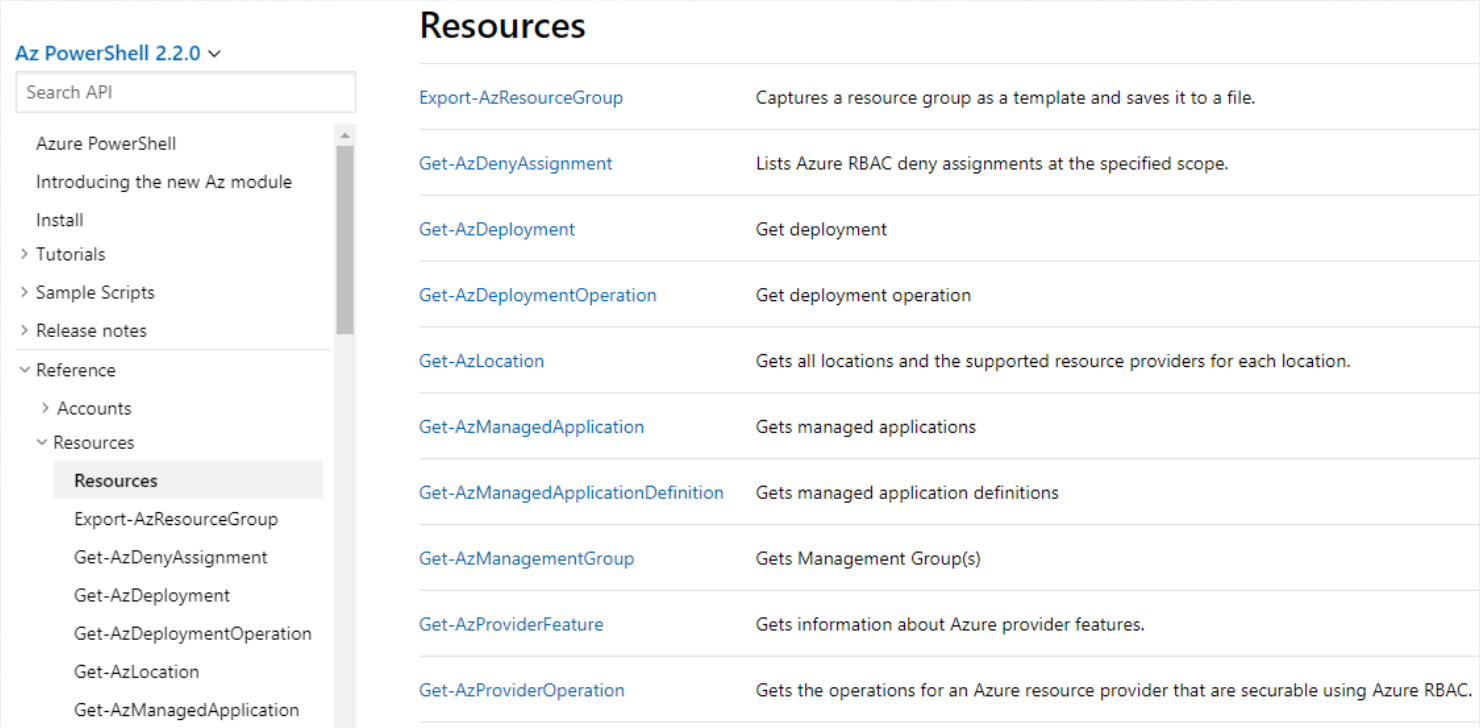
Az



sources: https://docs.microsoft.com/en-us/powershell/module/az.resources/?view=azps-2.2.0#resources

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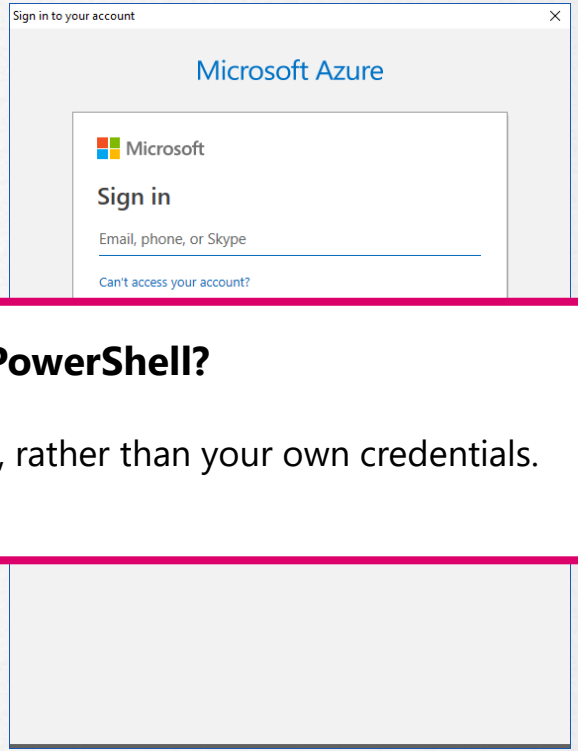
Az – PowerShell

```
# ----------------------
# | Interactive Login |
# ----------------------

# Login using interactive login to Azure (popup)
Login-AzAccount
```



Plan to manage your app or service with **Azure PowerShell?**

Run your script with an **AAD Service Principal**, rather than your own credentials.

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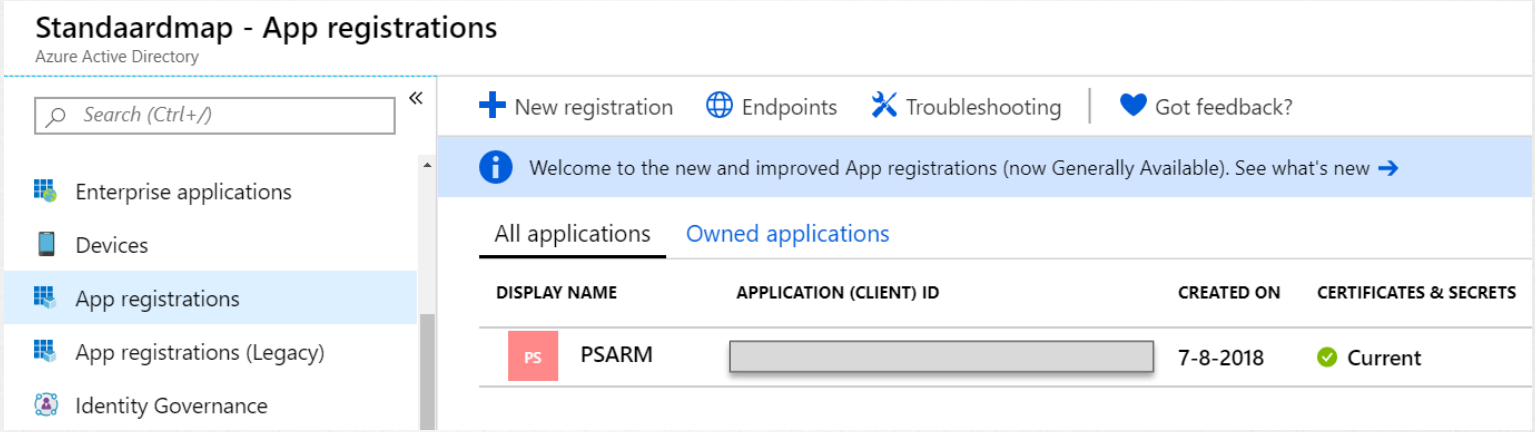
Az – Service Principal



step 1: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-create-service-principal-portal

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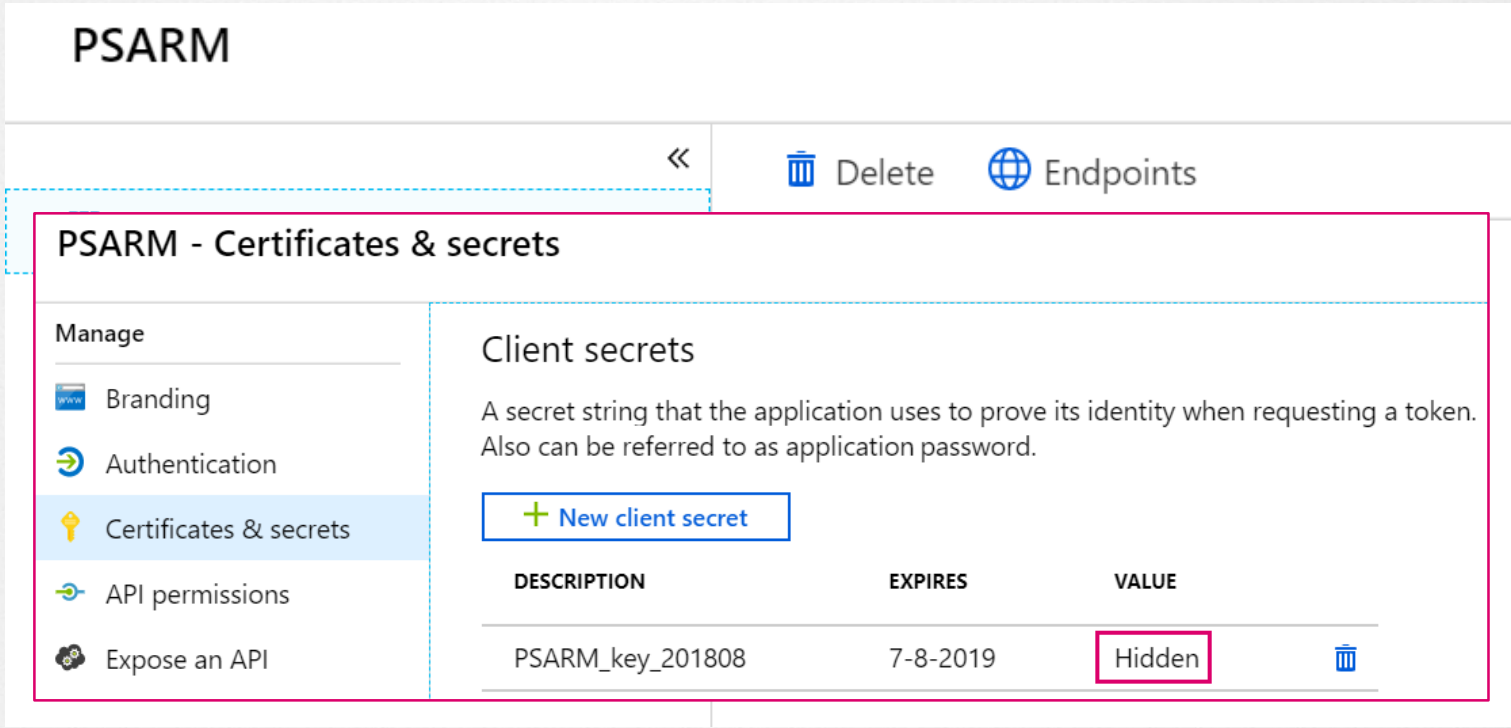
Az – AppID, AppKey & TenantID



step 2: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-create-service-principal-portal

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Az

```
Write-Output ""
Write-Output "## ------------------------------------------------------------------"
Write-Output "## | Section 1 - Logging onto Azure using the Az PowerShell Module |"
Write-Output "## ------------------------------------------------------------------"
Write-Output ""

#region Logon information
    # Read App secrets from CSV file
        $AppSecrets = Import-Csv -Path "C:\Sources\Azure_App_Secrets.csv" -Delimiter ","
        $ApplicationID = $AppSecrets.AppID
        $ApplicationKey = $AppSecrets.AppKey
        $TenantID = $AppSecrets.TenantID
    # Create Azure Credentials
        $SPpasswd = ConvertTo-SecureString $ApplicationKey -AsPlainText -Force
        $SPCreds = New-Object System.Management.Automation.PSCredential($ApplicationID, $SPpasswd)
#endregion

#region Step 0: Sign in to Azure with Service Principal
    Write-Output "Step 0: Create a session to Azure ..."
    $Session = Connect-AzAccount -Credential $SPCreds -TenantId $TenantID -ServicePrincipal `
                                 -SkipContextPopulation
#endregion
```

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AUTOMATION

Az

```
Write-Output ""
Write-Output "## ------------------------------------------------------------------"
Write-Output "## | Section 1 - Logging onto Azure using the Az PowerShell Module |"
Write-Output "## ------------------------------------------------------------------"
Write-Output ""

#region Logon
    # Read App
        $AppSe
        $Appli
        $Appli
        $TenantID = $AppSecrets.TenantID
    # Create Azure Credentials
        $SPpasswd = ConvertTo-SecureString $ApplicationKey -AsPlainText -Force
        $SPCreds = New-Object System.Management.Automation.PSCredential($ApplicationID, $SPpasswd)
#endregion

#region Step 0: Sign in to Azure with Service Principal
    Write-Output "Step 0: Create a session to Azure ... "
    $Session = Connect-AzAccount -Credential $SPCreds -TenantId $TenantID -ServicePrincipal `
                                 -SkipContextPopulation
#endregion
```

```
Step 0: Create a session to Azure ...
 => Session Created Successful!
```

```
Write-Output ""
Write-Output "## ------------------------------------------------------------------------------"
Write-Output "## | Section 2 - Deploy NetScaler VPX BYOL, based on custom ARM Template (w/ 2 NICs) |"
Write-Output "## ------------------------------------------------------------------------------"
Write-Output ""

## Create Hashtable object
Write-Output "Step 2. Create a Hashtable object that contains all the ARM Template variables and values."
$objTemplateParameter = @{}

## Add the parameter values to it
$objTemplateParameter.Add('location', 'westeurope')
$objTemplateParameter.Add('virtualMachineName', $NetScalerName)
$objTemplateParameter.Add('virtualMachineSize', 'Standard_A4_v2')
$objTemplateParameter.Add('adminUsername', $NSUsername)
$objTemplateParameter.Add('adminPassword', $SecurePassword)
$objTemplateParameter.Add('virtualNetworkName', 'RG-PSARM-vnet')
$objTemplateParameter.Add('virtualNetworkAddressPrefix', '10.1.4.0/24')
$objTemplateParameter.Add('availabilitySetName', 'AS-PSARM-NS')
$objTemplateParameter.Add('nic1SubnetName', 'sn-internal')
$objTemplateParameter.Add('nic1SubnetAddressPrefix', '10.1.4.0/26')
$objTemplateParameter.Add('nic2SubnetName', 'sn-external')
$objTemplateParameter.Add('nic2SubnetAddressPrefix', '10.1.4.64/26')
$objTemplateParameter.Add('networkSecurityGroup1Name', 'nsg-ns-internal')
$objTemplateParameter.Add('networkSecurityGroup2Name', 'nsg-ns-external')

## Create NetScaler, using ARM Template and TemplateParameterObject for (input) parameters
New-AzResourceGroupDeployment -ResourceGroupName $ResourceGroupName -TemplateFile $strTemplateFile `
                              -TemplateParameterObject $objTemplateParameter
```

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Azure Automation

Runbooks & Hybrid Workers

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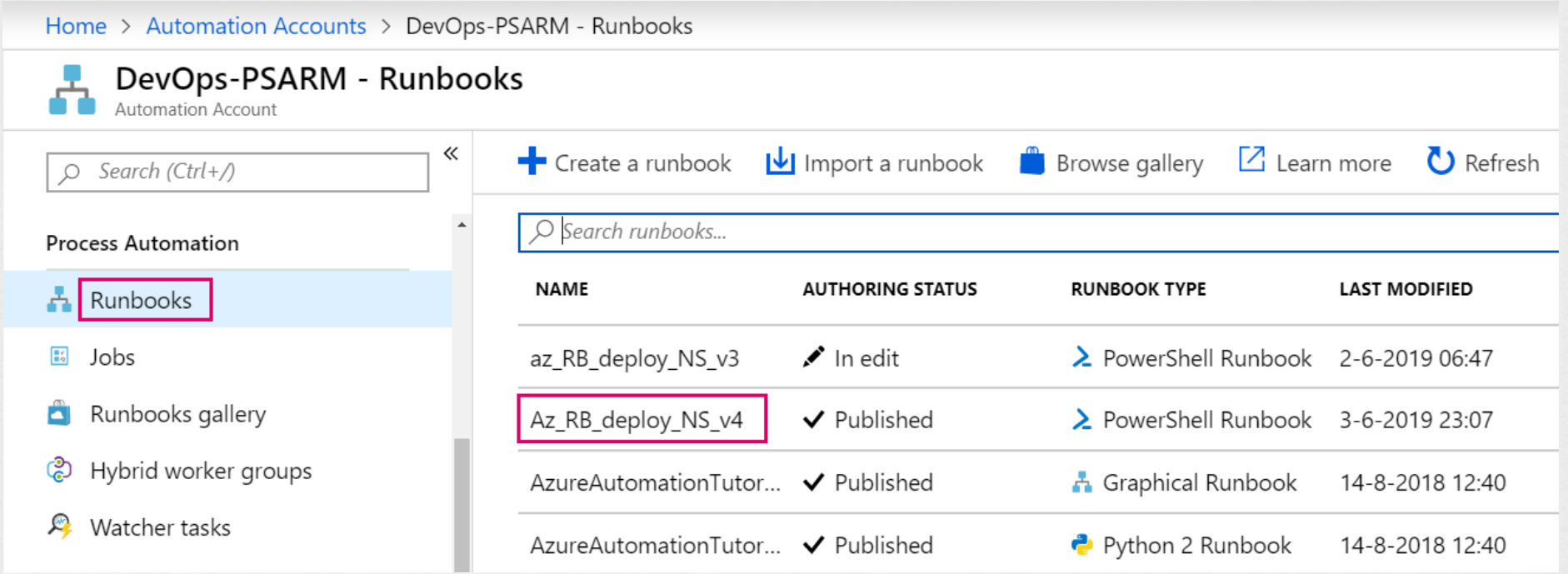
Azure Automation



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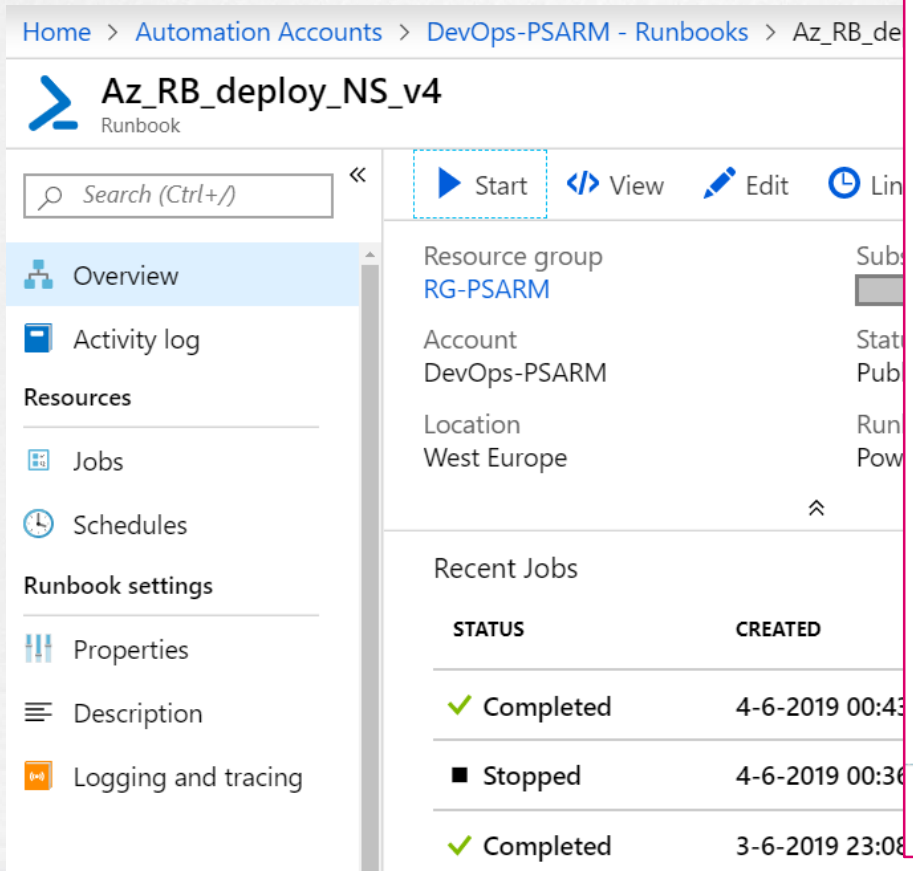
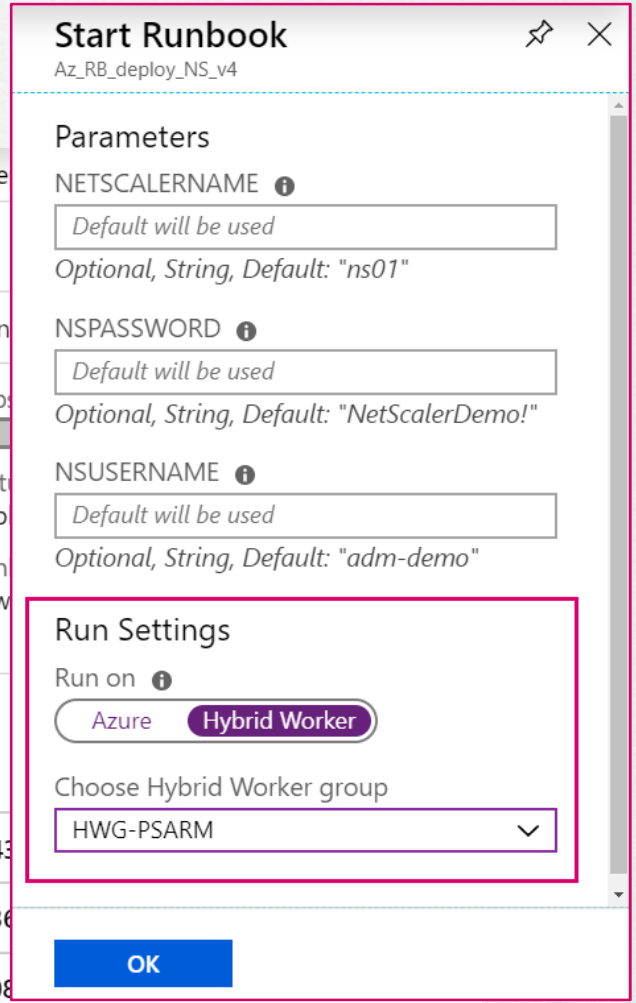
Azure Automation





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Hybrid Worker

```powershell
# Getting Started with Az Module
Install-Module Az

#region Logon information
    $AppSecrets = Import-Csv -Path "C:\Sources\Azure_App_Secrets.csv" -Delimiter ","
    $SubscriptionID = $AppSecrets.SubscriptionID
#endregion

#region Install Hybrid Worker
    # Script variables
    $AutomationAccountName = "DevOps-PSARM"
    $AAResourceGroupName = "RG-PSARM"
    $LogAnalyticsWorkspaceName = "OMS-WS-PSARM"
    $OMSResourceGroupName = "RG-PSARM"
    $HybridGroupName = "HWG-PSARM"

    # Install Hybrid Worker locally and add to specified Hybrid Worker Group in Azure
    C:\Scripts\New-OnPremiseHybridWorker.ps1 -AutomationAccountName $AutomationAccountName `
    -AAResourceGroupName $AAResourceGroupName -OMSResourceGroupName $OMSResourceGroupName `
    -HybridGroupName $HybridGroupName -SubscriptionId $SubscriptionID `
    -WorkspaceName $LogAnalyticsWorkspaceName
#endregion
```

sources: https://docs.microsoft.com/en-us/azure/automation/automation-hybrid-runbook-worker
https://docs.microsoft.com/en-us/azure/automation/automation-windows-hrw-install

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PowerShell in Action

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Create a resource
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Dashboard
All services
FAVORITES
All resources
Resource groups
Virtual machines
Virtual networks
Network interfaces
Public IP addresses
Storage accounts
Network security groups
Load balancers
Availability sets
Automation Accounts
Key vaults
Disks
Templates
Azure Active Directory
Virtual network gateways
Log Analytics workspaces
App Services
SQL databases
SQL data warehouses
Monitor
Advisor
Security Center
Cost Management + Bill...
Help + support

Dashboard > Automation Accounts > DevOps-PSARM - Runbooks > Az_RB_deploy_NS_v4

Az_RB_deploy_NS_v4

Runbook

Search (Ctrl+/)

Overview
Activity log
Tags
Diagnose and solve problems

Resources
Jobs
Schedules
Webhooks

Runbook settings
Properties
Description
Logging and tracing

Settings
Locks
Export template

Support + troubleshooting
New support request

Start | View | Edit | Link to schedule | Add webhook | Delete | Export | Refresh

Resource gro... : RG-PSARM
Account : DevOps-PSARM
Location : West Europe
Subscription : Visual Studio Enterprise
Tags (change) : Click here to add tags

Subscription I... :
Status : Published
Runbook type : PowerShell Runbook
Last modified : 3-6-2019 23:05

Recent Jobs

STATUS	CREATED	LAST UPDATED
Completed	3-6-2019 22:51:08	3-6-2019 22:58:07
Completed	3-6-2019 22:20:54	3-6-2019 22:21:22
Completed	3-6-2019 22:17:53	3-6-2019 22:18:22

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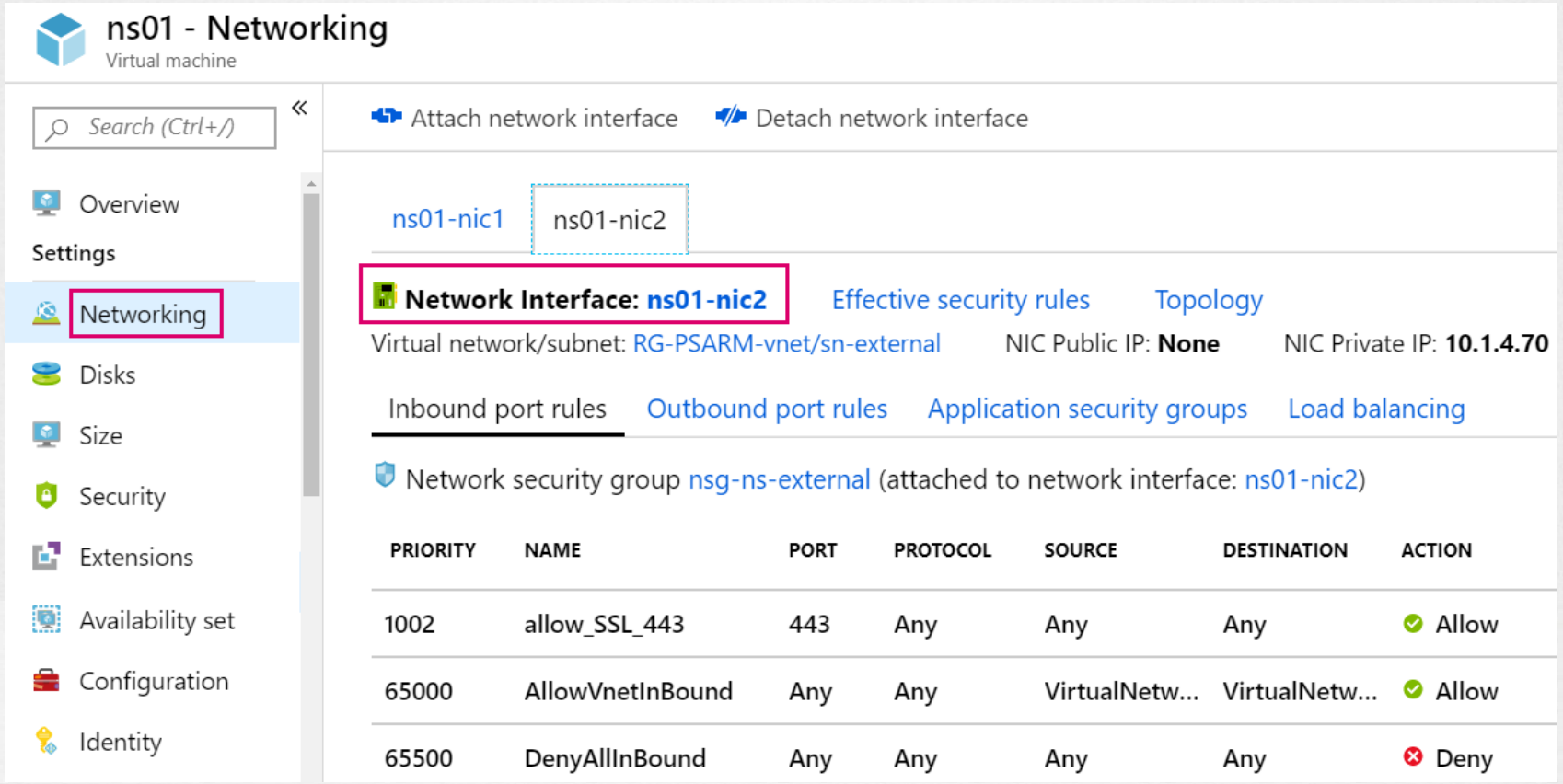
Virtual Machine



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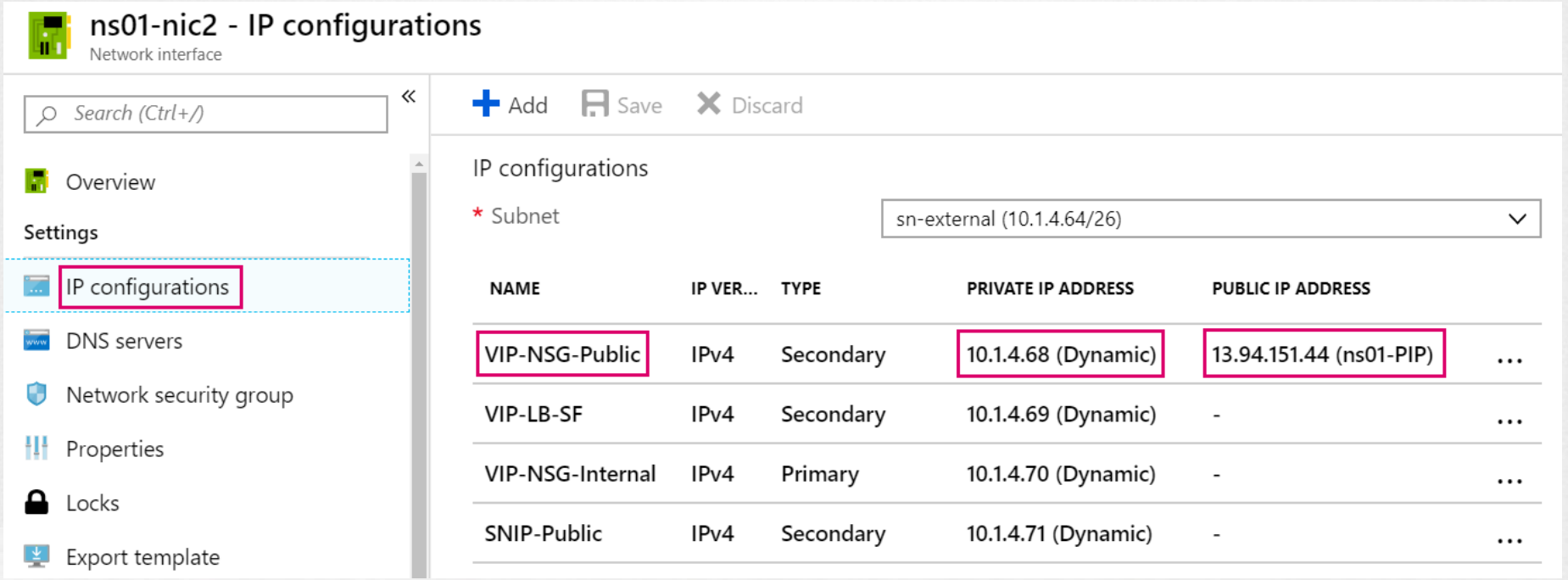
Virtual Machine



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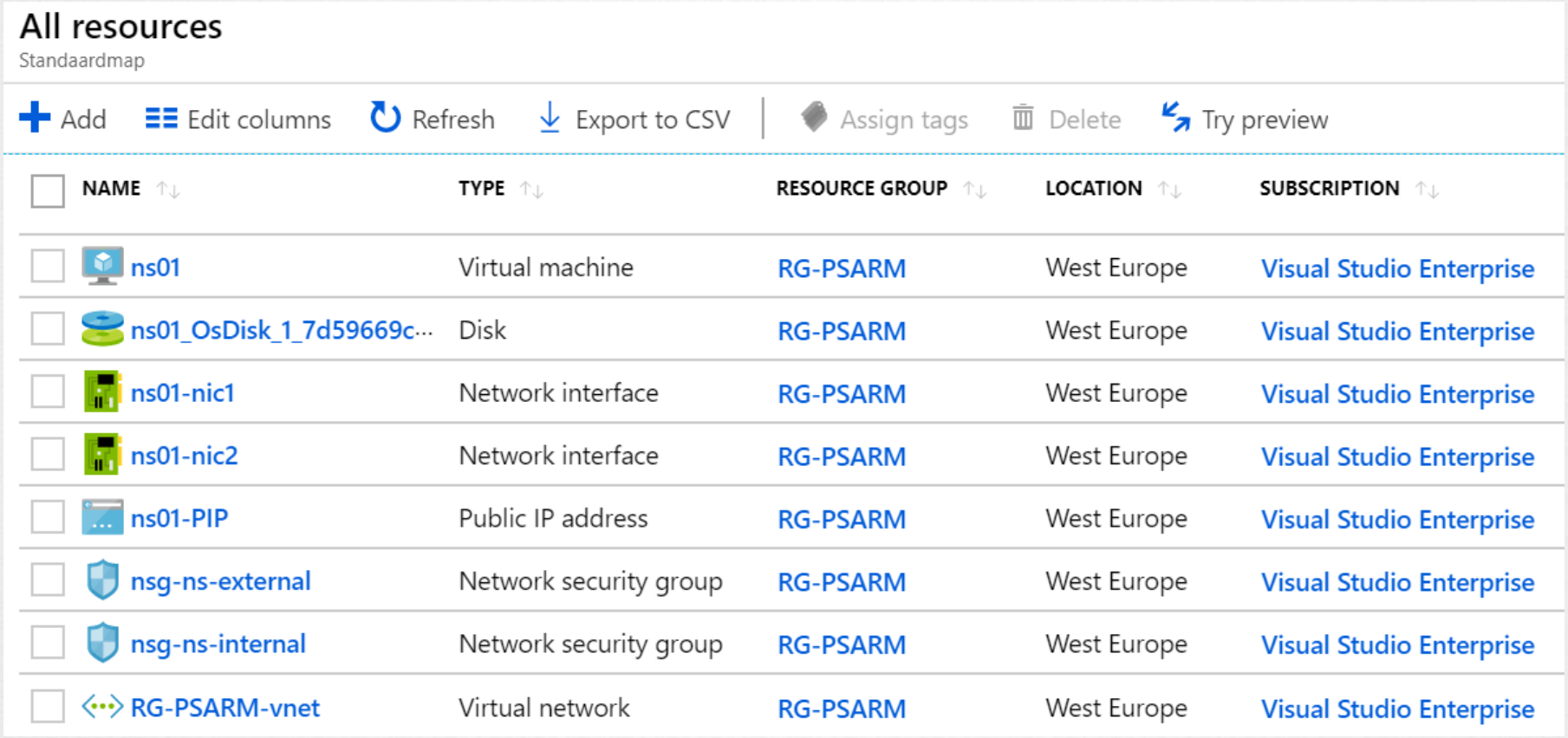
Resources



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The Scripts

Where to go next?

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GitHub

Check out the scripts and get started after the presentation

Sharing the **Azure Automation fun** and demo **scripts** with the **Community**:

https://github.com/cognitionIT/AzureAutomation

GitHub

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Presented by:

Esther Barthel **Solutions Architect**

@virtuEs_IT
http://nl.linkedin.com/in/ebarthel
http://www.virtues.it

COGNITION
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Bonus Scripts

Automatic Deployments

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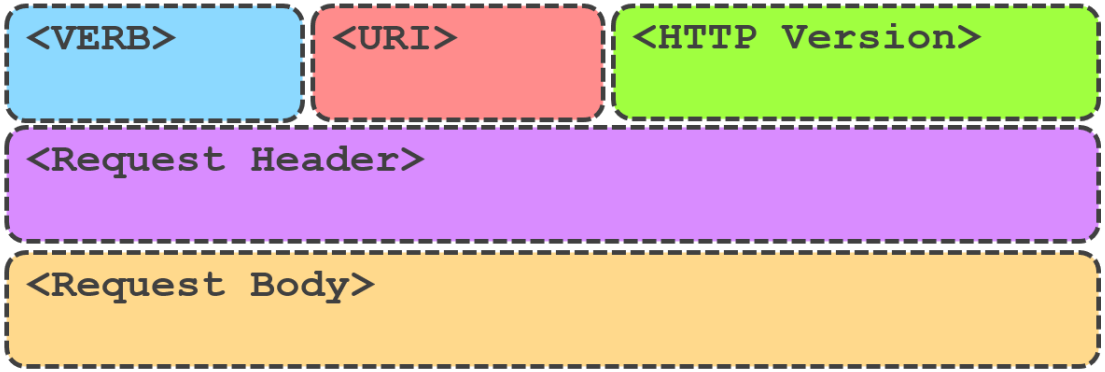
Bonus: Automatically start a Runbook

A way to interact with an API via series of HTTP calls

- **VERB:** HTTP Method (GET, PUT, POST, DELETE, OPTIONS)
- **URI:** the URI of the resource on which the operation is performed
- **HTTP Version:** usually "HTTP v1.1"
- **Request Header:** contains metadata (formatting, etc.)
- **Request Body:** actual message content



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Bonus: Automatically start a Runbook

```
#region Start specified Runbook
    $Uri = 'https://management.azure.com/subscriptions/'
    $Uri = $Uri + '{0}/resourceGroups/{1}/providers/Microsoft.Automation/automationAccounts/{2}/jobs/{3}?api-version={4}' `
    -f $SubscriptionID, $ResourceGroupName, $AutomationAccountName, $((New-Guid).guid), $APIVersion

    $body = ConvertTo-Json @{
        "properties" = @{
            "runbook"   = @{"name" = $RunbookName}
            "parameters" = @{"NetScalerName" = "ns01";"NSPassword" = "NetScalerDemo!";"NSUsername" = "adm-demo"}
            "runon" = $HybridWorkerGroup
        }
        "tags" = @{}
    } -Depth 5

    # Invoke-RestMethod parameters
    $params = @{
        ContentType = "application/json"
        Headers = @{"authorization" = "Bearer $($token.Access_Token)"}
        Method = "Put"
        URI = $Uri
        Body = $body
    }

    # Make the REST API call
    $oRunbook = Invoke-RestMethod @params
#endregion
```

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AutoStartAzureAutomationRunbook_v0_4.ps1

```powershell
#requires -Version 3
# ------------------------------------------------------
# Based upon the script shared by MS employee Stefan Stranger
#              https://blogs.technet.microsoft.com/stefan_stranger/2017/08/09/triggering-azure-automation-runbooks-using-the-azure-arm-rest-api/
# ... and the script from Laurie Rhodes
#            http://www.laurierhodes.info/?q=node/118
# ------------------------------------------------------


## ---------------------------------------------------------------------
## | Section 1 - Create a Access Token for Azure with REST API call |
## ---------------------------------------------------------------------
Write-Output ""
Write-Host "* Creating an Access Token for Azure, using REST API" -ForegroundColor Yellow

# Azure Automation account information
    $ResourceGroupName = "RG-PSARM"
    $AutomationAccountName = "DevOps-PSARM"
    $APIVersion = "2015-10-31"
    $RunbookName = "Az_RB_deploy_NS_v4"
    $HybridWorkerGroup = "HWG-PSARM"

#region Read App secrets from CSV file
    #source: https://docs.microsoft.com/en-us/powershell/module/microsoft.powershell.utility/import-csv?view=powershell-6
    $AppSecrets = Import-Csv -Path "C:\`$_Sources\Azure_App_Secrets.csv" -Delimiter ","
    $ClientID = $AppSecrets.AppID
    $ClientSecret = $AppSecrets.AppKey
    $TenantID = $AppSecrets.TenantID
    $SubscriptionID = $AppSecrets.SubscriptionID
#endregion

$TokenEndpoint = {https://login.windows.net/{0}/oauth2/token} -f $TenantID
$ARMResource = "https://management.core.windows.net/";

# Create the JSON payload
$Body = @{
        'resource'= $ARMResource
        'client_id' = $ClientID
        'grant_type' = 'client_credentials'
        'client_secret' = $ClientSecret
}

```

```
PS C:\_Scripts\PoSH\AzureAutomation>
```

Completed

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145%

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The Links

Resources

Resources

Microsoft Azure:

- https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-create-service-principal-portal
- https://docs.microsoft.com/en-us/powershell/azure/create-azure-service-principal-azureps?view=azurermps-6.9.0
- https://docs.microsoft.com/en-us/powershell/azure/overview?view=azurermps-6.9.0
- https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-authoring-templates

GitHub:

- https://github.com/cognitionIT
- https://github.com/cognitionIT/AzureAutomation
- https://github.com/Azure/azure-quickstart-templates

Next session: 11:30 – 12:30

Overleven in de jungle van DevOps tools

Joran Markx

Experts Live Netherlands

Feedback

Please review my session in the Yellenge App!

Thank You!

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