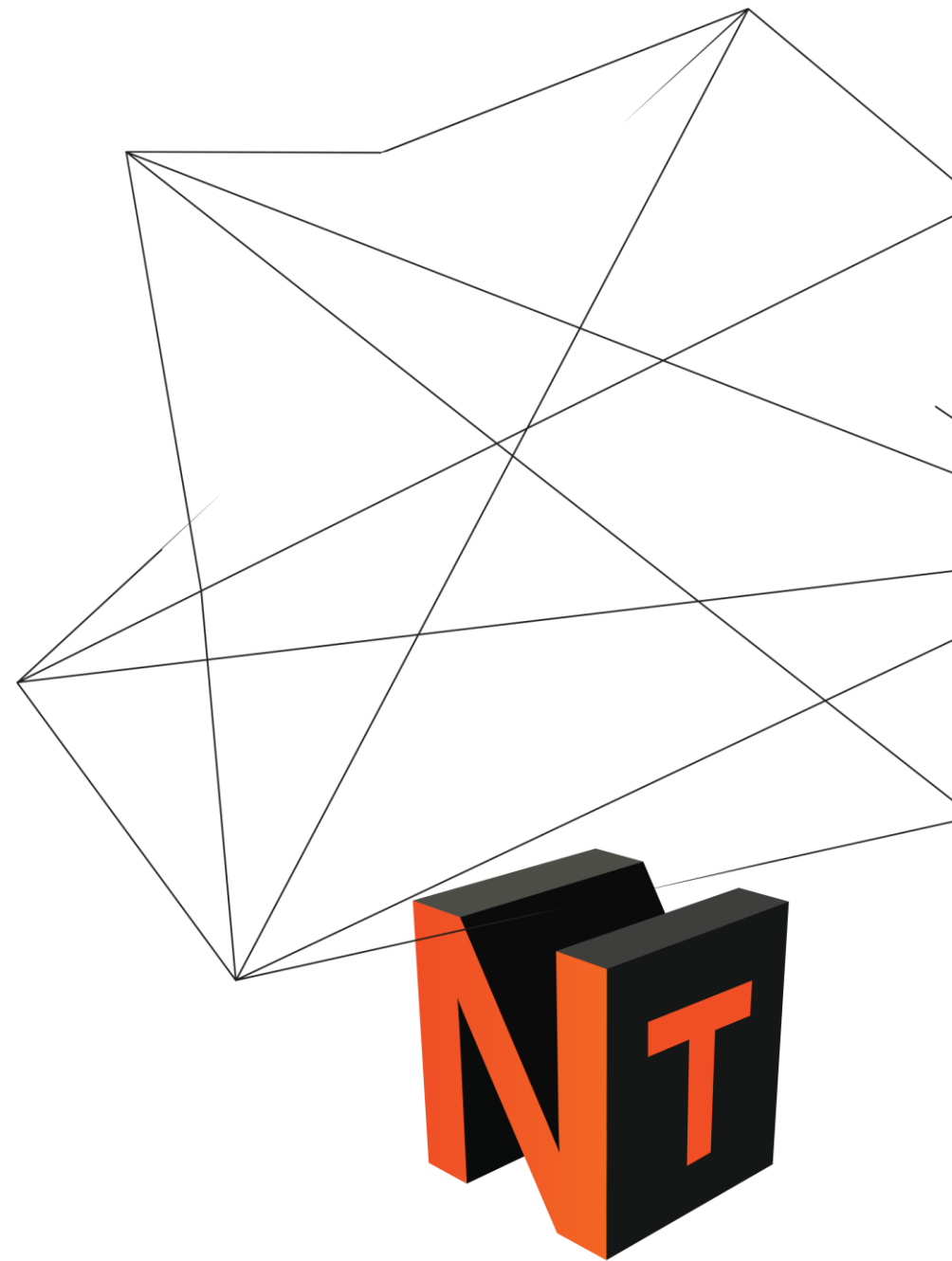


Infrastructure as a code – Automating Azure

Saša Kranjac

#ntk18



Who is this anyway...?

Security & Azure Specialist, IT Instructor, Speaker, CEO

MCT, MCSE, CEH, CEI and 50+

Official + bespoke courses: Microsoft, EC-Council, Security, Azure, Wireshark... AutoCAD as well ;-)

1st PC: Sir Clive's ZX Spectrum

1st Windows Server: NT 3.5

 info@kranjac.eu

 [@SasaKranjac](https://twitter.com/SasaKranjac)



Microsoft
CERTIFIED
Trainer

Microsoft
CERTIFIED
Solutions Expert
Cloud Platform and
Infrastructure

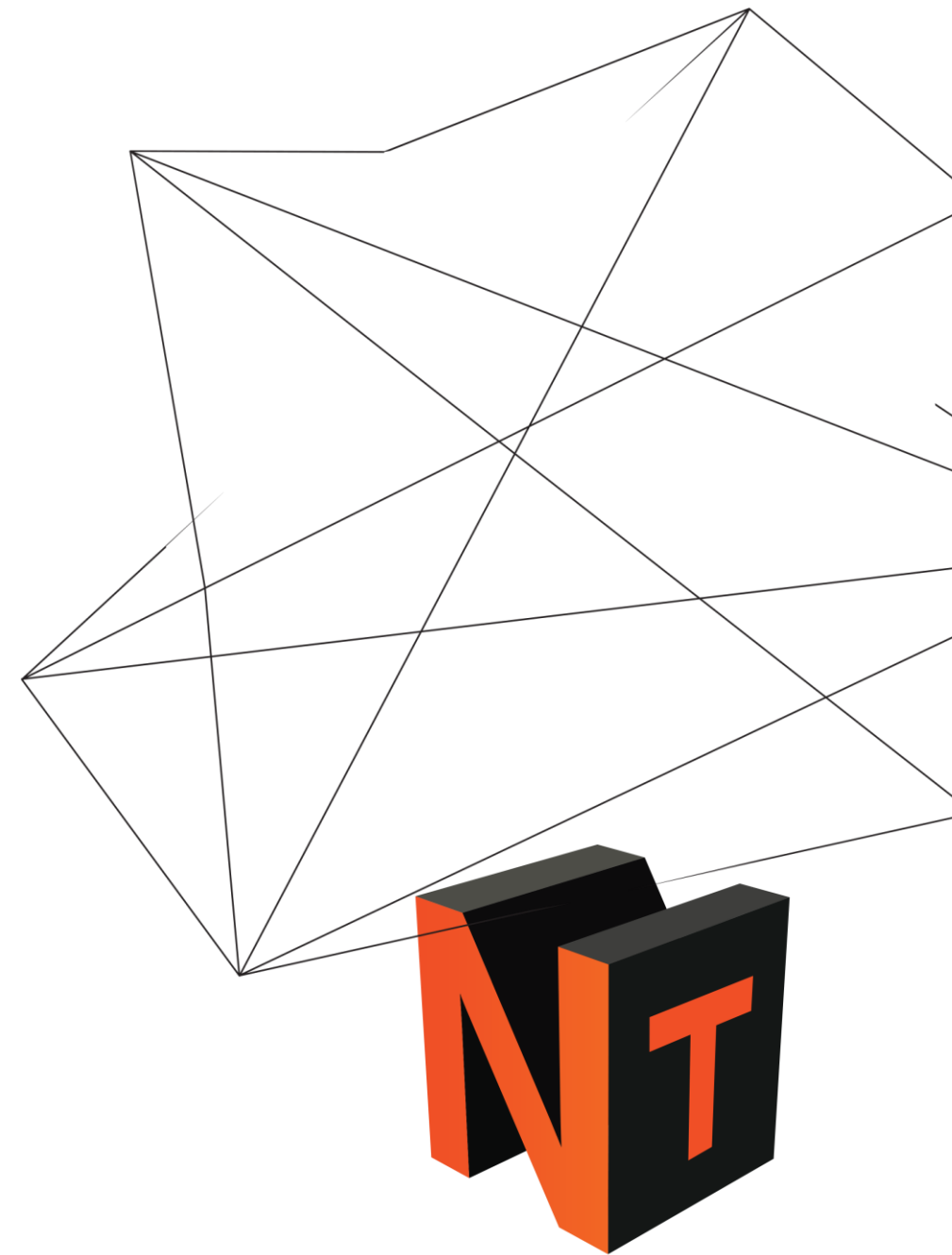
Microsoft
CERTIFIED
Solutions Expert
Mobility

Microsoft
Specialist
Implementing Microsoft
Azure Infrastructure
Solutions

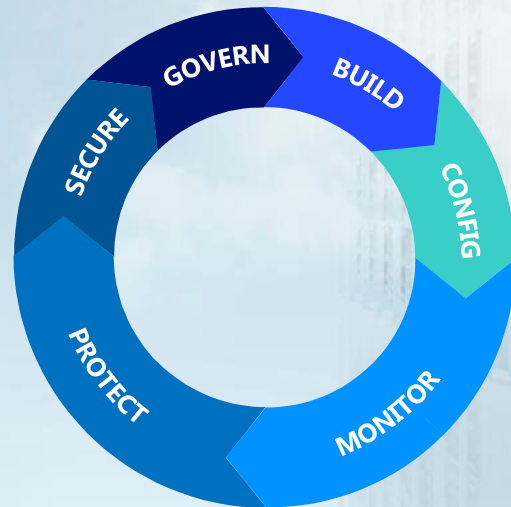
Microsoft
Specialist
Architecting Microsoft
Azure Solutions

Azure Automation Concepts

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Speed with
choice and control



Automation and control technologies

Azure Automation

Key concepts include:

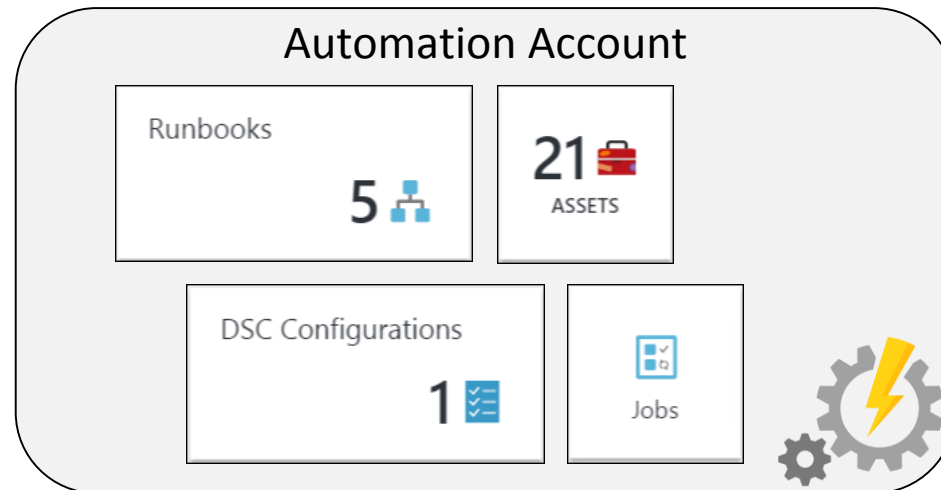
- Automation Account
- Run As Accounts
- Runbooks
- Jobs
- Assets
- Hybrid Worker Groups
- Desired State Configuration
- DSC Configurations
- DSC Nodes



Components of Azure Automation

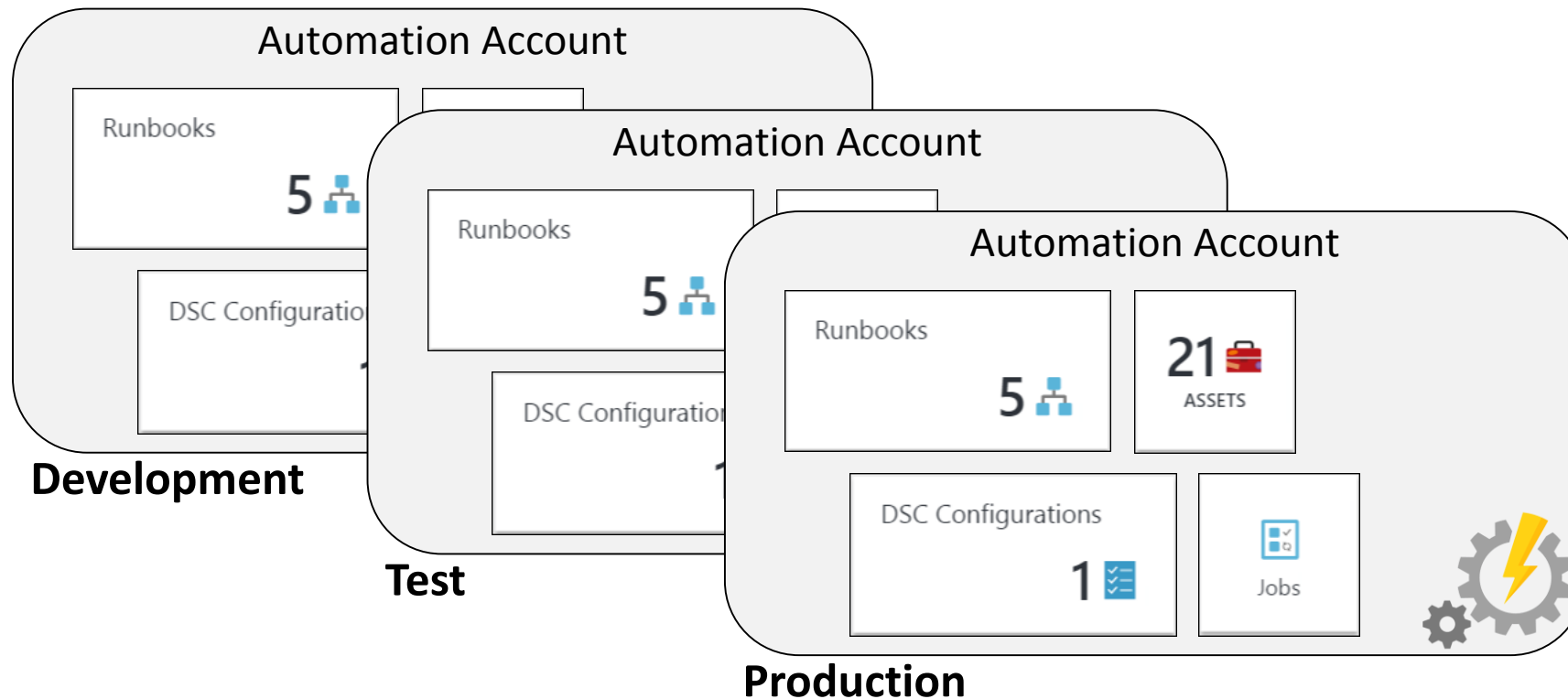
Automation Account – a container

- A container for your automation resources



Components of Azure Automation

- Automation Account – an isolation boundary



Logically separate
resources



Components of Azure Automation

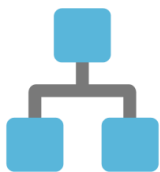
- Azure Automation authentication
 - Azure AD Org ID credential-based authentication
- When creating an Azure Automation account the following are created:
 - Run As account
 - New service principle in Azure AD
 - Certificate
 - Contributor access granted at the subscription level
 - Classic Run As account
 - Uses a management certificate to authenticate when managing classic resources

```
PS C:\Users\colda> Get-AzureRmADServicePrincipal

DisplayName                                Type
-----
ContosoAutomation_h1n1oyCiieC ServicePrincipal
Hoz/YoHgN+O9fTd0Kw2gIgcgaXqWGY
jI=
```



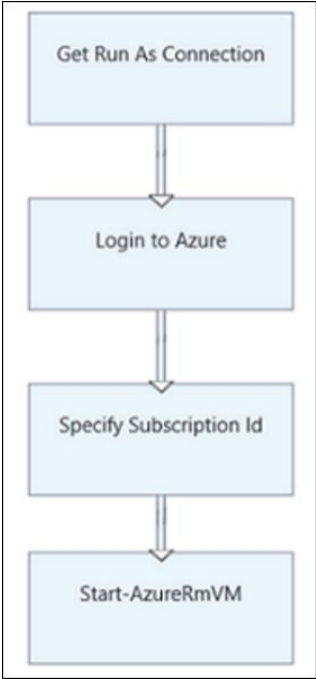
Components of Azure Automation



Runbooks

- Define steps to automate activities on-premises and in the cloud
- Types

Type	Description
Graphical	Based on Windows PowerShell and created and edited completely in graphical editor in Azure portal
Graphical PowerShell Workflow	Based on Windows PowerShell Workflow and created and edited completely in the graphical editor in Azure portal
PowerShell	Text runbook based on Windows PowerShell script
PowerShell Workflow	Text runbook based on Windows PowerShell Workflow



Components of Azure Automation

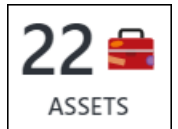
- **Jobs**

- A single execution instance of a runbook
- Jobs are executed by Azure Automation workers



- **Assets**

- the various resources that are globally available to be used in or associated with a runbook.
- Includes:
 - Schedules
 - Connections
 - Modules
 - Variables
 - Certificates
 - Credentials

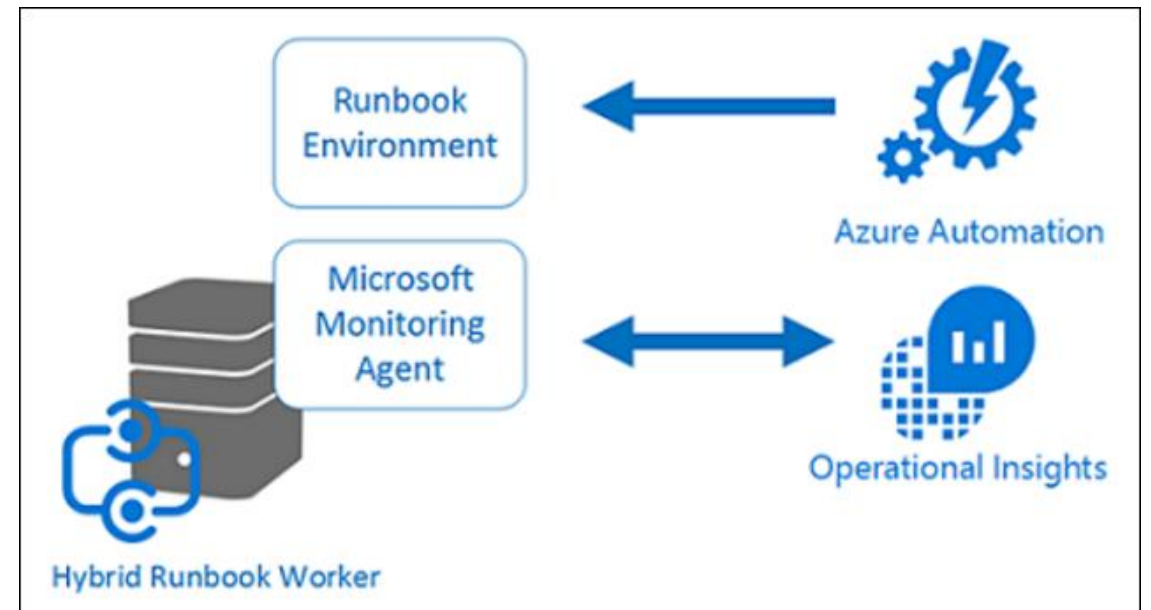


Components of Azure Automation



Hybrid Worker Groups

- On-premises machines designated to run runbooks from Azure Automation
- Workers have the Microsoft Management Agent installed
- Connectivity to OMS workspace is maintained for monitoring
- Onsite worker initiates communication with Azure Automation to download runbooks



Components of Azure Automation

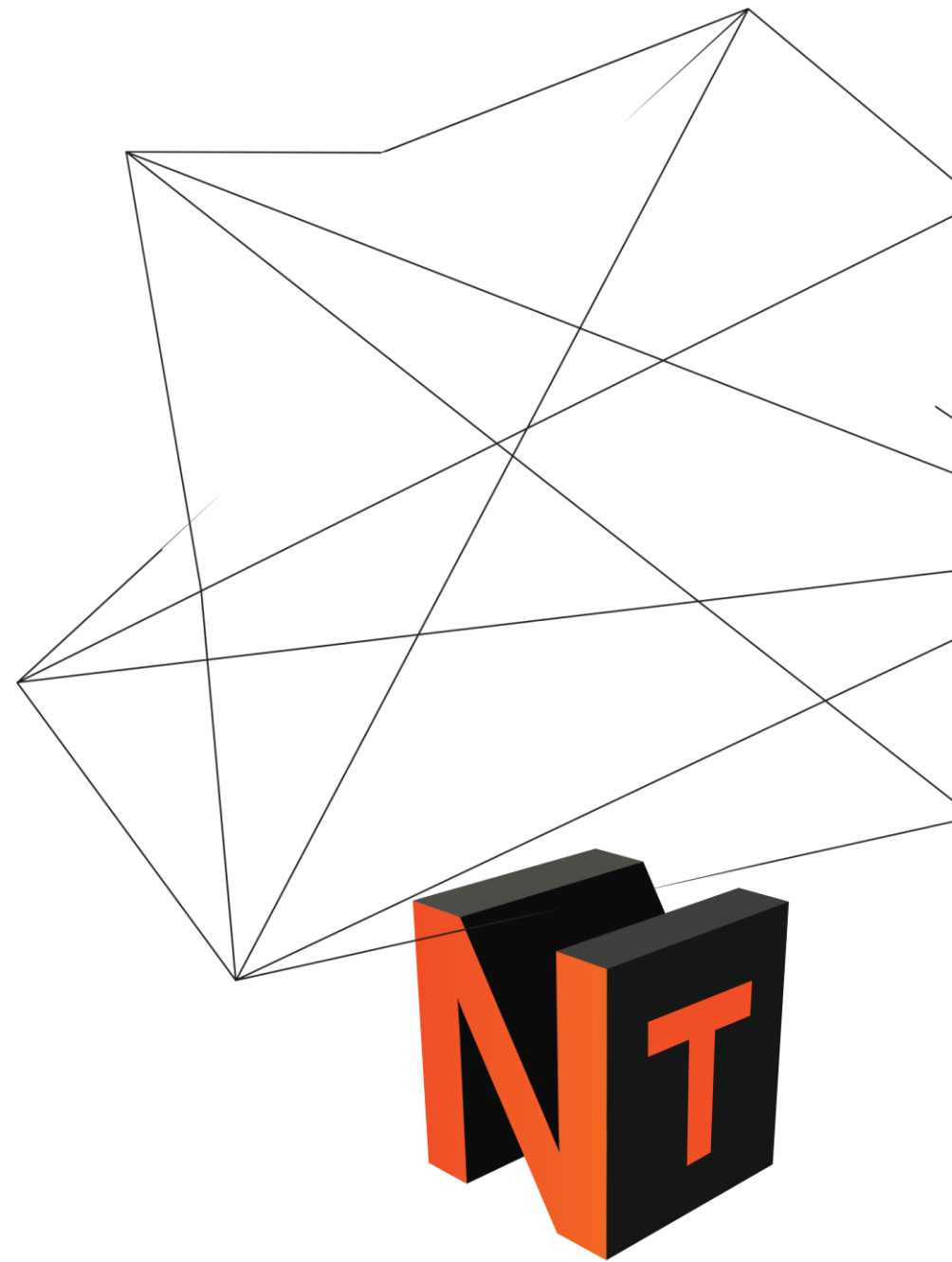
Desired State Configuration

- Builds on PowerShell DSC
- DSC Nodes exclusively 'pull' configurations from Azure Automation DSC Pull Server
 - No inbound firewall changes required
- Manage the configuration of Windows and Linux
 - On-premises
 - Physical and VM



Using Azure Automation

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The Right Tool for the Job

When should use Azure Automation Runbooks and when should you use Azure Automation DSC?

- Runbooks:
 - When automating fabric-level operations
 - Example: starting/stopping VMs based on a schedule
- DSC Configurations
 - When managing configurations within the operating system of a physical or virtual (on-premises or IaaS)
 - Example: configuring a new IaaS VM as a standard web server
- Some overlap exists... use whatever you are most familiar with or what suites you better



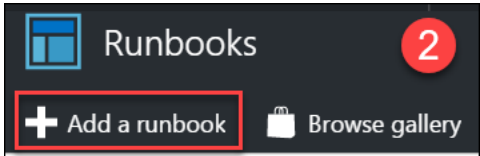
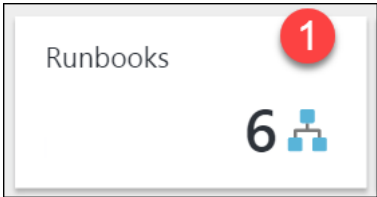
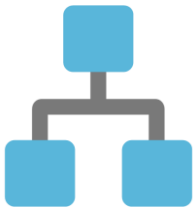
Example Use Cases



Task to accomplish	Solution
I want to automate the starting and stopping of Azure IaaS VMs?	Azure Automation
I need to automatically scale (up or down) my Azure SQL Database based on performance metrics?	Azure Automation
I want to make copies of my Azure IaaS VM disks and place them in a remote storage account?	Azure Automation
I want to make sure my application servers are configured identically and automatically?	Azure Automation DSC
I want to make sure the standard configuration of my servers does not drift or get skewed?	Azure Automation DSC
I know VM Scale Sets deploys identical VMs, but how do I ensure they stay identical?	Azure Automation DSC
I use OMS Log Analytics to monitor my on premises and cloud servers. How can I automate installing the MMA agent and ensure it is running?	Azure Automation DSC



Runbook Creation



Add Runbook

Quick Create

Create a new runbook

Import

Import an existing runbook

* Name

MyFirstRunbook

✓

* Runbook type

PowerShell

▼

Description

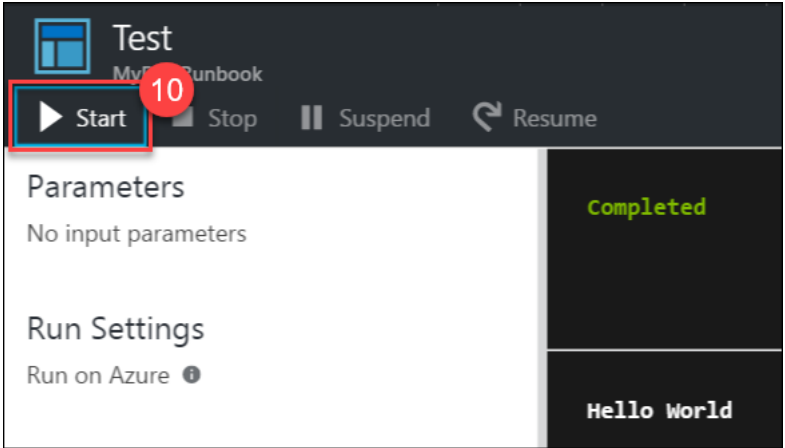
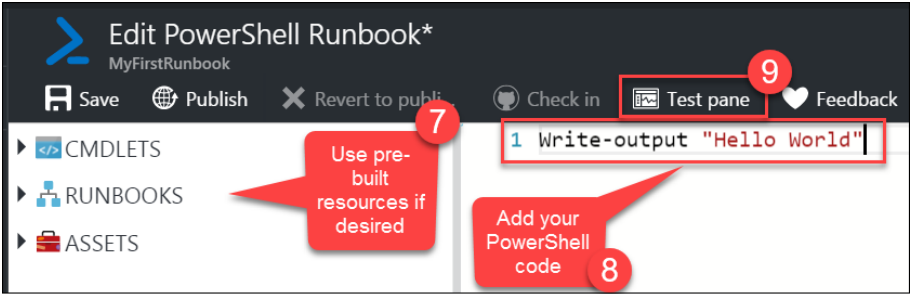
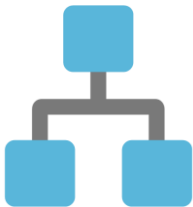
My first runbook

✓

Create

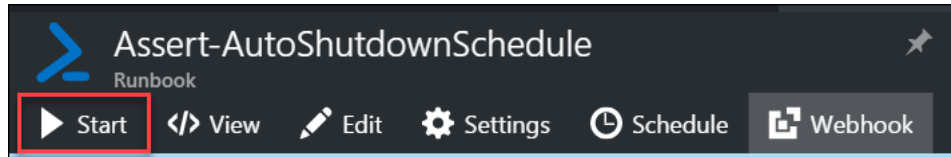


Runbook Creation (cont.)

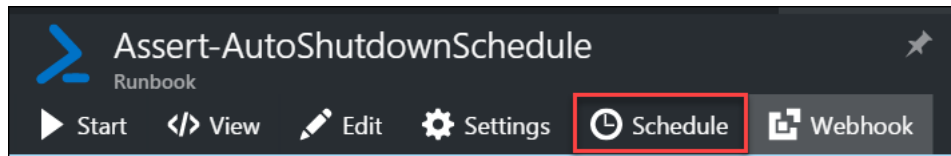


How to Invoke a Runbook

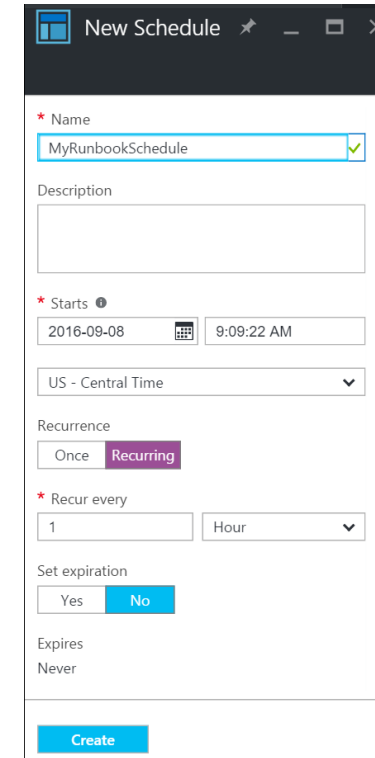
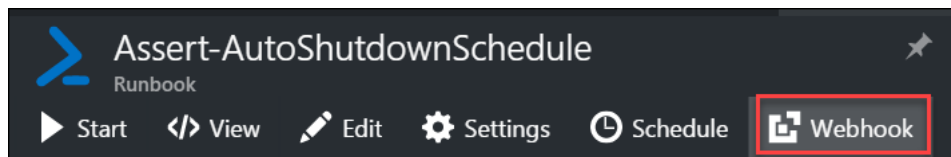
- Manual start



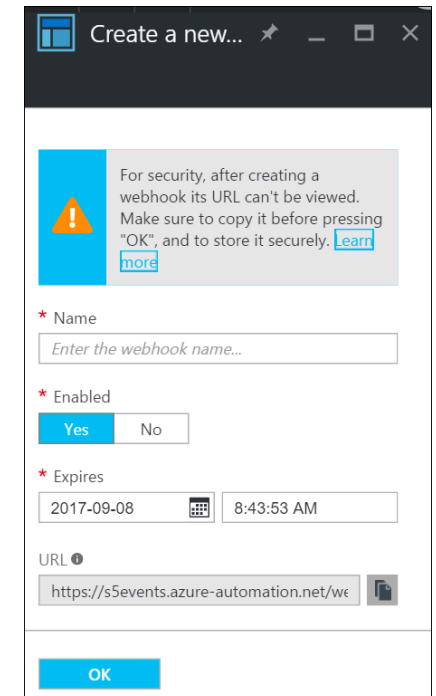
- Start according to schedule



- Start by using a webhook



A screenshot of the 'New Schedule' dialog box. It has a title bar with a blue icon and the text 'New Schedule'. The form contains the following fields: 'Name' (text input with 'MyRunbookSchedule' and a checkmark), 'Description' (text area), 'Starts' (date and time picker showing '2016-09-08' and '9:09:22 AM'), 'US - Central Time' (dropdown menu), 'Recurrence' (radio buttons for 'Once' and 'Recurring', with 'Recurring' selected), 'Recur every' (text input with '1' and a dropdown menu with 'Hour' selected), 'Set expiration' (radio buttons for 'Yes' and 'No', with 'No' selected), and 'Expires' (text input with 'Never'). A blue 'Create' button is at the bottom.



A screenshot of the 'Create a new...' dialog box. It has a title bar with a blue icon and the text 'Create a new...'. The form contains the following fields: a warning message with a yellow triangle icon and text 'For security, after creating a webhook its URL can't be viewed. Make sure to copy it before pressing "OK", and to store it securely. Learn more', 'Name' (text input with placeholder 'Enter the webhook name...'), 'Enabled' (radio buttons for 'Yes' and 'No', with 'Yes' selected), 'Expires' (date and time picker showing '2017-09-08' and '8:43:53 AM'), and 'URL' (text input with 'https://s5events.azure-automation.net/wc' and a copy icon). A blue 'OK' button is at the bottom.

Using DSC



- Author a PowerShell DSC Configuration and import into Automation DSC
- Import required PowerShell modules into Automation DSC
- Compile the configuration
- Assign the configuration to machines (DSC Nodes)



Author a DSC Configuration



- Example: Enabling OMS Log Analytics monitoring by installing (if needed) the MMA agent and ensuring that it is running.
- Prerequisite: Existing OMS Log Analytics workspace



DSC Configuration Example



```
Configuration MMAgentConfig {  
  
    # TODO: add your OMS workspace onboarding values here  
    $OmsWorkspaceId = "YOUR WORKSPACE ID"  
    $OmsWorkspaceKey = "YOUR WORKSPACE KEY"  
  
    $OIPackageLocalPath = "C:\MMASetup-AMD64.exe"  
    Import-DscResource -ModuleName xPSDesiredStateConfiguration
```

```
Node OMSServer {
```

```
    #Service state  
    Service OIService {  
        Name = "HealthService"  
        State = "Running"  
        DependsOn = "[Package]OI"  
    }
```

Service
Resource

```
    xRemoteFile OIPackage {  
        Uri = "https://opsinsight.blob.core.windows.net/publicfiles/MMASetup-AMD64.exe"  
        DestinationPath = $OIPackageLocalPath  
    }
```

xRemoteFile
Resource

```
    #Application  
    Package OI {  
        Ensure = "Present"  
        Path = $OIPackageLocalPath  
        Name = "Microsoft Monitoring Agent"  
        ProductId = "C318816D-D471-4F18-999A-7662DB906BC0"  
        Arguments = '/C:"setup.exe /qn ADD_OPINSIGHTS_WORKSPACE=1 OPINSIGHTS_WORKSPACE_ID=' + $OmsWorkspaceId + '  
OPINSIGHTS_WORKSPACE_KEY=' + $OmsWorkspaceKey + ' AcceptEndUserLicenseAgreement=1'  
        DependsOn = "[xRemoteFile]OIPackage"  
    }
```

Package
Resource



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Import the configuration



DSC Configurations

1 + Add a configur... Learn more Refresh

Import Configuration

Add a new configuration or update an existing one. Select a file smaller than 1 MB to import.

* Configuration file **2** Select your config file

OMS_MMA_Agent_Mgmt.ps1 ✓

OMS_MMA_Agent_Mgmt.ps1

* Name

MMAAgentConfig

Description **3**

Installs (if necessary) the MMA agent and ensures it is running

4 OK

DSC Configurations

+ Add a configur... Learn more Refresh

NAME	AUTHORING STATUS	LAST MODIFIED
MMAAgentConfig	Published	9/8/2016, 12:19 PM



Import required PS Modules



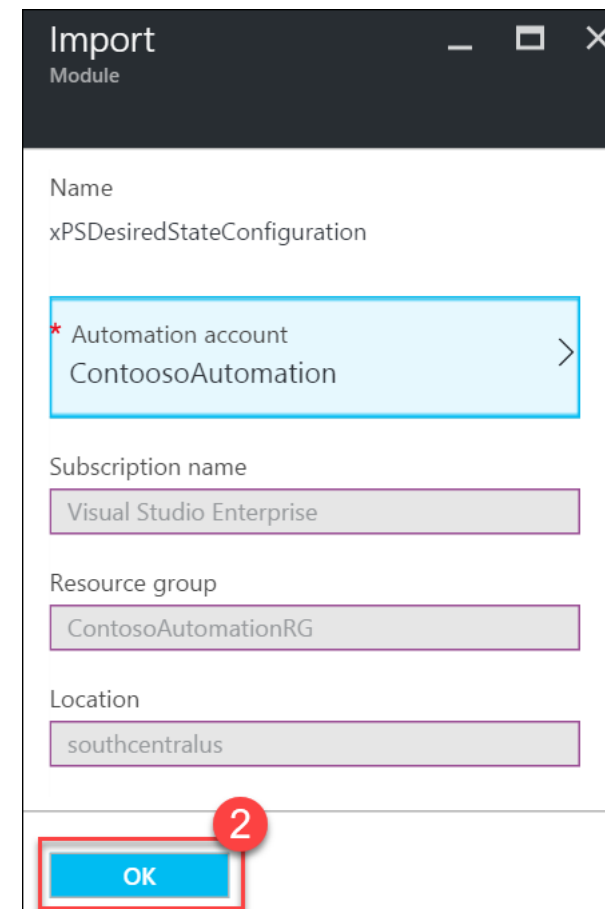
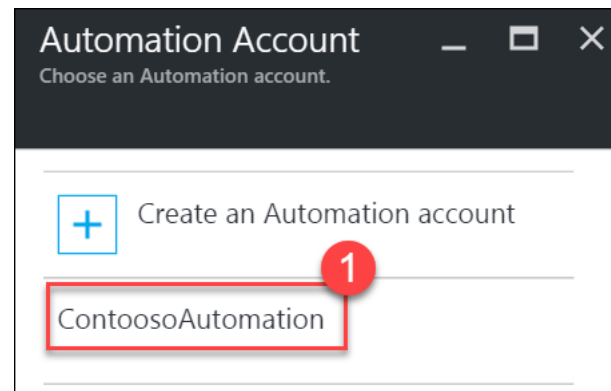
- This example requires the *xPSDesiredStateConfiguration* module
- Navigate to <https://www.powershellgallery.com/packages/xPSDesiredStateConfiguration>
- Click **Deploy to Azure Automation**



Import required PS Modules (cont.)



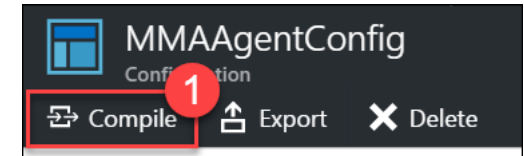
- Choose your Automation Account and click **OK** on the **Import** blade.



Compile the configuration



- On the configuration blade click **Compile**
- Note the confirmation and click **Yes**



Compile DSC Configuration

Are you sure you want to compile this configuration? Any node configurations generated will be automatically placed on the Azure Automation DSC pull server. If node configurations with the same name exist on the pull server, they will be overwritten.

2 Yes No

- Monitor the compilation job until it completes successfully.

Compilation jobs		
STATUS	CREATED	LAST UPDATED
✓ Completed	9/8/2016, 1:14 PM	9/8/2016, 1:15 PM



Apply the configuration



- Get the name of the configuration

MMAgentConfig
Configuration

Compile Export Delete

Essentials ^

Resource group ContosoAutomationRG	Account ContosoAutomation
Location southcentralus	Subscription name Visual Studio Enterprise
Subscription ID [REDACTED]	Status Published
Last published 9/8/2016, 12:19 PM	Configuration source View configuration source

Available on Pull Server Add tiles +

Node Configurations

1

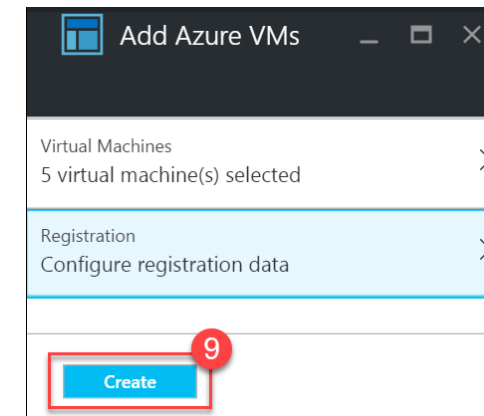
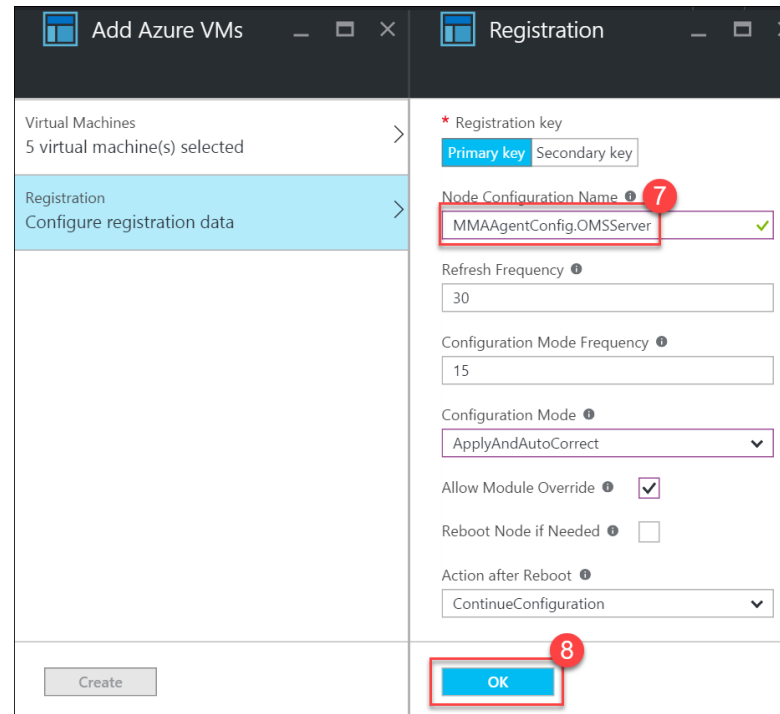
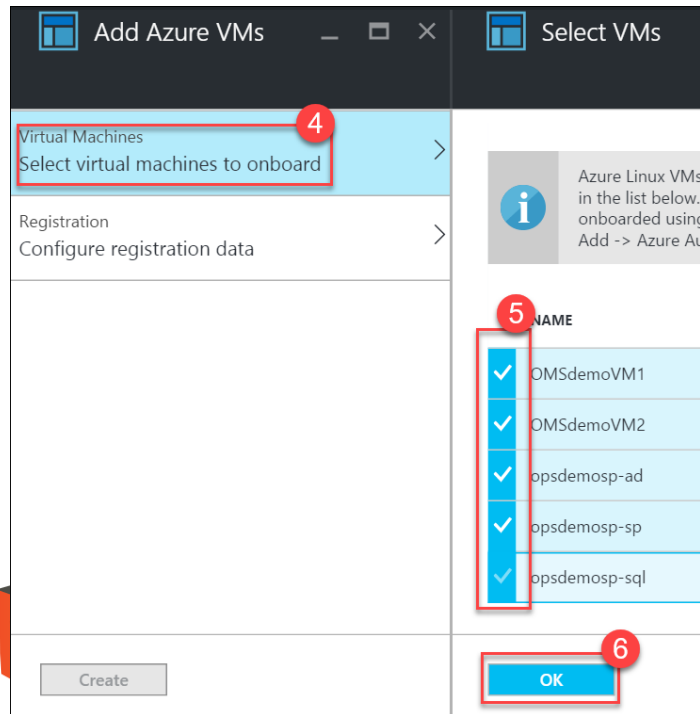
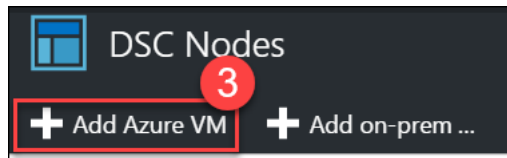
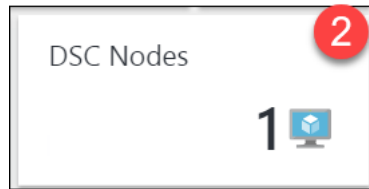
NAME	LAST UPDATED
MMAgentConfig.OMSServer	9/8/2016, 1:15 PM



Apply the configuration (cont.)



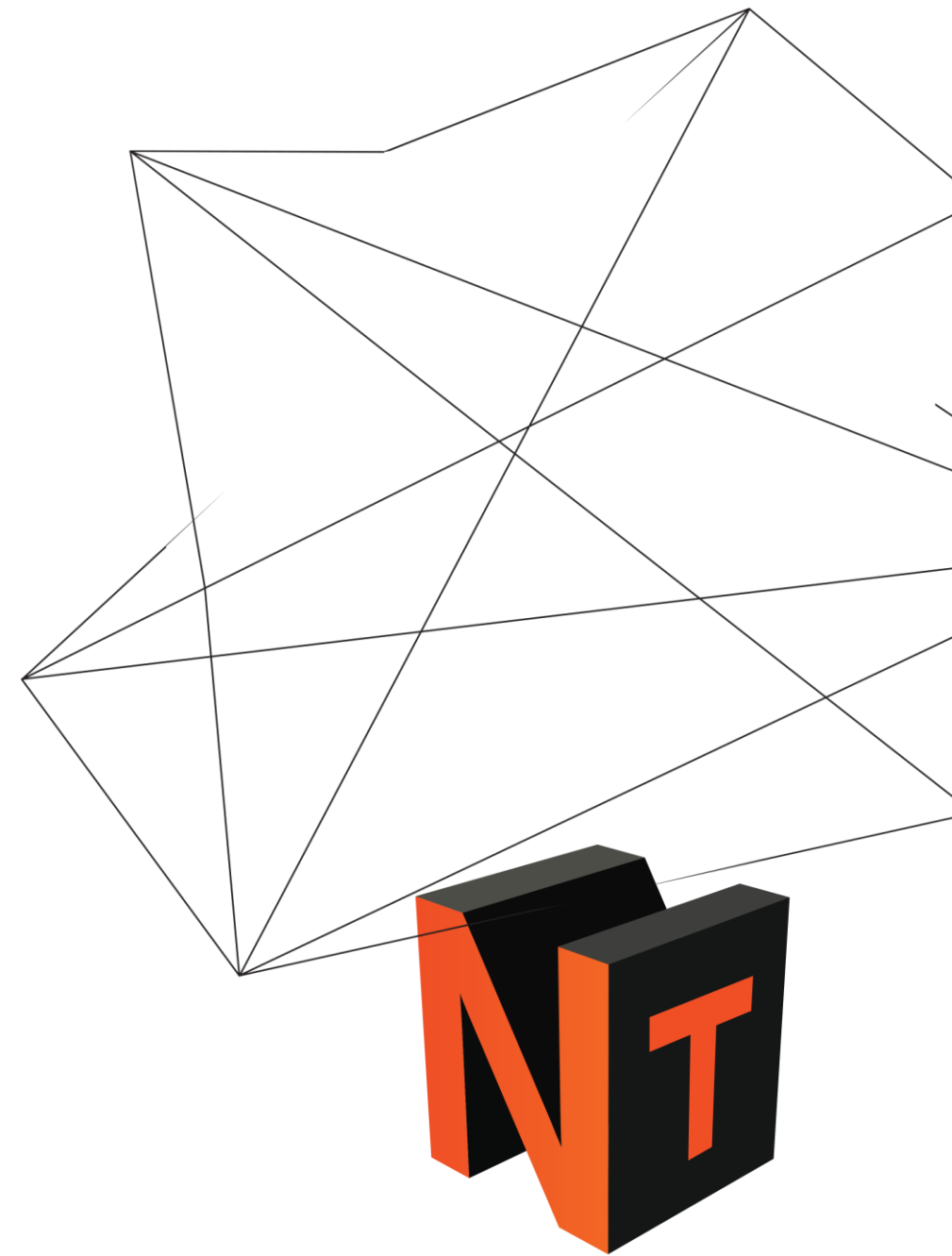
- Add the DSC Nodes



Demo

Azure Automation

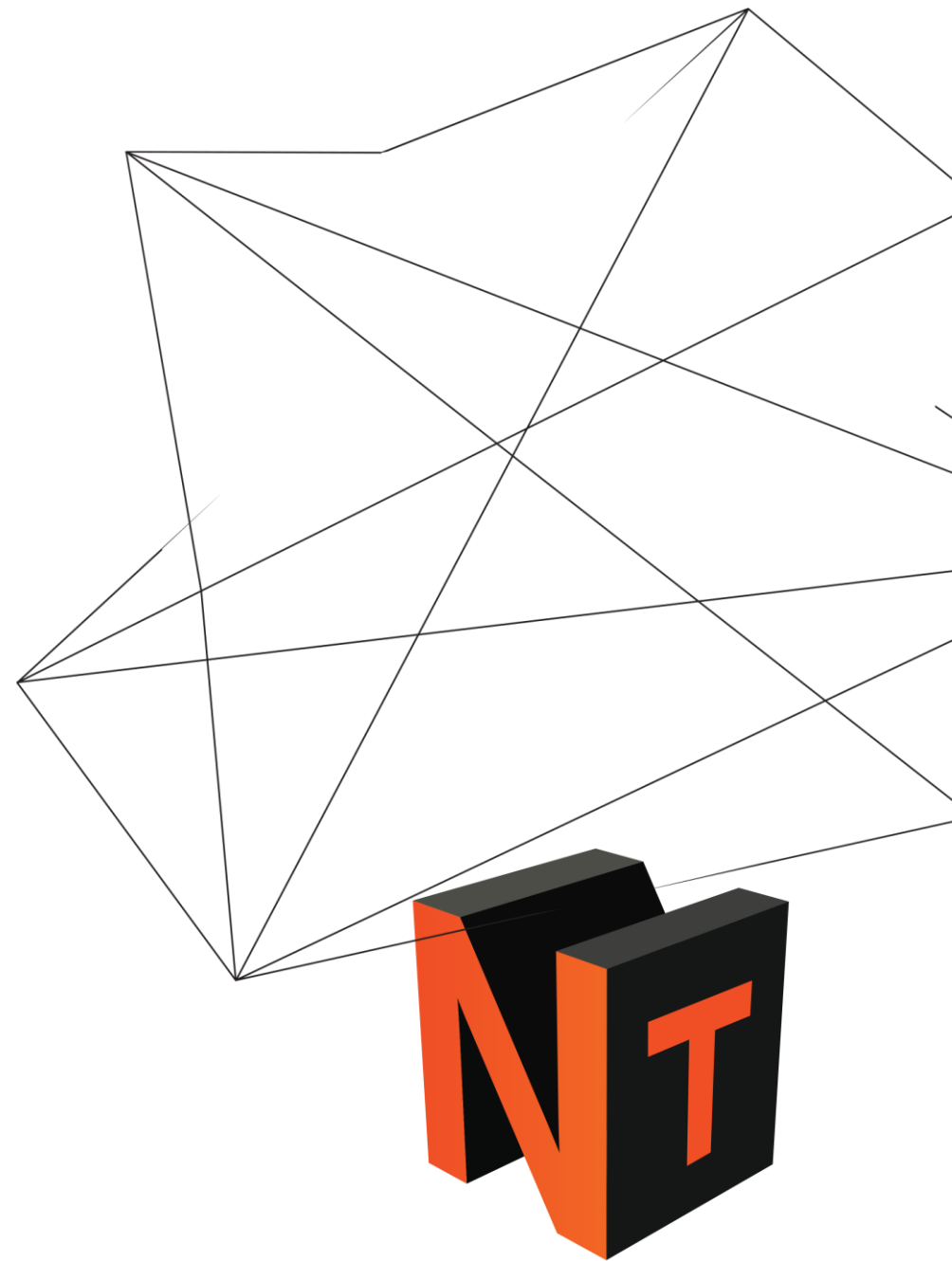
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Thank you!
Hvala!
Grazie!
Tack!
Danke!

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2018
NT Konferenca
Portorož | 22. - 24. maj 2018

