

BI4Dynamics Process Automation

How to automatically update data from BC to Data Lake and finally to Analysis Services

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1 Process Automation #1 – Start Container Instance

1.1 Introduction

This automation process is for an Azure Container instance (Docker), which is a light virtual machine, based on Bl4Dynamics image. These Container instances are used for running table export from BC to Blob storage. Through Logic apps docker will run on a scheduled day and time. Logic app will automatically start and terminate the docker after finishing the export.

1.2 Prerequisite

For this manual you will need a working Container instance, which exports table data from BC to Blob storage. Picture below shows Container instance settings made as per instructions of BI4Dynamics in BI4Dynamics Application Installation Manual for BC Cloud on Local or Azure Virtual Machine.

bi4dynamics-docker							
₽ Search (Ctrl+/) «	🕨 Start 🤇 Restart	🗌 Stop 📋 Delete 💍 Refresh					
Overview	∧ Essentials						
Activity log	Resource group (change) : azure-development			: Windows			
Access control (IAM)	Status	: Succeeded	IP address (Public	:) :			
🗳 Tags	Location	: West Europe	FQDN	:			
•	Subscription (change)	: Pay-As-You-Go	Container count	:1			
Settings	Subscription ID	: 0edf89a6-c40e-475e-99db-92b04c					
📧 Containers	Tags (change)	: Click here to add tags					

1.3 Setup Logic App

1. Search for Logic Apps in Azure.



2. Add a logic app and select Consumption

Home >							
Logic apps ☆ … BI4DYNAMICS d.o.o. (bi4dynamics.com)							
🕂 Add 🗸 🚳 Manage view 🗸 🖒 Refresh 🞍 Export to CSV 😚 Open query 🕴 🖗 Assign tags 🕚 Enable/Start 🛇 Disable/Stop 🛍 Delete 🕴 🗢 Feedback							
+ Consumption == all Subscription == all Resource group == all X Location == all X + Add filter							
+ Standard Showing 1 to 3 of 3 records.							

3. Enter **Subscription**, **Resource group** and create a meaningful **name** for your logic app.

Select the Region and click **Review + create**. Select **Create** in the next window.

Subscription *	Pay-As-You-Go	~
Resource group *	azure-docker	~
	Create new	
Instance details		
Logic app name *	bi4dynamics+docker+schedule	×
Region *	West Europe	~
Associate with integration service environment ③		
Integration service environment		\sim
Enable log analytics ①		
Log Analytics workspace		\sim
Review + create < Previou	is : Basics Next : Tags >	Download a template for automation ①
Your deployment	t is complete	
Deployment name: Microso Subscription: Pay-As-You-G	ft.EmptyWorkflow	Start time: 11/06/2021, 10:35:49 Correlation ID: 87584a5c-5e0a-

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4. Go to **Logic apps** and open the newly created application.

Home >								
Logic apps ダ … BI4DYNAMICS d.o.o. (bi4dynamics.com)								
+ Add \vee 🔅 Manage view \vee 🕐 Refresh 🞍 Export to CSV 😚 Open query								
Filter for any field Subscription == all Resource group == all X								
Showing 1 to 2 of 2 records.								
□ Name ↑↓								
🗌 💑 bi4dynamics-docker-schedule								

5. Logic apps designer will open with premade templates to use. Select **Recurrence** in the template or search for it in the search dialog.

Home > Logic apps > biddynamics-docker-schedule > Logic Apps Designer				
	Introducing Azure Logic A { Azure	pps Logic App ► 1 1 ←	Build Cogic The e powe busin and e • t • t	Ing integration solutions is easis Apps brings speed and scalability is ass of use of the designer, variety o aff un anagement tools make central sease move towards digitalization to uting-edge systems together. Create business processes and work negrate with SaaS and enterprise a Joliock value from on-premises and
	Start with a common trigger. Pick from one of the most commonly used trigger	s, then orchestrate any number of ac	ctions using the rich collection o	of connectors
	When a message is received in a Service Bus queue	When a H request is When a n received I Outlook.c	TTP received ew email is n com	When a new tweet is posted When a new file is created on OneDrive

6. Select the **Interval** and **Frequency** at which you decide the docker should be run.

1		Week	~
Time zone	(UTC) Coordinated Un	iversal Time	\checkmark ×
On these days Monday			\checkmark ×
At these hours	22		\checkmark ×
At these minutes	0		×
Preview Burs at 22:00 on Mr	nday ayan waak		

If the selected Frequency is Week, you can add new parameters which set the days, hours, and minutes when the application will run.

7. Click + New step, search for Azure Container instance and select it.

	63		\vee		
Choose	an operation				
, ∂ azure co	ontainer				×
For You	All Built-in	Standard	Enterprise	Custom	
Azura Riah	Ature				

8. In the drop-down menu select **Start containers in a container group**.



9. **Sign** into your tenant.

Azure Con	tainer Instance			
Tenant	BI4DYN/	AMICS	\sim	
Sign in to create a connection to Azure Container Instance.				
		Sign in		

10. Enter your Subscription Id, Resource Group and Container Group Name (docker).

Start containe	rs in a container group	
*Subscription Id	Pay-As-You-Go	~
*Resource Group	azure-docker	~
*Container Group Name	bi4dynamics-docker	
Connected to jp@bi4	dynamics.com. Change connection.	

11. Click **Save** in the top left of the designer and press **Run** to test if the application is working correctly.

Ø Recurrence	Os 🗸
\downarrow	
Start containers in a container group	2s

1.4 Test logic app

12. Go to **Container instances**.

	𝒫 Search resources, services, and docs (G+/)								E
Azure services + Create a resource	Container instances	Logic apps	App registrations	? Subscriptions	Storage	Resource groups	Azure Active Directory	Automation Accounts	

13. Check the selected container instance (docker) if it is being **Created** or already **Running**.

bi4dynamics-docker Container instances	\$	
P Search (Ctrl+/) ≪	🕞 Start 🤇 Restart	🗌 Stop 📋 Delete 💍 Refresh
Overview	∧ Essentials	
Activity log	Resource group (change)) : azure-development
Access control (IAM)	Status	: Running
Tags	Location	: West Europe
· · · · · · · · · · · · · · · · · · ·	Subscription (change)	: Pay-As-You-Go
Settings	Subscription ID	: 0edf89a6-c40e-475e-99db-92b04c
3 Containers	Tags (change)	: Click here to add tags

You have now successfully created and tested a logic app that automatically starts container instance at specific times.

2 Process Automation #2 – Start and Stop Virtual Machine

Process automation for Virtual Machine on azure is very similar as for container instance. Steps 1 through 6 are the same. To test the Logic App go to Azure virtual machines and check if the VM is running.

Note: We will create two logic apps, one for starting the VM and one for deallocating(stopping) it.

2.1 Start Virtual Machine

1. Search for Azure VM in search dialog and select it.

				\checkmark		
Choose	an ope	eration				
, ⊘ azure vr	n					
For You	All	Built-in	Standard	Enterprise	Custom	
	1					
L						

2. Select Start virtual machine option.

Recurren	ice					
				\downarrow		
Choose a	an ope	ration				
, ⊘ azure vm						
For You	All	Built-in	Standard	Enterprise	Custom	
Azure VM						
				~		
				~		
Tricerer	A	ione				
Triggers	Act	tions		•		
Triggers	Act	tions				U .
Triggers	Act e VM age virt	tions	in a VM scale s	set		U A
Triggers Azure Azure Azure	Act e VM age virt e VM	tions	in a VM scale s	set		U 0
Triggers	Act e VM age virt e VM art virtu e VM	tions tual machine ial machine	in a VM scale s	set		U () ()
Triggers Azur Reim Azur Azur Azur	Act e VM age virt e VM art virtu e VM	tual machine	in a VM scale s	set		U () ()
Triggers	Act e VM e VM e VM art virtu e VM art virtu e VM	tual machine Ial machine Ial machine in	in a VM scale s n a VM scale se	set		U () () ()
Triggers Azure Azure Azure Resta Azure Resta Azure Start	Act e VM aage virt e VM art virtu e VM art virtu e VM	tual machine ual machine ual machine iu machine	in a VM scale s n a VM scale se	set		U 0 0
Triggers Azur Reim Azur Resta Azur Resta Azur Start Azur	Act e VM age virt e VM art virtu e VM art virtual e VM	tual machine al machine al machine in machine	in a VM scale s	set		U 0 0 0
Triggers Azur Reim Azur Resta Azur Azur Start	Act e VM age virt e VM art virtu e VM virtual e VM	tual machine al machine al machine in machine machine in a	in a VM scale s n a VM scale se v M scale set	set		

3. Insert values for Subscription id, Resource group and Virtual Machine name.

Start virtual m	lachine	
Subscription Id	Pay-As-You-Go	~
Resource Group	vm-bi4	~
Virtual Machine	vm-bi4	~
Connected to @bi4	dynamics.com. Change connection.	
onnected to @bi4	dynamics.com. Change connection.	

4. Next step is to **Save** and **Run** the application and go to **Virtual Machines** on Azure to check if it is **Running**.

vm-bi4 ☆ ·		
	🖋 Connect 🖒 Star	t 🤇 Restart 🔲 Stop 🕅 Capture 📋 Delete 🖒 Refresh
Overview	∧ Essentials	
Activity log	Resource group (change	e) : vm-bi4
Access control (IAM)	Status	: Running
Tags	Location	: West Europe
Diagnose and solve problems	Subscription (change)	: Pay-As-You-Go
C Diagnose and solve problems	Subscription ID	: 0edf89a6-c40e-475e-99db-92b04c
Settings	Tags (change)	: Click here to add tags

2.2 Deallocate Virtual Machine

Process automation for Virtual Machine Deallocation is almost identical to Start VM Logic app. First select the scheduled time when the VM should stop.

1. In Logic Apps select Recurrence, add a new step and search for Azure VM.



2. Next select Deallocate virtual machine option.

Azure VM	>
← Search connectors and actions	
Triggers Actions	
Deallocate virtual machine Azure VM	o
Deallocate virtual machine in a VM scale set Azure VM	0
Get virtual machine Azure VM	0
Get virtual machine in a VM scale set Azure VM	Ū
Power off virtual machine Azure VM	0
Power off virtual machine in a VM scale set Azure VM	0
Reapply virtual machine Azure VM	0
Redeploy virtual machine Azure VM	Ū
Redeploy virtual machine in a VM scale set Azure VM	0

3. Insert values for Subscription id, Resource group and Virtual Machine name.

길 Deallocate virtu	al machine	
*Subscription Id	Pay-As-You-Go	\sim
* Resource Group	vm-bi4	\sim
*Virtual Machine	vm-bi4	\sim
Connected to bi4dy	namics.com. Change connection.	

4. Click **Save** and exit Logic Apps Designer. Go to **Logic Apps** and check for apps VM start and VM stop.

Logic apps → BI4DYNAMICS d.o.o. (bi4dynamics.com) + Add ∨ [®] Manage view ∨ [®] Refresh [±] Export to CSV [®] Open query [®] Assign tags ()	() Enable/Start	🛇 Disable/Stop	🗊 Delete 💝 Feedback
Filter for any field Subscription == all Resource group == all X Location == all	+ ₇ Add filter		
Showing 1 to 4 of 4 records.			
□ Name ↑↓	Status \uparrow_\downarrow	Plan ↑↓	Resource group ↑↓
🗌 📥 bi4dynamics-docker-schedule	Enabled	Consumption	azure-docker
🗋 📥 bi4dynamics-vm-app	Enabled	Consumption	azure
🔽 🚠 bi4dynamics-vm-app-stop	Enabled	Consumption	azure

5. To check if Logic apps are properly working first run the start VM app, after the Virtual machine is running, run the stop VM app and check if it is allocated.

You have now successfully created a logic app that automatically starts virtual machine at specified times and a logic app that automatically stops(deallocates) the virtual machine at specified times.

3 Process Automation #3 – Start SQL server Agent (VM)

When Virtual machine is running, it is ready to process data. This process is triggered by SQL Server Agent feature, a part of SQL server.

1.1. Enable SQL Server agent

Go to **Services** and find the **SQL Server Agent** service. If you are using newly created Virtual Machine, it will probably be the only SQL Server Agent, but if you are running more SQL server engines, there may be more Agents.

Services								
File Action View Help								
Services (Local)	Services (Local)							
SQL	Server Agent (BC)	Name	Description	Status	Startup Type	Log On As		
		😳 SQL Server Agent (BC)	Executes jobs, monitors SQL Server, fires alerts, and allows a	Running	Automatic	mgvozden@nps-group.com		
Stop	the service	SQL Server Agent (BCDEMO)	Executes jobs, monitors SQL Server, fires alerts, and allows a		Disabled	Network Service		
<u>Nesia</u>	are the service	🖏 SQL Server Agent (FO)	Executes jobs, monitors SQL Server, fires alerts, and allows a		Manual	NT Service\SQLAgent\$FO		
		🖏 SQL Server Agent (MSSQLSERVER)	Executes jobs, monitors SQL Server, fires alerts, and allows a		Manual	NPS-GROUP\bisvc		
Desc	ription:	🖏 SQL Server Agent (TAB)	Executes jobs, monitors SQL Server, fires alerts, and allows a		Manual	NT Service\SQLAgent\$TAB		
Exect	utes jobs, monitors SQL Server,	🖏 SQL Server Analysis Services (AX)	Supplies online analytical processing (OLAP) and data mini		Manual	nps-group.com\mgvozden		
some	e administrative tasks.	🖏 SQL Server Analysis Services (BC)	Supplies online analytical processing (OLAP) and data mini	Running	Automatic	nps-group\mgvozden		
		🤹 SQL Server Analysis Services (FO)	Supplies online analytical processing (OLAP) and data mini	Running	Automatic	nps-group\mgvozden		

Right click and select **Properties** and set Start-up Type to Automatic.

SQL Server Agent	(BC) Properties (Local Computer)	×						
General Log On	Recovery Dependencies							
Service name:	SQLAgent\$BC							
Display name:	SQL Server Agent (BC)							
Description:	Description: Executes jobs, monitors SQL Server, fires alerts, and allows automation of some administrative tasks.							
Path to executab "C:\Program Files	Path to executable: "C:\Program Files\Microsoft SQL Server\MSSQL15.BC\MSSQL\Binn\SQL/							
Startup type:	Automatic	/						
Service status:	Running	-						
Start	Stop Pause Resume							
You can specify t from here. Start parameters:	the start parameters that apply when you start the service							

Note: make sure that user running service is a domain admin user (not a service) and has permissions needed to process data warehouse and analysis services. On VM this would be the VM admin user.

3.1 Setup SQL Server Agent

Setup the starting time for Agent few minutes (10 minutes) after VM start.



4 Process Automation #4 – Start and Stop Azure Analysis Services

Setup for process automation for Azure Analysis Services (AAS) can be found here: <u>https://microsoft-bitools.blogspot.com/2019/12/schedule-start-stop-of-azure-analysis.html</u>

Authors **Joost van Rossum**, **Ricardo Schuurman** & **Mark de Groot** explain the process of automating schedule for Azure Analysis Services (AAS).

Note: There is no need to enter parameters into the script, as it gets the parameters from the schedules. We end up with two schedules, one to start and one to stop AAS.

StartStopAAS (bi4-schedule/StartStopAAS) Schedules ∞ Runbook ∞						
₽ Search (Ctrl+/) «	+ Add a schedule 💍 Refresh					
📩 Overview	Name	Next run				
Activity log	StartAAS	30/06/2021, 08:00				
Tags	StopAAS	30/06/2021, 20:00				
Diagnose and solve problems						

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5 Process Automation - Timing Schedule

Here is an example of processing schedule for daily update:

Step	Step description	Start Time	Duration	Comment
1	Start Container instance	22:00	45 min	BC export to data lake can run anytime after BC users are finishing their daily work. This process time can vary 30% (!) day by day, exporting same amount of data, in the after- office hours when no-one is using BC.
				Keep enough buffer time for next step.
2	Start Virtual Machine	07:00	2-3 min	VM hosts data warehouse that must be ready when DW processing start
3	Start Azure Analysis Services	07:00	2-3 min	Azure AS must be ready when DW processing start
4	Start SQL Server Agent	07:15	20 min	DW processing (data are in Azure AS)
5	Stop Virtual Machine	08:00		Leave some buffer time after DW is processed and then stop VM.
6	Stop Azure Analysis Services	17:00		AAS will run during business hours when users are querying data.