

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

SYSTEMS MANAGEMENT AND PROVISION

Assessment 2 PowerShell and Cloud Scripting and Research

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May 17, 2020

Contents

1	Wir	ndows 2016 Server PowerShell scripting	1
	1.1	Rapidly provision DC with script 1	1
	1.2	Rapidly convert DC to a Domain controller with script 2	3
	1.3	Log in to DigiTech domain on the domain controller	4
	1.4	Rapidly provision WebServer	5
	1.5	Convert WebServer into a web server by using script 5 to add the IIS web hosting to the server	8
	1.6	Set up a Digitech. abc website on WebServer using the Digitech web page that you created earlier 	9
2	Wel	b servers and storage in the cloud	11
	2.1	Creating a storage bucket	11
	2.2	Uploading the Digitech web site on the storage bucket	12
	2.3	Hosting the DigiTech Website in a Linux Server instance	12
	2.4	Autoscaling	15
	2.5	Modifying Instance templates and Autoscaling	19
Bi	bliog	graphy	22

Part 1

Windows 2016 Server PowerShell scripting

1.1 Rapidly provision DC with script 1

Create the PowerShell script from the text file provided.

Note: you will need to modify the IP addressing settings inside the script.

For the NIC use:

- IP address: 172.16.0.100/16
- Default gateway: 172.16.0.1
- DNS: 172.16.0.100
- Server Name: DC



		DC [Ru	unning]				
	👱 System				-		<
	← → × ↑ 🛂 > Control Pane	el > System and Security > Sy	rstem v	G	Search Control Panel	م	
Recycle Bin							0
	Control Panel Home	View basic information	about your computer				
	👽 Device Manager	Windows edition					
	💔 Remote settings	Windows Server 2016 Stan	dard Evaluation				
script_1	Advanced system settings	© 2016 Microsoft Corpora reserved.	tion. All rights	. W	indows Server [®] 2	2016	
		System					
		Processor:	Intel(R) Core(TM) i7-6820H	IQ CPL	J @ 2.70GHz 2.71 GHz		
		Installed memory (RAM):	2.00 GB				
		System type:	64-bit Operating System, x	64-bas	ed processor		
		Pen and Touch:	No Pen or Touch Input is a	vailabl	e for this Display		
		Computer name, domain, and	workgroup settings				
		Computer name:	DC		Cha	ange settings	
		Full computer name:	DC				
		Computer description:					
		Workgroup:	WORKGROUP				
		Windows activation					
	See also	Windows is activated Rea	ad the Microsoft Software Lic	ense Te	erms		
	Security and Maintenance	Product ID: 00378-00000-0	0000-AA739		Change	e product key	Standard Evaluation se valid for 180 days release 161220-1747
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	DC [Running]			
	Network Connections			×
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Recycle Bin	Organize Disable this network device Diagnose this connectio Ethernet Properties X	n Rename this connection »	₩	Ð
	Net Internet Protocol Version 4 (TCP/IPv4) Properties	× sktop Ad		
script_1	Co You can get IP settings assigned automatically if your network support this capability. Otherwise, you need to ask your network administration for the appropriate IP settings.	ts r		27
	Th Obtain an IP address automatically OUse the following IP address:			
	IP address: 172 . 16 . 0 . 100 Subnet mask: 255 . 255 . 0 . 0			
	Default gateway: 172 . 16 . 0 . 1			
	Use the following DNS server addresses:			
	Preferred DNS server: 172 . 16 . 0 . 100			
	Alternate DNS server: 8 . 8 . 8 . 8			
	Validate settings upon exit Advanced			
	2 теття-	ncel	0 0 0	Standard Evaluation se valid for 180 days 5.151_release.161220-1747
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1.2 Rapidly convert DC to a Domain controller with script 2

- Set the Domain and Forest modes to Win2016R2 (inside script2)
- Use the Domain name digite ch.cct for the domain.
- Let the script run to reboot the server

	DC [Running]		
B	🚰 Administrator: Windows PowerShell ISE —		
Recycle	File Edit View Tools Debug Add-ons Help		
	script_2.ps1 X		
2	1 Install-windowsfeature -name AD-Domain-Services -IncludeManagementTools 2 Import-Module ADDSDeployment	^	
script	3 Install-ADDS-Porest 4 -CreateDnsDelegation:Sfalse		
	5 -DatabasePath "C:\Windows\NTDS"		
	6 - DomainMode "Win201682" 7 - DomainMame "digitech.cct"		
	8 -DomainNetbiosName "DOMAIN39"		
	9 -FORESTRIGGE WINZUERZ 10 -Installons:Strue		
	K Constant	>	
script_			
	Start Installation 29%.		
		~	
		>	
	Running script / selection. Press Ctrl+Break to stop. Press Ctrl+B to break into debugger.	100%	
	Windows S	Server 2016 Standard I	Evaluation i
	Win Build	dows License valid fo 14393.rs1_release.16	or 180 days 1220-1747
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1.3 Log in to DigiTech domain on the domain controller

Use script3 to set up DNS settings on DC for the digitech.cct website.

Use the DNS console in Administrative Tools to verify that www now exists in the DigiTech

Forward lookup zone.

	DC [Running]		
	비행 이 아이는 것이 같은 것이 같은 것이 없는 것 않이 않이 않이 않이 않는 것이 않이		
2	Administrator: Windows PowerShell ISE	-	
ecycle File	Edit View Tools Debug Add-ons Help		
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S	cript_3.ps1 ×		
	# This is run on the Domain Controller which already has DNS installed # Creating a zone for the DigiTech.cct website		^
script_	4 Add-DnsServerPrimaryZone -Name "digitech.cct" -ReplicationScope "Forest" -PassT	hru	
	<pre>5 # The next line is an A-record customized for web cluster address 172.16.0.200 7 Add-DnsServerResourceRecordA -Name "www" -ZoneName "digitech.cct" -AllowUpdateAr</pre>	ny -IPv4Address "172.16.0	.200" -Tin
			J
			>
script_	S C:\Users\Administrator>		
<			`
Co	mpleted	Ln 1 Col 28	100%
		Windows Ser Windo Build 1	ver 2016 Standard Eval ws License valid for 18 4393.rs1_release.16122
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0.00	DC [Runnin	ig]		
🕯 🔝 DNS Manager			- 0	ı x
File Action View Help				2
Recycle Bin 🧼 🚔 📰 🔀 🛐 🔒 🛛				
 DNS DDS Construction msdcs.digitech.cct msdcs.digitech.cct msdcs.digitech.cct msdcs msdcs	Name Insdcs Itcp Iccp Iccp Comparison Second	Type Start of Authority (SOA) Name Server (NS) Host (A) Host (A) Host (A) Host (A) Host (A)	Data [23], dc.digitech.cct., host dc.digitech.cct. 172,16.0100 10.03,15 172,16.0100 172,16.0200	Timestam A static static 17/05/202 17/05/202 static stat
30 items 1 item selected 1.20 KB		10/01/2010 11110	ononear	📰 📰 se valid for 180 days
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1.4 Rapidly provision WebServer

Like what you did with DC (modify the script1 text file):

- For the NIC use the IP address: 172.16.0.200/16
- Default gateway: 172.16.0.1
- DNS: 172.16.0.100Server
- Name: WebServer (now let the script run and provision this server)

Do not make WebServer into a domain controller... you will joinit to the DigiTech.abc domain.



		WebServer	r (Running)			
	🖳 System			-		
	🗧 🔶 👻 🛧 🔛 > Control Pane	el > System and Security > Sy	stem v	ට Search Control Panel	م	
Recycle Bin					•	
	Control Panel Home	View basic information	about your computer		-	
	💎 Device Manager	Windows edition				
	💎 Remote settings	Windows Server 2016 Stan	dard Evaluation			
script_1	Advanced system settings	© 2016 Microsoft Corpora reserved.	tion. All rights	Windows Server [®] 2	2016	a start
		System				
		Processor:	Intel(R) Core(TM) i7-6820HO	CPU @ 2.70GHz 2.71 GHz		
		Installed memory (RAM):	2.00 GB			
		System type:	64-bit Operating System, x64	-based processor		
		Pen and Touch:	No Pen or Touch Input is ava	ilable for this Display		
		Computer name, domain, and	l workgroup settings			
		Computer name:	WebServer	Cha	inge settings	
		Full computer name:	WebServer			
		Computer description:				
		Workgroup:	WORKGROUP			
		Windows activation				
		Windows is activated Rea	d the Microsoft Software Licen	ise Terms		
	See also	Product ID: 00378-00000-0	0000-AA739	Change	e product kev	Standard Evoluation
	Security and Maintenance			•	0010 1400013	se valid for 180 days release.161220-1747
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	WebServer [Runni	ng]
Q	Network Connections	- X
Recycle Bin script_1	Previous connections	Image: Search Network Connections Rename this connection Image: Search Network Connections Image: Search Network Connectio
	Validate settings upon exit Advanced.	
	2 Rems	build 14050.151_release.161220-174
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		S 🐵 🖬 🖉 🖾 🖉 🖉 S 🖬 🖬 🖉

Next, join WebServer to the digite ch.cct Domain using PowerShell script 4

WebServer (Running)			
Administrator: Windows PowerShell ISE	-	Ц	×
le File Edit View Tools Debug Add-ons Help			
script_4.ps1 ×			
1 Install-WindowsFeature -Name Web-Server			^
pt			
			- 11
			~
et			>
Start Installation			
24%			
			4
			> ×
Preside entité (estadion Pres Chill President des Pres Chill Par hereit inter debusers			009/
Running script / selection. Press Ctri+Break to stop. Press Ctri+B to break into debugger.			
	Windows Se	erver 2016 St	andard B
	Wind	lows License 14393.rs1 re	valid fo lease.16
	- 6- F		04:19
	~ 🕑 i	듣 🧏 17/	05/2020

1.5 Convert WebServer into a web server by using script 5 to add the IIS web hosting to the server

Use Server Manager and Administrative Tools to verify that the IIS web service has been added.

	websever (kunning)				
	Administrator: Windows PowerShell ISE	-		×	
Recycle	File Edit View Tools Debug Add-ons Help				
	script_5.ps1 ×				
	 # This script would be run on all cluster nodes to add each node to the Domain Add-Computer -domainname digitech.cct -Credential administrator -restart -force 				
script_					
				~	
region t				\rightarrow	
scopt	PS C:\Users\Administrator>			^	
script_					
				>	
	Ln 1 Col 1			100%	
	Wi	ndows Serve	er 2016 S	tandard	Evaluation
		Window Build 14	s Licens 393.rs1_r	e valid fo elease.16	ir 180 days 1220-1747
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			WebServer [Running]					
	🎬 I 📝 🔜 🖛 I	Shortcut Tools	Application Tools	Administrative Tools		- 🗆	×	
	File Home Share	View Manage	Manage				~ 🕐	
Recycle Bin	← →	tem and Security > Admini	strative Tools >	5 V	Search Admin	istrative Tools	P	
	- Quick access	Name		Date modified	Туре	Size	^	
	Desites a	Terminal Services		16/07/2016 14:23	File folder			
	Desktop 🖈	🏇 Component Services		16/07/2016 14:18	Shortcut	2 KE	3	
ectint 1	👆 Downloads 🛛 🖈	🐕 Computer Manageme	nt	16/07/2016 14:18	Shortcut	2 KE	3	
script_1	🚆 Documents 🛛 🖈	heragment and Optin	nize Drives	16/07/2016 14:18	Shortcut	2 KE	3	
	📰 Pictures 🛛 🖈	🔚 Disk Cleanup		16/07/2016 14:19	Shortcut	2 KE	3	
	👳 scripts (\\VBoxSvr) (🔢 Event Viewer		16/07/2016 14:18	Shortcut	2 KE	3	
		濻 Internet Information S	ervices (IIS) Manager	16/07/2016 14:19	Shortcut	2 KE	3	
	This PC	👧 iSCSI Initiator		16/07/2016 14:18	Shortcut	2 KE	3	
script_4	🔿 Network	📠 Local Security Policy		16/07/2016 14:19	Shortcut	2 KE	3	
		🌮 Microsoft Azure Servic	es	16/07/2016 14:19	Shortcut	2 KE	3	
		🚮 ODBC Data Sources (3)	2-bit)	16/07/2016 14:18	Shortcut	2 KE	3	
		📆 ODBC Data Sources (6-	4-bit)	16/07/2016 14:18	Shortcut	2 KE	3	
		🔊 Performance Monitor		16/07/2016 14:18	Shortcut	2 KE	3	
script 5		諦 Print Management		16/07/2016 14:19	Shortcut	2 KE	3	
		🔊 Resource Monitor		16/07/2016 14:18	Shortcut	2 KE	3	
		声 Server Manager		16/07/2016 14:19	Shortcut	2 KE	3	
		🙈 Services		16/07/2016 14:18	Shortcut	2 KE	3	
		🔛 System Configuration		16/07/2016 14:18	Shortcut	2 KE	3	
		👰 System Information		16/07/2016 14:19	Shortcut	2 KE	3	
		💮 Task Scheduler		16/07/2016 14:18	Shortcut	2 KE	3 🗸 <mark>5</mark>	tandard Evaluation
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1.6 Set up a Digitech.abc website on WebServer using the Digitech web page that you created earlier

Demonstrate that the web site works by using the web browser on the domain controller to access the www.digitech.cct website.



	_	WebServer [Running]	
	×∰ 🔽 📑 ∓	Add Website	? ×
-	File Home Share Vie	Site name: Application pool:	
Recycle Bin	$\leftarrow \ ightarrow \ \uparrow \ ਵਿ extsf{w}$ « System and	digitech digitech	Select
script_1	Quick access Mam Guick access Guick access	Content Directory Physical path: C:\inetpub\wwwroot\DigiTech Pass-through authentication Connect as Test Settings Binding Type: IP address: Port: http IT2:16.0.20 V B0 Host name: www.digitech.cct Example: www.contoso.com or marketing.contoso.com	
		Start Website immediately	DK Cancel suid for 180 days DK Cancel suid for 180 days Herese follow
) 🧀 🦲 🛄 🦄		^ ঢ়ৄ 4 <mark>×</mark> 05:04
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Part 2

Web servers and storage in the cloud

2.1 Creating a storage bucket



2.2 Uploading the Digitech web site on the storage bucket

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← ⇒ ∷ Ap	▶ C 🔒 console.cloud.google.c ps 📀 Grammarly 🐧 Microso	om/storage/browser/wonderful-bucket-2017279?pro Q 🏚 🦉 🔝 👂 🔟 🐵 ី 🎼 ft Offi W User:Adeloale 🌱 Organize dire 😵 Centering in C »
=	Google Cloud Platform	۹ 🌲 :
	Storage	← Bucket details ✓ EDIT BUCKET C REFRESH BUCKET
	Browser	wonderful-bucket-2017279
≠	Transfer	Objects Overview Permissions Bucket Lock
6	Transfer for on-premises	Upload files Upload folder Create folder Manage holds Delete
*	Transfer Appliance Settings	Q Filter by prefix
		Buckets / wonderful-bucket-20172/9
		Name Size Type Storage class Last modified Public access @ Encryptic
		object ACLs
		Drop files here to upload them to:
		DigiTech wonderful-bucket-2017279
<1		4

2.3 Hosting the DigiTech Website in a Linux Server instance



Creating a new Linux Instance:

We have created an Ubuntu 18.04 server:



=	Google Cloud Platform	🗣 Adelo2017279 👻		Q Searcl	n products and resou	irces		-				۶.
۲	Compute Engine	VM instances	CREATE INSTANCE	📩 IMPORT VM	C REFRESH	▶ START	STOP	() RESET	T DELET	ΓE		SHOW INFO
A	VM instances											
晶	Instance groups	= Filter VM instances							6	Colu	imns 🔻	
	Instance templates	Name 🔿	Zone	Recommendation	In use by	Internal IP		External IP		Connect		
	notanoe templateo	🗌 🔮 europe-instance-group-h6j	1 europe-west2-b		europe-instance-group	10.154.0.3 (nic0)	35.246.98.166	l.	SSH -	:	
8	Sole-tenant nodes	🗌 🔮 linux-web	europe-west2-c			10.154.0.2 (nic0)	34.89.30.164		SSH -	:	
1	Machine images	🖉 us-instance-group-54x2	us-central1-f		us-instance-group	10.128.0.2 (nic0)	34.68.187.69		SSH 🗸	:	
	Disks											

Remotely accessing the linux-web instances using gcloud:



After updating the Ubuntu repositories (sudo apt update), we have installed the neccesaries packages:

- apache2
- php

In the following Figure, we show the installation of the apache webserver.



Now, we can use gsutil to transfer our web page from our wonderful bucket to the /var/www/html directory of the linux-web instance:

adelo@linux-web: ~		●
File Edit View Search Terminal Tabs Help		
adelo@adelo-laptop: ~/desktop/i × adelo@adelo-laptop: ~/1-system/ ×	adelo@linux-web: ~	× Æ 🔻
<pre>adelo@linux-web:-\$ sudo gsutil cp -r gs://wonderful-bucket-2017279/I /snap/google-cloud-sdk/129/lib/third_party/requests/initpy:83: version of cryptography ([1, 2, 3]) may cause slowdown. warnings.warn(warning, RequestsDependencyWarning) Copying gs://wonderful-bucket-2017279/DigiTech/css/menu.css Copying gs://wonderful-bucket-2017279/DigiTech/css/menu.css Copying gs://wonderful-bucket-2017279/DigiTech/css/style.css Copying gs://wonderful-bucket-2017279/DigiTech/css/style.css / [4 files][3.9 KiB/ 3.9 KiB] ==> NOTE: You are performing a sequence of gsutil operations that may run significantly faster if you instead use gsutil -m cp Please see the -m section under "gsutil help options" for further informati about when gsutil -m can be advantageous.</pre>	DigiTech /var/www/html/ RequestsDependencyWarnir ay ion	ng: Old
Copying gs://wonderful-bucket-2017279/DigiTech/img/architecture_diag Copying gs://wonderful-bucket-2017279/DigiTech/img/architecture_diag Copying gs://wonderful-bucket-2017279/DigiTech/img/architecture_diag Copying gs://wonderful-bucket-2017279/DigiTech/img/cloudCCT2.png Copying gs://wonderful-bucket-2017279/DigiTech/index.html - [9 files][860.7 KiB/860.7 KiB] Operation completed over 9 objects/860.7 KiB. adelo@linux-web:-\$ ls /var/www/html/ DigiTech index.html adelo@linux-web:-\$	gram.drawio gram.pdf gram.png	

When acceding the Digitech website hosted in linux-web, through the public IP address, we can see our website has

been deployed:



2.4 Autoscaling

I first created an instance template. I modified the startup script so it deploys a page with my Name and Student number:

=	Google Cloud Platform	♣ Adelo2017279	۹	6	:	-				
۲	Compute Engine	Create an instance template								
B	VM instances	Automation Startup script (Optional)				^				
Б а	Instance groups	You can choose to specify a startup script that will run when your instance boots up or restarts. Startup scripts can be used to install software and updates, and to ensure that services are running within the virtual machine. Learn more								
	Instance templates	#I/bin/bash								
A	Sole-tenant nodes	apr-get install apache2 -y apt-get install apache2 -y								
	Machine images	mv /var/www/html/index.html /var/www/html/index.php cat < <eof> /var/www/html/index.php <html></html></eof>								
	Disks	<pre><body> chody></body></pre>								
0	Snapshots	<center> DigiTech choc (fro</center>	center> DigiTech							
	Images	Adelo Vieira				- 1				
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۲	Migrate for Compute Engi	<pre><pre><pre><pre><pre>April, 2020</pre></pre></pre></pre></pre>				- 1				
.%	Committed use discounts	 				- 1				
≣≣	Metadata	<7php echogethostname(); 2>				- 1				
Ô	Health checks	 								
	Zones	EOF								
**	Network endpoint groups	Metadata (Optional) You can set custom metadata for an instance or project outside of the server-defined								
*	Marketplace	metadata. This is useful for passing in arbitrary values to your project or instance that can be queried by your code on the instance. Learn more								
<1		Key Value								
		+ Add item				-				

≡	Google Cloud Platform	🕈 Adelo2017279 👻					ৎ 🔈	: 🌍
۲	Compute Engine	Instancplates	Ð (Π.	SHOW IN	IFO PANEL	LEARN
B	VM instances							
ц <mark>и</mark> н	Instance groups	= Filter instance temp	olates				Col	umns 💌
	Instance templates	Name ^	Machine type	Image	Disk type	In use by	Creation time	
B	Sole-tenant nodes	template	GB	v20200413	persistent disk		10:35:47 PM	:
11	Machine images							

Then, I created 2 instance groups. One in a Europe region and another in a US region:

≡	Google Cloud Platform Stade	lo2017279	. α		:	-
←	Create an instance group					
To cre	eate an instance group, select one of the options:		Organize VM instances in a group to manage them together. Instance groups \vec{L}			
A	New managed instance group A group of VMs created from a template. Supports autohealing, autoscaling, auto updating, regional deployments, and load balancing.	>	varie is permanent us-instance-group Description (Optional)	1		
,G	New unmanaged instance group A group of existing VMs that you manage. Supports load balancing.		Cocation To ensure higher availability, select a multiple zone location for an instance group Learn more Single zone Multiple zones Only managed instance groups can exist in multiple zones. Region).		
			Region is permanent us-central1	•		
			 Configure zones Specify port name mapping (Optional) 			
			Instance template 💿			
			digitech-instance-template	•		
			Number of instances			
			Based on autoscaling configuration			
			Autoscaling Use autoscaling to allow automatic resizing of this instance group for periods of high and low load. Autoscaling groups of instances [2]			
			Autoscaling mode			
			Autoscale	•		

The corresponding Health checks have been created:

≡ Google Cloud Platform	Name 💿 Name is permanent	
Create an instance group	us-instance-health-check	
	Description (Optional)	
		h
	Protocol	Port 🕢
	НТТР	- 80
	Proxy protocol	
	NONE	-
	Request path	
	/	
	🗧 💥 More	
	ö More	
	➢ More Health criteria	
	➢ More Health criteria Define how health is determined: how of	ften to check, how long to wait for a
	More Health criteria Define how health is determined: how of response, and how many successful or for the second secon	ften to check, how long to wait for a failed attempts are decisive
	More Health criteria Define how health is determined: how of response, and how many successful or f Check Interval ③	ften to check, how long to wait for a failed attempts are decisive
	 More Health criteria Define how health is determined: how of response, and how many successful or f Check Interval @ 10 seconds 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds
	➢ More Health criteria Define how health is determined: how of response, and how many successful or f Check interval 10 seconds Healthy threshold	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @
	 ➢ More Health criteria Define how health is determined: how of response, and how many successful or f Check Interval ② 10 seconds Healthy threshold ② 2 consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 ➢ More Health criteria Define how health is determined: how of response, and how many successful or the seconds Check interval ② 10 seconds Healthy threshold ② 2 consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 ➢ More Health criteria Define how health is determined: how of response, and how many successful of the consecutive successful of the consecutive successes In seconds Healthy threshold Consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 More Health criteria Define how health is determined: how of response, and how many successful or for the check interval @ 10 seconds Healthy threshold @ 2 consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 More Health criteria Define how health is determined: how of response, and how many successful of the check interval and the consecutive successful of the consecutive successes 10 seconds Healthy threshold and consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 More Health criteria Define how health is determined: how of response, and how many successful or f Check interval @ 10 seconds Healthy threshold @ 2 consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 ➢ More Health criteria Define how health is determined: how of response, and how many successful or f Check Interval ② 10 seconds Healthy threshold ② 2 consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 ➢ More Health criteria Define how health is determined: how of response, and how many successful or f Check Interval ② 10 seconds Healthy threshold ② 2 consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 ➢ More Health criteria Define how health is determined: how of response, and how many successful or 1 Check interval ② 10 seconds Healthy threshold ③ 2 consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
	 ➢ More Health criteria Define how health is determined: how of response, and how many successful or 1 Check interval ② 10 seconds Healthy threshold ② 2 consecutive successes 	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures
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	More Health criteria Define how health is determined: how of response, and how many successful of f Check interval @ 10 seconds Healthy threshold @ 2 consecutive successes	ften to check, how long to wait for a failed attempts are decisive Timeout @ 5 seconds Unhealthy threshold @ 3 consecutive failures

≡	Google Cloud Platform	🕹 Adelo201727	Adelo2017279 🗸 🔍 Q 🔈 (?	9	:	-	
۲	Compute Engine	Instance grou	ups	R CREATE	E INSTANCE GRO	OUP C REFI	Resh i	DELETE				۵.	EARN
日	VM instances	Instance groups are automated services	e collections of V	M instances th	at use load balan	cing and							
afa	Instance groups												
	Instance templates	= Filter resou	Filter resources							0	Colum	ns 🔻	
8	Sole-tenant nodes	Name ^	Zone	Instances	Template	Creation time	Recommen	dation	Autosc	aling	in u	se by	
E	Machine images	europe- Instance- group	europe- west2 (3/3 zones)	1	digitech- instance- template	May 16, 2020, 10:44:18 PM			On: Ta CPU utilizat 60%	rget ion			
	Disks	UIS-	118-	1	digitech-	May 16, 2020			On: Ta	raet			
Ō	Snapshots	instance- group	central1 (3/4 zones)		instance- template	10:49:18 PM			CPU utilizat 60%	ion			
	Images												

In the following image we can see that new Instances have been launched in by the instance groups:

≡	Google Cloud Platform	🕈 Adelo2017279 👻					Q 5. Ø	9 : 🏶
۲	Compute Engine	VM instances	CREAT	E INSTANCE	🛃 C 🕠		SHOW INFO PAN	EL 🗢 LEARN
A	VM instances							
д а	Instance groups	Filter VM instances						Columns *
	Instance templates	Name ^	Zone	Recommendation	In use by	Internal IP	External IP	Connect
8	Sole-tenant nodes	 instance-group-h6j1 	europe- west2-b		europe- instance-group	10.154.0.3 (nic0)	35.246.98.166 🖄	SSH 🗸 🚦
E	Machine images	Iinux-web	europe- west2-c			10.154.0.2 (nic0)	None	SSH •
	Disks	group-54x2	us- central1-f		us-instance- group	10.128.0.2 (nic0)	34.68.187.69	SSH 👻 🗄
<u>0</u>	Snapshots							

We can finally access the deployed websites using the IP addresses:



2.5 Modifying Instance templates and Autoscaling

Modify the start-up script in the Instance template (Startup - script.sh) so that the script pulls the DigiTech website from your wonderful bucket. Use the external IP address of the linux - web to demonstrate that your DigiTech web page shows in a browser tab.

We had to create a new Instance template because they are immutable: [Diwaakar (2017)]

≡	Google Cloud Platform	♣ Adelo2017279	٩	Search products and
۲	Compute Engine	← Create an instance template		
B	VM instances	Allow default access Allow full access to all Cloud APIs Set access for each API		
晶	Instance groups			
	Instance templates	Firewall ② Add tags and firewall rules to allow specific network traffic from the Inter	rnet	
8	Sole-tenant nodes	 ✓ Allow HTTP traffic ✓ Allow HTTPS traffic 		
	Machine images	Management Security Disks Networking Sole Tena	ncy	
	Disks	Network 📀		
_		default		•
0	Snapshots	Subnet 📀		
	Images	Auto subnet		•
\propto	TPUs	ö Show alias IP ranges		
۲	Migrate for Compute Engine	Network tags @ (Optional) http-tag 😒		
1%1	Committed use discounts	External IP 💿]
≣≣	Metadata	Ephemeral		•

We add the new Startup-script.sh so it will pull the DigiTech website from our wonderful bucket:



Here we show that a new Instance template has been created:

≡	Google Cloud Platform	🐉 Adelo2017279 👻		Q Search	products and re	sources	*			. 0
۲	Compute Engine	Instance templates	CREATE	INSTANCE TEMPLATE	C REFRESH	СОРУ	NH CREATE INSTANCE GROUP	🗑 DELETE	SHOV	V INFO PAI
日	VM instances									
4Ba	Instance groups	Filter instance templates							Column	s *
	Instance templates	Name	Machine type	Image	Disk type		In use by	Creation time		
-	maturice templatea	digitech-instance-template	1 vCPU, 3.75 GB	debian-10-buster-v2020041	3 Standard per	sistent disk	us-instance-group, europe-instance-group	May 16, 2020,	10:35:47 PM	:
日	Sole-tenant nodes	digitech-instance-template2	1 vCPU, 3.75 GB	debian-10-buster-v2020041	3 Standard per	sistent disk		May 17, 2020,	3:40:32 AM	:
	Machine images									

Then, we need to edit both Instance groups so the Instance template is the new one:



Finally, we had to restart/replace instance of both Instance groups:

≡	Google Cloud Platform	Adelo2017279 ▼ Q Search products and resources ▼
۲	Compute Engine	← Restart / replace instances of europe-instance-group
	VM instances	Gradual restart or replace of all instances in the group. Learn more
# 8	Instance groups	Current template(s)
	Instance templates	Operation
8	Sole-tenant nodes	Replace Deletes instances and creates new ones
E	Machine images	Maximum surge Maximum number (or percentage) of temporary instances to add while replacing. Learn
0	Disks	o instance(s) x
0	Snapshots	Maximum unavailable
[8]	Images	Maximum instances (number or percentage) that can be offline at the same time while restarting / replacing. Learn more
8	TPUs	3 instance(s) • out of 1 instance
۲	Migrate for Compute Engine	Minimum wait time Time to wait between consecutive instance restart / replace operations. Learn more
1%)	Committed use discounts	0 \$
==	Metadata	Replace Cancel

After that, we can see that new instances have been created. For one of them, the IP address has been changed:

=	Google Cloud Platform	🏞 Adelo2017279 👻		Q Search products and resources			-			2.	
۲	Compute Engine	VM instances	REATE INSTANCE	📩 IMPORT VM	C REFRESH	▶ START	STOP	也 RESET	DELETE		SHOW INF
A	VM instances										
昂	Instance groups	Filter VM instances							0	Columns	*
	Instance templates	Name ~	Zone	Recommendation	In use by	Internal IP		External IP	Con	nect	
-		europe-instance-group-8sdf	europe-west2-b		europe-instance-group	10.154.0.4 (nic	0)	35.246.98.166	SSF	+ +	:
B	Sole-tenant nodes	Iinux-web	europe-west2-c			10.154.0.2 (nic	0)	34.89.30.164 ピ	SS⊢	+ -	:
E	Machine images	🔮 us-instance-group-mhl	us-central1-f		us-instance-group	10.128.0.3 (nic	0)	35.193.133.84	SS⊢	+ -	:

When according the Digitech website from the new Instances created by the modified Instance groups, we can see our website has been deployed by the Startup - script.sh:



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