



Az-104 - LABs

- *Created by Lucas Brito Rodrigues dos Santos*
- **Fontes :**

Exame AZ-104: Microsoft Azure Administrator - Certifications
Exame AZ-104: Microsoft Azure Administrator

 <https://learn.microsoft.com/pt-br/certifications/exams/az-104/>



Login - TFTEC Prime

 <https://www.tftecprime.com.br/ead/course/az-104/#section13>



Summary

- **Identity Solutions**
- **Governance and Compliance**
- **Azure Administration**
- **Virtual Networking**
- **Intersite Connectivity**
- **Network Traffic Management**
- **Azure Storage**
- **Azure Virtual Machines**
- **Serverless Computing**
- **Data Protection**
- **Monitoring**

▼ Identity Solutions

▼ Lab01 → Criar e configurar usuários do AzAD

- AD → Gerenciador de identidades
- AzAD não é substituível pelo AD Local
- AzAD trabalha em conjunto com o AD local

The screenshot shows the Azure Active Directory (Azure AD) Overview page. The left sidebar lists various management options like Users, Groups, External Identities, etc. The main area displays basic information about the tenant, including Name (Diretório Padrão), Tenant ID (623f1785-d96a-453f-8a24-d6b5bbea2343), Primary domain (tftecraphaeloutlook.com.onmicrosoft.com), and License (Azure AD Free). It also shows user counts (1 User, 0 Groups, 0 Applications, 0 Devices). Two alerts are present: one about Upcoming MFA Server deprecation and another about Upcoming TLS 1.0, 1.1 and 3DES deprecation.

- Em roles podemos atribuir funções que são voltadas para o Az AD
- É possível usar o domínio personalizado para que vá no sufixo da criação do usuário no AD

This screenshot shows the 'Basic information' section of the Azure AD Overview page. The primary domain is highlighted with a cursor, showing the URL tftecraphaeloutlook.com.onmicrosoft.com. The other fields shown are Name (Diretório Padrão), Tenant ID (623f1785-d96a-453f-8a24-d6b5bbea2343), and License (Azure AD Free).

- Quando tentar criar um usuário, será criado com o sufixo que está configurado
- A criação de usuário é simples e intuitiva
- O domínio primário será sempre onmicrosoft

Home > Diretório Padrão | Users > Users >

New user

Diretório Padrão

Got feedback?

Identity

User name: @
 The domain name I need isn't shown here

Name:

First name:

Last name:

Password

Auto-generate password
 Let me create the password

Initial password:

Show Password

Groups and roles

Groups: 0 groups selected

- Através da criação já é possível atribuir a role

Home > Diretório Padrão | Users > Users >

New user

Diretório Padrão

Got feedback?

Identity

First name:

Last name:

Password

Auto-generate password
 Let me create the password

Initial password:

Show Password

Groups and roles

Groups: 0 groups selected

Roles:

Settings

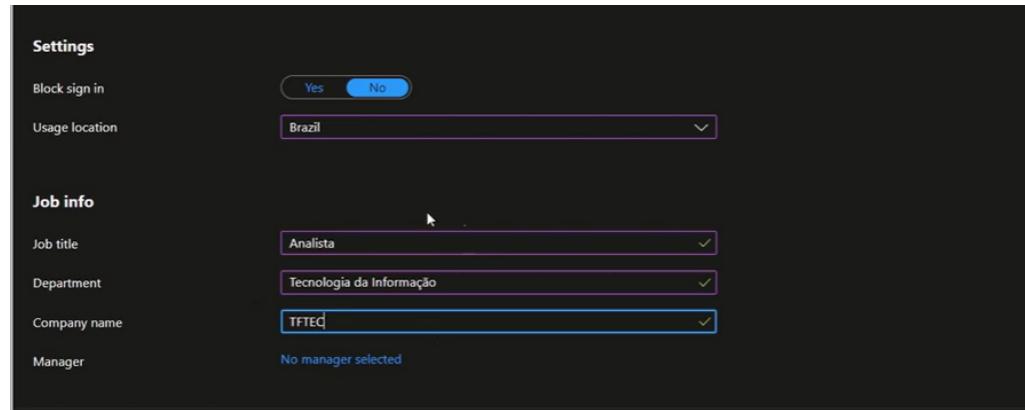
Block sign in:

Directory roles

To assign custom roles to a user, your organization needs Azure AD Premium P1 or P2.

Role	Description
<input type="checkbox"/> B2C IEF Keyset Administrator	Can manage secrets for federation and encryption in the Identity Experience Framework (IEF).
<input type="checkbox"/> B2C IEF Policy Administrator	Can create and manage trust framework policies in the Identity Experience Framework (IEF).
<input type="checkbox"/> Billing Administrator	Can perform common billing related tasks like updating payment information.
<input type="checkbox"/> Cloud App Security Administrator	Can manage all aspects of the Cloud App Security product.
<input type="checkbox"/> Cloud Application Administrator	Can create and manage all aspects of app registrations and enterprise apps except App Proxy.
<input type="checkbox"/> Cloud Device Administrator	Limited access to manage devices in Azure AD.
<input type="checkbox"/> Compliance Administrator	Can read and manage compliance configuration and reports in Azure AD and Microsoft 365.
<input type="checkbox"/> Compliance Data Administrator	Creates and manages compliance content.
<input type="checkbox"/> Conditional Access Administrator	Can manage Conditional Access capabilities.
<input type="checkbox"/> Customer LockBox Access Approver	Can approve Microsoft support requests to access customer organizational data.
<input type="checkbox"/> Desktop Analytics Administrator	Can access and manage Desktop management tools and services.
<input type="checkbox"/> Directory Readers	Can read basic directory information. Commonly used to grant directory read access to applications and guests.
<input type="checkbox"/> Directory Writers	Can read and write basic directory information. For granting access to applications, not intended for users.

- Com essas informações podemos utilizar para atribuir a grupos dynamics



- Em settings colocamos a localização, com o ad premium podemos bloquear caso o usuário tente logar de outra localização
- O usuário ao entrar irá utilizar a senha provisória e vai criar uma nova senha

User type	On-premises sync	Identities
Member	No	tffecraphaeloutlook.com
Member	No	tffecraphaeloutlook.com
Member	No	MicrosoftAccount

- Quando o usuário não possui atributo, role, nenhuma a única coisa que ele consegue fazer é validar o active directory, no caso somente ver algumas informações, efetuar alterações não será possível
- Em user settings pode definir o que cada usuário poderá fazer

Enterprise applications
Manage how end users launch and view their applications

App registrations
Users can register applications Yes No

Tenant creation
Users can create Azure AD tenants Yes No

Administration portal
Restrict access to Azure AD administration portal
Learn more Yes No

LinkedIn account connections
Allow users to connect their work or school account with LinkedIn.
Data sharing between Microsoft and LinkedIn is not enabled until users consent to connect their Microsoft work or school account
Learn more about LinkedIn account connections Yes Selected group No

- No ad é possível validar todo os logs em sign-in-logs

Basic info	Location	Device info	Authentication Details	Conditional Access	Report-only
Location	Porto Alegre, Rio Grande Do Sul, BR				
IP address	179.181.157.164				
Autonomous system number	18881				
Named location type		Location name			
No network details					

▼ Lab02 → Crie grupos do AzAD com associação atribuída e dinâmica

Display name ↑	User principal name	User type	On-premises sync status	Identities	Company name
GC Guilherme Campos	guilherme.campos@tftec...	Member	No	tftecraphaeloutlook.com.onmicrosoft.com TFTEC	
PS Paulo Silva	paulo.silva@tftecraphael...	Member	No	tftecraphaeloutlook.com.onmicrosoft.com TFTEC	
RA Raphael Andrade	tftec.rafael_outlook.com...	Member	No	MicrosoftAccount	

- Para criar grupos é bem simples
- Podemos criar um grupo de segurança e um grupo de Ms365
 - Segurança → Dar acesso, restrições etc
 - MS365 → possui geralmente um conta, pede um e-mail pois vai gerar uma caixa
- Vamos trabalhar somente com o grupo de segurança
- Podemos criar associação estatica e dinamica
 - dinamica add membros que possui determinada característica
 - estatica é manual

New Group ...

Got feedback?

Group type * ⓘ
Security

Group name * ⓘ
GR-TFTEC

Group description ⓘ
Colaboradores da TFTEC

Membership type ⓘ
Assigned

Owners
No owners selected

Members
No members selected

- Para associar as licenças vamos em azad>license>license → add uma para teste

Licenses | All products

Diretório Padrão - Azure Active Directory

Overview

Diagnose and solve problems

Manage

Licensed features

All products

Self-service sign up products

Audit logs

Troubleshooting + Support

New support request

Name	Total	Assigned	Available
Azure Active Directory Premium P2	100	0	100

- Após add a licença irá aparecer no azad

Basic information

Name	Diretório Padrão	Users	3
Tenant ID	623f1785-d96a-453f-8a24-d6b5bbea2343	Groups	1
Primary domain	titecraphaeloutlookcom.onmicrosoft.com	Applications	0
License	Azure AD Premium P2	Devices	0

Alerts

Upcoming MFA Server deprecation

Upcoming TLS 1.0, 1.1 and 3DES deprecation

- Agora podemos definir os tipos de membros (estatico ou dinamico)

New Group ...

[Got feedback?](#)

Group type * ⓘ
Security

Group name * ⓘ
Enter the name of the group

Group description ⓘ
Enter a description for the group

Azure AD roles can be assigned to the group ⓘ
Yes No

Membership type * ⓘ
Assigned

Assigned
Dynamic User
Dynamic Device

No members selected

- Vamos colocar uma associação dinamica do usuario
- Assim efetuamos a criação de uma query, salvamos e criamos o grupo

Dynamic membership rules ...

[Save](#) [Discard](#) | [Got feedback?](#)

[Configure Rules](#) [Validate Rules \(Preview\)](#)

You can use the rule builder or rule syntax text box to create or edit a dynamic membership rule. ⓘ [Learn more](#)

And/Or	Property	Operator	Value
And	jobTitle	Contains	Analista
+ Add expression	+ Get custom extension properties ⓘ		
Rule syntax <pre>[{"operator": "Contains", "property": "jobTitle", "value": "Analista"}]</pre>			
Add All And Any Contains Equals Greater Than or Equal			

- Podemos alterar a regra após criar o grupo

The screenshot shows the 'Configure Rules' section for a dynamic membership rule. The rule definition is:

```
(user.jobTitle -contains "Analista")
```

And/Or	Property	Operator	Value
	jobTitle	Contains	Analista

- Com a regra os usuários que contém determinada característica irá aparecer no grupo

Name	Type	Email	User type
GC	User		Member
PS	User		Member

- É uma boa prática colocar na descrição sempre para o que aquele determinado grupo, ou recurso, faz
- Associação dinâmica normalmente demora um pouco, cerca de 30m
- Preview em dynamic membership rules podemos validar se a regra está certa

Save Discard | Got feedback?

Configure Rules Validate Rules (Preview)

Rule syntax

```
(user.department -contains "Marketing")
```

Add users to validate against this rule. Learn more

+ Add users Validate

In group Not in group Unknown

Name	Status
 Paulo Silva paulo.silva@tfteraphaeloutlookcom.onmicrosoft.com	 View details

Configure Rules Validate Rules (Preview)

Rule syntax

```
(user.department -contains "Marketing")
```

Add users to validate against this rule. Learn more

+ Add users Validate

In group Not in group Unknown

Name	Status
 Guilherme Campos guilherme.campos@tfteraphaeloutlookcom.onmicrosoft.com	 View details

- Para validar se o campo de determinado usuário está certo

The screenshot shows the Azure portal's user management interface. On the left, there's a sidebar with navigation links like Overview, Audit logs, Sign-in logs, Diagnose and solve problems, Manage, Troubleshooting + Support, and New support request. The main area displays detailed user information for 'Paulo Silva'. The 'Department' field is explicitly highlighted with a red box. Other visible fields include User principal name (paulo.silva@tftecraphaeloutlook.com.onmicrosoft.com), Object ID (b32a2f06-8329-4f81-844a-be0b249effa3), Identities (tftecraphaeloutlook.com.onmicrosoft.com), User type (Member), Creation type, Created date time (22 de nov. de 2022 15:24), Last password change date time (22 de nov. de 2022 15:27), External user state, External user state change date ..., Assigned licenses (View), Password policies, Password profile, Preferred language, Sign in sessions valid from date ... (22 de nov. de 2022 15:27), Authorization info (View), Job title (Analista), Company name (TFTEC), Department (Marketing), Employee ID, Employee type, ZIP or postal code, Country or region, Business phone, Mobile phone, Email, Other emails, Proxy addresses, Fax number, IM addresses, Mail nickname (paulo.silva), Parental controls (Edit), Age group, Consent provided for minor, Legal age group classification, Settings (Edit), Account enabled (Yes), Usage location (Brazil), Preferred data location, On-premises (Edit), and On-premises sync enabled (No).

▼ Lab03 → Criar um AzAD tenant

- Quando criamos uma conta no azure através do e-mail, é criado um tenant automaticamente
- Podemos criar um novo AzAD, um novo tenant e um novo diretório
- Não é trabalhado com níveis de hierarquia no AzAD como florestas, domínio pai e filho. Todos os domínios são segmentados
- O tenant sempre será onmicrosoft.com
- No AzAD podemos usar o custom domain para alterarmos o sufixo, assim podemos escolher um dos dois sufixos principais para utilizar
- Se criarmos um novo AzAD, somente o usuário criador conseguira ter acesso aos dois AD's
- Os recursos são associados não ao tenant mas a subscription
- No caso a subscription está abaixo do tenant
- Cada subscription está associada a um tenant
- É possível definir qual tenant trabalha com determinada subscription
- Assim todos os recursos irão mudar, mas os usuários nativos pertencentes ao tenant antigo não terão mais acessos
- No caso os usuários pertencentes ao tenant antigo não terão mais acessos e permissões aos recursos da subscription que eram atreladas ao tenant antigo
- Criando o Tenant

Home > Diretório Padrão | Overview

Manage tenants

Basic information

Name	Diretório Padrão	Users	1
Tenant ID	c698796a-ec3e-4769-a227-5e08315cd63d	Groups	0
Primary domain	lucasbcontatooutlook.onmicrosoft.com	Applications	0
License	Azure AD Free	Devices	0

Alerts

- Upcoming Authenticator number matching enforcement**: Microsoft Authenticator number matching admin
- Upcoming MFA Server deprecation**: Please migrate from MFA Server to Azure AD Multi-Factor Authentication by September 2024 to avoid

Manage tenants

Create

Current tenant: Diretório Padrão

Organization name	Domain name	Tenant type	Organization ID
Diretório Padrão (Default)	lucasbcontatooutlook.onmicrosoft.com	Azure Active Directory	c698796a-ec3e-4769-a227-5e08315c

- Vamos definir AzAD normalmente

Create a tenant

Azure Active Directory

*** Basics * Configuration Review + create**

Azure Active Directory and Azure Active Directory (B2C) enable users to access applications published by your organization, and share same administration experiences.

Tenant type

Select a tenant type *

Azure Active Directory

Azure Active Directory (B2C)

[Help me choose...](#)

- Na proxima definimos o sufixo (que estara na UPN dos usuarios)

Create a tenant ...
Azure Active Directory

* Basics * Configuration Review + create

Directory details
Configure your new directory

Organization name * ✓

Initial domain name *

lucaslabs.onmicrosoft.com

Location

Geographic location - United States

The location selected above will determine the geographic location where Microsoft will store your Azure Active Directory (Azure AD) Core Store data only. For details on where your Azure AD components and service data will be stored or processed, see [Azure AD data residency](#).

Create a tenant ...

Azure Active Directory

Validation passed.

* Basics * Configuration Review + create

Summary

Basics

Tenant type Azure Active Directory

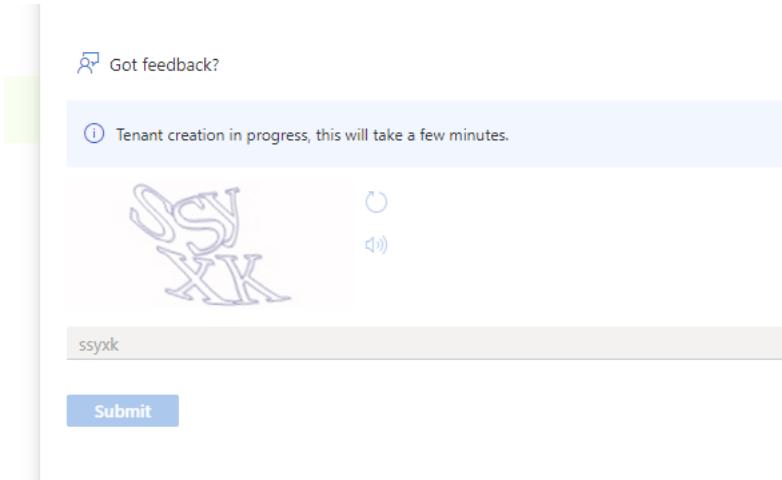
Configuration

Organization name luc4slabs

Initial domain name luc4slabs.onmicrosoft.com

Location United States

- Colocamos o craptcha e será criado normalmente



- Demora de 3 a 5 minutos a criação
- Após a criação será gerado um link para que possamos validar o tenant que foi criado

Tenant creation was successful. Click here to navigate to your new tenant: [luc4slabs](#)

- Podemos ver todos os tenants em Manage Tenants

Manage tenants ...

Current tenant: Diretório Padrão				
<input type="text"/> Search tenants		Domain name	Tenant type	Organization ID
<input type="checkbox"/>	Diretório Padrão (Default)	lucascontatooutlook.onmicrosoft.com	Azure Active Directory	c698796a-ec3e-4...
<input type="checkbox"/>	luc4slabs	luc4slabs.onmicrosoft.com	Azure Active Directory	66f08d27-3a12-4...

- Nós podemos mudar o diretório clicando em switch, assim mudamos de tenant e consecutivamente de AzAD

Portal settings | Directories + subscriptions

Directories + subscriptions		Advanced filters	
All services and resources across the Azure portal will inherit the selection from basic filtering. Your selection will also be saved and reloaded the next time you sign in or reload the Azure portal.	Default subscription filter	Azure subscription 1 - Don't see a subscription? Switch to another directory.	Advanced filters
Directories	Switching directories will reload the portal. The directory you choose will impact the subscription, resource group, and region filters that are available in the portal. Learn more about directories.	Current directory : Diretório Padrão (lucascontatooutlook...)	Startup directory : Last visited (change)
Favorites	All Directories	Domain	Directory ID
<input type="text"/> Search	Directory name	lucascontatooutlook.onmicrosoft.com	c698796a-ec3e-4769-a227-5e08315cd63d
	<input checked="" type="radio"/> Current	luc4slabs.onmicrosoft.com	66f08d27-3a12-4294-b585-cd4fa3b578e4
	<input type="radio"/> Switch		

- No caso a conta de usuário criador será a única permanente a validar os dois tenants

The screenshot shows the Azure portal's 'Users' section. On the left, there's a sidebar with links like 'All users (preview)', 'Audit logs', 'Sign-in logs', 'Diagnose and solve problems', 'Manage', 'Deleted users (preview)', 'Password reset', 'User settings', 'Bulk operation results', 'Troubleshooting + Support', and 'New support request'. The main area has a search bar and a message about switching to the legacy users list experience. A table lists one user found: 'Lucas Brito' with the principal name 'lucasbcontato_outlook.com#EXT#@luc4slabs.onmicrosoft.com'. The 'User type' column shows 'Member'.

- Podemos convidar usuários de outros tenants a trabalhar em outros tenants
 - Assim podemos definir níveis de permissionamentos
- No caso vamos migrar nossa subscription que é try (possui os créditos) Para o nosso tenant criado

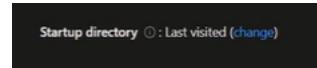
The screenshot shows the Azure portal's 'Subscriptions' page. A red arrow points from the 'Subscriptions' link in the sidebar to the 'Subscriptions' page. Another red arrow points from the 'Change directory' button in the 'Change the directory' dialog to the 'To' field where 'luc4slabs' is entered. The dialog also contains a note about changing the directory not changing billing ownership and a checkbox for understanding resource transfers.

- Agora a subscription e seus RGs irão mudar para o outro diretório, dependendo da quantidade de recursos irá demorar cada vez mais
- Após criar mover a sub a mesma irá aparecer no novo diretório

Subscription name: Luc4slabs

Status: Future subscription

- Podemos definir qual usuario iremos acessar ao logar

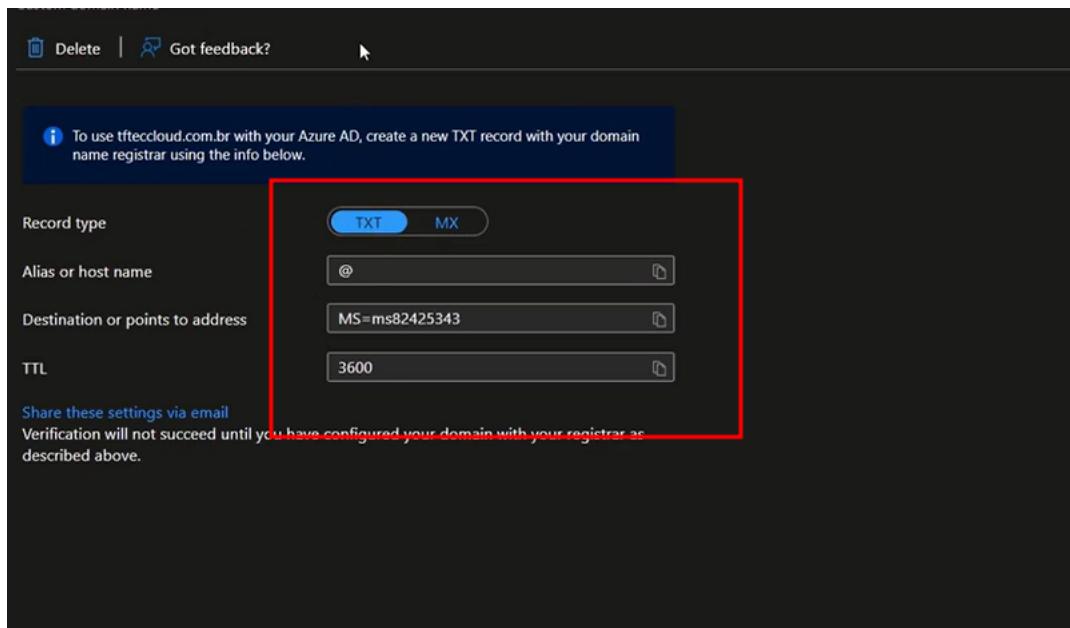


- Podemos adicionar um dominio personalizado para o ambiente

+ Add custom domain

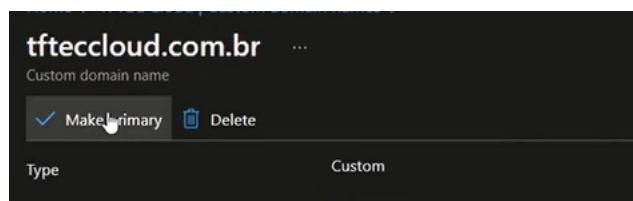
Name	Status	Federated	Primary
luc4slabs.onmicrosoft.com	Available		✓

- Para isso adicionamos o nome e cria um registro txt ou mx



- Assim adicionamos o registro no provedor de DNS

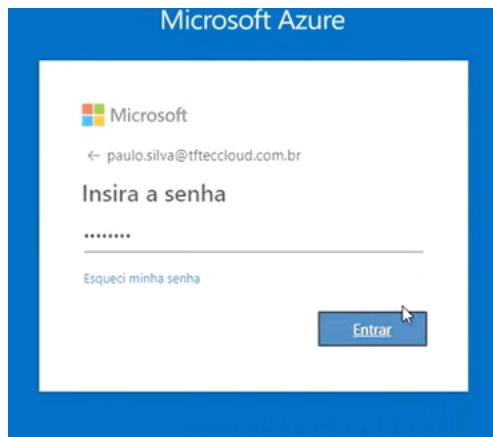
- Assim incluimos na zona de DNS publica e o registro ficará marcado
- Após esse procedimento o provedor irá propagar o endereço
- Um dominio sempre será padrão e o customizado será opcional
- Após o procedimento podemos definir o dominio customizado



- Feito isso podemos adicionar o endereço ao invés do padrão com onmicrosoft.com



- Assim o usuário irá logar com o custom domain



- Site Gratuito para criar um domínio

Freenom - Um Nome para Todos
Todos os direitos reservados - © 2015 Freenom - Países Baixos
<https://www.freenom.com/pt/index.html?lang=pt>

▼ Lab04 → Gerenciar usuários convidados do AzAD

- Podemos ter acesso a vários tenants associados a várias contas diferentes
- No caso é possível atribuir convidados para o nosso tenant principal
- Para adicionarmos um usuário mandamos um convite

Home > luc4slabs | Users >

Users ...

User principal name	User type
lucasbcontato_outlook.co...	Member

New user Download users Bulk operations Refresh Manage

Search

- All users (preview)
- Audit logs
- Sign-in logs
- Diagnose and solve problems

Create new user
Create a new internal user in your organization

Invite external user
Invite an external user to collaborate with your organization

Lucas Brito

A red arrow points from the 'Diagnose and solve problems' menu item to the 'Invite external user' option in the dropdown menu.

- Podemos dar uma role, add a um determinado grupo, adicionar uma mensagem, etc.

Identity

Name ⓘ	Example: 'Chris Green'
Email address * ⓘ	Example: chris@contoso.com
First name	
Last name	

Personal message



Groups and roles

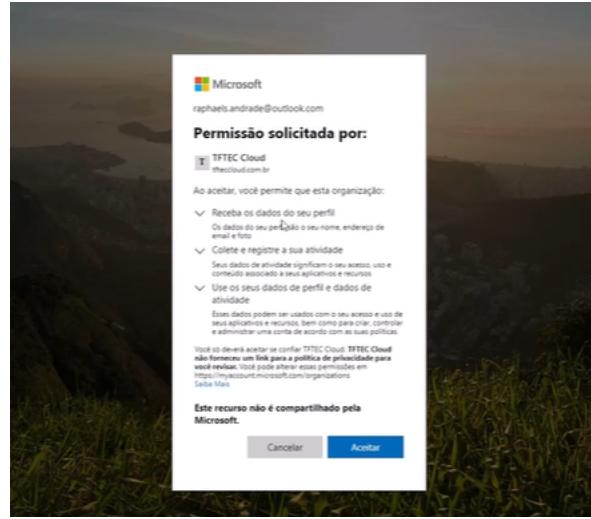
- Groups 0 groups selected
Roles User



- Será apresentado um #EXT# e em user type ficará como Guest
- Não há necessidade de gerenciar a senha pois quem irá gerenciar será o tenant na qual a conta está atribuída

Display name	User principal name	User type	On-premises sync	Identities	Company name
Lucas Brito	lucasbcontato_outlook.com#EXT#@luc4slabs.onmicrosoft.com	Member	No	MicrosoftAccount	
Rodrigues Guest	rodrigues_lucasbcontatooutlook.onmicrosoft.com#EXT#@luc4slabs.onmicrosoft.com	Guest	No	luc4slabs.onmicrosoft.com	

- Após encaminhar o convite, o usuário irá receber um convite, e será necessário permitir
 - É solicitado consentimento para coleta de dados sensíveis do usuário



- Após entrar irá aparecer uma tela chamada myapps, por padrão

- E na conta irá aparecer em o diretório do tenant que foi atribuída
- Como user padrão é possível fazer validações no AD
- O permissionamento terá que ser atribuído pelo responsável do tenant que realizou o convite
 - Ex de permissão a um RG de uma sub:

- No caso adicionaremos uma role de contributor
- RBAC → Owner, contributor, reader

Name	Description	Type
Owner	Grants full access to manage all resources, including the ability to assign roles in Azure RBAC.	BuiltinRole
Contributor	Grants full access to manage all resources, but does not allow you to assign roles in Azure RBAC, manage assignments in Azure Blueprint...	BuiltinRole
Reader	View all resources, but does not allow you to make any changes.	BuiltinRole

- Selecionemos por usuário, ou identidades gerenciadas (webapp, vm, banco de dados)

Name	Object ID	Type
Lucas Brito	lucasbcontato_outlook.com#EXT#@luc4slabs.onmicrosoft.com	User
Rodrigues Guest (Guest)	rodrigues@lucasbcontatooutlook.onmicrosoft.com	Guest

- Após conceder a permissão, é aconselhável sair e entrar novamente na conta

rg-teste | Access control (IAM)

Resource group

Search

Add Download role assignments Edit columns Refresh Remove Got feedback?

Check access Role assignments Roles Deny assignments Classic administrators

Number of role assignments for this subscription 1 4000

Search by name or email Type : All Role : All Scope : All scopes Group by : Role

1 items (1 Users)

Name	Type	Role	Scope	Condition
RG Rodrigues Guest (Guest) rodrigues@lucasbcontato...	User	Contributor	This resource	None

- Como foi atribuída uma permissão apenas para um grupo de recurso só será possível efetuar criação de recursos apenas dentro do RG que a role está atribuída
- Podemos deletar o usuário do nosso tenant após o término de utilização

Users

All users (preview)

New user Download users Bulk operations Refresh Manage view Delete Per-user MFA Preview features

Delete the selected users?

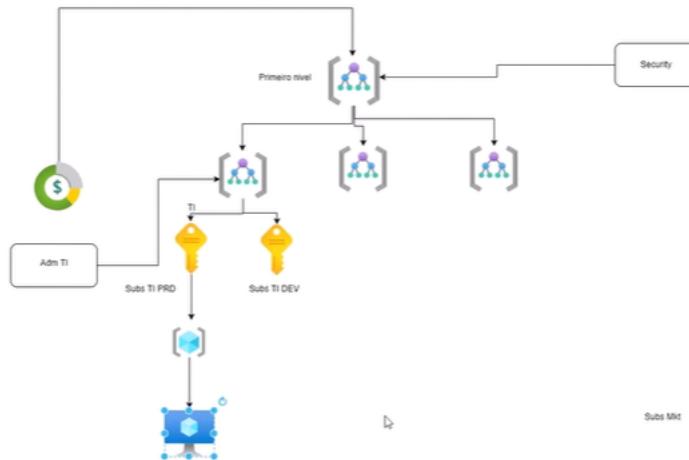
OK Cancel

Display name	User principal name	User type	On-premises sync	Identities	Company name
LB Lucas Brito	lucasbcontato_outlook.co...	Member	No	MicrosoftAccount	
RG Rodrigues Guest	rodrigues_lucasbcontato...	Guest	No	luc4slabs.onmicrosoft.com	

▼ Governance and Compliance

▼ Lab01 → Criar Management Group

- Quando temos mais de uma sub, se torna necessário criar management group
- Através do management group é possível gerenciar o custo de todas as subs atreladas
- Caso precisamos atribuir permissão para vários usuários em várias subs, o ideal é efetuar através do management group pois por ser maior na hierarquia irá repassar para as subs
- Com os management group podemos criar vários, e ir segmentando para cada área
- Os níveis são : Management group > subs > RG > recurso
- O nível de permissão é herdado conforme a hierarquia



- O procedimento para criação do management group é bem simples

Management groups

lucdslabs

Search

Overview

Get started

Settings

You might experience some delays for a few minutes while Management Groups is setting up your directory.

You are registered as a directory admin but do not have the necessary permissions to access the root management group. Click here for more info.

No management groups to display

Organize your subscriptions into groups called 'management groups' to help you manage access, policy and compliance across your subscriptions. Management groups give you enterprise-grade management at a large scale no matter what type of subscriptions you might have. Learn more

Start using management groups

Create management group

Management group ID (Cannot be updated after creation) *

Management group display name

TENANT sempre será raiz

Podemos criar outros management groups dentro do que foi criado

Create management group

Create a new management group to be a child of 'luc4slabs.org'

Management group ID (Cannot be updated after creation) *

Management group display name

Podemos atribuir por departamento, por ex: TI, MKT, etc.

- Agora para mover a sub para o mg é bem simples

New parent management group *

Search by name or ID

⚠ Moving a management group will affect all policies, roles, and subscriptions under it.

▼ [A] Tenant Root Group	66f08d27-3a12-4294-b585-cd4fa3b578e4	1
▼ [A] luc4slabs.org	luc4slabs.org	1
▼ [A] labs.org	labs.org	1
[Key] Azure subscription 1	8f909918-9255-4e7e-991c-35f4db71ef3a	

▼ Lab02 → Criar Custom RBAC Roles

- RBAC → São as permissões no nível de recursos
 - Owner, contributor, read
- Roles AAD → As roles são somente para o AD
 - Um user com global admin não tem permissão para criar recursos
- Um usuário com permissão RBAC não tem no AZAD e um user com permissão no AZAD não tem permissão nos recursos
- Para este lab, vamos em nosso management group no qual criamos > Vamos em access control (IAM) > Vamos em roles

luc4slabs.org | Access control (IAM)

Management group

Search Add Download role assignments Edit columns Refresh Remove Got feedback?

Overview Subscriptions Resource Groups Resources Activity Log Access control (IAM) Get started Security Policy Deployments Cost Management Cost analysis Budgets

Check access Role assignments Roles Deny assignments Classic administrators

A role definition is a collection of permissions. You can use the built-in roles or you can create your own custom roles. [Learn more](#)

Type : All	Category : All	Name	Description	Type	Category	Details
<input type="checkbox"/>	<input type="checkbox"/>	Owner	Grants full access to manage all resources, including the ability to assign roles in Azure RBAC.	BuiltinRole	General	View
<input type="checkbox"/>	<input type="checkbox"/>	Contributor	Grants full access to manage all resources, but does not allow you to assign roles in Azure RBAC, manage assignments in Az...	BuiltinRole	General	View
<input type="checkbox"/>	<input type="checkbox"/>	Reader	View all resources, but does not allow you to make any changes.	BuiltinRole	General	View
<input type="checkbox"/>	<input type="checkbox"/>	Access Review Operator Service Role	Lets you grant Access Review System app permissions to discover and revoke access as needed by the access review process.	BuiltinRole	None	View
<input type="checkbox"/>	<input type="checkbox"/>	AcrDelete	acr delete	BuiltinRole	Containers	View
<input type="checkbox"/>	<input type="checkbox"/>	AcrImageSigner	acr image signer	BuiltinRole	Containers	View
<input type="checkbox"/>	<input type="checkbox"/>	AcrPull	acr pull	BuiltinRole	Containers	View
<input type="checkbox"/>	<input type="checkbox"/>	AcrPush	acr push	BuiltinRole	Containers	View
<input type="checkbox"/>	<input type="checkbox"/>	AcrQuarantineReader	acr quarantine data reader	BuiltinRole	Containers	View
<input type="checkbox"/>	<input type="checkbox"/>	AcrQuarantineWriter	acr quarantine data writer	BuiltinRole	Containers	View
<input type="checkbox"/>	<input type="checkbox"/>	AgFood Platform Sensor Partner Contributor	Provides contribute access to manage sensor related entities in AgFood Platform Service	BuiltinRole	None	View
<input type="checkbox"/>	<input type="checkbox"/>	AgFood Platform Service Admin	Provides admin access to AgFood Platform Service	BuiltinRole	AI + Machine Learning	View
<input type="checkbox"/>	<input type="checkbox"/>	AgFood Platform Service Contributor	Provides contribute access to AgFood Platform Service	BuiltinRole	AI + Machine Learning	View
<input type="checkbox"/>	<input type="checkbox"/>	AgFood Platform Service Reader	Provides read access to AgFood Platform Service	BuiltinRole	AI + Machine Learning	View
<input type="checkbox"/>	<input type="checkbox"/>	AnyBuild Builder	Basic user role for AnyBuild. This role allows listing of agent information and execution of remote build capabilities.	BuiltinRole	None	View
<input type="checkbox"/>	<input type="checkbox"/>	API Management Developer Portal Content Editor	Can customize the developer portal, edit its content, and publish it.	BuiltinRole	None	View
<input type="checkbox"/>	<input type="checkbox"/>	API Management Service Contributor	Can manage service and the APIs	BuiltinRole	Integration	View
<input type="checkbox"/>	<input type="checkbox"/>	API Management Service Operator Role	Can manage service but not the APIs	BuiltinRole	Integration	View

- As 3 permissões padrões são owner, contributor e reader, já as demais são derivadas destas, que no caso são permissões voltadas para recursos e serviços no geral porém de forma mais granulada
- Como podemos ver o contributor possui todas as ações liberadas ("*"), porém as ações relacionadas a autorização e liberação de acesso não estão liberadas

Contributor

BuiltinRole

Permissions JSON Assignments

```
4   "roleName": "Contributor",
5   "description": "Grants full access to manage all resources, but does not allow you to assign roles in Azu
6   "assignableScopes": [
7     "/"
8   ],
9   "permissions": [
10     {
11       "actions": [
12         "*"
13     ],
14     "notActions": [
15       "Microsoft.Authorization/*/Delete",
16       "Microsoft.Authorization/*/Write",
17       "Microsoft.Authorization/elevateAccess/Action",
18       "Microsoft.Blueprint/blueprintAssignments/write",
19       "Microsoft.Blueprint/blueprintAssignments/delete",
20       "Microsoft.Compute/galleries/share/action"
21     ],
22     "dataActions": [],
23     "notDataActions": []
24   }
25 ]
```

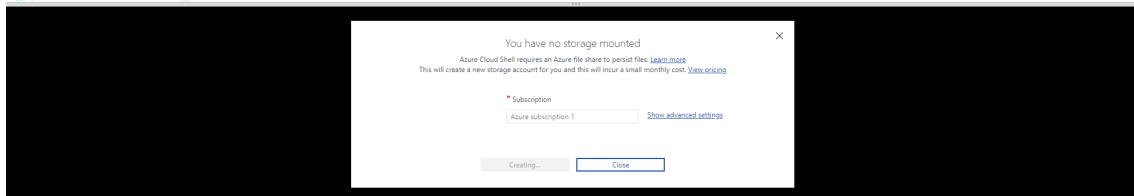
- No caso vamos atuar na permissão support request contributor

Name	Description	Type	Category	Details
<input type="checkbox"/> Quota Request Operator	Read and create quota requests, get quota request status, and create support tickets.	BuiltinRole	Management + Govern...	View
<input type="checkbox"/> Resource Policy Contributor	Users with rights to create/modify resource policy, create support ticket and read resources/hierarchy.	BuiltinRole	Management + Govern...	View
<input type="checkbox"/> Support Request Contributor	Lets you create and manage Support requests	BuiltinRole	Management + Govern...	View

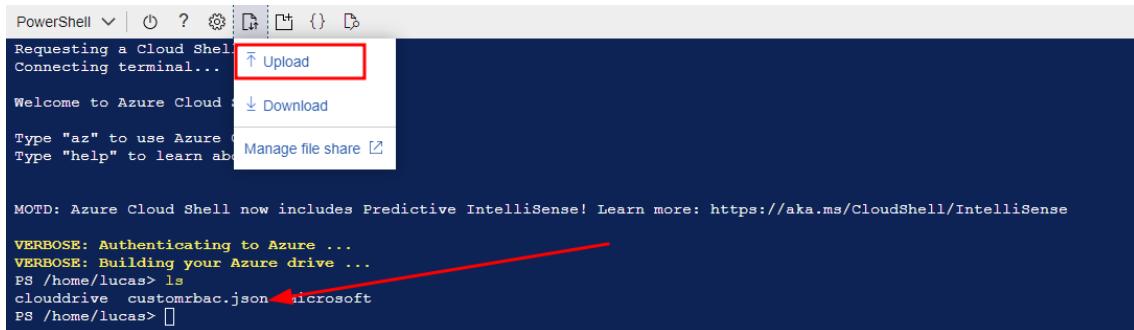
- No caso vamos utilizar a seguinte configuração no arquivo JSON

```
1  {
2    "Name": "Support Request Contributor (Custom)", ← Nome da role
3    "IsCustom": true,
4    "Description": "Allows to create support requests",
5    "Actions": [
6      "Microsoft.Resources/subscriptions/resourceGroups/read",
7      "Microsoft.Support/*" ← Tudo o que ele vai poder fazer
8    ],
9    "NotActions": [ ← Tudo o que ele não vai poder
10   ],
11   "AssignableScopes": [
12     "/providers/Microsoft.Management/managementGroups/mgtid",
13     "/subscriptions/subid" ← ID da Sub e do management Group
14   ]
15 }
```

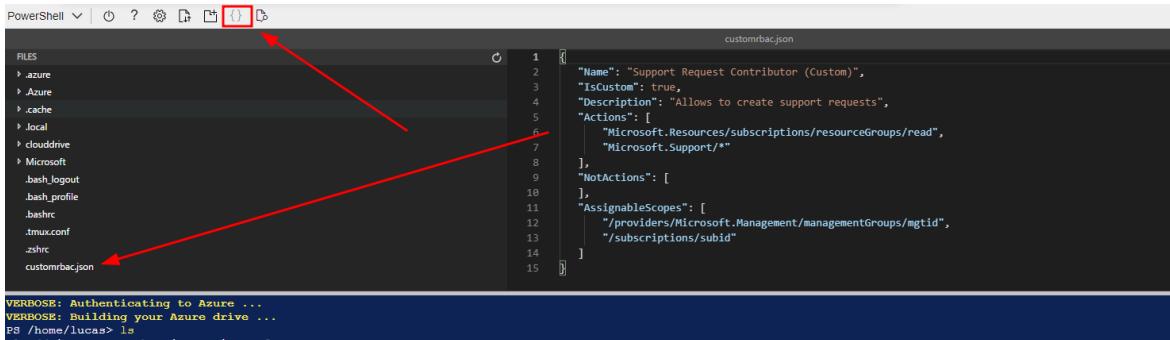
- No caso vamos utilizar o cloud shell → É criado um storage em uma sub para que possa armazenar as informações



- Demos um upload no arquivo



- Em seguida vamos efetuar a edição do mesmo através da propria plataforma do cloudshell



- Agora editamos o arquivo conforme especificado no script do json

The screenshot shows the Azure portal interface for a management group named 'luc4slabs.org'. In the center, there is a modal window titled 'customrbac.json' displaying a JSON configuration for a custom role. The JSON content is as follows:

```

    "Name": "Support Request Contributor (Custom)",
    "Id": "c7c4087a-bf91-4004-afbc-ea7b09e67689",
    "IsCustom": true,
    "Description": "Allows to create support requests",
    "Actions": [
        "Microsoft.Resources/subscriptions/resourceGroups/read",
        "Microsoft.Support/*"
    ],
    "NotActions": [
    ],
    "AssignableScopes": [
        "/providers/Microsoft.Management/managementGroups/luc4slabs.org",
        "/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a"
    ]
}

```

The screenshot shows the Azure portal interface for the same management group 'luc4slabs.org'. The custom role 'Support Request Contributor (Custom)' has been assigned to a specific Azure subscription, which is highlighted in the list. The subscription ID is shown as a tooltip: '8f909918-9255-4e7e-991c-35f4db71ef3a'.

- Feito isso rodamos o comando `New-AzRoleDefinition -InputFile $Home/customrbac.json` para subir o json

```

PS /home/lucas> New-AzRoleDefinition -InputFile $Home/customrbac.json

```

The PowerShell session output shows the details of the newly created role definition:

```

Name      : Support Request Contributor (Custom)
Id       : c7c4087a-bf91-4004-afbc-ea7b09e67689
IsCustom : True
Description : Allows to create support requests
Actions   : {Microsoft.Resources/subscriptions/resourceGroups/read, Microsoft.Support/*}
NotActions : {}
DataActions : {}
NotDataActions : {}
AssignableScopes : {"/providers/Microsoft.Management/managementGroups/luc4slabs.org", "/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a}

```

- Feito isso adicionamos a Role

▼ Lab03 → Associar RBAC Roles

- Neste lab iremos associar o RBAC no qual criamos
- Primeiramente criamos um usuário no AZAD

- No caso a role que criamos irá permitir aberturas de chamados para a MS

- Atrelamos agora no Management Groups > Access control (IAM) > Add role assignment > Selecionamos a que customizamos, e adicionamos o usuário para está role

Add role assignment ...

Role • Members • Review + assign

A role definition is a collection of permissions. You can use the built-in roles or you can create your own custom roles. [Learn more](#)

Name ↑↓	Description ↑↓
Quota Request Operator	Read and create quota requests, get quota request status, and create support tickets.
Resource Policy Contributor	Users with rights to create/modify resource policy, create support ticket and read resources/hie
Support Request Contributor	Lets you create and manage Support requests
Support Request Contributor (Custom)	Allows to create support requests

< Previous Page 1 of 1 Next >

Add role assignment ...

Role • Members • Conditions (optional) • Review + assign

Selected role: Support Request Contributor (Custom)

Assign access to: User, group, or service principal

Members: + Select members

Description: Optional

Select members:

- Lucas Brito lucascontato_outlook.com#EXT#@luc4slabs
- Rodrigues Guest (Guest) rodrigues@lucascontatooutlook.onmicrosoft.com

Selected members:

- James Albert james.albert@luc4slabs.onmicrosoft.com

- Setamos review + Assign

luc4slabs.org | Access control (IAM) ...

Management group

Overview Subscriptions Resource Groups Resources Activity Log Access control (IAM) Get started Security Policy Deployments

Check access Role assignments Roles Deny assignments Classic administrators

Search by name or email Type: All Role: All Scope: All scopes Group by: Role

2 items (2 Users)

Name	Type	Role
Lucas Brito lucascontato_outlook.com#EXT#@luc4slabs	User	Owner
Support Request Contributor (Custom)	User	Support Request Contributor (Custom)
James Albert james.albert@luc4slabs.onmicrosoft.com	User	Support Request Contributor (Custom)

- Agora o usuário conseguira criar chamados e terá as permissões e restrições que definimos após a criação da role
- Agora o usuário terá a visibilidade do RG e da Sub, e também poderá abrir chamados para a MS

▼ Lab04 → Criar e Associar tags via the Azure Portal

- Tags são etiquetas que adicionamos a nossos recursos
- Tags servem principalmente para bilhetagem (billing)
- A fatura por si só mostra o custo com base em todos os recursos, para organizar isso e gerenciar qual recurso consumiu mais, colocamos as tags
- A tag em si não é segmentada para níveis de hierarquia inferior, ou seja se atribuirmos uma tag na sub, a mesma não irá replicar para os demais RGs e Recursos

cloud-shell-storage-eastus Resource group

Subscription (move) : Azure subscription 1
Subscription ID : 8f009918-9255-4e7e-991c-35f4db71ef3a
Tags (edit) : Departamento : TI Ambiente : Produção

Resources Recommendations

Showing 1 to 1 of 1 records. Filter for any field... Type equals all Location equals all Add filter

Name ↑	Type ↑	Location ↑
cs210032002700e8e01	Storage account	East US

cs210032002700e8e01 Storage account

Resource group (move) : cloud-shell-storage-eastus
Location : East US
Subscription (move) : Azure subscription 1
Subscription ID : 8f009918-9255-4e7e-991c-35f4db71ef3a
Disk state : Available

Tags (edit) : ms-resource-usage : azure-cloud-shell

O storage não herda a tag que adicionamos, no caso o mesmo possui uma tag específica para identificação do produto

Properties Monitoring Capabilities (7) Recommendations (0) Tutorials Developer Tools

Blob service

Hierarchical namespace	Disabled
Default access tier	Hot
Blob public access	Disabled
Blob soft delete	Disabled
Container soft delete	Disabled
Versioning	Disabled
Change feed	Disabled

Security

Require secure transfer for REST API operations	Enabled
Storage account key access	Enabled
Minimum TLS version	Version 1.2
Infrastructure encryption	Disabled

Networking

Allow remote from	All networks
-------------------	--------------

- RBAC → Herdaveu
 - Tags Não
- As tags servem para automação também
 - Podemos gerar scripts para desligar e ligar vms por exemplo

▼ Lab05 → Aplicar configurações via Azure policy

- Azure policy são semelhantes as GPOs

- Podemos definir limites de criação de recursos
- Podemos determinar quais tipos de recursos a serem criados
- Iniciativa são conjuntos de política
 - Pegar um conjunto de políticas
- No azure temos politicas já preparadas e programadas para serem adicionadas ao ambiente

The screenshot shows the 'Policy | Definitions' blade in the Azure portal. The left sidebar includes links for Overview, Getting started, Compliance, Remediation, Events, Authoring, Definitions (which is selected), Assignments, and Exemptions. The main area displays a table of policy definitions with the following columns: Name, Definition location, Policies, Type, Definition type, and Category. The table lists numerous built-in policies across various categories such as Compute, Regulatory Compliance, Synapse, Data Factory, Security Center, Batch, and Cognitive Services.

Name	Definition location	Policies	Type	Definition type	Category
Audit virtual machines without disaster recovery configured		Builtin	Policy	Compute	Regulatory Compliance
Restrict location of information processing, storage and services		Builtin	Policy	Synapse	
Vulnerability assessment should be enabled on your Synapse ...		Builtin	Policy	Regulatory Compliance	
Establish parameters for searching secret authenticators and v...		Builtin	Policy	Regulatory Compliance	
SQL Server Integration Services integration runtimes on Azure –		Builtin	Policy	Data Factory	
[Preview]: Configure VMSS created with Shared Image Gallery –		Builtin	Policy	Security Center	
Private endpoint connections on Batch accounts should be en...		Builtin	Policy	Batch	
Integrate risk management process into SDLC		Builtin	Policy	Regulatory Compliance	
View and configure system diagnostic data		Builtin	Policy	Regulatory Compliance	
Azure Backup should be enabled for Virtual Machines		Builtin	Policy	Backup	
Configure App Service app slots to use the latest TLS version		Builtin	Policy	App Service	
Implement a threat awareness program		Builtin	Policy	Regulatory Compliance	
Implement system boundary protection		Builtin	Policy	Regulatory Compliance	
Authorize remote access to privileged commands		Builtin	Policy	Regulatory Compliance	
Configure a private DNS Zone ID for table groupID		Builtin	Policy	Storage	
[Preview]: Azure Security agent should be installed on your Wi...		Builtin	Policy	Security Center	
Identify incident response personnel		Builtin	Policy	Regulatory Compliance	
Cognitive Services accounts should restrict network access		Builtin	Policy	Cognitive Services	

- Para configurarmos uma politica vamos em associação > associar uma politica
- Definimos se será em um management group
- Se haverá exceções (Um determinado RG não terá x politica)

Assign policy ...

Basics Advanced Parameters Remediation Non-compliance messages Review + create

Scope
Scope [Learn more about setting the scope *](#)
Azure subscription 1

Exclusions
Optionally select resources to exclude from the policy assignment.

Basics
Policy definition *
Add a tag to resources

Assignment name * ⓘ
Add a tag to resources

Description

Policy enforcement ⓘ
 Enabled Disabled

Assigned by
Lucas Brito

Review + create Cancel Previous Next

- No caso optamos pela política de tags, que irá atribuir uma tag específica para a criação dos recursos na assinatura selecionada

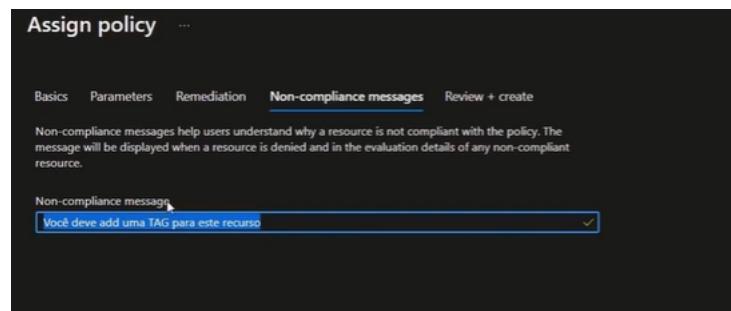
Basics Advanced Parameters Remediation Non-compliance messages Review + create

Search by parameter name Only show parameters that need input or review

Tag Name * ⓘ
Empresa

Tag Value * ⓘ
LUC4SLABS

- Remediação é o pilar fundamental de uma política, com ela será possível realizar notificações e procedimentos de correção de forma autônoma, caso algo fuja do padrão no ambiente
- Com a regra Non-compliance message serve para quando criar de forma manual a tag



- Como será de forma automática não será necessário nesse caso
- Por fim seguimos com a criação

[Home](#) > [Policy | Assignments](#) >

Assign policy ...

The screenshot shows the 'Assign policy' interface with the 'Review + create' tab selected. The 'Basics' section is highlighted with a red box. A red arrow points from the 'Non-compliance messages' input field in the previous screenshot to the 'Add a tag to resources' option in this screenshot. The 'Basics' section includes fields for Scope, Exclusions, Policy definition, Assignment name, Description, Policy enforcement, and Assigned by. The 'Advanced' section includes Resource selectors, Overrides, and Parameters. The 'Parameters' section shows tagName: Empresa and tagValue: LUC4SLABS. The 'Remediation' section includes Create managed identity (Yes), System assigned identity location (eastus), and Create a remediation task (Yes). The bottom navigation bar includes 'Create' (highlighted with a red box), 'Cancel', 'Previous', and 'Next'.

- Pode demorar de 20 a 30 minutos, como nosso ambiente é pequeno será feito de forma rápida
- Por fim a política foi aplicada no ambiente

- Quando ocorrer erros e problema de non-compliance, haverá indicativos nessa tela

The screenshot shows the 'Assignment Details' page for a policy assignment. The top navigation bar includes 'Home > Policy > Assignment Details'. Below it, there are tabs for 'View definition', 'Edit assignment', 'Assign to another scope', 'Delete assignment', 'Create Remediation Task', and 'Create exemption'. The 'Selected Scopes' dropdown shows '1 selected subscription'. The main area displays a 'Compliance state' of 'Compliant' with a green checkmark icon and a 'Overall resource compliance' of '100%' (0 out of 1). A circular progress bar indicates 100%. Below this, a 'Resources by compliance state' chart shows 0 Compliant, 0 Exempt, and 0 Non-compliant. The 'Details' section shows 'Effect Type: Modify' and 'Parent Initiative: <NONE>'. The 'Resource compliance' section lists resources with their compliance status, including a row for 'Non-compliant' resources.

- No caso quando o ambiente não estiver de acordo com a política será apresentado da seguinte forma

The screenshot shows the 'Policy' page. The left sidebar has sections for 'Overview', 'Getting started', 'Compliance' (selected), 'Remediation', 'Events', 'Authoring', 'Definitions', 'Assignments' (selected), and 'Exemptions'. The main area shows 'Overall resource compliance' at '0%' (0 out of 3). A circular progress bar indicates 0%. Below this, a 'Resources by compliance state' chart shows 3 Non-compliant resources. The 'Non-compliant initiatives' section shows 3 out of 0. The 'Non-compliant policies' section shows 3 out of 1. A table below lists resources with their compliance status, all marked as 'Non-compliant'. A red arrow points from the 'Non-compliant' status in the table to the 'Non-compliant' status in the 'Compliance details' sidebar.

- É possível validar o recurso que está fora do compliance

The screenshot shows the 'Assignment Details' page for a policy assignment. The top navigation bar includes 'Home > Policy | Assignments > Assignment Details'. Below it, there are tabs for 'View definition', 'Edit assignment', 'Assign to another scope', 'Delete assignment', 'Create Remediation Task', and 'Create exemption'. The 'Selected Scopes' dropdown shows '1 selected subscription'. The main area displays a 'Compliance state' of 'Non-compliant' with a red X icon and an 'Overall resource compliance' of '0%' (0 out of 1). A circular progress bar indicates 0%. Below this, a 'Resources by compliance state' chart shows 1 Non-compliant resource. The 'Details' section shows 'Effect Type: Modify' and 'Parent Initiative: <NONE>'. The 'Resource compliance' section lists resources with their compliance status, including a row for 'Non-compliant' resources. A red arrow points from the 'Non-compliant' status in the table to the 'Non-compliant' status in the 'Compliance details' sidebar.

- No caso aplicamos uma politica somente para os recursos porém podemos criar uma politica para os grupos de recursos no qual será criada uma tag para os mesmos
- Criamos uma politica que será aplicada somente para o rg-teste no qual os recursos criados nesse RG deverão pertencer somente ao East US

Assign policy ...

Basics Advanced Parameters Remediation Non-compliance messages Review + create

Scope [Learn more about setting the scope](#)

Azure subscription 1/rg-teste

Exclusions

Optional select resources to exclude from the policy assignment.

Basics

Policy definition *

Allowed locations

Assignment name *

Allowed locations

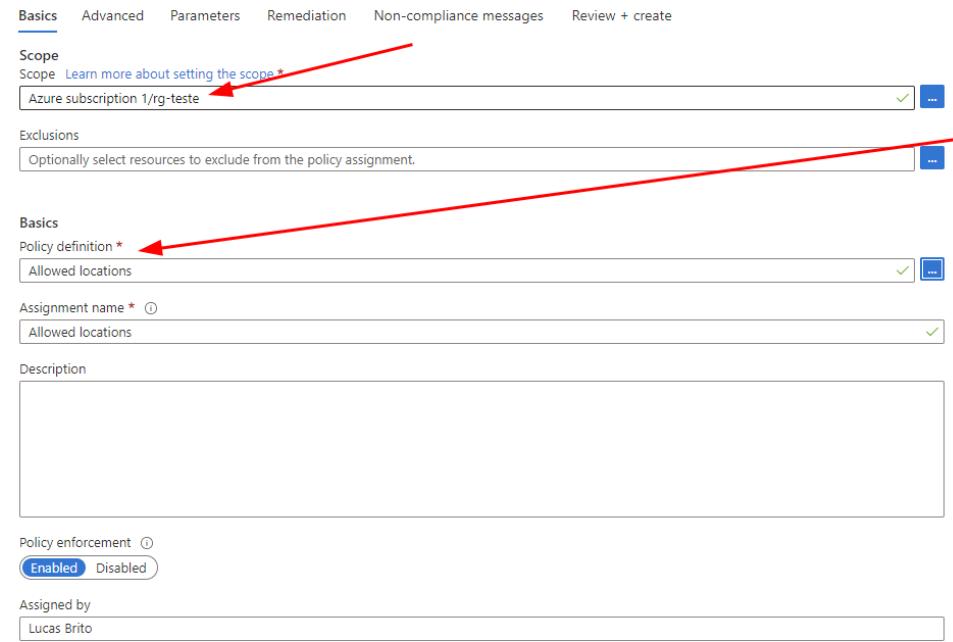
Description

Policy enforcement

Enabled

Assigned by

Lucas Brito



Home > Policy | Assignments >

Assign policy ...

Basics Advanced **Parameters** Remediation Non-compliance messages Review + create

Search by parameter name

Only show parameters that need input or review

Allowed locations *

East US

- No caso não tem uma remediação, para isso colocaremos uma aviso de non-compliance

Assign policy ...

Basics Advanced Parameters Remediation **Non-compliance messages** Review + create

Non-compliance messages help users understand why a resource is not compliant with the policy. The message will be displayed when a resource is denied and in the evaluation details of any non-compliant resource.

Non-compliance message

Recurso deve ser criado na região East Us devido a politicas de compliance

- Como não tem nenhum recurso lá no rg-teste, então irá apontar como 0

- Mas caso criemos um recurso fora da região especificada na política dentro do recurso será barrado

▼ Lab06 → Criar um Azure policy Customizada

- Para atribuir que a tag seja atribuída de forma herdada, do RG para o recurso, podemos criar uma política
 - Por padrão a tag não é herdável
- No caso vamos associar uma política que realize esse tipo de procedimento

- Porém por padrão para esta política conseguimos colocar somente uma tag

Assign policy ...

Basics Advanced Parameters Remediation Non-compliance messages Review + create

Search by parameter name Only show parameters that need input or reviewTag Name *

- Se quisermos efetuar uma configuração para que seja aplicada mais de uma tag, por exemplo “custos : <departamento>” e “ambiente : <prd, hml, dev>”, utilizamos as tags personalizadas
- Para isso vamos em definitions > buscamos pela tag > E procuramos pela policy que possui essa opção de herança
- Em seguida vamos em duplicate definition

Inherit a tag from the resource group ...

Policy definition

[Assign](#) [Edit definition](#) [Duplicate definition](#) [Delete definition](#) [Export definition](#)

[Essential](#)

Name : Inherit a tag from the resource group
Description : Adds or replaces the specified tag and value from the parent resource group when any resource is created or updated. Existing ...
Available Effects : Modify
Category : Tags

Definition location : --
Definition ID : /providers/Microsoft.Authorization/policyDefinitions/cd3aa116-8754-49c9-a813-ad46512ece54
Type : Built-in
Mode : Indexed

Definition Assignments (0) Parameters

```

1   {
2     "properties": {
3       "displayName": "Inherit a tag from the resource group",
4       "policyType": "BuiltIn",
5       "mode": "Indexed",
6       "description": "Adds or replaces the specified tag and value from the parent resource group when any resource is created or updated. Existing resources can be remediated by triggering a remediation task.",
7       "metadata": {
8         "version": "1.0.0",
9         "category": "Tags"
10      }
11    },
12    "parameters": {
13      "tagName": {
14        "type": "String",
15        "metadata": {
16          "displayName": "Tag Name",
17          "description": "Name of the tag, such as 'environment'"
18        }
19      }
20    },
21    "policyRule": {
22      "if": {
23        "allOf": [
24          {
25            "field": "[concat('tags[', parameters('tagName'), ']')]",
26            "notEquals": "[resourceGroup().tags[parameters('tagName')]]"
27          },
28          {
29            "value": "[resourceGroup().tags[parameters('tagName')]]",
30            "more": ...
31          }
32        ]
33      }
34    }
35  }
  
```

- No caso aplicamos somente para a sub

Inherit a tag from the resource group ...

New Policy definition

BASICS

Definition location *

Name * Inherit a tag from the resource group

Description : Adds or replaces the specified tag and value from the parent resource group when any resource is created or updated. Existing resources can be remediated by triggering a remediation task.

Category: Create new Use existing

Tags:

POLICY RULE

[Import sample policy definition from GitHub](#)

Management Group
 Tenant Root Group (69f08d27-3a12-4294-b5b5-cd4fa1b579e4)
 luc4slabs.org (luc4slabs.org)
 labs.org (labs.org)

Subscription Azure subscription 1

- Vamos alterar no caso o arquivo JSON (as politicas são representadas por configuração json)

- No caso adicionamos uma nova linha para que haja mais de um campo de tag ao aplicar a politica

```

14   ],
15 },
16 "then": {
17   "effect": "modify",
18   "details": {
19     "roleDefinitionIds": [
20       "/providers/Microsoft.Authorization/roleDefinitions/b24988ac-6180-42a0-ab88-20f7382dd24c"
21     ],
22     "operations": [
23       {
24         "operation": "add",
25         "field": "[concat('tags[', parameters('tagName1'), ']')]",
26         "value": "[resourceGroup().tags[parameters('tagName1')]]"
27       },
28       {
29         "operation": "add",
30         "field": "[concat('tags[', parameters('tagName2'), ']')]",
31         "value": "[resourceGroup().tags[parameters('tagName2')]]"
32       }
33     ]
34   }
35 },
36 },
37 "parameters": {
38   "tagName1": {
39     "type": "String",
40     "metadata": {
41       "displayName": "First Tag Name",
42       "description": "Name of the tag, such as 'environment'"
43     }
44   },
45   "tagName2": {
46     "type": "String",
47     "metadata": {
48       "displayName": "Second Tag Name".

```

- Após isso salvamos e efetuamos a criação dessa nova politica que criamos que no caso é **Inherit multiples tags from the resource group**
- Agora é possível adicionar mais de uma tag como herdavel no ambiente

Inherit multiples tags from the resource group ...

Edit Policy Assignment

Basics Advanced Parameters Remediation Non-compliance messages Review + save

Search by parameter name Only show parameters that need input or review

First Tag Name * ⓘ

Second Tag Name * ⓘ

- Com alguns grupos que criamos podemos validar que ao criamos recursos novos (no exemplo criamos uma storage account) podemos ver que o recurso irá herdar a tag do grupo

Subscription (move) : Azure subscription 1
Subscription ID : 8f909918-9255-4e7e-991c-35f4db71ef3a
Tags (edit) : centro de custo : ti, ambiente : prd, empresa : luc4slabs

Resources	Recommendations
Filter for any field... Type equals all Location equals all Add filter	Showing 1 to 1 of 1 records. <input type="checkbox"/> Show hidden types No grouping
<input type="checkbox"/> Name ↑ <input type="checkbox"/> stoti01 Storage account	Type ↑ Location ↑ Storage account East US

Resource group (move) : rg-ti
Location : East US
Subscription (move) : Azure subscription 1
Subscription ID : 8f909918-9255-4e7e-991c-35f4db71ef3a
Disk state : Available
Tags (edit) : ambiente : prd, centro de custo : ti, empresa : luc4slabs

▼ JSON criado para este procedimento

```
{
  "properties": {
    "displayName": "Add multiple tags to resource if missing",
    "policyType": "Custom",
    "mode": "Indexed",
    "description": "Adds multiple tags with its value from the parent resource group when any resource missing this tag is cre
  "parameters": {
    "tagName1": {
      "type": "String",
      "metadata": {
        "displayName": "First Tag Name",
        "description": "Name of the tag, such as 'environment'"
      }
    },
    "tagName2": {
      "type": "String",
      "metadata": {
        "displayName": "Second Tag Name",
        "description": "Name of the tag, such as 'environment'"
      }
    }
  },
  "policyRule": {
    "if": {
      "anyOf": [
        {
          "field": "[concat('tags[', parameters('tagName1'), ']')]",
          "exists": "false"
        },
        {
          "field": "[concat('tags[', parameters('tagName2'), ']')]",
          "exists": "false"
        }
      ]
    }
  }
}
```

```

    "then": {
      "effect": "modify",
      "details": {
        "roleDefinitionIds": [
          "/providers/Microsoft.Authorization/roleDefinitions/b24988ac-6180-42a0-ab88-20f7382dd24c"
        ],
        "operations": [
          {
            "operation": "add",
            "field": "[concat('tags[', parameters('tagName1'), ']')]",
            "value": "[resourceGroup().tags[parameters('tagName1')]]"
          },
          {
            "operation": "add",
            "field": "[concat('tags[', parameters('tagName2'), ']')]",
            "value": "[resourceGroup().tags[parameters('tagName2')]]"
          }
        ]
      }
    }
  }
}

```

▼ Azure Administration

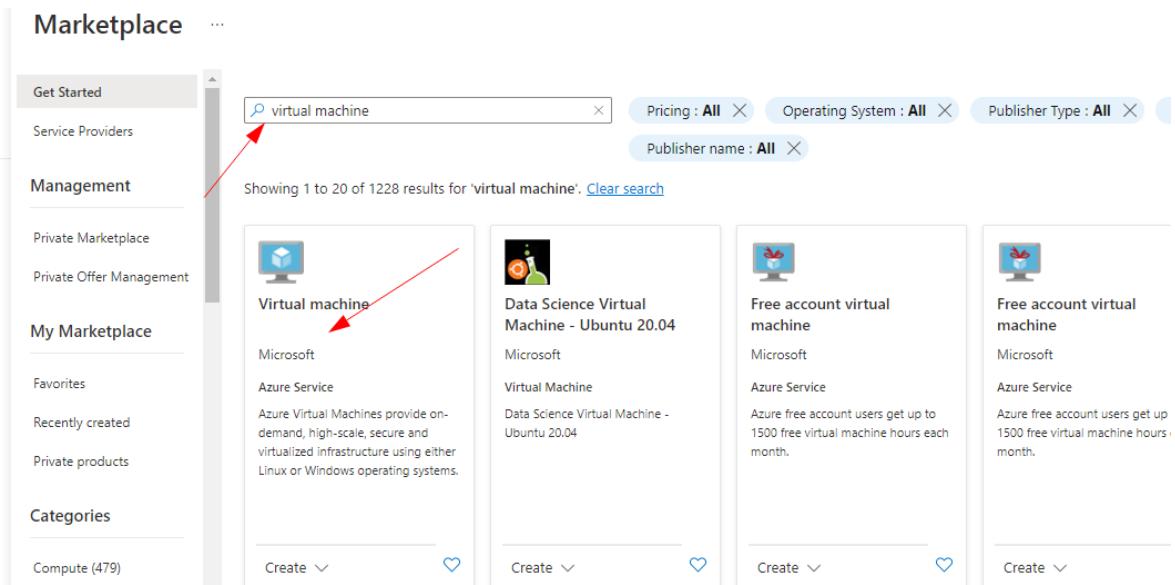
▼ Lab01 → Criar dois resource groups com uma VM

- Podemos realizar movimentação de recursos entre RGs, subs, e regiões
- Vamos criar dois RGs

<input type="checkbox"/>  rg-destino	Azure subscription 1	North Europe
<input type="checkbox"/>  rg-origem	Azure subscription 1	North Europe

- Após criar dois RGs, criamos a nossa vm, e adicionamos no RG de origem

Marketplace ...



Get Started

Service Providers

Management

Private Marketplace

Private Offer Management

My Marketplace

Favorites

Recently created

Private products

Categories

Compute (479)

Pricing : All × Operating System : All × Publisher Type : All × Publisher name : All ×

Showing 1 to 20 of 1228 results for 'virtual machine'. [Clear search](#)

 Virtual machine Microsoft Azure Service Azure Virtual Machines provide on-demand, high-scale, secure and virtualized infrastructure using either Linux or Windows operating systems.	 Data Science Virtual Machine - Ubuntu 20.04 Microsoft Virtual Machine Data Science Virtual Machine - Ubuntu 20.04	 Free account virtual machine Microsoft Azure Service Azure free account users get up to 1500 free virtual machine hours each month.	 Free account virtual machine Microsoft Azure Service Azure free account users get up to 1500 free virtual machine hours each month.
---	--	--	--

Create ▾ 

Create ▾ 

Create ▾ 

Create ▾ 

Create a virtual machine

your resources.

Subscription * ⓘ

Azure subscription 1

Resource group * ⓘ

rg-origem

[Create new](#)

Instance details

Virtual machine name * ⓘ

vm1-labs

Region * ⓘ

(Europe) Switzerland North

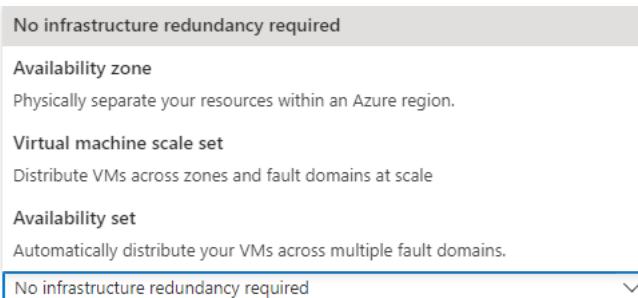
Availability options ⓘ

No infrastructure redundancy required

Security type ⓘ

Standard

- Nem todas as regiões estão disponíveis na conta try, no caso estamos utilizando a north europe, mas pode ser que mude e a mesma fique indisponível para contas try
- Deixemos sem a opção de availability zone



- Vamos setar win server 2022

Image * ⓘ

Windows Server 2022 Datacenter: Azure Edition - x64 Gen2 (free services el)

[See all images](#) | Configure VM generation

- Vamos usar a vm B2s

Select a VM size

Search by VM size...

Display cost : Monthly

vCPUs : All

RAM (GiB) : All

Add filter

Showing 380 VM sizes.

Subscription: Azure subscription 1

|

|

Region: South Africa North

|

Current size: Standard_B1s

|

Image: Windows Server 2022 Datacenter: Azure Edition

[Learn more about VM sizes](#)

[Group by series](#)

VM Size ↑↓

Type ↑↓

vCPUs ↑↓

RAM (GiB) ↑↓

Data disks ↑↓

Max IOPS ↑↓

Temp storage (GiB) ↑↓

Most used by Azure users ↗

The most used sizes by users in Azure

[DS1_v2 ↗](#)

General purpose

1

3.5

4

3200

7

[D2s_v3 ↗](#)

General purpose

2

8

4

3200

16

[B2s ↗](#)

General purpose

2

4

4

1280

8

[B1s ↗ \(free services eligible\)](#)

General purpose

1

1

2

320

4

[B2ms ↗](#)

General purpose

2

8

4

1920

16

[DS2_v2 ↗](#)

General purpose

2

7

8

6400

14

- Config User e senha

Administrator account

Username *	luc4slabs	✓
Password *	*****	✓
Confirm password *	*****	✓

- Deixar liberada a porta RDP

Public inbound ports *	<input type="radio"/> None <input checked="" type="radio"/> Allow selected ports
Select inbound ports *	RDP (3389)
<small>⚠ This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.</small>	

- Não é recomendado mas para este lab iremos liberar para realizarmos o acesso
- Disco premium mesmo, pois iremos utilizar somente para este lab

Home > Resource groups > rg-origem > Marketplace > Virtual machine >

Create a virtual machine ...

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host ⓘ

Encryption at host is not registered for the selected subscription.
[Learn more about enabling this feature](#)

OS disk

OS disk type * ⓘ

Premium SSD (locally-redundant storage) ▾

Delete with VM ⓘ



Key management ⓘ

Platform-managed key ▾

Enable Ultra Disk compatibility ⓘ



Ultra disk is supported in Availability Zone(s) 3 for the selected VM size Standard_B2s.

- Por padrão será criado uma vnet caso não haja uma

Virtual network *	(new) rg-origem-vnet	▼
	Create new	
Subnet *	(new) default (10.0.0.0/24)	▼
	Create new	
Public IP ⓘ	(new) vm1-labs-ip	▼
	Create new	

- Será criado também uma NIC na rede
- Será liberada a porta 3389

NIC network security group (i)

None
 Basic
 Advanced

Public inbound ports * (i)

None
 Allow selected ports

Select inbound ports *

RDP (3389) ▾

- Setar para deletar o ip publico após a exclusão

Delete public IP and NIC when VM is deleted (i)

- Em gerenciamento podemos configurar um horário para que a máquina seja desligada sozinha, e podemos optar um e-mail para que avise quando desligar

Create a virtual machine ...

RBAC role assignment of Virtual Machine Administrator Login or Virtual Machine User Login is required when using Azure AD login. [Learn more](#)

Auto-shutdown

Enable auto-shutdown (i)

Shutdown time (i) 7:00:00 PM

Time zone (i) (UTC) Coordinated Universal Time ▾

Notification before shutdown (i)

Email * (i) lucasbcontato@outlook.com ✓

Backup

Enable backup (i)

Site Recovery

- Não usaremos nenhum monitoramento mas podemos deixar como padrão nesta opção
- Em advanced podemos colocar um script para instalar programas e pacotes após deploy

Create a virtual machine ...

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Add additional configuration, agents, scripts or applications via virtual machine extensions or cloud-init.

Extensions

Extensions provide post-deployment configuration and automation.

Extensions ⓘ

Select an extension to install



VM applications

VM applications contain application files that are securely and reliably downloaded on your VM after deployment. In addition to the application files, an install and uninstall script are included in the application. You can easily add or remove applications on your VM after create. [Learn more](#) ⓘ

Select a VM application to install



Custom data

Pass a script, configuration file, or other data into the virtual machine while it is being provisioned. The data will be saved on the VM in a known location. [Learn more about custom data for VMs](#) ⓘ

Custom data



- E podemos configurar tags para o billing
- Por fim irá revisar, e em seguida seguimos com o create

Home > Resource groups > rg-origem > Marketplace > Virtual machine >

Create a virtual machine ...

Validation passed

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Cost given below is an estimate and not the final price. Please use [Pricing calculator](#) for all your pricing needs.

PRODUCT DETAILS

1 X Standard B2s

by Microsoft

[Terms of use](#) | [Privacy policy](#)

Subscription credits apply ⓘ

0.0622 USD/hr

[Pricing for other VM sizes](#)

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

Create

< Previous

Next >

[Download a template for automation](#)

- Após o deploy vamos acessar a vm e validar se está funcional

[Home](#) > [CreateVm-MicrosoftWindowsServer.WindowsServer-202-20230214103527 | Overview](#) [...](#)

 Deployment

[Delete](#) [Cancel](#) [Redeploy](#) [Download](#) [Refresh](#)

[Overview](#) [Inputs](#) [Outputs](#) [Template](#)

 Your deployment is complete

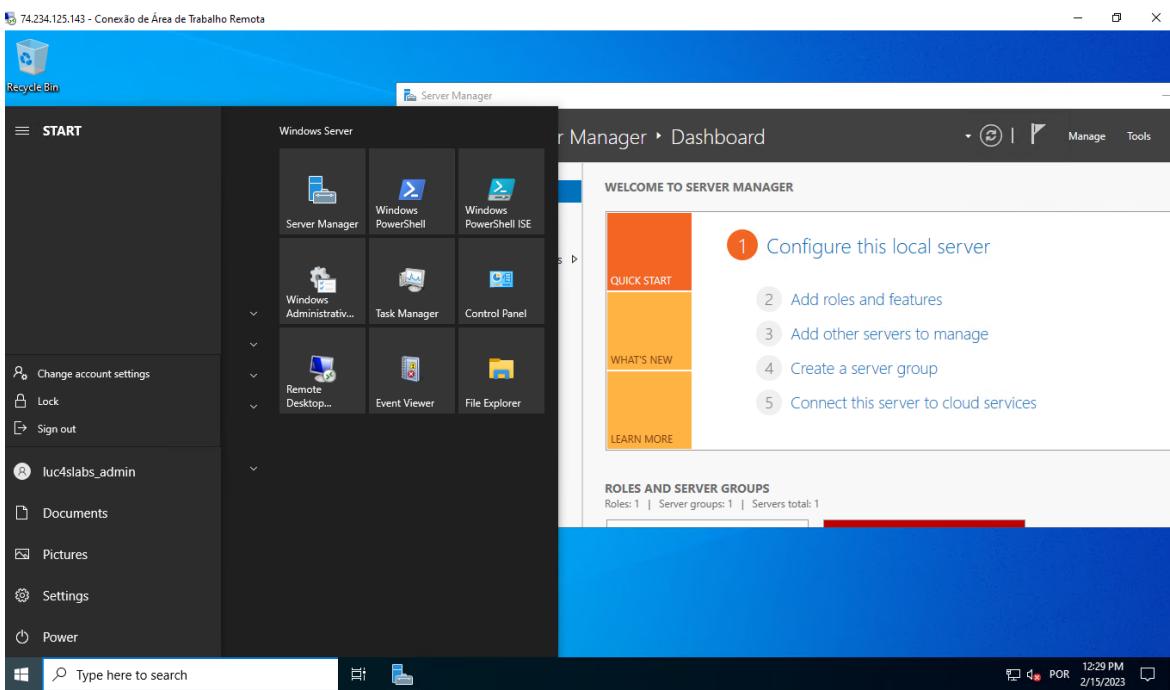
Deployment name: CreateVm-MicrosoftWindowsServer.WindowsServer-202-20230214103527 | Start time: 2/14/2023, 10:47:10 AM
Subscription: Azure subscription 1 | Correlation ID: d48a1292-f0b3-4468-b0c4-2e070ec02e4d [Copy](#)

[Deployment details](#) [Next steps](#)

- [Setup auto-shutdown](#) Recommended
- [Monitor VM health, performance and network dependencies](#) Recommended
- [Run a script inside the virtual machine](#) Recommended

[Go to resource](#) [Create another VM](#)

[Give feedback](#) [Tell us about your experience with deployment](#)



- Para mover entre RGs da mesma região, a VM poderá ficar ligada
- Quando se trata de outra região isso não será possível, deverá ser feito um desligamento da vm para a movimentação tendo em vista que o ambiente de provisionamento da vm (no caso a região) será diferente

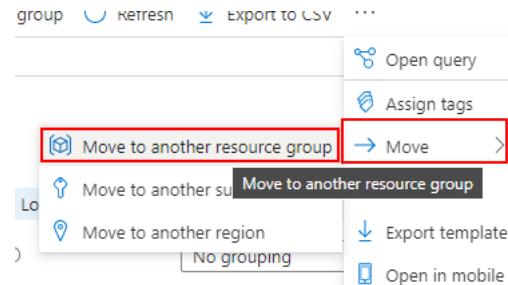
▼ Lab02 → Mover recursos entre RGs

- Vamos no RG de origem e selecionamos os recursos que iremos mover

The screenshot shows the Azure portal interface for the resource group 'rg-origem'. On the left, there's a navigation menu with options like Overview, Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings (Deployments, Security, Policies, Properties, Locks), and Cost Management. The main area is titled 'Essentials' and shows a table of resources. The table has columns for Name, Type, and Location. The resources listed are:

Name	Type	Location
rg-origem-vnet	Virtual network	North Europe
vmlabs1	Virtual machine	North Europe
vmlabs1-ip	Public IP address	North Europe
vmlabs1-nsg	Network security group	North Europe
vmlabs1611	Network Interface	North Europe
vmlabs1_disk1_dc2addf2e8bd46fb31aaa06...	Disk	North Europe

- A vm deve ser movido junto a todos os recursos no qual está atrelada
- Selecionamos o RG destino



The screenshot shows the 'Move resources' wizard. It has three steps: 1. Source + target (selected), 2. Resources to move, 3. Review. Step 1 shows the source information: Subscription (Azure subscription 1) and Resource group (rg-origem). Step 2 shows the target information: Subscription (Azure subscription 1) and Resource group * (rg-destino, highlighted with a red arrow). Step 3 is not visible in the screenshot.

- É efetuado uma validação, após todos estiverem ok podemos mover normalmente

The screenshot shows the 'Resources to move' step of the Azure Resource Move wizard. It lists five resources with their types, resource types, and validation status:

Name	Type	Resource type	Validation status
vmlabs1	Virtual machine	microsoft.compute/virtualmachines	Succeeded
vmlabs1-ip	Public IP address	microsoft.network/publicipaddresses	Succeeded
vmlabs1-nsg	Network security group	microsoft.network/networksecuritygroups	Succeeded
vmlabs1611	Network interface	microsoft.network/networkinterfaces	Succeeded
vmlabs1_disk1_dc2addf2e8bd46fb31aaa067...	Disk	microsoft.compute/disks	Succeeded

- No caso a vnet não precisa estar no mesmo RG, desde que esteja na mesma região
- Podemos mover normalmente, e a VM não precisará ser desligada

Notifications

The screenshot shows a notification in the Azure Notifications center. It indicates that 5 resources are being moved from 'rg-origem' to 'rg-destino' in 'Azure subscription 1'. The status is 'Running' and it occurred 'a minute ago'.

More events in the activity log → Dismiss all

☰ Moving resources Running ×

Moving 5 resources from resource group 'rg-origem' in subscription 'Azure subscription 1' to resource group 'rg-destino' in subscription 'Azure subscription 1'

a minute ago

The screenshot shows a Windows Server desktop environment. The taskbar includes icons for File Explorer, Task View, and Start. The Start menu shows a pinned item for 'Server Manager'. The desktop background is blue. The Server Manager dashboard is open, showing the 'WELCOME TO SERVER MANAGER' screen with 'QUICK START' steps and 'ROLES AND SERVER GROUPS' information. The system tray shows the date and time as '12:36 PM 2/15/2023'.

The screenshot shows the Azure portal interface for the resource group 'rg-destino'. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings (Deployments, Security, Policies, Properties, Locks), and Cost Management. The main area displays the 'Essentials' section with a table of resources. The table has columns for Name, Type, and Location. The resources listed are:

Name	Type	Location
vmlabs1	Virtual machine	North Europe
vmlabs1-ip	Public IP address	North Europe
vmlabs1-nsg	Network security group	North Europe
vmlabs1611	Network Interface	North Europe
vmlabs1_disk1_dc2addf2e8bd46fb31aaa067...	Disk	North Europe

- Embora seja possível não é recomendado realizar este procedimento em ambiente produtivo
- O Azure bloqueia qualquer operação nos recursos durante a movimentação

▼ Lab03 → Implantar e testar recursos locks

- Opção que permite com que os recursos sejam bloqueados para deletar ou restringido para leitura
- Lock delete → Bloqueia exclusão de recurso
- Lock Read Only → Somente leitura (restrito)
- Se aplicarmos o Lock no RG, o mesmo irá se propagar para os outros recursos

The screenshot shows the Azure portal interface for the resource group 'rg-origem'. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings (Deployments, Security, Policies, Properties, Locks), and Cost Management. The main area displays the 'Locks' blade, which is currently active. A modal window titled 'Add lock' is open, prompting for 'Lock name' (with the value 'NoDelete' highlighted by a red arrow), 'Lock type' (with the value 'Delete' selected from a dropdown menu highlighted by a red arrow), and 'Notes' (with the value 'Block-Deletes' highlighted by a red arrow). At the bottom of the modal are 'OK' and 'Cancel' buttons.

rg-origem | Locks

Lock name	Lock type	Scope	Notes
NoDelete	Delete	rg-origem	Block-Deletes

rg-origem-vnet | Locks

Lock name	Lock type	Scope	Notes
NoDelete	Delete	rg-origem	Block-Deletes

- Lock é herdável
- Aplicamos o lock para o RG origem, no qual só há uma vnet
- Criamos uma storage account no RG origem

rg-origem | Resource group

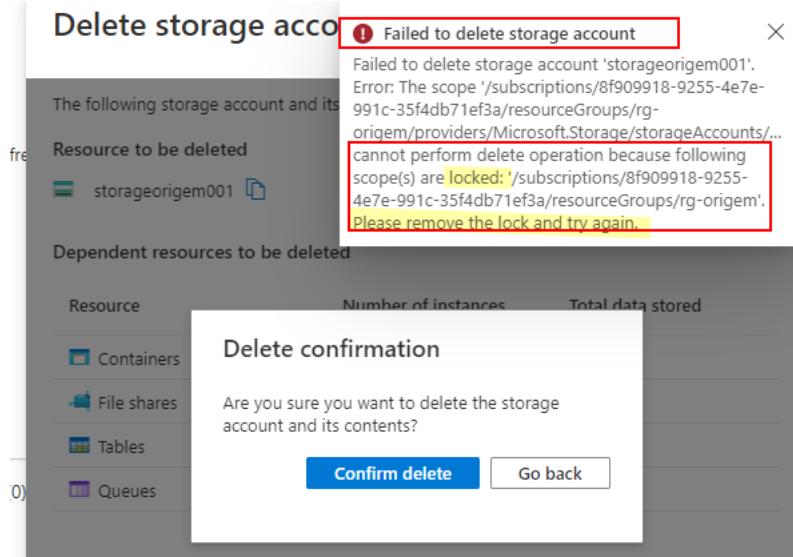
Name	Type	Location
rg-origem-vnet	Virtual network	North Europe
storageorigem001	Storage account	East US

- Se validarmos o lock do recurso criado, o lock vai estar lá, justamente por herdar do RG

storageorigem001 | Locks

Lock name	Lock type	Scope	Notes
NoDelete	Delete	rg-origem	Block-Deletes

- Para que possamos remover o recurso, o user adm precisa remover o lock do RG, caso o contrario teremos um erro ao tentar apagar o recurso



- A movimentação para outros RGs é possível, e após movimentarmos para o outro RG, podemos seguir com a exclusão normalmente caso não haja lock

Move resources ...
rg-origem

+ Add resources × Remove from the move list

1 Source + target 2 Resources to move 3 Review

Name	Type	Resource type	Validation status
storageorigem001	Storage account	microsoft.storage/storageaccounts	Succeeded

- Agora setando o lock read only, a movimentação não é possível

rg-origem | Locks ...
Resource group

Search + Add Subscription Refresh Feedback

Settings

- Deployments
- Security
- Policies
- Properties

Lock name	Lock t...	Scope	Notes
NoDelete	Delete	[rg-origem]	Block-Delete
ReadOnly	Read...	[rg-origem]	OnlyRead

- Com o lock de read only, não conseguimos fazer operação nos recursos, como ligar e desligar vm

- Se o storage account estiver com o lock não é possível acessar o access keys, que seria a chave que permite modificar externamente (fora do azure) o azure

- Sem Lock

- Com Lock

The screenshot shows the Azure Storage Access Keys page for the resource group 'storageorigem001'. The left sidebar lists various storage components: Data storage (Containers, File shares, Queues, Tables), Security + networking (Networking, Azure CDN), and a highlighted 'Access keys' section. The main area displays session details: Session ID (e7dfccb9604c4adda8aa10e499236f54), Extension (Microsoft_Azure_Storage), Error code (409), and a 'ScopeLocked' status message. Buttons for 'Get support' and 'Perform self-diagnostics' are also visible.

- Não é possível mover um recurso para um RG com lock de read only

The screenshot shows the 'Move resources' wizard in the Azure portal. It's step 2, 'Resources to move', where a virtual network named 'rg-origem-vnet' is selected. An error message states: 'Some resources couldn't be moved. Learn more.' Below the table, an error detail window shows the full error message: 'The scope '/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/resourceGroups/rg-destino/providers/Microsoft.Network/virtualNetworks/rg-origem-vnet' cannot perform write operation because following scope(s) are locked: '/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/resourceGroups/rg-destino'. Please remove the lock and try again. (Code: ScopeLocked)'.

▼ Lab04 → Instalar o visual studio code, Revisar um modelo ARM para implantar uma VM. Realizar o Deploy de uma VM a partir de um ARM template

- ARM → Azure Resource Manager
 - Tamplestes para criação de recursos dentro do azure, são em formatos JSON
 - Hj em dia é utilizado o **Bicep** para o desenvolvimento
 - Para IAC a linguagem mais famosa é a Terraform que serve para todas as clouds
- Download do VsCode

<https://code.visualstudio.com/>

- Vamos instalar o ARM Tools no plugin do VsCode



- No Azure podemos validar nos recursos o export do template, que seria o template do recurso

The screenshot shows the Azure portal interface for a resource group named 'rg-destino'. In the center, there's a modal window titled 'vmlabs1 | Export template' for a 'Virtual machine'. On the left, a sidebar lists various monitoring and diagnostic tasks. A red box highlights the 'Export template' button in the center of the modal. Another red box highlights the 'Template' tab in the modal. The main area displays the JSON template code for the virtual machine.

```

1  "$schema": "https://schema.management.azure.com/schemas/2019-04-01/
2  deploymentTemplate.json#",
3  "contentVersion": "1.0.0.0",
4  "parameters": {
5    "virtualMachines_vmlabs1_name": {
6      "defaultValue": "vmlabs1",
7      "type": "String"
8    },
9    "disks_vmlabs1_disk1_dc2addf2e8bd46fb31aaa067c7b4663_externalid": {
10       "defaultValue": "/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/
11       resourceGroups/RG-DESTINO/providers/Microsoft.Compute/disks/
12       vmlabs1_disk1_dc2addf2e8bd46fb31aaa067c7b4663",
13       "type": "String"
14     },
15     "networkInterfaces_vmlabs1611_externalid": {
16       "defaultValue": "/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/
17       resourceGroups/rg-destino/providers/Microsoft.Network/networkInterfaces/vmlabs1611",
18       "type": "String"
19     }
20   }
21 }
```

- São dois arquivos, um o template, e o outro os parâmetros
- Para usar um template não é ideal usar de um recurso já pronto, pois a atributos que são unicos, como id do storage, id do NIC, e isso é um problema pois ao criar a partir do template os atributos deverão ser substituídos

```

8   },
9   "disks_vmlabs1_disk1_dc2addf2e8bd46fb31aaa067c7b4663_externalid": {
10    "defaultValue": "/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/
11    resourceGroups/RG-DESTINO/providers/Microsoft.Compute/disks/
12    vmlabs1_disk1_dc2addf2e8bd46fb31aaa067c7b4663",
13    "type": "String"
14  },
15  "networkInterfaces_vmlabs1611_externalid": {
16    "defaultValue": "/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/
17    resourceGroups/rg-destino/providers/Microsoft.Network/networkInterfaces/vmlabs1611",
18    "type": "String"
19  }
20 }
```

- Ao criarmos uma VM por exemplo, podemos baixar o template antes de implantar

Create a virtual machine

Validation passed

Basics

Subscription	Azure subscription 1
Resource group	rg-origem
Virtual machine name	vm-template
Region	North Europe
Availability options	No infrastructure redundancy required
Security type	Standard
Image	Ubuntu Server 20.04 LTS - Gen2
VM architecture	x64
Size	Standard B1s (1 vcpu, 1 GiB memory)
Authentication type	Password
Username	luc4slabs
Public inbound ports	SSH
Azure Spot	No

Create < Previous Next > [Download a template for automation](#)



Template

[Download](#) [Add to library](#) [Deploy](#)

Automate deploying resources with Azure Resource Manager templates in a single, coordinated operation. Define resources and configurable input parameters and deploy with script or code. [Learn more about template deployment.](#)

Template **Parameters** **Scripts**

```

1  {
2    "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3    "contentVersion": "1.0.0.0",
4    "parameters": {
5      "location": {
6        "type": "string"
7      },
8      "networkInterfaceName": {
9        "type": "string"
10     },
11     "networkSecurityGroupName": {
12       "type": "string"
13     },
14     "networkSecurityGroupRules": {
15       "type": "array"
16     }
17   }
  
```

- Ao validarmos com o VsCode podemos validar os arquivos de parâmetros e o template em si
 - Parameters

```

1 {
2   "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentParameters.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "location": {
6       "value": "northeurope" ← Região
7     },
8     "networkInterfaceName": {
9       "value": "vm-template2" ← Nome do NIC
10    },
11    "networkSecurityGroupName": {
12      "value": "vm-template-ns" ← Nome do NSG
13    },
14    "networkSecurityGroupRules": {
15      "value": [
16        {
17          "name": "SSH",
18          "properties": {
19            "priority": 300,
20            "protocol": "TCP",
21            "access": "Allow",
22            "direction": "Inbound",
23            "sourceAddressPrefix": "*",
24            "sourcePortRange": "22",
25            "destinationAddressPrefix": "*",
26            "destinationPortRange": "22"
27          }
28        }
29      ]
30    },
31    "subnetName": {
32      "value": "default" ← Nome da subnet
33    },
34    "virtualNetworkId": {
35      "value": "/subscriptions/8f009198-9255-4e7e-991c-35f4db71ef3a/resourceGroups/rg-origem/providers/Microsoft.Network/virtualNetworks/rg-origem-vnet" ← Vnet que será alocado
36    },
37    "publicIpAddressName": {
38      "value": "vm-template-ip" ← IP
39    },
40    "publicIpAddressType": {
41      "value": "Static" ← Tipo de IP
42    },
43    "publicIpAddressSku": {
44      "value": "Standard" ← Tier
45    },
46  },
47}

```

- Template

```

1 {
2   "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": { ← No template será a configuração da VM, como tudo se encaixa para formar a vm.
5     "location": { ← Ele vai puxar os parametros referenciados do arquivo "parameters"
6       "type": "string" ← E vai add os mesmos nas variáveis, funções, e no recurso
7     },
8     "networkInterfaceName": {
9       "type": "string"
10    },
11    "networkSecurityGroupName": {
12      "type": "string"
13    },
14    "networkSecurityGroupRules": { ←
15      "type": "array"
16    },
17    "subnetName": {
18      "type": "string"
19    },
20    "virtualNetworkId": {
21      "type": "string"
22    },
23    "publicIpAddressName": {
24      "type": "string"
25    },
26    "publicIpAddressType": {
27      "type": "string"
28    },
29    "publicIpAddressSku": {
30      "type": "string"
31    },
32    "pipDeleteOption": {
33      "type": "string"
34    },
35    "virtualMachineName": {
36      "type": "string"
37    },
38    "virtualMachineComputerName": {
39      "type": "string"
40    },
41    "virtualMachineRc": {
42      "type": "string"
43    },
44    "osDiskType": {
45      "type": "string"
46    },
47    "osDiskDeleteOption": {
48      "type": "string"
49    }
50  }
51}

```

```

    "variables": {
        "nsId": "[resourceId(resourceGroup().name, 'Microsoft.Network/networkSecurityGroups', parameters('networkSecurityGroupName'))]",
        "vnetId": "[parameters('virtualNetworkId')]",
        "vnetName": "[last(split(variables('vnetid'), '/'))]",
        "subnetRef": "[concat(variables('vnetId'), '/subnets/', parameters('subnetName'))]"
    },
    "resources": [
        {
            "name": "[parameters('networkInterfaceName')]",
            "type": "Microsoft.Network/networkInterfaces",
            "apiVersion": "2021-08-01",
            "location": "[parameters('location')]",
            "dependsOn": [
                "[concat('Microsoft.Network/networkSecurityGroups/', parameters('networkSecurityGroupName'))]",
                "[concat('Microsoft.Network/publicIpAddresses/', parameters('publicIpAddressName'))]"
            ],
            "properties": {
                "ipConfigurations": [
                    {
                        "name": "ipconfig1",
                        "properties": {
                            "subnet": {
                                "id": "[variables('subnetRef')]"
                            },
                            "privateIPAllocationMethod": "Dynamic",
                            "publicIPAddress": {
                                "id": "[resourceId(resourceGroup().name, 'Microsoft.Network/publicIpAddresses', parameters('publicIpAddressName'))]",
                                "properties": {
                                    "deleteOption": "[parameters('pipDeleteOption')]"
                                }
                            }
                        }
                    }
                ],
                "networkSecurityGroup": {
                    "id": "[variables('nsId')]"
                }
            }
        },
        {
            "name": "[parameters('networkSecurityGroupName')]",
            "type": "Microsoft.Network/networkSecurityGroups",
            "apiVersion": "2019-02-01",
            "location": "[parameters('location')]",
            "properties": {
                "securityRules": "[parameters('networkSecurityGroupRules')]"
            }
        }
    ],
    "outputs": {
        "adminUsername": {
            "type": "string",
            "value": "[parameters('adminUsername')]"
        }
    }
}

```

```

    "outputs": {
        "adminUsername": {
            "type": "string",
            "value": "[parameters('adminUsername')]"
        }
    }
}

```

- Podemos armazenar nossos templates no repositório do azure devops , que no caso seria o ideal como boa pratica
- Mas no Azure podemos importar o templates no tamplate specs, por lá podemos fazer os deploys

The screenshot shows the Azure DevOps interface for managing template specifications. At the top, there's a header with 'Home > Template specs ... Microsoft'. Below the header, there's a search bar with a magnifying glass icon and a 'Search' placeholder. To the right of the search bar are filters for 'Resource group', 'Latest version', 'Last modified', and sorting options. At the top left, there are buttons for 'Import template', 'Create template spec' (which has a red arrow pointing to it), and 'Refresh'. A blue button labeled 'Scopes : 1 Selected' also has a red arrow pointing to it. The main area displays a table with one row, 'No results'.

Importing template ...

Basics Edit Template Tags Review + Create

Template Content:

```

1  {
2      "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3      "contentVersion": "1.0.0.0",
4      "parameters": {
5          "location": {
6              "type": "string"
7          },
8          "networkInterfaceName": {
9              "type": "string"
10         },
11         "networkSecurityGroupName": {
12             "type": "string"
13         },
14         "networkSecurityGroupRules": {
15             "type": "array"
16         },
17         "subnetName": {
18             "type": "string"
19         }
20     }
21 }
```

Template specs ...

Microsoft

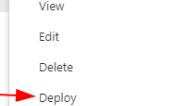
Import template Create template spec Refresh

Scopes : 1 Selected

Search

Name	Resource group	Latest version	Last modified
vm-template	rg-origem	1.0	

No caso subimos o template e podemos dar um deploy no mesmo para que a vm suba



Home > Template specs >

Deploy vm-tamplate (1.0) ...

Template spec

Instance details

Region * ⓘ (Europe) North Europe ✓

Location *

Network Interface Name *

Network Security Group Name *

Network Security Group Rules *

Subnet Name *

Virtual Network Id *

Public Ip Address Name *

Public Ip Address Type *

Public Ip Address Sku *

Como não adicionamos o arquivo parameters, ele irá pedir para especificar cada uma das informações faltantes

Review + create < Previous Next : Review + create >

- Podemos criar ou implantar também através do custom deployments que seria o local mais ideal
 - Por lá podemos pegar ttemplates já prontos do Github

Custom deployment ...

Deploy from a custom template

[Build your own template in the editor](#)

Common templates

- [Create a Linux virtual machine](#)
- [Create a Windows virtual machine](#)
- [Create a web app](#)
- [Create a SQL database](#)
- [Azure landing zone](#)

Start with a quickstart template or temp

Template source ⓘ

100-blank-template

application-workloads/active-directory/active-directory-new-domain-ha-2-dc-zo...

application-workloads/active-directory/active-directory-new-domain-ha-2-dc

application-workloads/active-directory/active-directory-new-domain-module-use

application-workloads/active-directory/active-directory-new-domain

application-workloads/active-directory/create-ad-forest-with-subdomain

application-workloads/airflow/airflow-postgres-app-services

application-workloads/airflow/mongodb-sharded-on-centos

application-workloads/apache/apache2-on-ubuntu-vm

application-workloads/apache/ubuntu-apache-test-page

Type to start filtering...

Quickstart template (disclaimer) ⓘ

- Por lá podemos fazer o deploy de nosso código

Custom deployment ...

Deploy from a custom template

Select a template Basics Review + create

Automate deploying resources with Azure Resource Manager templates in a single, coordinated way. Select a template below to get started. [Learn more about template deployment](#)

[Build your own template in the editor](#)

Common templates

- No caso criamos a vm linux através do custom template

The screenshot shows the 'Edit template' interface in the Azure portal. At the top, there are buttons for '+ Add resource', 'Quickstart template', 'Load file' (which is highlighted with a red box), and 'Download'. Below these is a code editor containing the following JSON template:

```

1 {
2   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {},
5   "resources": []
6 }

```

At the bottom of the editor are 'Save' and 'Discard' buttons.

The screenshot shows the 'Custom deployment' interface. It includes sections for 'Template' (Customized template.rst, 4 resources), 'Edit template', 'Edit parameters' (with a red arrow pointing from the previous screenshot), and 'Visualize'. The 'Project details' section shows a subscription dropdown set to 'Azure subscription 1' and a resource group dropdown set to 'rg-origin'. A note on the right states: 'No caso subimos o template apenas mas podemos adicionar os parametros no proprio custom deployment'. The 'Instance details' section includes fields for Region (Region * (Europe) North Europe), Location (Location *), and Network Interface Name (Network Interface Name *). At the bottom are 'Review + create' and 'Next : Review + create >' buttons.

The screenshot shows the 'Edit parameters' interface. It features a 'Load file' button and a code editor with the same JSON template as above. A red arrow points from the 'Load file' button to a file browser window titled 'Área de Trabalho > template'. The browser shows a folder structure with 'parameters' and 'template' files selected. The file browser has standard controls like 'Organizar', 'Nova pasta', 'Pesquisar em template', and buttons for 'Abrir' and 'Cancelar'.

Deploy from a custom template

Region *	East US
Location *	northeurope
Network Interface Name *	vm-template52
Network Security Group Name *	vm-template-nsg
Network Security Group Rules *	[{"name": "SSH", "properties": {"priority": 300, "protocol": "TCP", "access": "All..."}]
Subnet Name *	default
Virtual Network Id *	/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/resourceGroup...
Public Ip Address Name *	vm-template-ip
Public Ip Address Type *	Static
Public Ip Address Sku *	Standard
Pip Delete Option *	Detach

Após adicionarmos todas as informações pendentes serão preenchidas

- Só temos que especificar o RG, que é obrigatório

Custom deployment ...

Deploy from a custom template

Validation Passed

Select a template Basics Review + create

Summary

 Customized template
4 resources

Terms

[Azure Marketplace Terms](#) | [Azure Marketplace](#)

By clicking "Create," I (a) agree to the applicable legal terms associated with the offering; charge or bill my current payment method for the fees associated the offering(s), includi same billing frequency as my Azure subscription, until I discontinue use of the offering(s); deployment involves 3rd party offerings, Microsoft may share my contact information ar deployment with the publisher of that offering.

Microsoft assumes no responsibility for any actions performed by third-party templates ; third-party products or services. See the [Azure Marketplace Terms](#) for additional terms.

[Create](#)

< Previous

Next >

Microsoft.Template-20230215135625 | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview

Your deployment is complete

Deployment name: Microsoft.Template-202302... Start time: 2/15/2023, 1:56:36 PM
 Subscription: Azure subscription 1 Correlation ID: e8227bf2-8977-43e8-b75b-631584d1a6
 Resource group: rg-origem

Deployment details

Resource	Type	Status	Operation details
vm-template	Microsoft.Compute/vir...	OK	Operation details
vm-template52	Microsoft.Network/net...	Created	Operation details
vm-template-ip	Microsoft.Network/pu...	OK	Operation details
vm-template-nsg	Microsoft.Network/net...	OK	Operation details

Next steps

[Go to resource group](#)

rg-origem | Resource group

Search Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Move Delete

Filter for any field... Type equals all Location equals all Add filter

Showing 1 to 6 of 6 records. Show hidden types No grouping List view

Name	Type	Location
ra-origem-vnet	Virtual network	North Europe
vm-template	Virtual machine	North Europe
vm-template-ip	Public IP address	North Europe
vm-template-nsg	Network security group	North Europe
vm-template52	Network Interface	North Europe
vm-template_disk1_b298a38612f742fb6257928d4104262	Disk	North Europe

```

lucassvertare@DESKTOP-2AEKE0L:/usr/local/bin$ ssh luc4slabs@68.219.231.139
The authenticity of host '68.219.231.139 (68.219.231.139)' can't be established.
ECDSA key fingerprint is SHA256:8NeLcUzNTuOsclENmerGnTVdEjRXqiafokO0PdSG3PA.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '68.219.231.139' (ECDSA) to the list of known hosts.
luc4slabs@68.219.231.139's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-1033-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

 System information as of Wed Feb 15 17:01:48 UTC 2023

 System load:  0.01           Processes:          104
 Usage of /:   5.2% of 28.89GB  Users logged in:     0
 Memory usage: 30%           IPv4 address for eth0: 10.0.0.5
 Swap usage:   0%

 * Introducing Expanded Security Maintenance for Applications.
 Receive updates to over 25,000 software packages with your
 Ubuntu Pro subscription. Free for personal use.

 https://ubuntu.com/azure/pro

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

luc4slabs@vm-template:~$
```

▼ Lab05 → Instalar PowerShell e criando um RG e uma Vnet

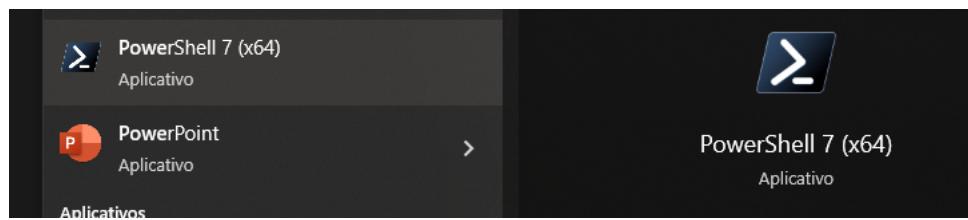
Installing PowerShell on Windows - PowerShell

Information about installing PowerShell on Windows

 <https://learn.microsoft.com/en-us/powershell/scripting/install/installing-powershell-on-windows?view=powershell-7.3>



- Tanto para linux quanto para macos podemos instalar o power shell, no caso o sistema core
- A versão recomendada pelo a ms é o 7.0.6, 7.1.4 em diante



- Podemos instalar o power shell 7 no qual cria um novo item, e se assemelha ao

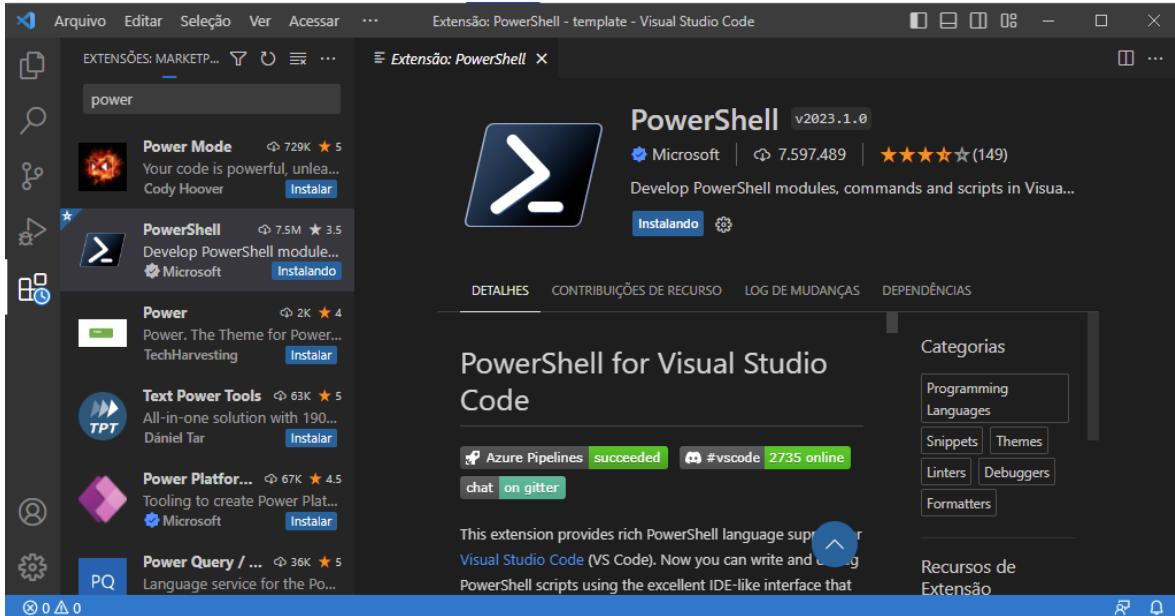
- Validar versão do Powershell → `$PSVersionTable.PSVersion`

```
PS C:\Users\LucasSantos> $PSVersionTable.PSVersion
Major  Minor  Patch  PreReleaseLabel BuildLabel
-----  -----  -----  -----
7      3       2      
```

- Precisaremos instalar os modulos do azure após verificar as versões do power shell
- Instalar o módulo de PowerShell → `Install-Module -Name Az -AllowClobber`

```
PS C:\Users\LucasSantos> Install-Module -Name Az -AllowClobber
Untrusted repository
You are installing the modules from an untrusted repository. If you trust this repository, change its
InstallationPolicy value by running the Set-PSRepository cmdlet. Are you sure you want to install the modules from
'PSGallery'?
[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "N"): a
Installing package 'Az' [Installing dependent package 'Az.Compute']
  Installing package 'Az.Compute' [Copying unzipped package to 'C:\Users\LucasSantos\AppData\Local\Temp\1516673435\A.]
```

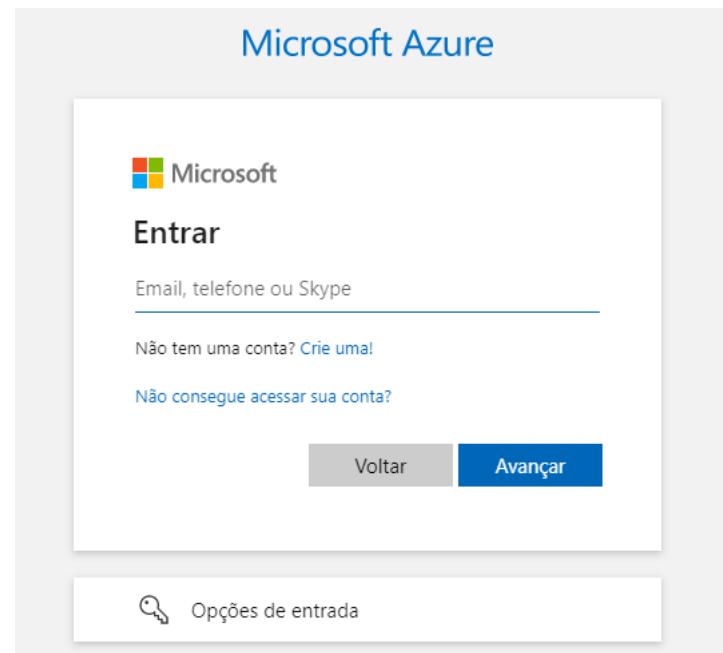
- Instalamos o powershell da ms no nosso VsCode



- Com a extensão no vscode o mesmo irá identificar os comandos de powershell, assim podemos usar o Run select para rodar o comando no texto (Ou usar o F8 também)

```
Bem-vindo powershellmode 1
C:\> Users > LucasSantos > Desktop > powershellmode > ...
1 TASK01
2 #Validar versão do Powershell:
3 $PSVersionTable.PSVersion
4
5
6 #Instalar o módulo de PowerShell:
7 Install-Module -Name Az -AllowClobber
8
9 Acessar sua subscrição do Azure:
10 Connect-AzAccount
11 #Atualizar seu módulo
12 Update-Module -Name Az
13
14 #Importar Módulo
15 Import-Module Az
16
17 TASK02
18 #Criar Resource Group
19 New-AzResourceGroup
20
21 #Criar uma VNET:
22 $virtualNetwork = New-AzVirtualNetwork
23 -ResourceGroupName "ResourceGroup01"
24 -Location "northeurope"
25 -Name "vnet-az1"
26 -AddressPrefixes "10.0.0.0/16"
27
28 #Adicionar uma Subnet
29 $subnetConfig = New-AzSubnet
30 -Name "sub-az10"
31 -AddressPrefix "10.0.1.0/24"
32 -VirtualNetwork $virtualNetwork
33
34 #Setar a Subnet
35 $virtualNetwork | Set-AzVirtualNetwork
36
```

- Acessar sua subscrição do Azure → `Connect-AzAccount`
 - Vai abrir uma tela de login para se conectar



```
● PS C:\Users\LucasSantos\Desktop\template> Connect-AzAccount
  Account          SubscriptionName   TenantId          Environment
  -----          -----           -----          -----
lucasbcontato@outlook.com Azure subscription 1 66f08d27-3a12-4294-b585-cd4fa3b578e4 AzureCloud
○ PS C:\Users\LucasSantos\Desktop\template> [
```

- Atualizar seu módulo de PowerShell → `Update-Module -Name Az`
 - Como instalamos agora, não será necessário realizar updates do modulo
- Importar Módulo Azure → `Import-Module Az`
- As regiões podem ser verificadas no azure tracks

Current Azure Region Names -- Reference

How do you get the name of a region to use in CLI or PowerShell for Azure coding? If you do a lot of CLI or PowerShell coding you will want to know the region names that you can reference for any region specific code you write. In this article I show you how easy it is to find the reference name to

<https://azuretracks.com/2021/04/current-azure-region-names-reference/>



- No power shell trabalhamos sempre com as variáveis, no caso jogamos uma informação na variável para que na hora de rodar um comando, rode com a variável ao invés de toda a informação
- Criar Resource Group → `New-AzResourceGroup -Name "rg-labaz104" -Location "northeurope" -Tag @{Modulo="MOD03"}`

```
PS C:\Users\LucasSantos\Desktop\template> New-AzResourceGroup -Name "rg-labaz104" -Location "northeurope" -Tag @{Modulo="MOD03"}

ResourceGroupName : rg-labaz104
Location         : northeurope
ProvisioningState : Succeeded
Tags             :
  Name   Value
  ===== ==
    Modulo MOD03

ResourceId       : /subscriptions/8f09918-9255-4e7e-991c-35f4db71ef3a/resourceGroups/rg-labaz104
```

Resource groups ⚙️ ...

luc4slabs

[Create](#) [Manage view](#) [Refresh](#) [Export to CSV](#) [Open query](#) [Assign tags](#)

Filter for any field... [Subscription equals all](#) [Location equals all](#) [Add filter](#)

[Unsecure resources](#) [Recommendations](#) [No grouping](#)

<input type="checkbox"/> Name ↑↓	Subscription ↑↓	Location ↑↓
<input type="checkbox"/> cloud-shell-storage-eastus	Azure subscription 1	East US
<input type="checkbox"/> NetworkWatcherRG	Azure subscription 1	South Africa North
<input type="checkbox"/> rg-destino	Azure subscription 1	North Europe
<input checked="" type="checkbox"/> rg-labaz104	Azure subscription 1	North Europe
<input type="checkbox"/> rg-origem	Azure subscription 1	North Europe

- Criar uma VNET (Primeiro armazenamos os parametros em uma variavel antes de utilizarmos o set para a criação da vnet) →

```
$virtualNetwork = New-AzVirtualNetwork -ResourceGroupName "rg-labaz104"
-Location "northeurope" -Name "vnet-az104"
-AddressPrefix 10.3.0.0/16
```

```
PS C:\Users\LucasSantos\Desktop\template> $virtualNetwork = New-AzVirtualNetwork ` 
    -ResourceGroupName "rg-labaz104" ` 
    -Location "northeurope" ` 
    -Name "vnet-az104" ` 
    -AddressPrefix 10.3.0.0/16
PS C:\Users\LucasSantos\Desktop\template>
```

- Adicionar uma Subnet (Primeiro armazenamos os parametros em uma variavel antes de utilizarmos o set para a criação da vnet) →

```
$subnetConfig = Add-AzVirtualNetworkSubnetConfig -Name "sub-az104"
-AddressPrefix 10.3.0.0/24
-VirtualNetwork $virtualNetwork
```

```
PS C:\Users\LucasSantos\Desktop\template> $subnetConfig = Add-AzVirtualNetworkSubnetConfig ` 
    -Name "sub-az104" ` 
    -AddressPrefix 10.3.0.0/24 ` 
    -VirtualNetwork $virtualNetwork
WARNING: Upcoming breaking changes in the cmdlet 'Add-AzVirtualNetworkSubnetConfig' :
Update Property Name
Cmdlet invocation changes :
Old Way : -ResourceId
New Way : -NatGatewayId
Update Property Name
Cmdlet invocation changes :
Old Way : -InputToObject
New Way : -NatGateway
Note : Go to https://aka.ms/azps-changewarnings for steps to suppress this breaking change warning, and other information on breaking changes in Azure PowerShell.
```

- Setar a Subnet criada na VNET existe → `$virtualNetwork | Set-AzVirtualNetwork`

```

PS C:\Users\LucasSantos\Desktop\template> $virtualNetwork | Set-AzVirtualNetwork

Name          : vnet-az104
ResourceGroupName : rg-labaz104
Location       : northeurope
Id             : /subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/resourceGroups/rg-labaz104/providers/Microsoft.Network/virtualNetworks/vnet-az104
Etag           : W/"215ff39-bc3b-43f5-879b-02365f569629"
ResourceGuid    : 05c38662-28fb-4217-b27a-47a0d8d94d5b
ProvisioningState : Succeeded
Tags          : {}
AddressSpace   : {
    "AddressPrefixes": [
        "10.3.0.0/16"
    ]
}
DhcpOptions    : {
    "DnsServers": []
}
FlowTimeoutInMinutes : null
Subnets        : [
    {
        "Delegations": [],
        "Name": "sub-az104",
        "Etag": "W/"215ff39-bc3b-43f5-879b-02365f569629"",
        "Id": "/subscriptions/8f909918-9255-4e7e-991c-35f4db71ef3a/resourceGroups/rg-labaz104/providers/Microsoft.Network/virtualNetworks/vnet-az104/subnets/sub-az104",
        "AddressPrefix": [
            "10.3.0.0/24"
        ],
        "IpConfigurations": [],
        "ServiceAssociationLinks": [],
        "ResourceNavigationLinks": [],
        "ServiceEndpoints": [],
        "ServiceEndpointPolicies": [],
        "PrivateEndpoints": [],
        "ProvisioningState": "Succeeded",
        "PrivateEndpointNetworkPolicies": "Disabled",
        "PrivateLinkServiceNetworkPolicies": "Enabled",
        "IpAllocations": []
    }
]
VirtualNetworkPeerings : []
EnabledDdosProtection : false
DdosProtectionPlan   : null
ExtendedLocation     : null

```

The screenshot shows the Azure portal interface. At the top, there's a navigation bar with a search bar, 'Create', 'Manage view', 'Delete resource group', 'Refresh', 'Export to CSV', and a 'JSON' button. Below the bar, the 'Essentials' section is expanded, showing 'Resources' and 'Recommendations'. A filter bar allows filtering by 'Type' (all), 'Location' (all), and adding a 'List view' filter. One record is shown: 'vnet-az104' (Virtual network, North Europe). This item is highlighted with a red border.

Below this, a sub-section titled 'vnet-az104 | Subnets' is displayed. It has a similar navigation bar with 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Resource visualizer', and 'Events'. The 'Overview' tab is selected. A table lists one subnet: 'sub-az104' with IP range '10.3.0.0/24' and 251 available IPs.

▼ Lab06 → Crie um grupo de Recursos e uma VNet com o Az Powershell

- Iremos criar uma VM e associar aos recursos já criados no rg-labaz104

The screenshot shows the Azure portal interface for a resource group named 'rg-labaz104'. The left sidebar lists various management options like Activity log, Access control (IAM), Tags, Resource visualizer, Events, Deployments, Security, Policies, Properties, and Locks. The main content area is titled 'Essentials' under 'Resources'. It displays a table with one record: 'vnet-az104' (Virtual network) located in North Europe. A red box highlights the search bar at the top and the entry 'vnet-az104' in the table.

- No caso sempre iremos declarar as variaveis aos utilizarmos os modulos do azure no powershell
- Sempre que tiver o \$+string = variavel

```
# Variables for common values
$resourceGroup = "rg-labaz104"
.setLocation = "northeurope"
$vmName = "vm-tftec-ps"
$vnet = "vnet-az104"
$subnet = "sub-az104"
```

- No caso podemos atribuir a variáveis comando no qual usaremos para deixar o script alinhado

A screenshot of a PowerShell window. The command shown is:

```
# Create a public IP address and specify a DNS name
$pip = New-AzPublicIpAddress -ResourceGroupName $resourceGroup -Location $location ^
-Name "vmps01pip" -AllocationMethod Dynamic
```

The variable assignment '\$resourceGroup' is highlighted with a green box and labeled 'Variavel'. The entire command line is labeled 'Comando para criar IP'.

- Comandos em variaveis podem puxar outras variaveis

```
# Create a public IP address (parameter) -ResourceGroupName $resourceGroup
$pip = New-AzPublicIpAddress -ResourceGroupName $resourceGroup -Location $location ^
-Name "vmps01pip" -AllocationMethod Dynamic
```

- Primeiramente declaramos as variáveis com os nomes que utilizaremos

```
$resourceGroup = "rg-labaz104"
$location = "northeurope"
$vmName = "vm-labsaz104"
$vnet = "vnet-az104"
$subnet = "sub-az104"
```

- Próximo passo será declarar as variáveis com os comandos
 - Criar o user object (User e password da VM)

```
# Create user object
$cred = Get-Credential -Message "Enter a username and password for the virtual machine."
```

- Criação do IP publico e um DNS

```
# Create a public IP address and specify a DNS name
$pip = New-AzPublicIpAddress -ResourceGroupName $resourceGroup -Location $location `
```

-Name "vm01pip" -AllocationMethod Dynamic

- Irá pegar a variavel do RG, juntamente com a variavel da localização + variavel da subnet

- Criação de uma regra de permissão inbound no NSG na porta 3389(RDP)

```
# Create an inbound network security group rule for port 3389
$nsgRuleRDP = New-AzNetworkSecurityRuleConfig -Name AllowRDP -Protocol Tcp `
```

-Direction Inbound -Priority 1000 -SourceAddressPrefix * -SourcePortRange * -DestinationAddressPrefix * `

-DestinationPortRange 3389 -Access Allow

- Criação de um NSG

```
# Create a network security group
$nsg = New-AzNetworkSecurityGroup -ResourceGroupName $resourceGroup -Location $location `
```

-Name "vm01nsg" -SecurityRules \$nsgRuleRDP

- Ira pegar a variavel do RG + localização + a regra de liberação do NSG

- Pegar as propriedades da subnet, para especificar a vnet utilizada + combinação com a subnet.

```
#Get the subnet details for the specified virtual network + subnet combination.
$azureVnetSubnet = (Get-AzVirtualNetwork -Name $vnet -ResourceGroupName $resourceGroup).Subnets | Where-Object {$_ .Name -e
```

- Irá pegar a variavel da vnet + RGs

- No caso será para pegar o ID da subnet para que possamos jogar na variável de criação de NIC

- Criação de um NIC + associação com o IP publico

```
# Create a virtual network card and associate with public IP address and NSG
$nic = New-AzNetworkInterface -Name "vm01nic" -ResourceGroupName $resourceGroup -Location $location `
```

-SubnetId \$azureVnetSubnet.Id -PublicIpAddressId \$pip.Id -NetworkSecurityGroupId \$nsg.Id

- Irá pegar o RG + Localização + IDSubnet + IP publico + NSG

- Configuração da VM

```
# Create a virtual machine configuration
$vmConfig = New-AzVMConfig -VMName $vmName -VMSize Standard_B2S | `
```

Set-AzVMOperatingSystem -Windows -ComputerName \$vmName -Credential \$cred | `

Set-AzVMSourceImage -PublisherName MicrosoftWindowsServer -Offer WindowsServer -Skus 2022-Datacenter -Version latest | `

Add-AzVMNetworkInterface -Id \$nic.Id

- Pegar a variavel com o nome da vm

- Pegar a credential

- Publisher → Empresa (MS, canonical, suse etc.)

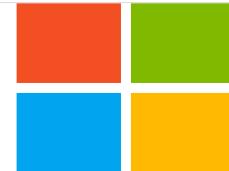
- Offer → SO

- SKUs → versão

Supported VM SKUs for Azure Policy - Azure Backup

An article describing the supported VM SKUs (by Publisher, Image Offer and Image SKU) which are supported for the built-in Azure Policies provided by Backup

 <https://learn.microsoft.com/en-us/azure/backup/backup-azure-policy-supported-skus>

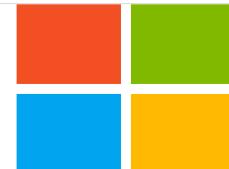


- VMsize é o tamanho da VM

VM sizes - Azure Virtual Machines

Lists the different sizes available for virtual machines in Azure.

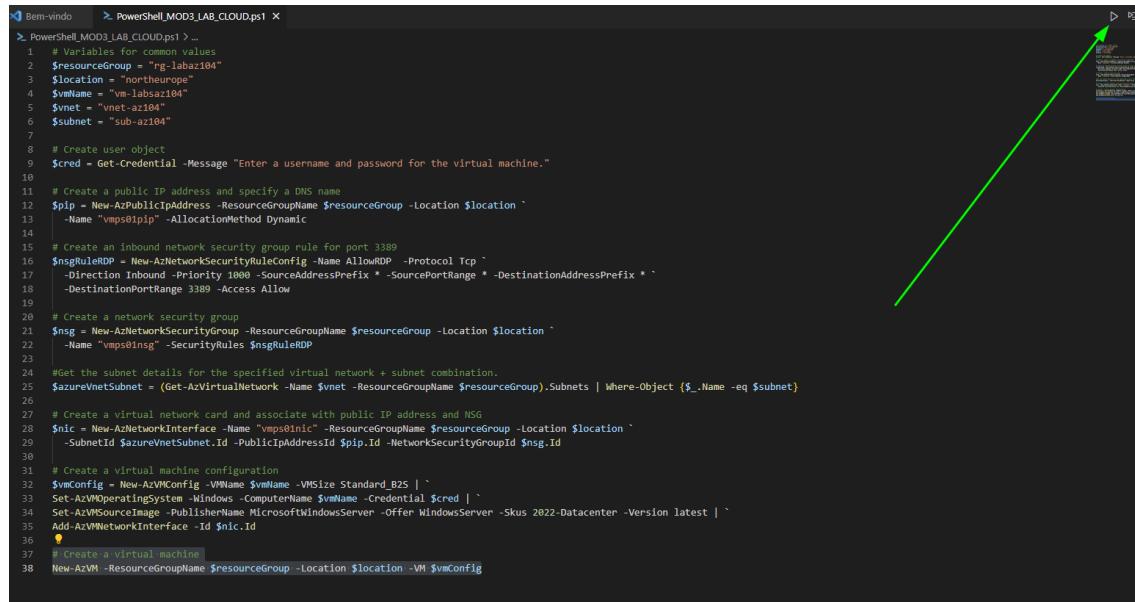
 <https://learn.microsoft.com/en-us/azure/virtual-machines/sizes>



- Por fim utilizamos o comando de criação da vm que é bem simples, mas sempre vai precisar as declarações dos parâmetros nas variáveis

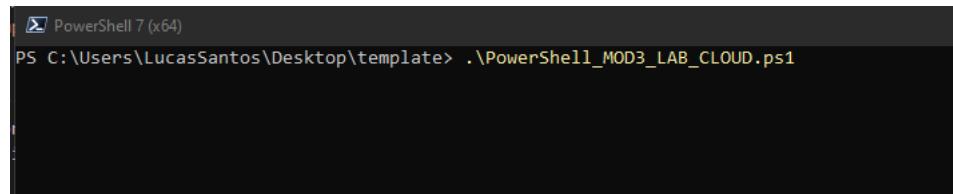
```
# Create a virtual machine
New-AzVM -ResourceGroupName $resourceGroup -Location $location -VM $vmConfig
```

- No caso invés de rodarmos comando por comando, podemos rodar diretamente no VsCode ou através do powershell



```
Bem-vindo > PowerShell_MOD3_LAB_CLOUD.ps1 > ...
1 # Variables for common values
2 $resourceGroup = "rg-labaz104"
3 $location = "northeurope"
4 $vmName = "vm-labaz104"
5 $vnet = "vnet-az104"
6 $subnet = "sub-az104"
7
8 # Create user object
9 $cred = Get-Credential -Message "Enter a username and password for the virtual machine."
10
11 # Create a public IP address and specify a DNS name
12 $pip = New-AzPublicIpAddress -ResourceGroupName $resourceGroup -Location $location `
13 -Name "vmpso1ip" -AllocationMethod Dynamic
14
15 # Create an inbound network security group rule for port 3389
16 $nsgruleRDP = New-AzNetworkSecurityRuleConfig -Name AllowRDP -Protocol Tcp `
17 -Direction Inbound -Priority 1000 -SourceAddressPrefix * -SourcePortRange * `
18 -DestinationPortRange 3389 -Access Allow
19
20 # Create a network security group
21 $nsg = New-AzNetworkSecurityGroup -ResourceGroupName $resourceGroup -Location $location `
22 -Name "vmpso1nsg" -SecurityRules $nsgruleRDP
23
24 #Get the subnet details for the specified virtual network + subnet combination.
25 $azureVnetSubnet = (Get-AzVirtualNetwork -Name $vnet -ResourceGroupName $resourceGroup).Subnets | Where-Object {$_._Name -eq $subnet}
26
27 # Create a virtual network card and associate with public IP address and NSG
28 $nic = New-AzNetworkInterface -Name "vmpso1nic" -ResourceGroupName $resourceGroup -Location $location `
29 -SubnetId $azureVnetSubnet.Id -PublicIpAddressId $pip.Id -NetworkSecurityGroupId $nsg.Id
30
31 # Create a virtual machine configuration
32 $vmConfig = New-AzVMConfig -VMName $vmName -VMSize Standard_B2S | `
33 Set-AzVMOperatingSystem -Windows -ComputerName $vmName -Credential $cred | `
34 Set-AzVMSourceImage -PublisherName MicrosoftWindowsServer -Offer WindowsServer -Skus 2022-Datacenter -Version latest | `
35 Add-AzVMNetworkInterface -Id $nic.Id
36
37 # Create a virtual machine
38 New-AzVM -ResourceGroupName $resourceGroup -Location $location -VM $vmConfig
```

- Para rodar o comando é sempre .\nome do script.ps1



- Para este experimento rodaremos pelo powershell

```

PS C:\Users\LucasSantos\Desktop\template> Unblock-File .\PowerShell_M003_LAB_CLOUD.ps1
PS C:\Users\LucasSantos\Desktop\template> .\PowerShell_M003_LAB_CLOUD.ps1
PowerShell credential request
User: luc4slabs_admin
Password for user luc4slabs_admin: *****

WARNING: Upcoming breaking changes in the cmdlet 'New-AzPublicIpAddress':
Default behaviour of Zone will be changed
Cmdlet invocation changes :
Old Way : Sku = Standard means the Standard Public IP is zone-redundant.
New Way : Sku = Standard and Zone = {} means the Standard Public IP has no zones. If you want to create a zone-redundant Public IP address, please specify all the zones in the region. For example [1, 2, 3].
It is recommended to use parameter '-Sku Standard' to create new IP address. Please note that it will become the default behavior for IP address creation in the future.
Note : Go to https://aka.ms/azps-changewarnings for steps to suppress this breaking change warning, and other information on breaking changes in Azure PowerShell.

```

- No caso ele vai criar um storage account para boot
- Por fim, validamos se todos os recursos foram criados

RequestId	IsSuccess	Status	StatusCode	ReasonPhrase
	True	OK	OK	

PS C:\Users\LucasSantos\Desktop\template>

Home > Resource groups >

rg-labaz104 Resource group

Search

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

Policies

Properties

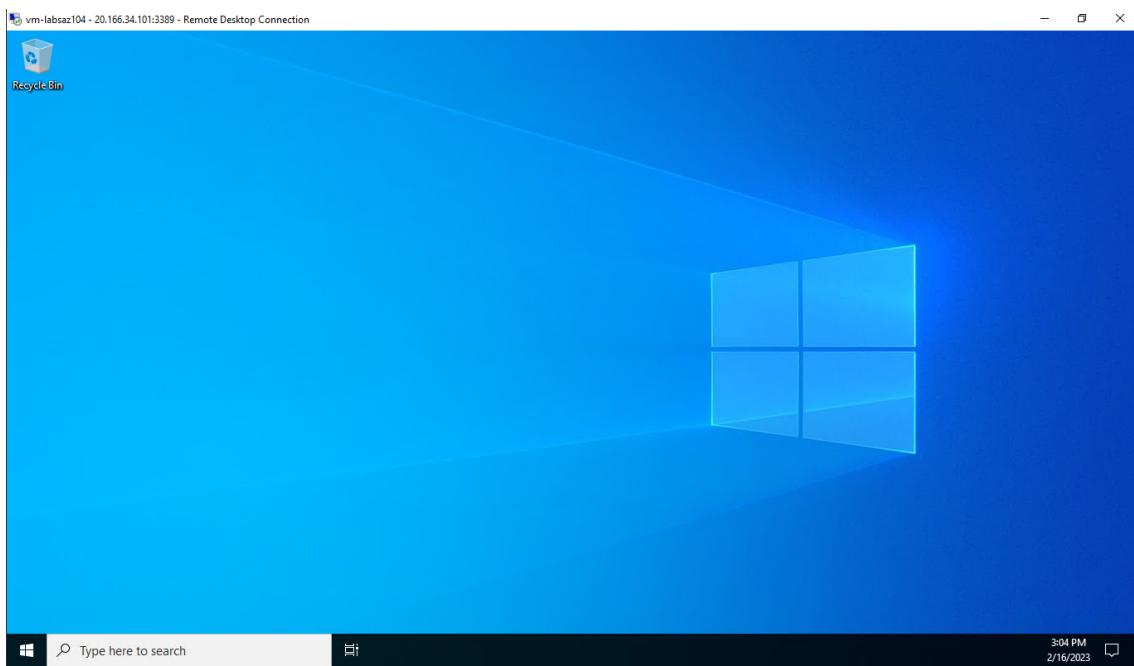
Locks

+ Create Manage view Delete resource group Refresh Export to CSV Open query ...

Filter for any field... Type equals all Location equals all Add filter

Showing 1 to 7 of 7 records. Show hidden types ⓘ No grouping List view

Name	Type	Location
azurerglabvml021611360	Storage account	North Europe
vm-labaz104	Virtual machine	North Europe
vm-labaz104_OsDisk_1_b2dece7201f4b409fa539b13a...	Disk	North Europe
vmps01nic	Network Interface	North Europe
vmps01nsg	Network security group	North Europe
vmps01pip	Public IP address	North Europe
vnet-az104	Virtual network	North Europe



▼ Lab07 → Instalando o Azure CLI e criando recursos

- Diferença do PowerShell para o Azure CLI são as instruções, ou seja a forma que rodamos os comandos
- No Azure PowerShell temos as opções de abrir ele como PowerShell ou Bash, em Bash seria o formato Azure CLI,
- Azure CLI pode ser usado nos 3 principais tipos de sistemas operacionais
- A versão recomendada para download será sempre a LTS
- O mesmo pode ser instalado pelo link abaixo:

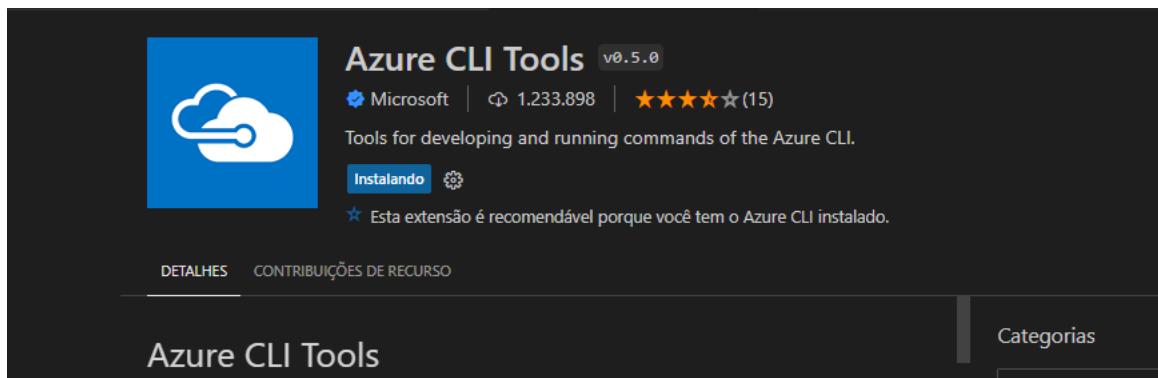
How to install the Azure CLI

The Azure CLI is available to install in Windows, macOS and Linux environments. It can also be run in a Docker container and Azure Cloud Shell.

<https://learn.microsoft.com/en-us/cli/azure/install-azure-cli>

A Microsoft logo consisting of four colored squares (red, green, blue, yellow) is positioned to the right of the text.

- No caso vamos instalar a seguinte extensão em nosso VsCode



- O símbolo \$ indica que representa comandos em Bash
- Para declarar as variáveis não precisam do \$ na frente

```
admin$ password=teste@123|
```

- Somente no comando que adicionarmos o \$ para chamar a variável
- Todos os comando CLI irão começar o az

```
az network public-ip create --re  
az network nsg create --resource  
az network nic create --resource  
az vm create --resource-group "r  
az vm open-port --port 3389 --re
```

- Em seguida será o tipo de recurso

```
az network public-ip create --resource-gro  
az network nsg create --resource-group "rg  
az network nic create --resource-group "rg  
az vm create --resource-group "rg-labscli-  
az vm open-port --port 3389 --resource-gro
```

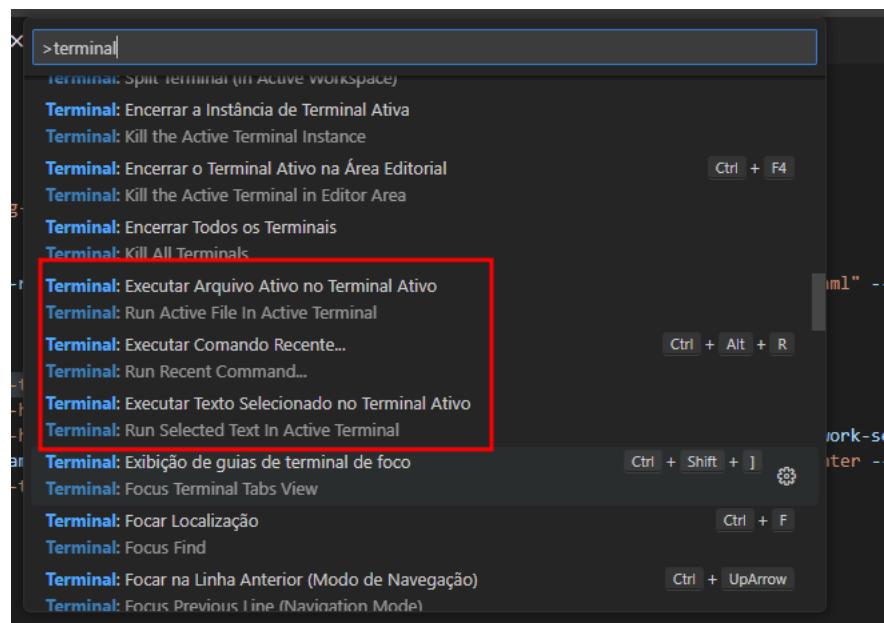
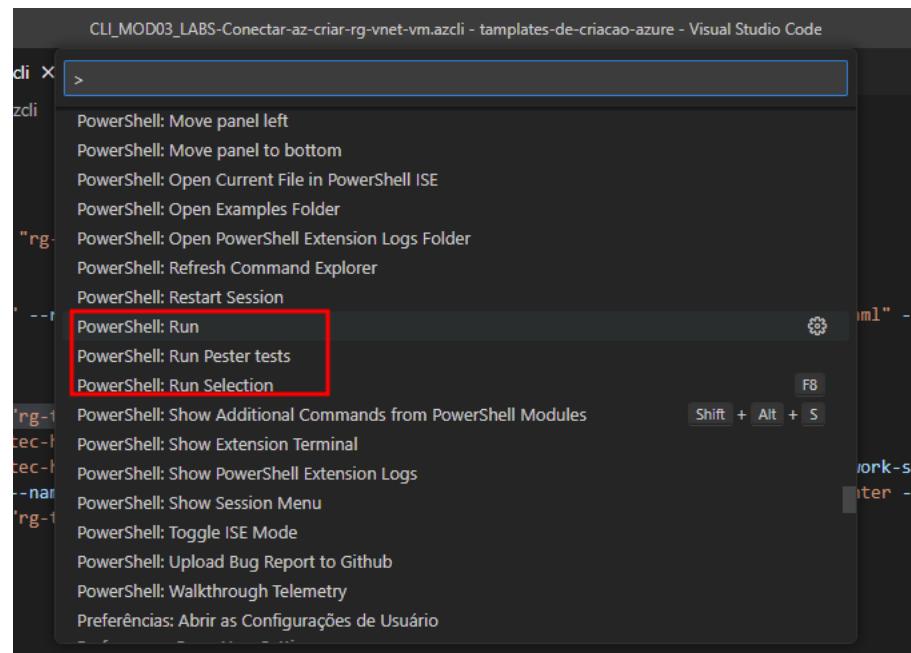
- E por fim o que ele quer fazer

```
az network public-ip create --resource-gro  
az network nsg create --resource-group "rg  
az network nic create --resource-group "rg  
az vm create --resource-group "rg-labscli-  
az vm open-port --port 3389 --resource-gro
```

- As flags são necessárias para definir os parâmetros (nome, grupo de recurso, tipo de imagem etc.)

```
#Criar uma VNET e uma Subnet:  
az network vnet create --name "vnet-labscli-hml" --resource-group "rg-labscli-hml" --address-prefix 10.4.0.0/16 --subnet-name "sub-hml" --subnet-prefix 10.4.0.0/24
```

- No caso para executarmos todos os comandos através do vscode, precisamos atribuir através de viewer a execução via powershell ou via terminal



- Ou juntamente com a extensão que instalamos, salvamos ele como .azcli, que irá identificar como shellscript

CLI_MOD03_LABS-Conectar-az-criar-rg-vnet-vm.azcli - ta

- Após esse procedimento rodamos o run code in terminal

```
#Acessar sua subscrição do Azure:
az login

#Criar Resource Group:
az group create --location northeurope --name "rg-labscli-hml" --tags "Modulo=MOD03"

#Criar uma VNET e uma Subnet:
az network vnet create --name "vnet-labscli-hml" --resource-group "rg-labscli-hml" --address-prefix 10.4.0.0/16 --subnet-name "sub-hml" --subnet-size 256

az network public-ip create --resource-group "rg-labscli-hml" --name "vmcli01pip"
az network nsg create --resource-group "rg-labscli-hml" --name "vmcli01nsg"
az network nic create --resource-group "rg-labscli-hml" --name "vmcli01nic" --vnet-name "vnet-labscli-hml" --subnet "sub-hml" --network-security-group "vmcli01nsg"
az vm create --resource-group "rg-labscli-hml" --name "vm-cli01" --location northeurope --nics "vmcli01nic" --image win2019datacenter --admin-user labuser --admin-password !L@b$u3r
az vm open-port --port 3389 --resource-group "rg-labscli-hml" --name "vm-cli01"
```

Alterar Todas as Ocorrências Ctrl+F2
Refatorar... Ctrl+Shift+R
Run Line in Editor Ctrl+Shift+~
Run Line in Terminal Ctrl+~
Recortar Ctrl+X
Copiar Ctrl+C
Colar Ctrl+V
Adicionar à Inspeção
Paleta de Comandos... Ctrl+Shift+P

- O AZ Cli sempre trará mais informações do que o powershell
- A execução via CLI é um pouco mais lenta que a modalidade powershell
- Porém ambas conseguem chegar ao mesmo resultado
- No script Az Cli, vamos criar um grupo de recurso

```
#Criar Resource Group:
az group create --location northeurope --name "rg-labscli-hml" --tags "Modulo=MOD03"az network vnet create --name "vnet-labscli-hml"
```

- Uma vnet com subnet

```
#Criar uma VNET e uma Subnet:
az network vnet create --name "vnet-tftec-hml" --resource-group "rg-tftec-hml" --address-prefix 10.4.0.0/16 --subnet-name "sub-hml"
```

- Um public IP

```
az network public-ip create --resource-group "rg-labscli-hml" --name "vmcli01pip"
```

- Um NSG

```
az network nsg create --resource-group "rg-labscli-hml" --name "vmcli01nsg"
```

- Uma NIC

```
az network nic create --resource-group "rg-labscli-hml" --name "vmcli01nic" --vnet-name "vnet-labscli-hml" --subnet "sub-hml" --net-work-security-group "vmcli01nsg"
```

- Uma vm

```
az vm create --resource-group "rg-labscli-hml" --name "vm-cli01" --location northeurope --nics "vmcli01nic" --image win2019datacenter
```

- E uma regra de open port

```
az vm open-port --port 3389 --resource-group "rg-labscli-hml" --name "vm-clio1"
```

- Executado o script

```
PS C:\Users\LucasSantos\Desktop\templates-de-criacao-azure> az login
A web browser has been opened at https://login.microsoftonline.com/organizations/oauth2/v2.0/authorize. Please continue the login in the web browser. If no web browser is available or if the web browser code flow with az login --use-device-code
The following tenants don't contain accessible subscriptions. Use 'az login --allow-no-subscriptions' to have tenant level access.
2d89796a-ec3e-4769-9227-5e80315ca63d [Diretório Padão]

{
    "cloudName": "AzureCloud",
    "homeTenantId": "6ff0f8d27-3a12-4294-b585-cd4fa3b578e4",
    "id": "bf9e9918-9255-4e7e-991c-35f4db71ef3a",
    "isDefault": true,
    "managedTenants": [],
    "name": "Azure Resource Group 1",
    "state": "Enabled",
    "tenantId": "6ff0f8d27-3a12-4294-b585-cd4fa3b578e4",
    "user": {
        "name": "lucasbscontate@outlook.com",
        "type": "user"
    }
}

PS C:\Users\LucasSantos\Desktop\templates-de-criacao-azure>
PS C:\Users\LucasSantos\Desktop\templates-de-criacao-azure> az group create --location northeurope --name "rg-tftec-hml" --tags "Modulo-M0083"
{
    "id": "/subscriptions/bf9e9918-9255-4e7e-991c-35f4db71ef3a/resourceGroups/rg-tftec-hml",
    "location": "northeurope",
    "managedBy": null,
    "name": "rg-tftec-hml",
    "properties": {
        "provisioningState": "Succeeded"
    },
    "tags": {
        "Modulo": "M0083"
    },
    "type": "Microsoft.Resources/resourceGroups"
}

PS C:\Users\LucasSantos\Desktop\templates-de-criacao-azure>
PS C:\Users\LucasSantos\Desktop\templates-de-criacao-azure> az network vnet create --name "vnet-tftec-hml" --resource-group "rg-tftec-hml" --address-prefix 10.4.0.0/16 --subnet-name "sub-hml" --subnet-encryption-supported null --workload-type null
],
"provisioningState": "Succeeded",
"resourceGroup": "rg-labscli-hml",
"resourceGuid": "b617e68-22ec-4741-9598-0b2ef9d70bd7",
"securityRules": [
    {
        "access": "Allow",
        "description": null,
        "destinationAddressPrefix": "*",
        "destinationAddressPrefixes": [],
        "destinationApplicationSecurityGroups": null,
        "destinationPortRange": "3389",
        "destinationPortRanges": [],
        "direction": "Inbound",
        "etag": "W/\"4404d022-a2ec-43bb-ae25-e00561bd654c\"",
        "id": "/subscriptions/bf9e9918-9255-4e7e-991c-35f4db71ef3a/resourceGroups/rg-labscli-hml/providers/Microsoft.Network/networkSecurityGroups/vmcli01nsg/securityRules/open-port-3389",
        "name": "open-port-3389",
        "priority": 900,
        "protocol": "*",
        "provisioningState": "Succeeded",
        "resourceGroup": "rg-labscli-hml",
        "sourceAddressPrefix": "*",
        "sourceAddressPrefixes": [],
        "sourceApplicationSecurityGroups": null,
        "sourcePortRange": "*",
        "sourcePortRanges": [],
        "type": "Microsoft.Network/networkSecurityGroups/securityRules"
    }
],
"subnets": null,
"tags": null,
"type": "Microsoft.Network/networkSecurityGroups"
}
PS C:\Users\LucasSantos\Desktop\templates-de-criacao-azure>
```

- E validamos se subiu todos os recursos

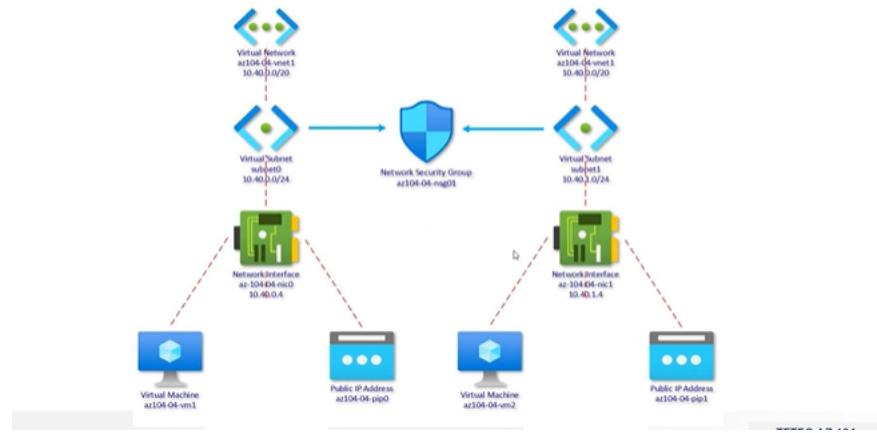
The screenshot shows the Azure portal interface for the resource group "rg-labscli-hml". The "Essentials" blade is active, displaying a list of resources. The resources listed are:

Name	Type	Location
vm-cli01	Virtual machine	North Europe
vmcli01_disk1_4ed57ed5005b4651932d5b4d749339f5	Disk	North Europe
vmcli01nic	Network Interface	North Europe
vmcli01nsg	Network security group	North Europe
vmcli01pip	Public IP address	North Europe
vnet-labscli-hml	Virtual network	North Europe

Below the portal, a screenshot of a Windows Server desktop shows the Start menu and taskbar. The Start menu is open, and the taskbar includes icons for Microsoft Edge, File Explorer, Task Manager, and Control Panel.

▼ Virtual Networking

- A estrutura abaixo será a que utilizaremos para a criação de nossa infraestrutura básica de rede



▼ Lab01 → Crie um RG, uma VNet e duas subnets

Resource Group	
Setting	Value
Resource Group	RG-MOD04
Region	East US 2

VNET	
Setting	Value
Vnet Name	az104-04-vnet1
Region	East US 2
Address	10.40.0.0/20

Subnet0	
Setting	Value
Subnet Name	subnet0
Address	10.40.0.0/24

Subnet1	
Setting	Value
Subnet Name	subnet1
Address	10.40.1.0/24

- Criaremos primeiramente o RG

rg-mod04

Resource group

Search

Create Manage view Delete resource group Refresh Export to CSV Open query

Overview

Activity log Access control (IAM) Tags Resource visualizer Events

Subscription (move)
Azure subscription 1

Deployment count
1 Succeeded

Subscription ID
8f909918-9255-4e7e-991c-35f4db71ef3a

Location
East US 2

Tags (edit)
modulo : 04

- Em seguida como primeiro recurso criamos a vnet

The screenshot shows the 'Create virtual network' wizard in the Azure portal. The 'Basics' tab is selected. At the top, there's a breadcrumb navigation: Home > Resource groups > rg-mod04 > Marketplace >. Below it is the title 'Create virtual network' with a close button. The main area has tabs: Basics (selected), Security, IP addresses, Tags, and Review + create. A note says 'to organize and manage all your resources.' Below this, 'Subscription' is set to 'Azure subscription 1' and 'Resource group' is set to 'rg-mod04'. There's also a 'Create new' link. Under 'Instance details', 'Virtual network name' is 'az104-04-vnet1' and 'Region' is '(US) East US 2'. A 'Deploy to an edge zone' link is present. At the bottom, there are 'Previous' and 'Next' buttons, a 'Review + create' button (which is blue), and a 'Give feedback' link.

- Em segurança temos alguns recursos opcionais para a vnet
 - A conexão via bastion é exigida que haja uma subnet reservada para ele, conexões via bastion são as mais seguras por ser uma acesso dentro do backbone da azure

The screenshot shows optional security settings for the virtual network creation wizard. It includes sections for 'Azure Bastion' and 'Azure DDoS Network Protection'.

Azure Bastion
Azure Bastion provides secure RDP/SSH connectivity to your virtual machines directly in the Azure portal over SSL. When you connect via Azure Bastion, your virtual machines do not need a public IP address. [Learn more.](#)

Enable Azure Bastion

Azure DDoS Network Protection
Azure DDoS Network Protection is a paid service that offers enhanced DDoS mitigation capabilities via adaptive tuning, attack notification, and telemetry to protect against the impacts of a DDoS attack for all protected resources within this virtual network. [Learn more.](#)

Enable Azure DDoS Network Protection

- DDos protection Standard é a mais avançada para, por padrão já temos o basic, mais utilizado para aplicações web
- Podemos habilitar o serviço de firewall para que proteja a rede como um todo

Azure Firewall

Azure Firewall is a managed cloud-based network security service that protects your Azure Virtual Network resources. [Learn more.](#)

Enable Azure Firewall [\(i\)](#)

- Por padrão o address vem como 10.0.0.0/16 para a vnet, vamos utilizar conforme especificado, criaremos também a subnet

Subnets	IP address range	Size	NAT gateway
default	10.0.0.0 - 10.0.0.255	/24 (256 addresses)	-

Add an IP address space

The address space for a virtual network has one or more non-overlapping address ranges. It is recommended to use private (RFC 1918), shared (RFC 6598), or local (RFC 4193) address ranges. [Learn more.](#)

Address space type (i)	<input checked="" type="radio"/> IPv4 <input type="radio"/> IPv6
Starting address (i) *	10.40.0.0
Address space size (i) *	/20 (4096 addresses)
IP address space (i)	10.40.0.0 - 10.40.15.255 (4096 addresses)

Create virtual network

Basics Security IP addresses Tags Review + create

The screenshot shows the 'IP addresses' tab of the 'Create virtual network' wizard. At the top, there's a header with tabs: Basics, Security, IP addresses (which is selected), Tags, and Review + create. Below the header, a large text input field contains the IP address range '10.40.0.0/20'. To the right of this field is a button labeled '+ Add a subnet'. A list of subnets is displayed below, with two entries highlighted by a green box:

Subnets	IP address range	Size	NAT gateway
subnet0	10.40.0.0 - 10.40.0.255	/24 (256 addresses)	-
subnet1	10.40.1.0 - 10.40.1.255	/24 (256 addresses)	-

- Por fim seguimos com o created]
- Com a VNet criada podemos adicionar mais se necessário

The screenshot shows the 'Subnets' blade for the 'az104-04-vnet1' virtual network. At the top, there's a header with tabs: Overview, Activity log, Access control (IAM), and Tags. Below the header, there's a search bar and several action buttons: Subnet, Gateway subnet, Refresh, Manage users, and a delete icon. A table lists the subnets:

Name ↑↓	IPv4 ↑↓	IPv6 ↑↓
subnet0	10.40.0.0/24	-

- Os endpoints para a subnet ser o ponto isolado de um serviço

subnet0

az104-04-vnet1

Route table

None

SERVICE ENDPOINTS

Create service endpoint policies to allow traffic to specific Azure resources from your virtual network over service endpoints. [Learn more](#)

Services ⓘ

0 selected

Filter services

Select all

Microsoft.AzureActiveDirectory

Microsoft.AzureCosmosDB

Microsoft.CognitiveServices

Microsoft.ContainerRegistry

Microsoft.EventHub

Microsoft.KeyVault

Save **Cancel**

- Podemos deixar a subnet privada para alguns tipos de serviços

SUBNET DELEGATION

Delegate subnet to a service ⓘ

None

None

Microsoft.AISupercomputer/accounts/jobs

Microsoft.AISupercomputer/accounts/models

Microsoft.AISupercomputer/accounts/npu

Microsoft.ApiManagement/service

Microsoft.Apollo/npu

None

- Address space podemos alterar, ou adicionar mais um range para a vnet

az104-04-vnet1 | Address space

The address space for a virtual network is composed of one or more non-overlapping address ranges that are specified in CIDR notation. An address range you define can be public or private (RFC 1918). Learn more

Address space	Address range	Address count
10.40.0.0/20	10.40.0.0 - 10.40.15.255	4096
Add additional address range		

Peered virtual network address space

Peering name	Peer to	Address space	Address range
No results.			

- Connected devices serão adicionadas as NICs conforme formos criando

az104-04-vnet1 | Connected devices

Virtual network

Search

Refresh

Search connected devices

Device ↑↓	Type ↑↓	IP Address ↑↓	Sub
No results.			

- Em diagram podemos ver como está ficando a nossa estrutura de rede

az104-04-vnet1 | Diagram

Virtual network

Search

Download topology

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Try our new Topology experience which offers visualization of Azure resources for ease of inventory management and monitoring network at scale. Leverage it to visualize resources and their dependencies across subscriptions, regions, and locations. Click to navigate to the experience

Subscription: Azure subscription 1

Resource Group: rg-mod04

Virtual Network: az104-04-vnet1

```

graph TD
    VNet[az104-04-vnet1] --- Subnet0[subnet0]
    VNet --- Subnet1[subnet1]
    Subnet0 --- Host0[Host]
    Subnet1 --- Host1[Host]
  
```

▼ Lab02 → Configurar NSG

NSG	
Setting	Value
NSG	az104-04-nsg01
Resource Group	RG-MOD04
Region	East US 2
Associate	subnet0
Associate	subnet1

- O NSG será anexado para as duas subnets
- Por padrão os NSGs são criados a partir da NIC da VM
- Mas a melhor prática é na frente da subnet

Network security group ⋮

Microsoft

Network security group Add to Favorites

Microsoft | Azure Service

★ 4.1 (406 ratings)

Plan

Network security group ⋮ Create

Deploy with Resource Manager (change to Classic)

Overview Plans Usage Information + Support Ratings + Reviews

- Seguiremos com a criação de modo default conforme as requisições

Create network security group ⋮

Basics Tags Review + create

Project details

Subscription * Azure subscription 1

Resource group * rg-mod04 Create new

Instance details

Name * az104-04-nsg01

Region * East US 2

Validation passed

Basics Tags Review + create

Basics

Subscription	Azure subscription 1
Resource group	rg-mod04
Region	East US 2
Name	az104-04-nsg01

Tags

Modulo	04
--------	----

Create < Previous Next > Download a template for automation

- Agora com o NSG criado vamos adicionar as subnets

az104-04-nsg01 | Subnets Network security group

Search Associate

Search subnets

Name	Address range	Virtual network
No results.		

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Inbound security rules Outbound security rules Network interfaces Subnets Properties



az104-04-nsg01 | Subnets

Network security group

Search Associate

Name	Address range	Virtual network
subnet0	10.40.0.0/24	az104-04-vnet1
subnet1	10.40.1.0/24	az104-04-vnet1

- NSG só se associa a subnet e as NICs das vms
- É possível criar duas camadas de NSG na frente da subnet e na frente da vm (na NIC). Assim sempre que ocorrer recebimento de pacotes inbound, o pacote bate no NSG da subnet, e em seguida no da VM
- Na vnet>diagrama, podemos ver como está ficando nossa estrutura de rede

az104-04-vnet1 | Diagram

Virtual network

Search Download topology Give feedback

Try our new Topology experience which offers visualization of Azure resources for ease of inventory management monitoring network at scale. Leverage it to visualize resources and their dependencies across subscriptions, regions, locations. Click to navigate to the experience.

Virtual Network az104-04-vnet1

▼ Lab03 → Implantar vms na vnet

- Seguiremos com a criação das vms, e das nics que irão apontar para as subnets
- Usaremos template para que seja criada as duas vms

```

az104-04-vms-parameters.json      az104-04-vms-template.json
C: > Users > LucasSantos > Desktop > Az104-mod4-network-vms-implanting > az104-04-vms-template.json

1  {
2    "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3    "contentVersion": "1.0.0.0",
4    Select or create a parameter file to enable full validation...
5    "parameters": {
6      "vmSize": {
7        "type": "string",
8        "defaultValue": "Standard_B2s",
9        "metadata": {
10          "description": "VM size"
11        }
12      },
13      "vm0Name": {
14        "type": "string",
15        "defaultValue": "az104-04-vm0",
16        "metadata": {
17          "description": "VM0 name"
18        }
19      },
20      "vm1Name": {
21        "type": "string",
22        "defaultValue": "az104-04-vm1",
23        "metadata": {
24          "description": "VM1 name"
25        }
26      },
27      "adminUsername": {
28        "type": "string",
29        "metadata": {
30          "description": "Admin username"
31        }
32      },
33      "adminPassword": {
34        "type": "securestring",
35        "metadata": {
36          "description": "Admin password"
37        }
38      },
39      "virtualNetworkName": {
40        "type": "string",
41        "defaultValue": "az104-04-vnet1",
42        "metadata": {
43          "description": "Virtual network name"
44        }
45      }
46    },
47    "variables": {
48      "vm0Name": "[parameters('vm0Name')]"
49    }
50  }

```

- Iremos rodar via script, através do powershell

```

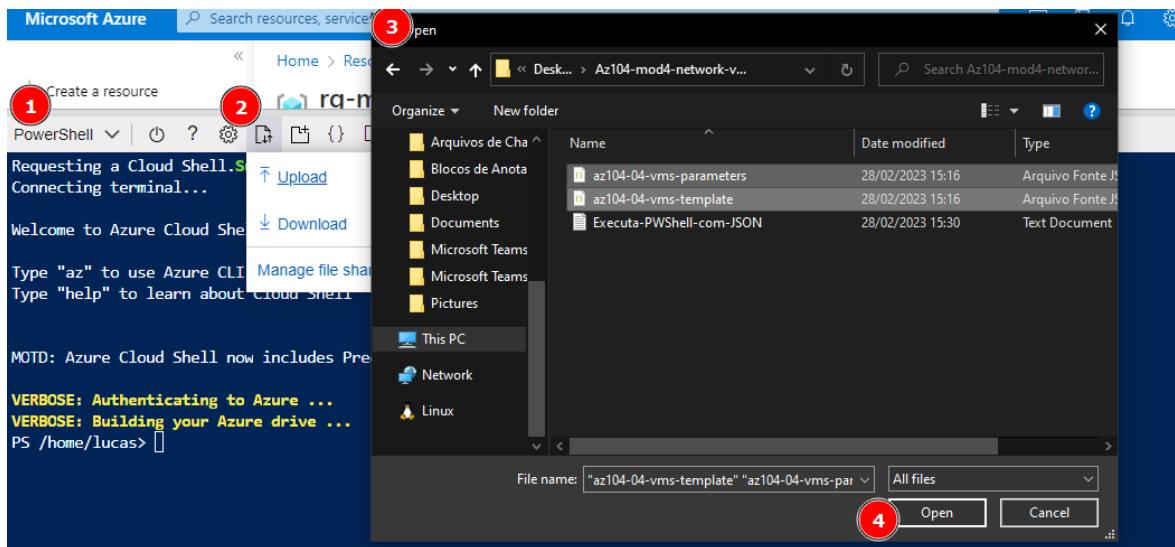
$rgName = 'rg-mod04'

New-AzResourceGroupDeployment -ResourceGroupName $rgName` 
-TemplateFile $HOME/az104-04-vms-template.json` 
-TemplateParameterFile $HOME/az104-04-vms-parameters.json

```

- Através do portal mesmo entramos no cloudshell, e carregamos os arquivos para o cloudshell

Name	Type	Location
az104-04-nsg01	Network security group	East US 2
az104-04-vnet1	Virtual network	East US 2



```
PS /home/lucas> dir
Directory: /home/lucas

UnixMode User Group LastWriteTime Size Name
---- -- - - - -
lwxrwxrwx lucas lucas 2/28/2023 18:27 22 clouddrive -> /usr/csuser/clouddrive
drwxr-xr-x lucas lucas 2/6/2023 20:56 4096 Microsoft
-rw-r--r-- lucas lucas 2/28/2023 18:34 372 az104-04-vms-parameters.json
-rw-r--r-- lucas lucas 2/28/2023 18:34 8248 az104-04-vms-template.json
-rw-r--r-- lucas lucas 2/6/2023 21:01 434 customrbac.json

PS /home/lucas>
```

- Iremos usar o powershell chamando o tamplate JSON
- Por fim rodamos o script de criação

```
PS /home/lucas> New-AzResourceGroupDeployment ` 
>>   -ResourceGroupName $rgName ` 
>>   -TemplateFile $HOME/az104-04-vms-template.json ` 
>>   -TemplateParameterFile $HOME/az104-04-vms-parameters.json
```

```
PS /home/lucas> New-AzResourceGroupDeployment
>> -ResourceGroupName $rgName
>> -TemplateFile $HOME/az104-04-vms-template.json
>> -TemplateParameterFile $HOME/az104-04-vms-parameters.json
```

```
DeploymentName      : az104-04-vms-template
ResourceGroupName   : rg-mod04
ProvisioningState   : Succeeded
Timestamp          : 2/28/2023 6:42:56 PM
Mode                : Incremental
TemplateLink        :
Parameters          :
:
Name                Type             Value
=====
vmSize              String           "Standard_B2s"
vm0Name              String           "az104-04-vm0"
vm1Name              String           "az104-04-vm1"
adminUsername        String           "Admin104"
adminPassword        SecureString      null
virtualNetworkName  String           "az104-04-vnet1"

Outputs              :
DeploymentLogLevel  :
```

- Agora validaremos se deu certo

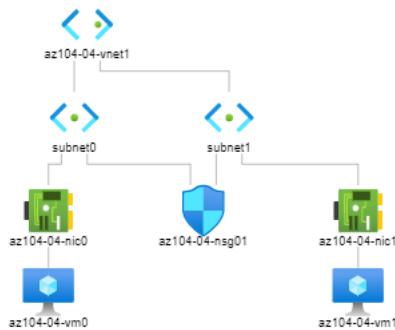
The screenshot shows the Azure portal interface for the 'rg-mod04' resource group. The left sidebar contains navigation links like Overview, Activity log, Access control (IAM), Tags, Resource visualizer, Events, Deployments, Security, Policies, Properties, Locks, and Cost Management. The main area has tabs for 'Essentials' and 'Resources'. Under 'Resources', there's a search bar, filter options, and a list of 8 resources. The resources listed are: 'az104-04-nic0' (Network Interface), 'az104-04-nic1' (Network Interface), 'az104-04-nsg01' (Network security group), 'az104-04-vm0' (Virtual machine), 'az104-04-vm0_OsDisk_1_95d10e94e88b4995b535e04f7...', 'az104-04-vm1' (Virtual machine), and 'az104-04-vm1_OsDisk_1_13c5d1301304432hh15127f22...'. The first four resources ('az104-04-nic0', 'az104-04-nic1', 'az104-04-nsg01', and 'az104-04-vm0') are highlighted with red boxes.

- Podemos ver através da vnet que as NICs se encontram conectadas conforme configurado no template

The screenshot shows the Azure portal's 'Connected devices' page for a virtual network. The left sidebar lists navigation options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Address space, and Connected devices (which is selected and highlighted with a red box). The main area displays a table of connected devices:

Device	Type	IP Address	Subnet
az104-04-nic0	Network interface	10.40.0.4	subnet0
az104-04-nic1	Network interface	10.40.1.4	subnet1

- Como não temo um IP público ainda não conseguimos acessar, mas iremos seguir com a criação para que seja possível o acesso.
- Podemos ver através do diagrama como nossa arquitetura está ficando



▼ Lab04 → Configurar IP público e privado nas VMs do azure

Setting	Value
Name	az104-04-pip0
SKU	Standard

Setting	Value
Name	az104-04-pip1
SKU	Standard

- Seguiremos com a criação dos IPs públicos para que possamos acessar
- Fazemos a configuração diretamente na NIC

az104-04-nic0 Network interface

Overview

Activity log

Access control (IAM)

Tags

Settings

IP configurations

DNS servers

Tags (edit) : Click here to add tags

Private IPv4 address : 10.40.0.4
Public IPv4 address : [REDACTED]
Private IPv6 address : -
Public IPv6 address : -
Attached to : az104-04-vm0 (Virtual machine)
Type : Regular

- O serviço de DHCP é atuado pelo azure por padrão
- O azure sempre irá reservar os 4 primeiros IPs, liberando o quinto em diante
 - Portando o azure pega 10.0.0.0, 1, 2, 3, seguindo dos hosts para o 4 em diante

Private IPv4 address : 10.40.0.4

- O IP atribuído a uma vm sempre será por padrão de forma dinamica, acessando o IP podemos alterar de dinamico para estatico

az104-04-nic0 | IP configurations Network interface

Overview

Activity log

Access control (IAM)

Tags

Settings

IP configurations

DNS servers

Network security group

Properties

Locks

Monitoring

+ Add Save Discard Refresh

IP forwarding settings

IP forwarding Disabled Enabled

Virtual network az104-04-vnet1

IP configurations Subnet * subnet0

Name	IP Version	Type	Private IP address	Public IP address
ipconfig1	IPv4	Primary	10.40.0.4 (Dynamic)	-

ipconfig1 az104-04-nic0

Save Discard

Public IP address settings

Public IP address Disassociate Associate

Private IP address settings

Virtual network/subnet az104-04-vnet1/subnet0

Assignment Dynamic Static

IP address 10.40.0.4

- Nas configurações do IP podemos associar diretamente o IP publico, criando um e já atribuindo em nossa NIC

The screenshot shows the Azure portal interface for managing network interfaces. At the top, it displays 'ipconfig1' and 'az104-04-nic0'. Below this, there are 'Save' and 'Discard' buttons. The main section is titled 'Public IP address settings' and contains a 'Public IP address' field with two buttons: 'Disassociate' and 'Associate'. The 'Associate' button is highlighted with a red box and a red arrow points from it to a 'Create new' link below the dropdown menu. The dropdown menu itself is titled 'Choose public IP address'. A modal window titled 'Add a public IP address' is overlaid on the page. It contains fields for 'Name *' (az104-04-pip0), 'SKU *' (Basic selected, Standard available), and 'Assignment' (Dynamic selected, Static available). The 'OK' button is visible at the bottom of the modal.

- O SKU standard sempre criará um IP static, já o basic podemos optar pelo dynamic

The screenshot shows the 'Add a public IP address' modal window. It has fields for 'Name *' (az104-04-pip0), 'SKU *' (Basic selected, Standard available), and 'Assignment *' (Dynamic selected, Static available). The 'Dynamic' radio button under 'Assignment' is highlighted with a red box. At the bottom are 'OK' and 'Cancel' buttons.

- Efetuamos para as duas NICs

az104-04-nic0

- Resource group (move) : rg-mod04
- Location (move) : East US 2
- Subscription (move) : Azure subscription 1
- Subscription ID : 8f909918-9255-4e7e-991c-35f4db71ef3a
- Accelerated networking : Disabled
- Virtual network/Subnet : az104-04-vnet1/subnet0
- Private IPv4 address : 10.40.0.4
- Public IPv4 address : 20.230.63.218 (az104-04-pip0)
- Type : Regular

az104-04-nic1

- Resource group (move) : rg-mod04
- Location (move) : East US 2
- Subscription (move) : Azure subscription 1
- Subscription ID : 8f909918-9255-4e7e-991c-35f4db71ef3a
- Accelerated networking : Disabled
- Virtual network/Subnet : az104-04-vnet1/subnet1
- Tags (edit) : Click here to add tags
- Private IPv4 address : 10.40.1.4
- Public IPv4 address : 20.122.165.214 (az104-04-pip1)
- Type : Regular

- Se validarmos na NIC a mesma não irá apontar as regras lá do nosso NSG, que no caso está atrelado as subnets

az104-04-nic0 | Network security group

- Network security group : None

- Mas se formos no networking da VM e veremos que a mesma já possui as regras do NSG da subnet

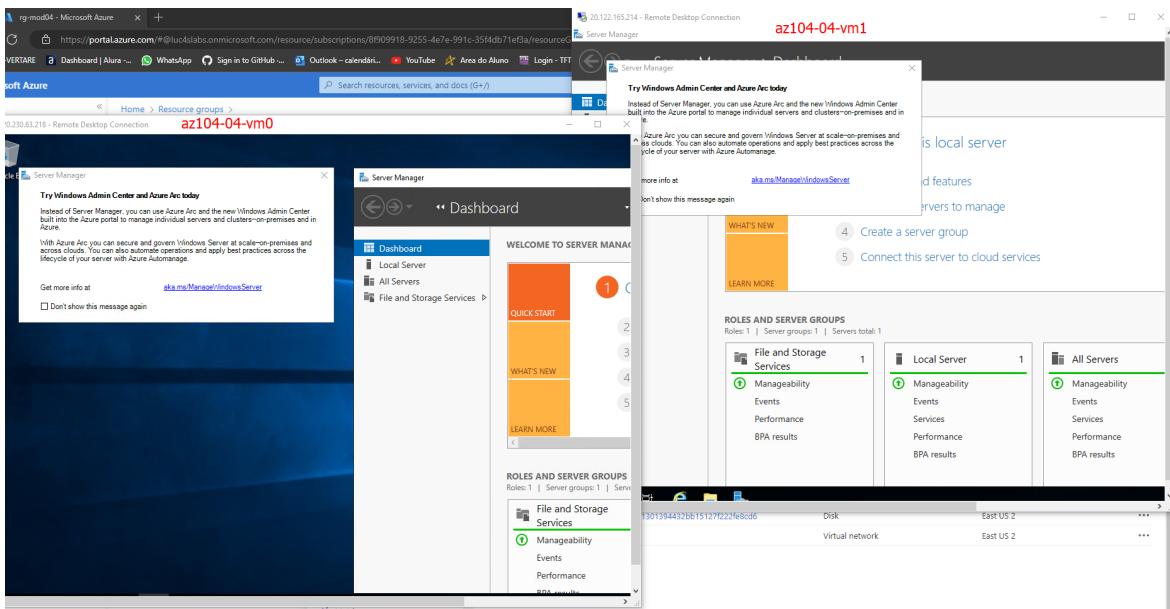
az104-04-vm0 | Networking

az104-04-nic0

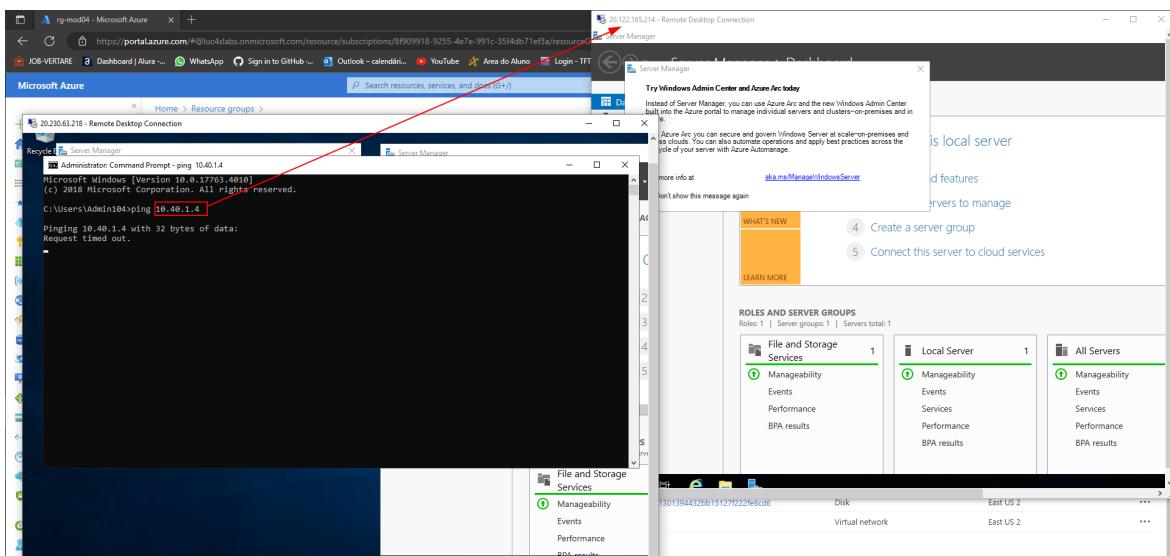
Priority	Name	Port	Protocol	Source	Destination	Action
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny

- Após esse procedimento vamos adicionar a regra de entrada na porta 3389, e liberar somente para as vms, nome=AllowRDP, prioridade 100

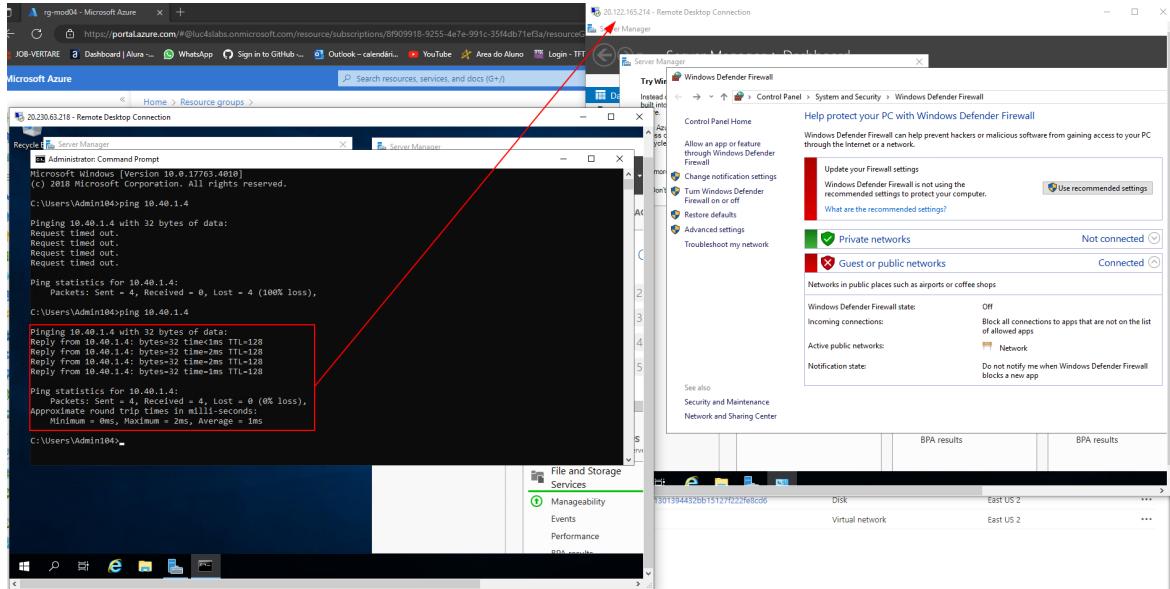
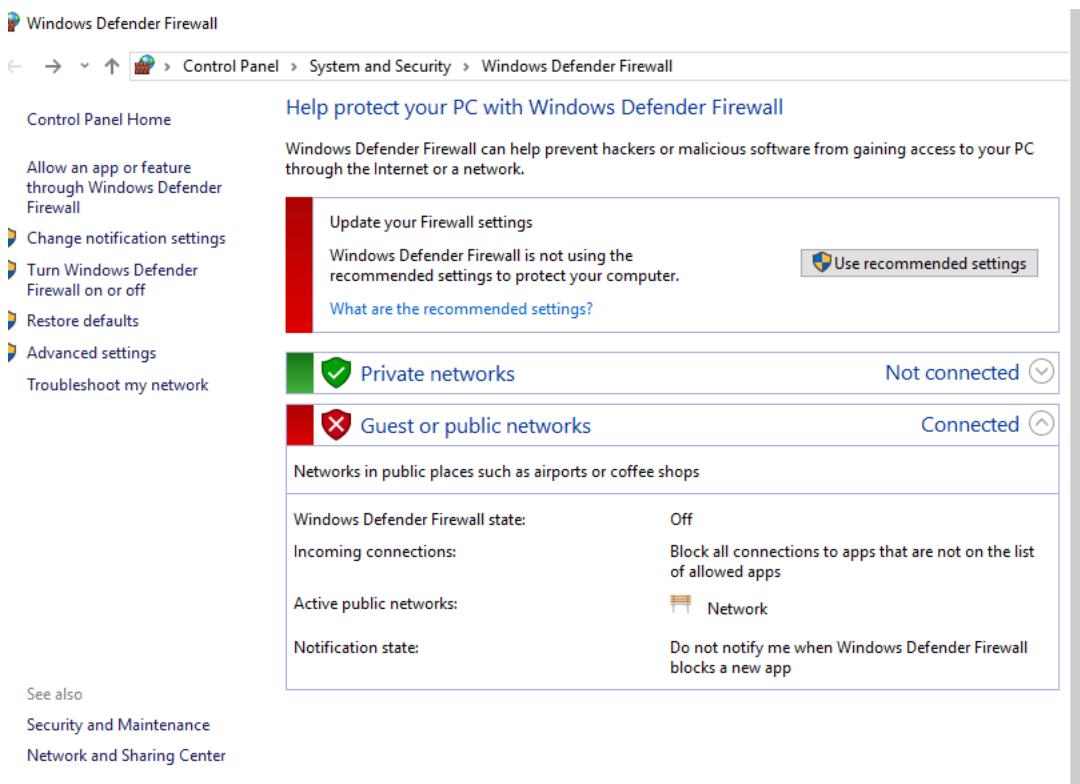
- Agora caso tentarmos acessar será possível



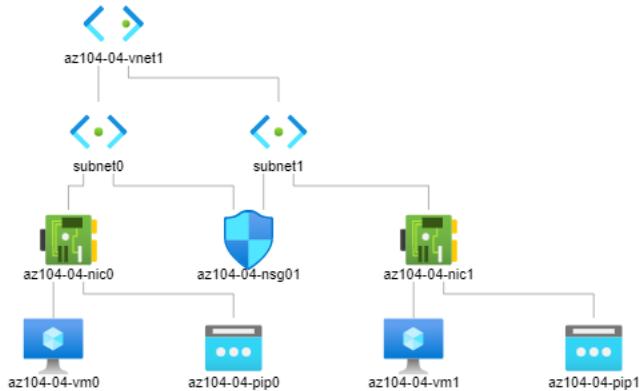
- Podemos testar o ping do ip interno, porém devido ao firewall do window server dará o timeout



- Mas se desabilitarmos poderemos pingar normalmente



- Por fim este é o diagrama de nossa infraestrutura básica,



▼ Lab05 → Configurar o DNS do Azure para a resolução interna de nomes

DNS Interno	
Setting	Value
Resource Group	RG-MOD04
Name	luc4slabs.intranet

Link DNS	
Setting	Value
Link name	az104-04-vnet1-link
Virtual network	az104-04-vnet1
Enable auto registration	enabled

- No caso para este procedimento seguiremos com a configuração de um domínio interno
- Precisamos que nossas máquinas se registrem com esse domínio por meio do DNS zone

Home > rg-mod04 >

Marketplace

Showing 1 to 20 of 28 results for 'dns zone'. [Clear search](#)

Service	Provider	Description	Price
DNS zone	Microsoft	A DNS zone hosts DNS records for a domain.	
Private DNS zone	Microsoft	A Private DNS zone hosts DNS records for a domain accessible to specified virtual networks.	
DNS Server	Cloud Infrastructure Services	Provide DNS resolution services to your servers & apps in Azure and on-prem on Windows Server 2016	Starts at \$0.025/hour
DNS Server	BIND9 DNS Server	Provide secure your servers ar	Starts at \$0.03/hour

- Como não temos um servidor de Dominio, iremos criar esse link dns para que todas as vms da vnet se registrem com esse dns pontuado
- Dentro o DNS servers na vnet podemos colocar os endereços, mas nesse caso será apenas para consulta e não para registro

Home > az104-04-vm1 > rg-mod04 > az104-04-vnet1

az104-04-vnet1 | DNS servers

Virtual network

DNS servers

Default (Azure-provided)

Custom

IP Address

Add DNS server

Por exemplo podemos colocar o 8.8.8.8

The value must not be empty.

- Para este procedimento precisaremos criar um zona de DNS que será privado
 - Vamos usar um nome personalizado

Create Private DNS zone

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Azure subscription 1

Resource group *

rg-mod04

Create new

Instance details

Name * ⓘ

luc4slabs.intranet

Resource group location ⓘ

East US 2

 You can link virtual networks to this Private DNS zone after zone has been created.

[Review + create](#)[Previous](#)[Next : Tags >](#)[Download a template for automation](#)

 Validation passed

[Basics](#) [Tags](#) [Review + create](#)

Basics

Subscription	Azure subscription 1
Resource group	rg-mod04
Resource group location	eastus2
Name	luc4slabs.intranet

Tags

Modulo	04
--------	----

The screenshot shows the Azure portal interface for a Private DNS zone named 'luc4slabs.intranet'. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings (Virtual network links selected), Properties, Locks, Monitoring (Alerts, Metrics), and Automation. The main content area displays the 'Virtual network links' section, which includes a search bar, a '+ Add' button, and a table with columns: Name, Type, TTL, Value, and Auto registered. A note states: 'You can search for record sets that have been loaded on this page. If you don't see what you're looking for, you can try scrolling to allow more record sets to load.' The table shows one record set entry:

Name	Type	TTL	Value	Auto registered
@	SOA	3600	Email: azureprivatedns-host.microsoft.com... Host: azureprivatedns.net Refresh: 3600 Retry: 300 Expire: 2419200 Minimum TTL: 10 Serial number: 1	False

- Após criarmos a zona vamos criar o link DNS

The screenshot shows the 'Virtual network links' page for the 'luc4slabs.intranet' Private DNS zone. The left sidebar has the same navigation as the previous screen. The main area features a search bar, a '+ Add' button, and a table titled 'Virtual network links' with columns: Link Name, Link status, and Virtual. A note says 'No results.' The 'Virtual network links' section in the sidebar is highlighted with a red box.

- Vamos usar o nome da vnet-link, e habilitar o configuration

Add virtual network link

luc4slabs.intranet

Link name *

az104-04-vnet1-link



Virtual network details

! Only virtual networks with Resource Manager deployment model are supported for linking with Private DNS zones.
Virtual networks with Classic deployment model are not supported.

I know the resource ID of virtual network ⓘ

Subscription * ⓘ

Azure subscription 1



Virtual network *

az104-04-vnet1 (rg-mod04)



Configuration

Enable auto registration ⓘ



Habilitar está opção

luc4slabs.intranet | Virtual network links

Private DNS zone

Search Add Refresh

Link Name	Link status	Virtual network	Auto-Registration
az104-04-vnet1-link	Completed	az104-04-vnet1	Enabled

Aguardar ficar completed (tende a demorar um pouco dependendo de infraestrutura)

- Com esse procedimento as vms também irão se registrar e poderemos ver no overview

luc4slabs.intranet

Private DNS zone

Search Record set Move Delete zone Refresh

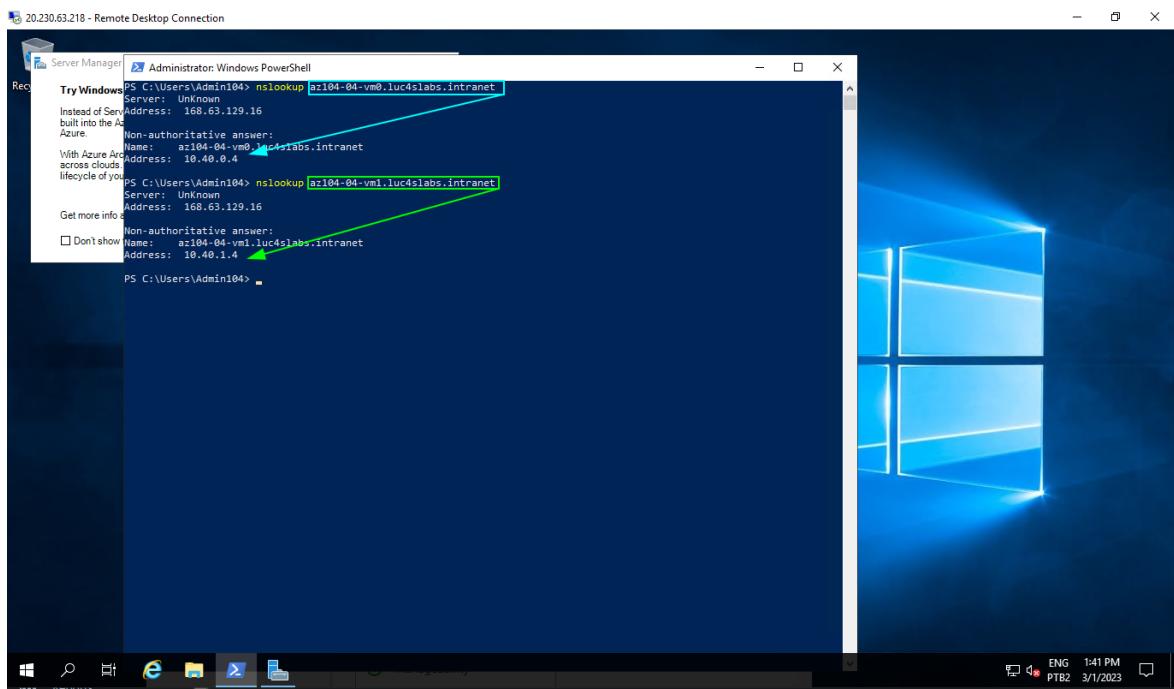
Subscription ID: 8f909918-9255-4e7e-991c-35f4db71ef3a

Tags (edit): Modulo : 04

You can search for record sets that have been loaded on this page. If you don't see what you're looking for, you can try scrolling to allow more record sets to load.

Name	Type	TTL	Value	Auto registered
@	SOA	3600	Email: azureprivatedns-host.microsoft.com... Host: azureprivatedns.net Refresh: 3600 Retry: 300 Expire: 2419200 Minimum TTL: 10 Serial number: 1	False
az104-04-vm0	A	10	10.40.0.4	True
az104-04-vm1	A	10	10.40.1.4	True

- Agora acessando uma das vms vamos usar o nslookup az104-04-vm0.luc4slabs.intranet e az104-04-vm1.luc4slabs.intranet para ver se nos trás o ip address



▼ Lab06 → Configurar o DNS do Azure para resolução de nomes externos

Setting	Value
Resource Group	RG-MOD04
Name	luc4slabs.com

Setting	Value
Name	az104-04-vm0
Type	A
TTL	1
TTL unit	Hours
IP address	the public IP address of az104-04-vm0

Setting	Value
Name	az104-04-vm1
Type	A
TTL	1
TTL unit	Hours
IP address	the public IP address of az104-04-vm1

- Vamos usar um domínio que esteja disponível, podemos validar através do site GoDaddy
 - No caso o domínio de testes luc4slabs.com está disponível, o mesmo pode ser comprado e posteriormente registrado em nosso ad do tenant, em custom domains, mas como usaremos somente para um experimento vamos seguir sem realizar a verificação total do domain,

Os domínios incluem Proteção de privacidade gratuita vitalícia.®

Seu domínio está disponível!

luc4slabs.com

R\$ 89,99 R\$ 9,99
no primeiro ano, com um registro de 2 ano(s)

INCLUI CRIADOR DE SITES GRÁTUITO
Crie e publique seu site de graça.
Adicione recursos pagos, como uma loja online, quando estiver pronto.

POPULAR NO BRASIL
luc4slabs.com.br
R\$ 29,99 R\$ 64,99
no primeiro ano, com um registro de 2 ano(s)

ECONIZE 88% COM PACOTES
luc4slabs.online + .club + .co
luc4slabs.online + luc4slabs.club + luc4slabs.co

R\$64,39 R\$545,00
no primeiro ano

Por que escolher a GoDaddy?

- ✓ Usa a extensão de domínio .com.
- ✓ luc4slabs tem 15 caracteres ou menos.
- ✓ Suporte premiado.
- ✓ Maior registrador de nomes de domínio.

Por que escolher a GoDaddy?

Restrições são aplicáveis. ☰

Comprar e Registrar domínio - Pesquisa de domínios disponíveis - GoDaddy BR

<p>Compre um domínio | Encontre os melhores nome de domínio com a GoDaddy</p> <p>Obtenha os melhores nomes de domínio da GoDaddy. Temos domínios de país, novas extensões de domínio e todos os domínios .com, .org e .net tradicionais, além de muitos outros para você escolher.</p>

<https://www.godaddy.com/pt-br/dominios>

- Vamos criar um DNS zona conforme criamos o interno, porém agora criaremos de forma externa

Marketplace ...

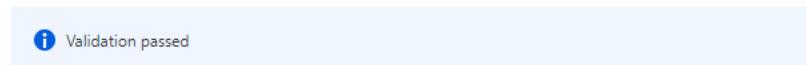
Showing 1 to 20 of 28 results for 'dns zone'. [Clear search](#)

Tile view

DNS zone Microsoft Azure Service A DNS zone hosts DNS records for a domain. Create Heart	Private DNS zone Microsoft Azure Service A Private DNS zone hosts DNS records for a domain accessible to specified virtual networks. Create Heart	DNS Server Cloud Infrastructure Services Virtual Machine Provide DNS resolution services to your servers & apps in Azure and on-prem on Windows Server 2016. Create Heart	DNS Server - BIND DNS Server Cloud Infrastructure Services Virtual Machine BIND9 DNS Server on Ubuntu 20.04. Provide secure DNS resolution to your servers and applications. Create Heart
---	--	--	--

- Usamos o domínio disponível

Create DNS zone ...



Basics Tags Review + create

Summary

Basics

Subscription	Azure subscription 1
Resource group	rg-mod04
Resource group location	eastus2
Name	luc4slabs.com

- Agora nos registros vamos usar os IPs publicos das vms para criar os dois registros, faremos através do record set

A screenshot of the Azure DNS zone management interface for 'luc4slabs.com'. The 'Record set' button in the top navigation bar is highlighted with a red box. The main pane displays two existing NS and SOA records with their respective properties. A search bar and a 'Tags' section are also visible.

- A ideia do IP estático é para evitar alteração, quando se trata de IP dinâmico o mesmo pode trocar seu endereçamento

Add record set

luc4slabs.com

Name
az104-04-vm0 ✓

Type
A – Alias record to IPv4 address ✓

Alias record set ?
 Yes No

TTL *
1 ✓ TTL unit
Hours ✓

IP address
20.230.63.218 ✓
0.0.0.0

OK

Home > Microsoft.DnsZone-20230301135216094 | Overview >

luc4slabs.com DNS zone ✓ Create record set
Successfully created record set 'az104-04-vm1'

Search ✓ Record set Child zone Move Delete zone Refresh

Modulo : 04

You can search for record sets that have been loaded on this page. If you don't see what you're looking for, you can try scrolling to allow more record sets to load.

Search record sets

Name	Type	TTL	Value	Alias resource type	Alias target
@	NS	172800	ns1-36.azure-dns.com. ns2-36.azure-dns.net. ns3-36.azure-dns.org. ns4-36.azure-dns.info.		
@	SOA	3600	Email: azuredns-host... Host: ns1-36.azure-d... Refresh: 3600 Retry: 300 Expire: 2419200 Minimum TTL: 300 Serial number: 1		
az104-04-vm0	A	3600	20.230.63.218		
az104-04-vm1	A	3600	20.122.165.214		

- Os name servers são os responsaveis por nossa zona

luc4slabs.com

DNS zone

Search

+ Record set + Child zone → Move ⚡ Delete zone Refresh

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource group (move) rg-mod04

Subscription (move) Azure subscription 1

Subscription ID 8f909918-9255-4e7e-991c-35f4db71ef3a

Tags (edit) Modulo : 04

You can search for record sets that have been loaded on this page. If you don't see what you're looking for, you can try scrolling to all record sets to load.

Search record sets

Name	Type	TTL	Value	Alias resource type	Alia
az104-04-vm0	A	3600	20.230.63.218		
az104-04-vm1	A	3600	20.122.165.214		

- Podemos usar o cloud shell com o comando nslookup apontando para a vm + os name servers, assim conseguimos validar se o name server estará apontando para os IPs Publicos das VMs

```
PS /home/lucas> nslookup az104-04-vm0.luc4slabs.com ns1-36.azure-dns.com
Server:      ns1-36.azure-dns.com
Address:     150.171.10.36#53
Name:        az104-04-vm0.luc4slabs.com
Address:     20.230.63.218
```

```
PS /home/lucas> nslookup az104-04-vm1.luc4slabs.com ns2-36.azure-dns.net
Server:      ns2-36.azure-dns.net
Address:     150.171.16.36#53
Name:        az104-04-vm1.luc4slabs.com
Address:     20.122.165.214
```

Usamos outro dns server para validar se encontra o drecionamento da vm1

- Por fim usamos o comando no powershell `Get-AzResourceGroup -Name 'rg-mod04' | Remove-AzResourceGroup -Force -AsJob` para deletar todo o grupo de recurso e todos os recursos desses lab, para que evitemos custos

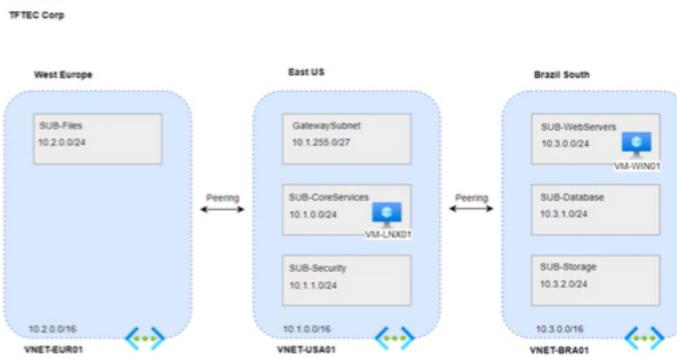
PS /home/lucas> Get-AzResourceGroup -Name 'rg-mod04' Remove-AzResourceGroup -Force -AsJob						
Id	Name	PSJobTypeName	State	HasMoreData	Location	Command
--	--	--	--	--	--	--
2	Long	Running	0... AzureLongRunni...	Running	localhost	Remove-AzResourceGroup

PS /home/lucas> █

▼ Intersite Connectivity (Conexão entre VNets)

▼ Lab01 → Criar estrutura de rede usando 3 VNets em regiões diferentes, com suas respectivas subnets

- Estrutura do ambiente hub-spokes → Serviços principais na rede central (USA) e apartir dela criamos os spokes, assim a fazemos com que as redes que precisam conversar se acessam, porém não é transitivo, BR e EUR não se conversam a menos que haja um peering entre elas



- Criamos um RG

Basics Tags Review + create

Basics

Subscription: Visual Studio Enterprise Subscription – MPN
Resource group: rg-labs-cloud
Region: East US

Tags

modulo: mod05

- Criamos um vnet para o RG, que no caso será a VNet central (USA), que no caso será a hub e as demais os spokes, vamos usar o IP 10.1.0.0/16
 - Vamos deixar a subnet como sub-core-services 10.1.0.0/24
 - E criamos outra denominada sub-security 10.1.1.0/24

Create virtual network ...

Basics Security IP addresses Tags Review + create

[View automation template](#)

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource Group	rg-labs-cloud
Name	vnet-us01
Region	East US

Security

Azure Bastion	Disabled
Azure Firewall	Disabled
Azure DDoS Network Protection	Disabled

IP addresses

Address space	10.1.0.0/16 (65536 addresses)
Subnet	sub-core-services (10.1.0.0/24) (256 addresses)
Subnet	sub-security (10.1.1.0/24) (256 addresses)

Tags

modulo	mod05
--------	-------

- Após isso vamos criar uma segunda VNET que pertencerá a EUR IP 10.2.0.0/16
 - Vamos usar as sub-files 10.2.0.0/24

[View automation template](#)

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource Group	rg-labs-cloud
Name	vnet-eur01
Region	North Europe

Security

Azure Bastion	Disabled
Azure Firewall	Disabled
Azure DDoS Network Protection	Disabled

IP addresses

Address space	10.2.0.0/16 (65536 addresses)
Subnet	sub-files (10.2.0.0/24) (256 addresses)

Tags

modulo	mod05
--------	-------

- E por fim criamos a VNet do Brasil, com o IP 10.3.0.0/16
 - sub-webserver usamos a 10.3.0.0/24
 - sub-database usamos 10.3.1.0/24
 - sub-storage usaremos 10.3.2.0/24

Create virtual network ...

Basics Security IP addresses Tags Review + create

[View automation template](#)

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource Group	rg-labs-cloud
Name	vnet-br01
Region	Brazil South

Security

Azure Bastion	Disabled
Azure Firewall	Disabled
Azure DDoS Network Protection	Disabled

IP addresses

Address space	10.3.0.0/16 (65536 addresses)
Subnet	sub-webserver (10.3.0.0/24) (256 addresses)
Subnet	sub-database (10.3.1.0/24) (256 addresses)
Subnet	sub-storage (10.3.2.0/24) (256 addresses)

Tags

modulo mod05

- O Gateway de Subnet será o que irá nos possibilitar configurar o virtual network gateway para que na hora que rodar um tráfego no tunnel de vpn utilizar o gateway de subnet

Name	IPv4	IPv6	Available IPs	Delegated to	Security group
sub-core-services	10.1.0.0/24	-	251	-	-
sub-security	10.1.1.0/24	-	251	-	-

- Iremos criar na subnet de USA rede 10.1.255.0/24

Add subnet

Name
GatewaySubnet

Subnet address range * ⓘ
10.1.255.0/24 ✓
10.1.255.0 - 10.1.255.255 (251 + 5 Azure reserved addresses)

NAT gateway associated to this subnet.

NAT gateway ⓘ
None

Network security group
None

Route table
None

SERVICE ENDPOINTS

Create service endpoint policies to allow traffic to specific Azure resources from your virtual network over service endpoints. [Learn more](#)

Services ⓘ
0 selected

SUBNET DELEGATION

Delegate subnet to a service ⓘ
None

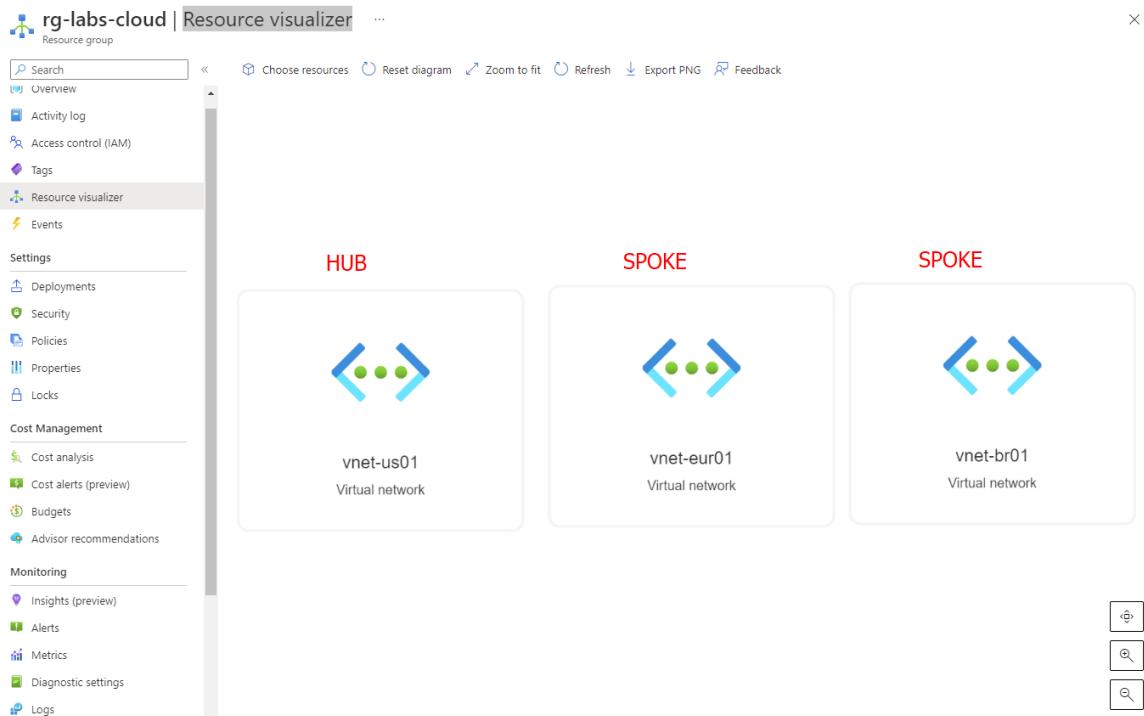
NETWORK POLICY FOR PRIVATE ENDPOINTS

The network policy affects all private endpoints in this subnet. Select the types of network policies that control traffic going to the private endpoints in this subnet. [Learn more](#)

Private endpoint network policy

Save **Cancel**

- Indo no RG>**Resource visualizer** podemos ver a estrutura das 3 VNets



▼ Lab01 → Criar configurações de Peering entre VNs

- Vamos na VNET USA
- E criamos um peering, com o nome para onde ela vai que será a VNET BR

Name ↑↓	Peering status ↑↓	Peer ↑↓
Add a peering to get started		

Add peering ...

vnet-us01

i For peering to work, two peering links must be created. By selecting remote virtual network, Azure will create both peering links.

This virtual network

Peering link name *

vnet-us01-to-vnet-br01



- Permitimos o tráfego

Traffic to remote virtual network ⓘ

Allow (default)

Block all traffic to the remote virtual network

- Encaminhar o tráfego que chega para a vnet que está conectada, permitir

Traffic forwarded from remote virtual network ⓘ

Allow (default)

Block traffic that originates from outside the remote virtual network

- Quando tivermos um virtual network gateway precisamos habilitar para que as vnets conectadas no peering possam se conectar também

Virtual network gateway or Route Server ⓘ

Use this virtual network's gateway or Route Server

Use the remote virtual network's gateway or Route Server

None (default)



- Configuramos a VNET que estamos conectando

- Colocamos a VNET que iremos nos conectar de outras regiões, que no caso será um peering global → É setado automaticamente

- E agora configuramos o inverso

Remote virtual network

Peering link name *

Virtual network deployment model ⓘ

Resource manager

Classic

I know my resource ID ⓘ

Subscription * ⓘ

Visual Studio Enterprise Subscription – MPN

Virtual network * ⓘ

vnet-br01

Traffic to remote virtual network ⓘ

Allow (default)  Permitir o Trafego

Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ

Allow (default)  Encaminhar o trafego que chega

Block traffic that originates from outside the remote virtual network

Virtual network gateway or Route Server ⓘ

Use this virtual network's gateway or Route Server

Use the remote virtual network's gateway or Route Server

None (default)

Add

- Agora faremos um peering para o EUR

Add peering

vnet-us01

- Use this virtual network's gateway or Route Server
- Use the remote virtual network's gateway or Route Server
- None (default)

Remote virtual network

Peering link name *

vnet-eur01-to-vnet-us01



Virtual network deployment model ⓘ

- Resource manager
- Classic

 I know my resource ID ⓘ

Subscription * ⓘ

Visual Studio Enterprise Subscription – MPN



Virtual network *

vnet-eur01



Traffic to remote virtual network ⓘ

- Allow (default)
- Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ

- Allow (default)
- Block traffic that originates from outside the remote virtual network

Virtual network gateway or Route Server ⓘ

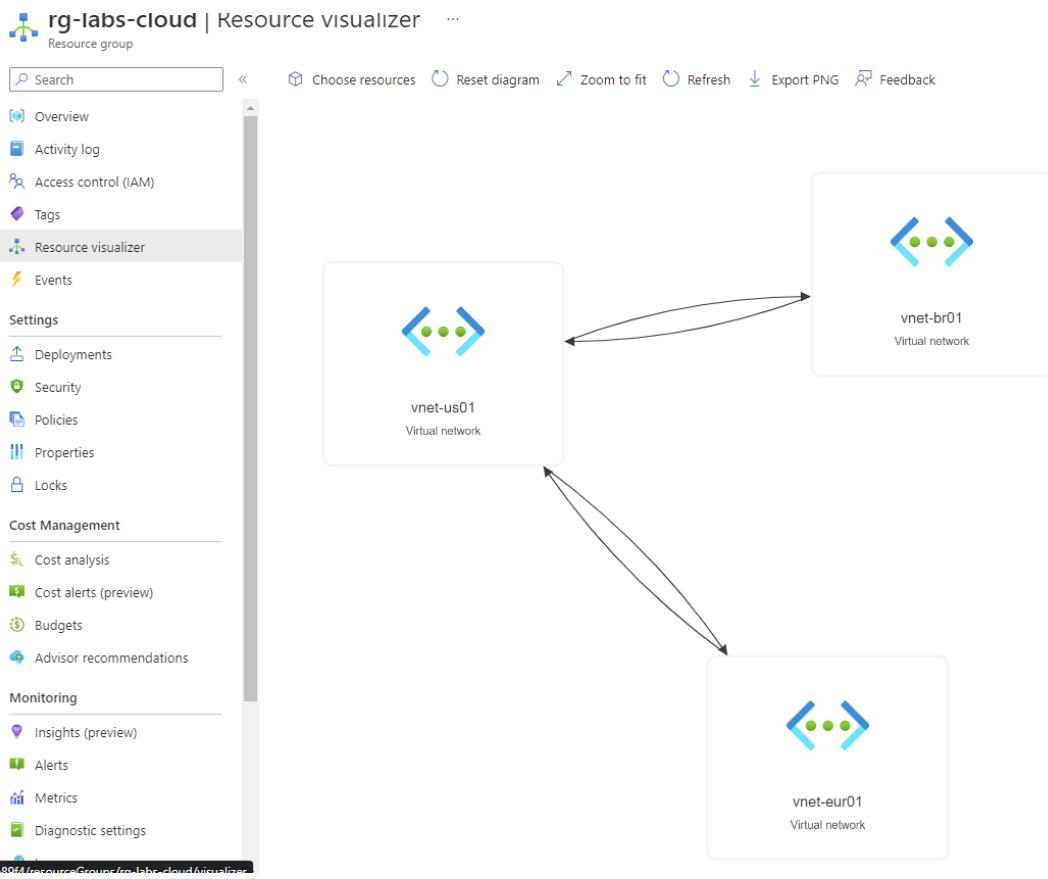
- Use this virtual network's gateway or Route Server
- Use the remote virtual network's gateway or Route Server
- None (default)

Add

- Se adicionarmos um novo address ou alterar, vamos precisar recriar o peering, devido ao novo range e rotas

private (RFC 1918). Learn more		Address space	Address range	Address count
10.1.0.0/16			10.1.0.0 - 10.1.255.255	65536
Add additional address range				
Peered virtual network address space		Address space	Address range	
Peering name	Peered to			
vnet-us01-to-vnet-br01	vnet-br01	10.3.0.0/16	10.3.0.0 - 10.3.255.255	
vnet-us01-to-vnet-eur01	vnet-eur01	10.2.0.0/16	10.2.0.0 - 10.2.255.255	

- Validando no **Resource visualizer** podemos visualizar o diagrama agora com uma conexão entre as VNets



▼ Lab02 → Realizar deploy de uma VM na VNet East US e Brazil South

- Vamos criar uma VM linux na vnet USA, ubuntu mesmo, o tamanho vamos criar uma B2S
 - Vamos deixar a porta selecionada e vamos deixar o disco premium

Create a virtual machine ...

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host [\(i\)](#)



i Encryption at host is not registered for the selected subscription.
[Learn more about enabling this feature](#)

OS disk

OS disk type * [\(i\)](#)

Premium SSD (locally-redundant storage) [\(v\)](#)

Delete with VM [\(i\)](#)



Key management [\(i\)](#)

Platform-managed key [\(v\)](#)

Enable Ultra Disk compatibility [\(i\)](#)



Ultra disk is supported in Availability Zone(s) 1,2,3 for the selected VM size Standard_D2s_v3.

- o Colocamos a VNET USA, subnet-core-services, NSG basic

When creating a virtual machine, a network interface will be created for you.

Virtual network * ⓘ

Subnet * ⓘ

Public IP ⓘ

NIC network security group ⓘ None Basic Advanced

Public inbound ports * ⓘ None Allow selected ports

Select inbound ports *

⚠ This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Delete public IP and NIC when VM is deleted

Enable accelerated networking

Load balancing
You can place this virtual machine in the backend pool of an existing Azure load balancing solution. [Learn more ↗](#)

[Review + create](#) [< Previous](#) [Next : Management >](#)

- Desabilitamos boot diagnostic

Basics Disks Networking Management **Monitoring** Advanced Tags Review + create

Configure monitoring options for your VM.

Alerts

Enable recommended alert rules ⓘ

Diagnostics

Boot diagnostics ⓘ Enable with managed storage account (recommended) Enable with custom storage account Disable

Enable OS guest diagnostics ⓘ

Create a virtual machine ...

Validation passed

⚠ You have set SSH port(s) open to the internet. This is only recommended for testing. If you want to change this setting, go back to Basics tab.

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-labs-cloud
Virtual machine name	vm-lx-us-cloud
Region	East US
Availability options	No infrastructure redundancy required
Security type	Standard
Image	Ubuntu Server 20.04 LTS - Gen2
VM architecture	x64
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Authentication type	Password
Username	az_admin
Public inbound ports	SSH
Azure Spot	No

Disk

OS disk type	Premium SSD LRS
Use managed disks	Yes
Delete OS disk with VM	Enabled
Ephemeral OS disk	No

Networking

Virtual network	vnet-us01
Subnet	sub-core-services (10.1.0.0/24)
Public IP	(new) vm-lx-us-cloud-ip
Accelerated networking	On
Place this virtual machine behind an existing load balancing solution?	No
Delete public IP and NIC when VM is deleted	Disabled

Management

Create

< Previous

Next >

Download a template for automation

- Vamos criar uma vm Windows para Brazil south, B2S
 - Conexão liberada, subnet webservices, vnet brasil

Create a virtual machine ...

⚠️ Changing Basic options may reset selections you have made. Review all options prior to creating the virtual machine.

[See all sizes](#)

Administrator account

Username * ⓘ ✓

Password * ⓘ ✓

Confirm password * ⓘ ✓

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports * ⓘ

None
 Allow selected ports

Select inbound ports *

RDP (3389)

⚠️ This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Licensing

Save up to 49% with a license you already own using Azure Hybrid Benefit. [Learn more ↗](#)

Would you like to use an existing Windows Server license? * ⓘ

[Review Azure hybrid benefit compliance ↗](#)

- Desabilitamos boot diagnostic

Alerts

Enable recommended alert rules ⓘ

Diagnostics

Boot diagnostics ⓘ

Enable with managed storage account (recommended)
 Enable with custom storage account
 Disable

Enable OS guest diagnostics ⓘ

Create a virtual machine ...

Validation passed

Agree, (a) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

⚠ You have set RDP port(s) open to the internet. This is only recommended for testing. If you want to change this setting, go back to Basics tab.

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-labs-cloud
Virtual machine name	vm-win-br-cloud
Region	Brazil South
Availability options	No infrastructure redundancy required
Security type	Standard
Image	Windows Server 2022 Datacenter: Azure Edition - Gen2
VM architecture	x64
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Username	azure_admin
Public inbound ports	RDP
Already have a Windows license?	No
Azure Spot	No

Disks

OS disk type	Premium SSD LRS
Use managed disks	Yes
Delete OS disk with VM	Enabled
Ephemeral OS disk	No

Networking

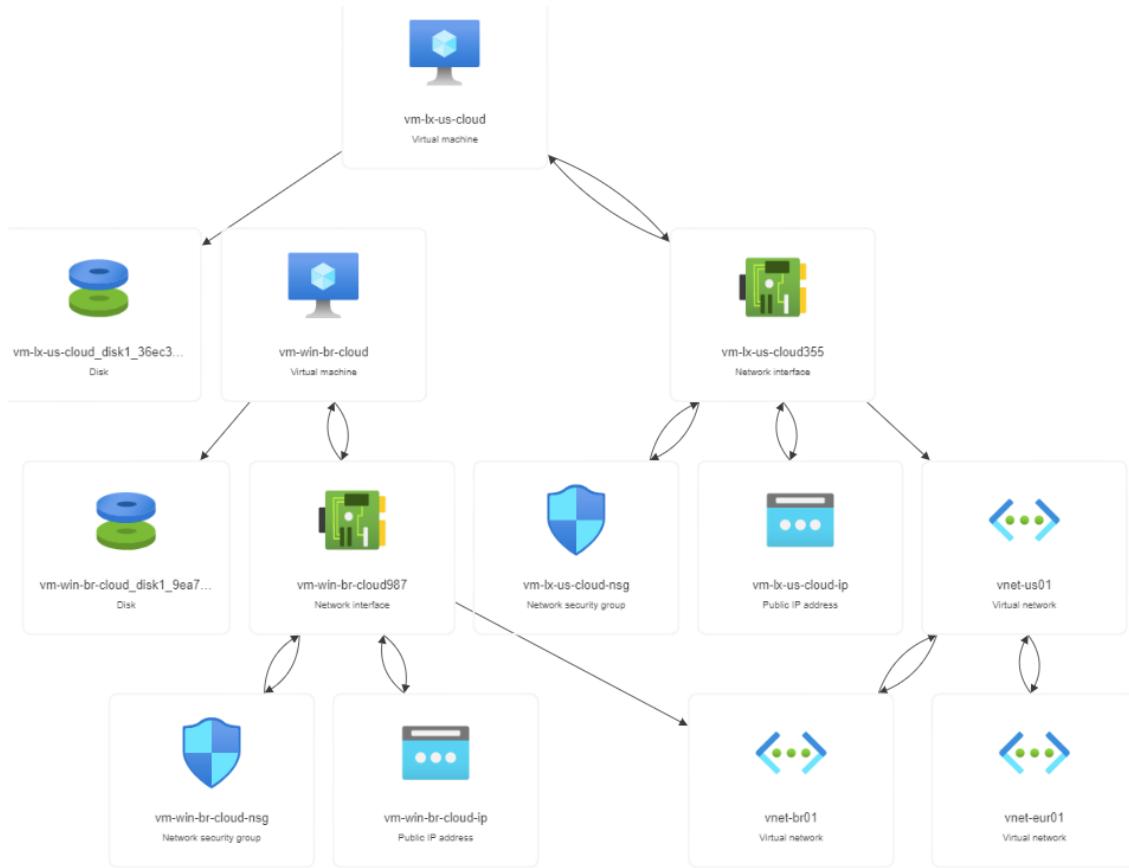
Virtual network	vnet-br01
Subnet	sub-webserver (10.3.0.0/24)
Public IP	(new) vm-win-br-cloud-ip
Accelerated networking	On
Place this virtual machine behind an existing load balancing solution?	No
Delete public IP and NIC when VM is deleted	Disabled

Management

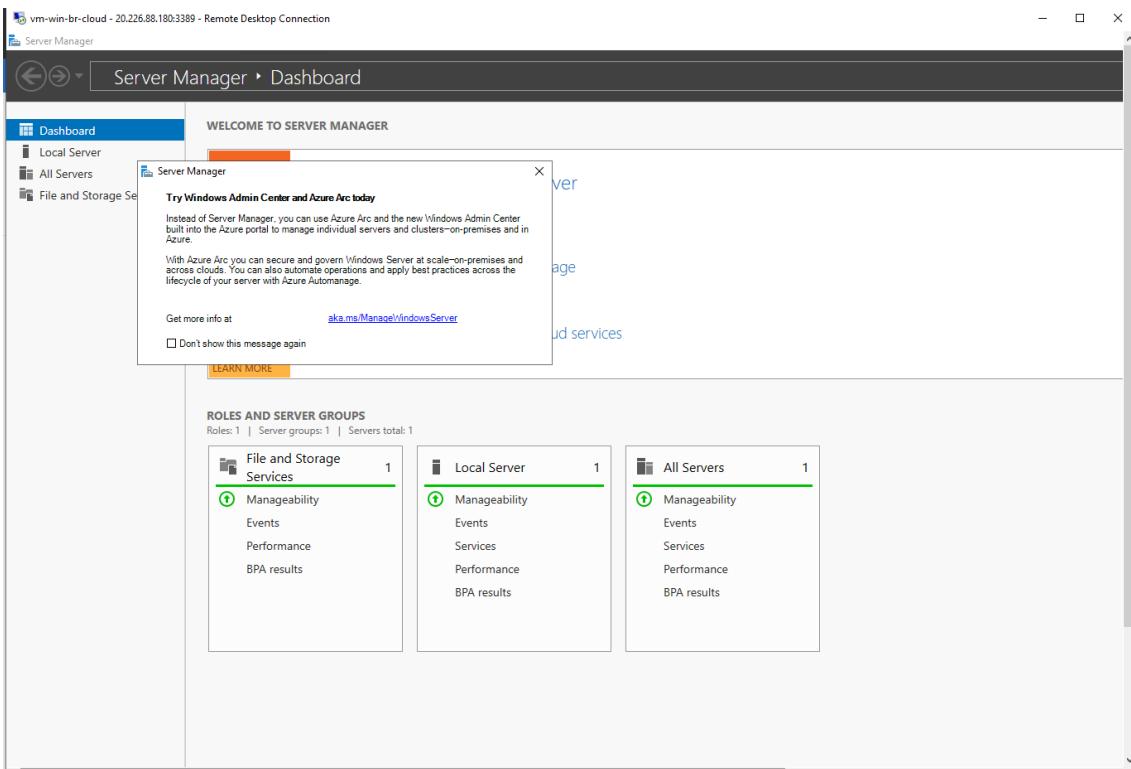
Microsoft Defender for Cloud Basic (free)

[Create](#) [< Previous](#) [Next >](#) [Download a template for automation](#)

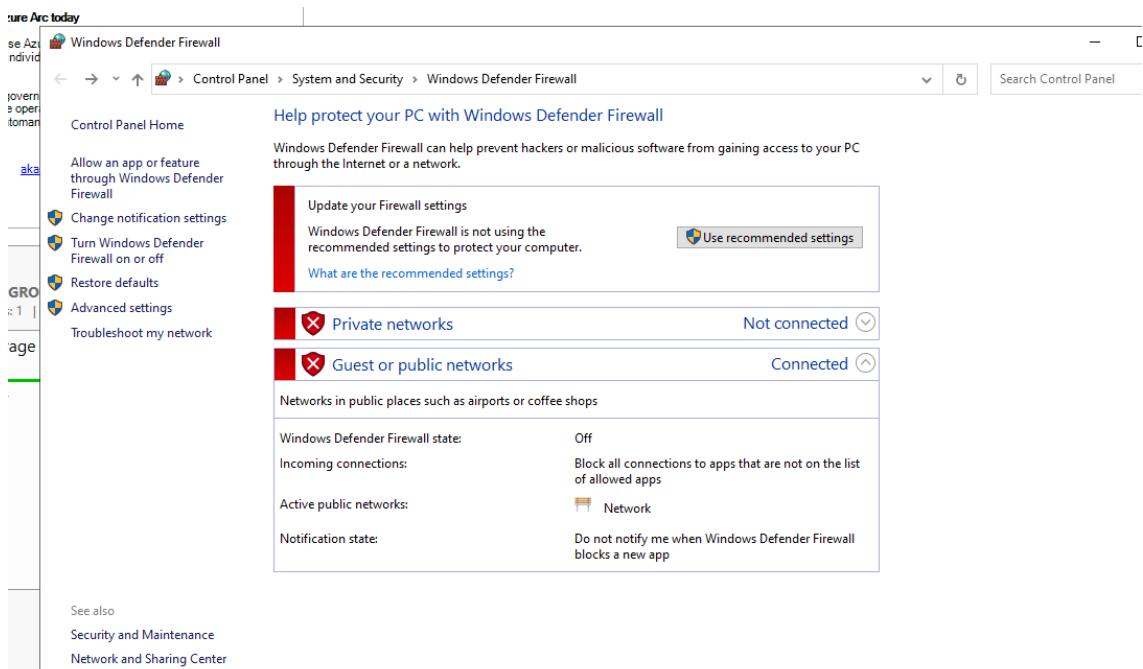
- Por fim vamos validar o nosso resource visualizer para validar nossa infraestrutura



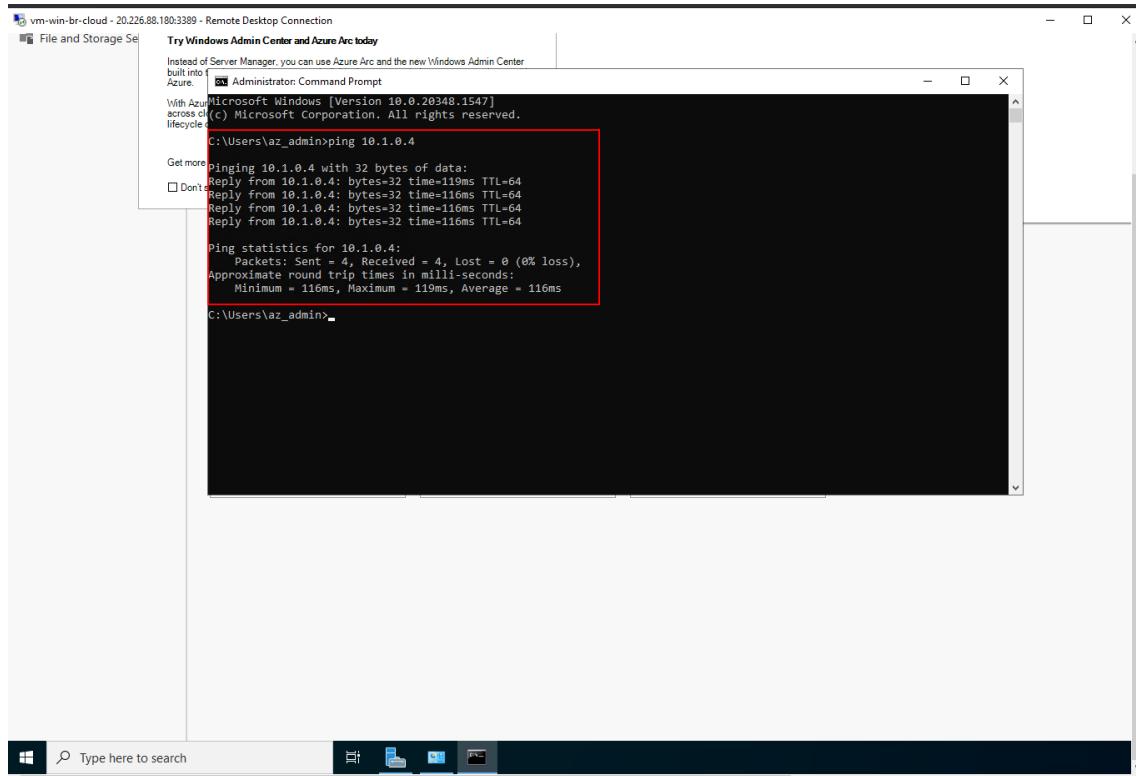
- Vamos conectar na VM windows



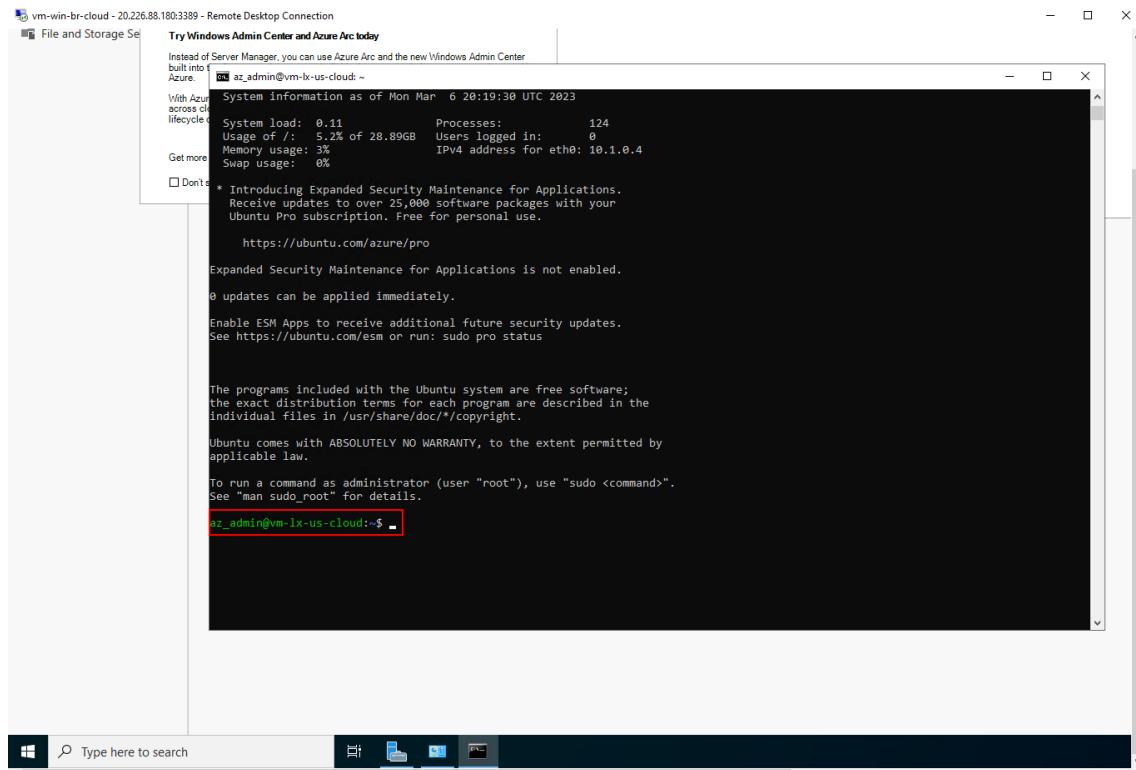
- Vamos desabilitar o firewall do windows para que possamos realizar nossos testes



- pingamos o IP da vm linux que está em USA, e podemos ver conectividade



- Agora iremos acessar a VM linux através da vm windows



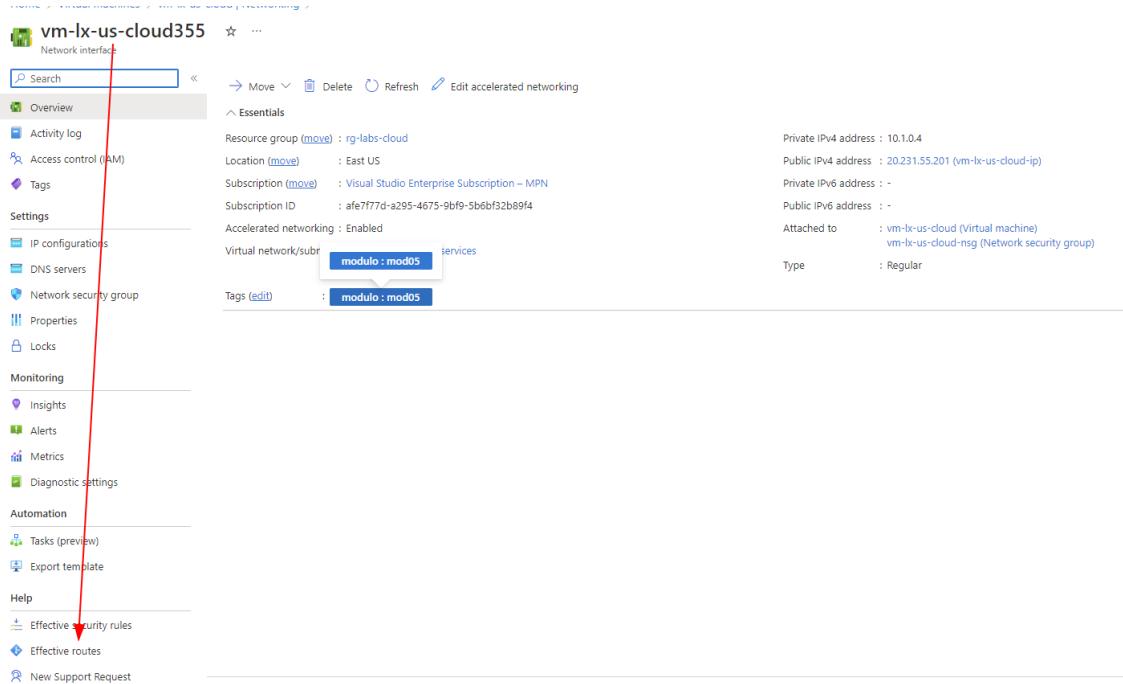
- E a conectividade é realizada com sucesso

- Agora podemos pingar o windows e funciona com sucesso

```

az_admin@vm-lx-us-cloud:~$ ping 10.3.0.4
PING 10.3.0.4 (10.3.0.4) 56(84) bytes of data.
64 bytes from 10.3.0.4: icmp_seq=1 ttl=128 time=116 ms
64 bytes from 10.3.0.4: icmp_seq=2 ttl=128 time=116 ms
64 bytes from 10.3.0.4: icmp_seq=3 ttl=128 time=116 ms
64 bytes from 10.3.0.4: icmp_seq=4 ttl=128 time=117 ms
64 bytes from 10.3.0.4: icmp_seq=5 ttl=128 time=116 ms
64 bytes from 10.3.0.4: icmp_seq=6 ttl=128 time=116 ms
64 bytes from 10.3.0.4: icmp_seq=7 ttl=128 time=116 ms
64 bytes from 10.3.0.4: icmp_seq=8 ttl=128 time=116 ms
64 bytes from 10.3.0.4: icmp_seq=9 ttl=128 time=117 ms
64 bytes from 10.3.0.4: icmp_seq=10 ttl=128 time=116 ms
```
--- 10.3.0.4 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 116.238/116.378/116.729/0.161 ms
az_admin@vm-lx-us-cloud:~$
```

- Indo na placa de rede da vm podemos validar em effective routes, mostram as regras de roteamento

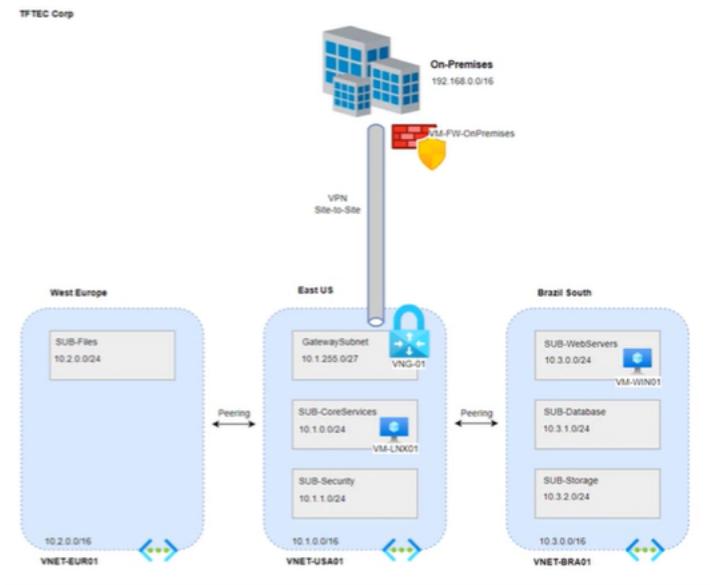


- Através desse caminho podemos validar o range do peering nas rotas

| Tags                     | Source  | ↑↓     | State          | ↑↓ | Address Prefixes  | ↑↓ | Next Hop Type | ↑↓ | Next Hop IP Address | ↑↓ | User Defined Route Name | ↑↓ |
|--------------------------|---------|--------|----------------|----|-------------------|----|---------------|----|---------------------|----|-------------------------|----|
| Settings                 | Default | Active | 10.1.0.0/16    |    | Virtual network   |    | -             |    | -                   |    | -                       |    |
| IP configurations        | Default | Active | 0.0.0.0/0      |    | Internet          |    | -             |    | -                   |    | -                       |    |
| DNS servers              | Default | Active | 10.0.0.0/8     |    | None              |    | -             |    | -                   |    | -                       |    |
| Network security group   | Default | Active | 100.64.0.0/10  |    | None              |    | -             |    | -                   |    | -                       |    |
| Properties               | Default | Active | 172.16.0.0/12  |    | None              |    | -             |    | -                   |    | -                       |    |
| Locks                    | Default | Active | 25.48.0.0/12   |    | None              |    | -             |    | -                   |    | -                       |    |
| Monitoring               | Default | Active | 25.4.0.0/14    |    | None              |    | -             |    | -                   |    | -                       |    |
| Insights                 | Default | Active | 198.18.0.0/15  |    | None              |    | -             |    | -                   |    | -                       |    |
| Alerts                   | Default | Active | 157.59.0.0/16  |    | None              |    | -             |    | -                   |    | -                       |    |
| Metrics                  | Default | Active | 192.168.0.0/16 |    | None              |    | -             |    | -                   |    | -                       |    |
| Diagnostic settings      | Default | Active | 25.33.0.0/16   |    | None              |    | -             |    | -                   |    | -                       |    |
| Automation               | Default | Active | 40.109.0.0/16  |    | None              |    | -             |    | -                   |    | -                       |    |
| Tasks (preview)          | Default | Active | 104.147.0.0/16 |    | None              |    | -             |    | -                   |    | -                       |    |
| Export template          | Default | Active | 104.146.0.0/17 |    | None              |    | -             |    | -                   |    | -                       |    |
| Help                     | Default | Active | 40.108.0.0/17  |    | None              |    | -             |    | -                   |    | -                       |    |
| Effective security rules | Default | Active | 23.103.0.0/18  |    | None              |    | -             |    | -                   |    | -                       |    |
| Effective routes         | Default | Active | 25.41.0.0/20   |    | None              |    | -             |    | -                   |    | -                       |    |
| New Support Request      | Default | Active | 20.35.252.0/22 |    | None              |    | -             |    | -                   |    | -                       |    |
|                          | Default | Active | 10.3.0.0/16    |    | VNetGlobalPeering |    | -             |    | -                   |    | -                       |    |
|                          | Default | Active | 10.2.0.0/16    |    | VNetGlobalPeering |    | -             |    | -                   |    | -                       |    |

### ▼ Lab03 → Deploy Virtual Network Gateway

- Agora vamos simular uma conexão com o ambiente on-premises, criaremos um RG, uma vnet, e uma vm para simular o fw do ambiente local o qual realizaremos uma conexão através de VPN



- Primeiramente criaremos um virtual network gateway, vamos fazer o deploy no rg-labs-cloud

Subscription \*

Resource group

**Instance details**

Name \*

Region \*

Gateway type \*  VPN  ExpressRoute

VPN type \*  Route-based  Policy-based

SKU \*

Generation

Virtual network \*  [Create virtual network](#)

Subnet

Only virtual networks in the currently selected subscription and region are listed.

Public IP Address Type  Standard  Basic

**Public IP address**

Public IP address \*  Create new  Use existing

Public IP address name \*

[Review + create](#) [Previous](#) [Next : Tags >](#) [Download a template for automation](#)

- Gateway types vpn, vpn type route-based

Gateway type \*  VPN  ExpressRoute

VPN type \*  Route-based  Policy-based

SKU \*

Generation

Virtual network \*  [Create virtual network](#)

Subnet

Only virtual networks in the currently selected subscription and region are listed.

• Vamos criar um IP publico

Public IP Address Type  Basic  Standard

Public IP address

Public IP address \*  Create new  Use existing

Public IP address name \*  ✓

Public IP address SKU Standard

- Não vamos criar ativo/ativo para não precisar criar um BGP

Assignment  Dynamic  Static

Enable active-active mode \*  Enabled  Disabled

Configure BGP \*  Enabled  Disabled

Azure recommends using a validated VPN device with your virtual network gateway. To view a list of validated devices and instructions for configuration, refer to Azure's [documentation](#) regarding validated VPN devices.

## Create virtual network gateway ...

✓ Validation passed

[Basics](#) [Tags](#) [Review + create](#)

**Basics**

|                           |                                             |
|---------------------------|---------------------------------------------|
| Subscription              | Visual Studio Enterprise Subscription – MPN |
| Resource group            | rg-labs-cloud                               |
| Name                      | vng-01-cloud                                |
| Region                    | East US                                     |
| SKU                       | VpnGw1                                      |
| Generation                | Generation1                                 |
| Virtual network           | vnet-us01                                   |
| Subnet                    | GatewaySubnet (10.1.255.0/24)               |
| Gateway type              | Vpn                                         |
| VPN type                  | RouteBased                                  |
| Enable active-active mode | Disabled                                    |
| Configure BGP             | Disabled                                    |
| Public IP address         | pip-vng-01-cloud                            |

**Tags**

|        |       |
|--------|-------|
| modulo | mod05 |
|--------|-------|

- Demora um pouco para a criação do VNG
- Após a criação
  - Podemos alterar o modo ativo/passivo e podemos alterar o SKU

▼ Lab04 → Criar estrutura de rede para simular ambiente On-Premises

- Vamos criar um RG diferente que irá representar o ambiente on-premises, vamos usar outra região

Create a resource group ...



Basics Tags Review + create

Basics

|                |                                             |
|----------------|---------------------------------------------|
| Subscription   | Visual Studio Enterprise Subscription – MPN |
| Resource group | rg-labs-onprem                              |
| Region         | South Central US                            |

Tags

|        |       |
|--------|-------|
| modulo | mod05 |
|--------|-------|

- Em seguida vamos criar uma vnet na mesma região 192.168.0.0/16 e subnet de mesmo range /24

Create virtual network ...

Basics Security IP addresses Tags Review + create

[View automation template](#)

Basics

|                |                                             |
|----------------|---------------------------------------------|
| Subscription   | Visual Studio Enterprise Subscription – MPN |
| Resource Group | rg-labs-onprem                              |
| Name           | vnet-onprem                                 |
| Region         | South Central US                            |

Security

|                               |          |
|-------------------------------|----------|
| Azure Bastion                 | Disabled |
| Azure Firewall                | Disabled |
| Azure DDoS Network Protection | Disabled |

IP addresses

|               |                                                |
|---------------|------------------------------------------------|
| Address space | 192.168.0.0/16 (65536 addresses)               |
| Subnet        | subnet-onprem (192.168.0.0/24) (256 addresses) |

Tags

|        |       |
|--------|-------|
| modulo | mod05 |
|--------|-------|

- Essa será a estrutura básica para está tarefa que irá representar o ambiente on-premises, proximo passo será criar e configurar um vm no ambiente on-premises que simule o firewall com o RAS

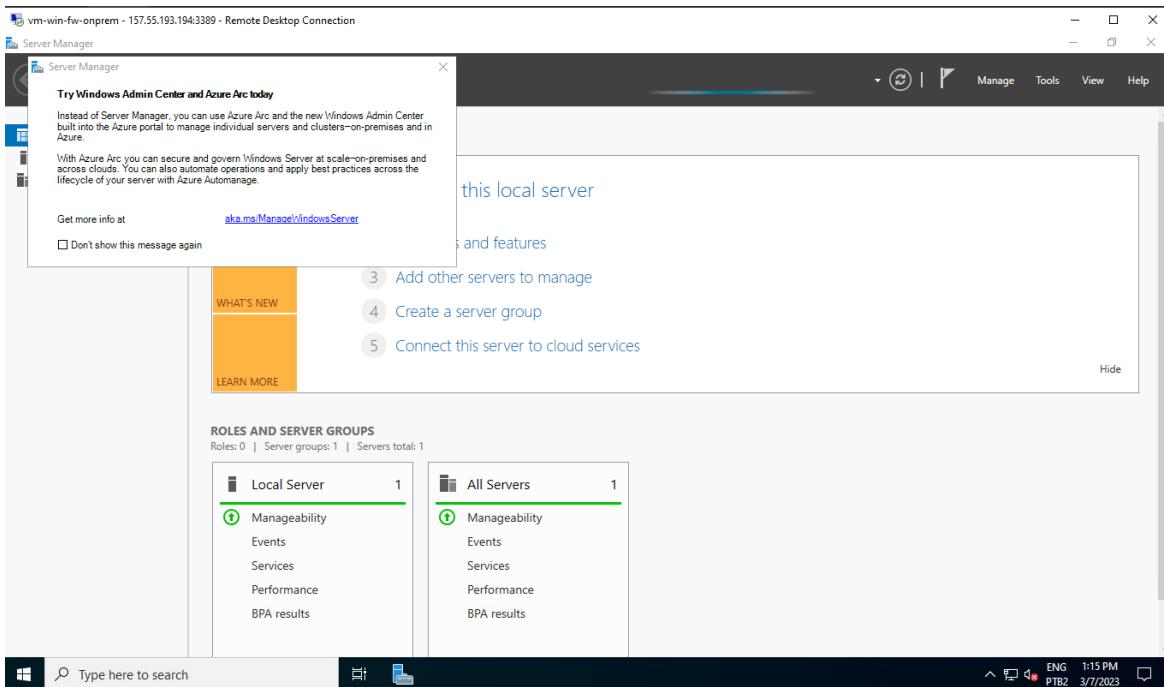
▼ Lab05 → Deploy VM para simular firewall On-Premises

- Vamos criar a vm no RG que representa o ambiente on-premises
  - Config padrão
  - Desabilitar o boot diagnóstico

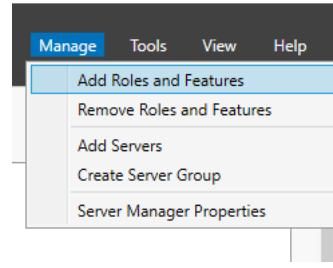
## Create a virtual machine ...

|                                                                        |                                                      |
|------------------------------------------------------------------------|------------------------------------------------------|
| Validation passed                                                      |                                                      |
| Subscription                                                           | Visual Studio Enterprise Subscription – MPN          |
| Resource group                                                         | rg-labs-onprem                                       |
| Virtual machine name                                                   | vm-win-fw-onprem                                     |
| Region                                                                 | South Central US                                     |
| Availability options                                                   | No infrastructure redundancy required                |
| Security type                                                          | Standard                                             |
| Image                                                                  | Windows Server 2022 Datacenter: Azure Edition - Gen2 |
| VM architecture                                                        | x64                                                  |
| Size                                                                   | Standard D2s v3 (2 vcpus, 8 GiB memory)              |
| Username                                                               | az_admin                                             |
| Public inbound ports                                                   | RDP                                                  |
| Already have a Windows license?                                        | No                                                   |
| Azure Spot                                                             | No                                                   |
| <b>Disks</b>                                                           |                                                      |
| OS disk type                                                           | Premium SSD LRS                                      |
| Use managed disks                                                      | Yes                                                  |
| Delete OS disk with VM                                                 | Enabled                                              |
| Ephemeral OS disk                                                      | No                                                   |
| <b>Networking</b>                                                      |                                                      |
| Virtual network                                                        | vnet-onprem                                          |
| Subnet                                                                 | subnet-onprem (192.168.0/24)                         |
| Public IP                                                              | (new) vm-win-fw-onprem-ip                            |
| Accelerated networking                                                 | On                                                   |
| Place this virtual machine behind an existing load balancing solution? | No                                                   |
| Delete public IP and NIC when VM is deleted                            | Disabled                                             |

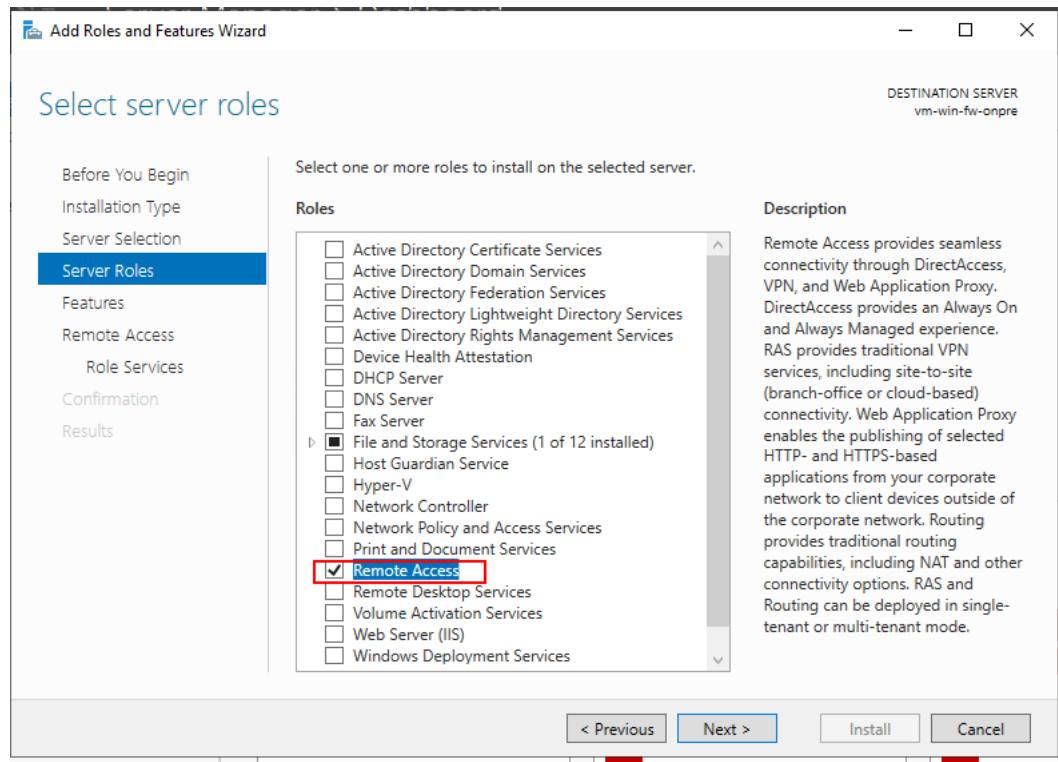
- Após criarmos a vm, efetuaremos um acesso



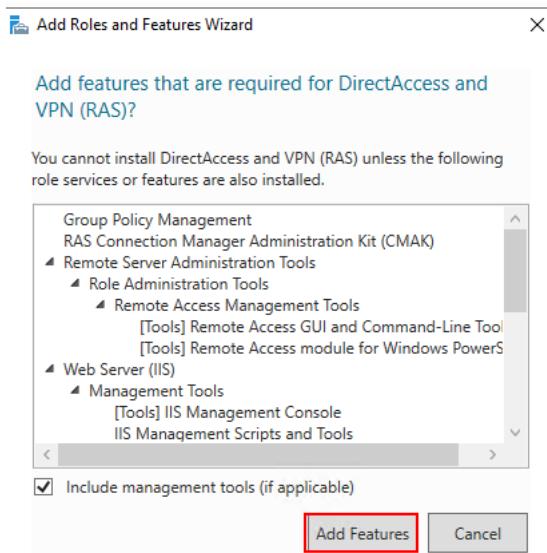
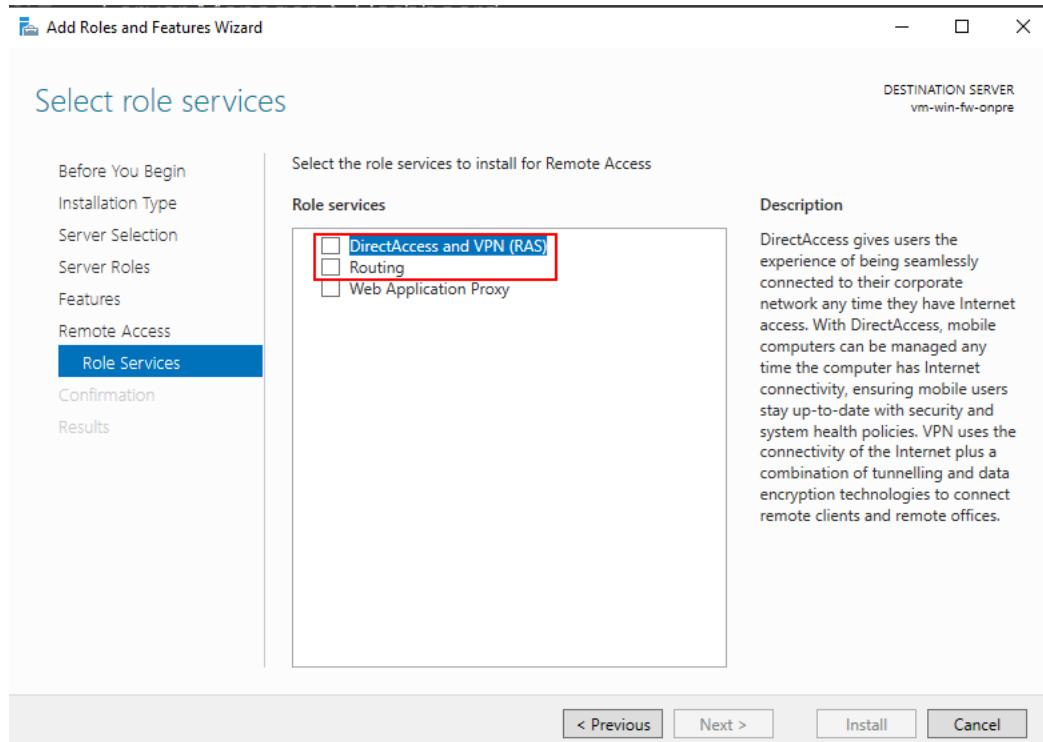
- Agora seguiremos com algumas configurações para simular um firewall no ambiente on premises
- No server manage vamos em add roles and features



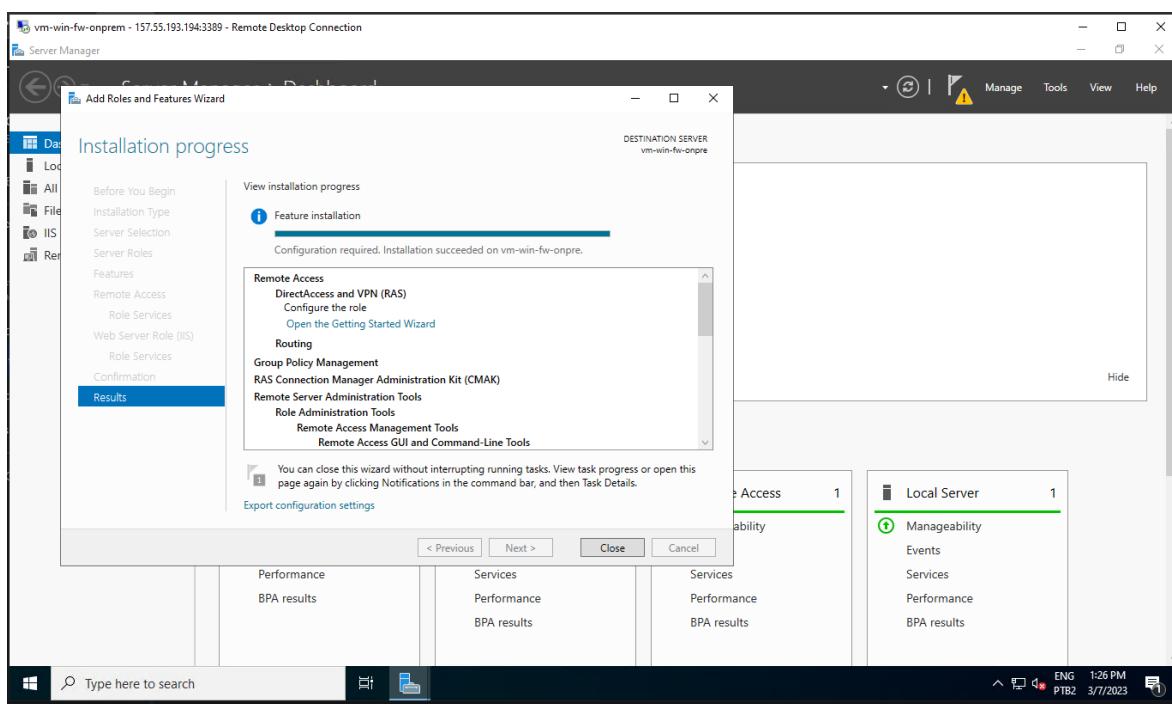
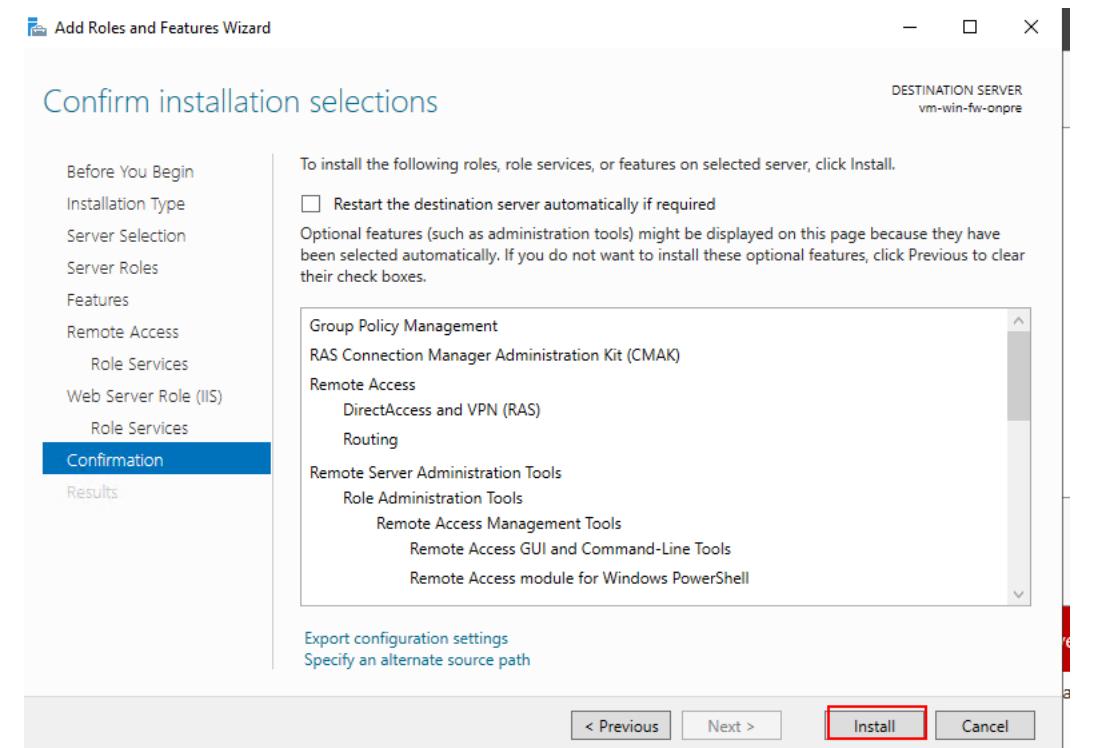
- Next > next > next > em server roles add o remote access > padrão > utilizaremos as duas opções da implementação do remote access >



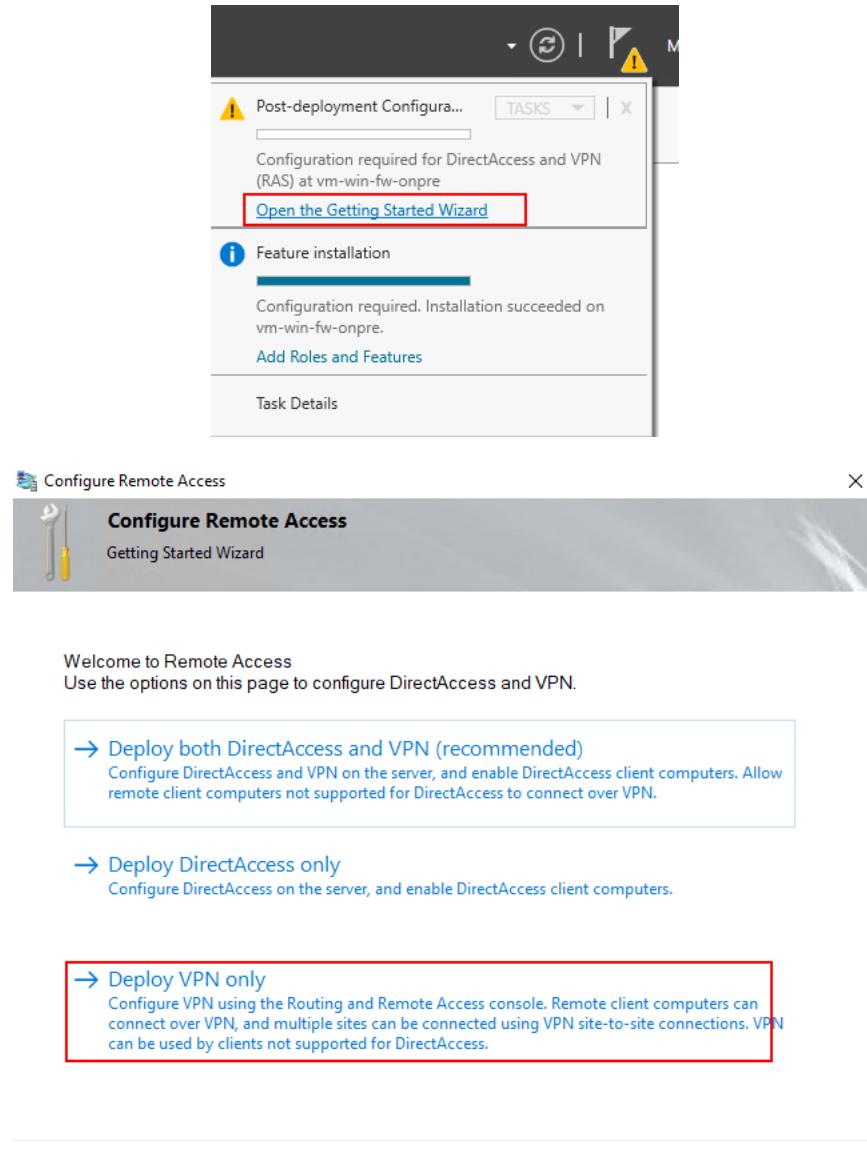
- Next > Next > Role Services adicionamos o RAS e o Routing

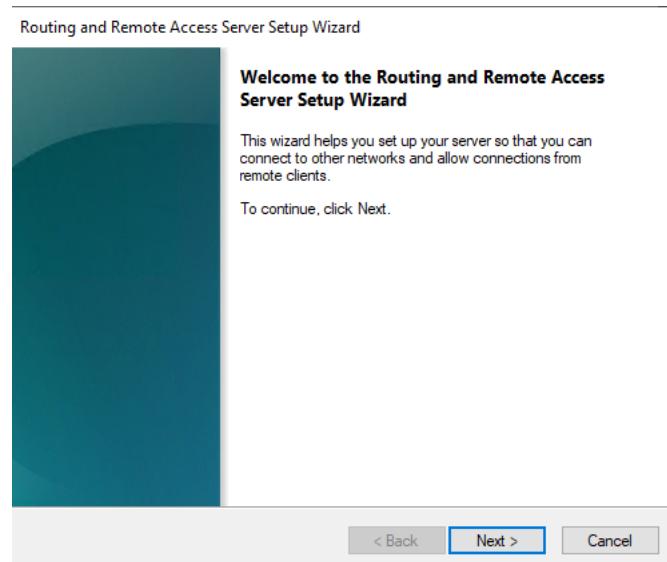
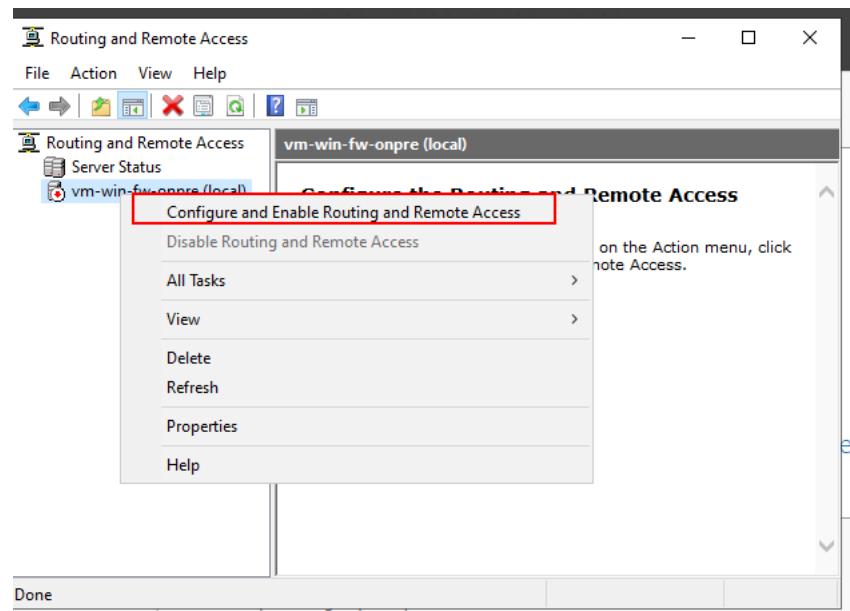


- Next > next > Install

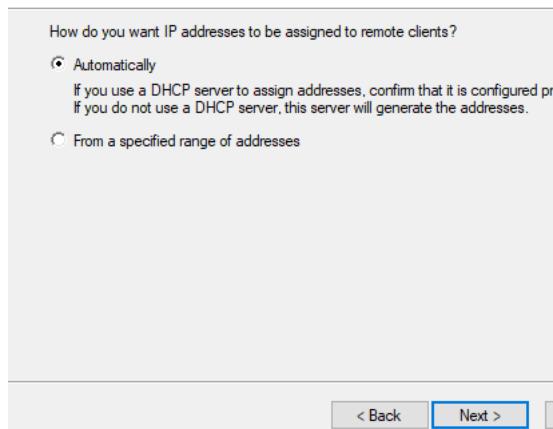
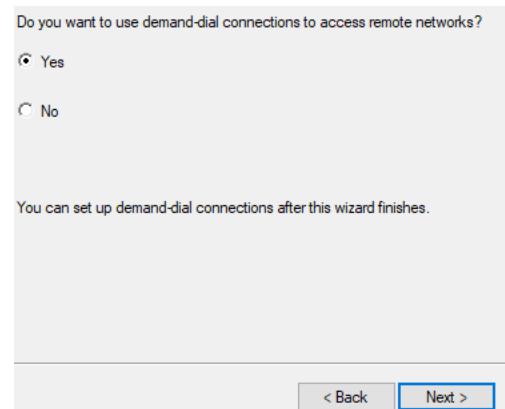
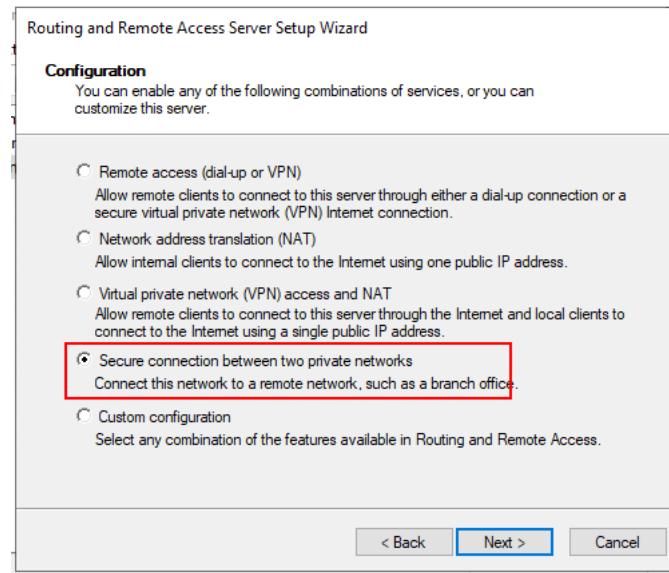


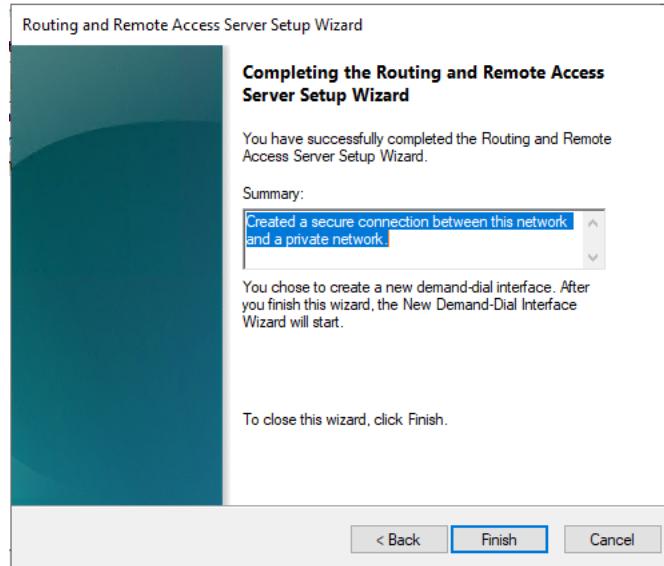
- Após concluir vamos configurar o RAS > deploy vpn on > clicamos em configure and enable routing and remote access> Abrir um wizzard de instalação



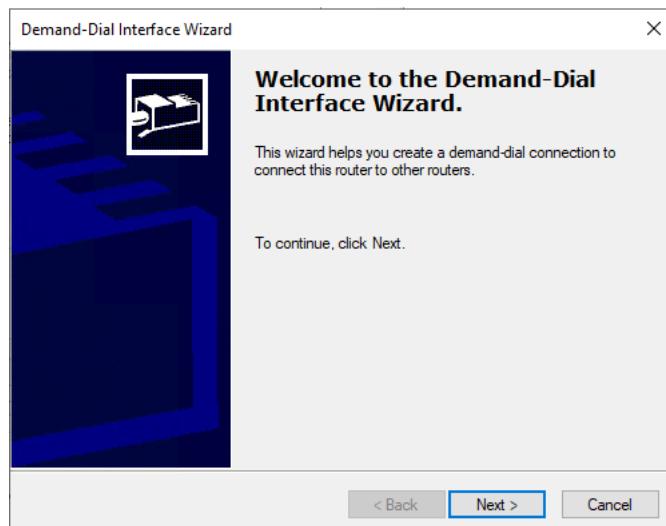


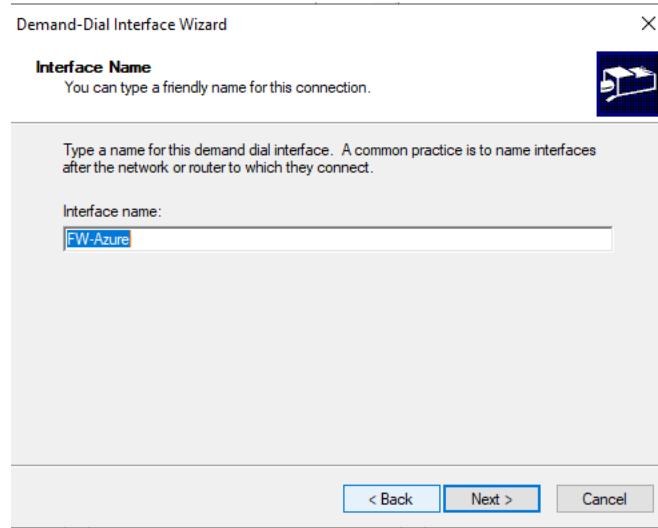
- Tipo de conexão secure connection between two private networks > yes > automatically > Finish



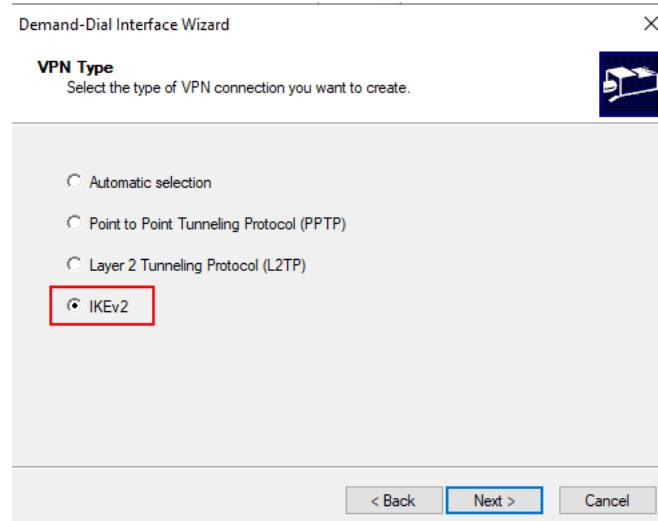
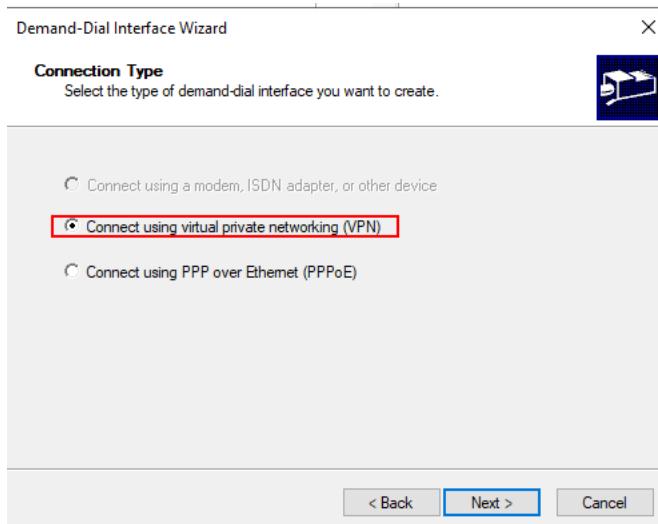


- Agora iremos configurar a interface para que aponte para o ambiente do azure > colocamos o nome como "FW - Azure"





- Correct using virtual private networking (VPN) > protocolo IKEv2



- No destino iremos colocar o IP publico do nosso virtual network Gateway > Em seguida será um roteamento de IP

The screenshot shows the Azure portal interface for managing a Virtual Network Gateway. The main pane displays the 'Essentials' section with details like Resource group (rg-labs-cloud), Location (East US), Subscription (Visual Studio Enterprise Subscription - MPN), and Tags (modulo : mod05). A red box highlights the 'Public IP address' field, which contains the value '4.246.159.152 (ip: vng-01-cloud)' with a 'Copied' button next to it. Below this, there's a 'Health check' section with a text input field containing '4.246.159.152'. At the bottom of the main pane are 'Back', 'Next >', and 'Cancel' buttons.

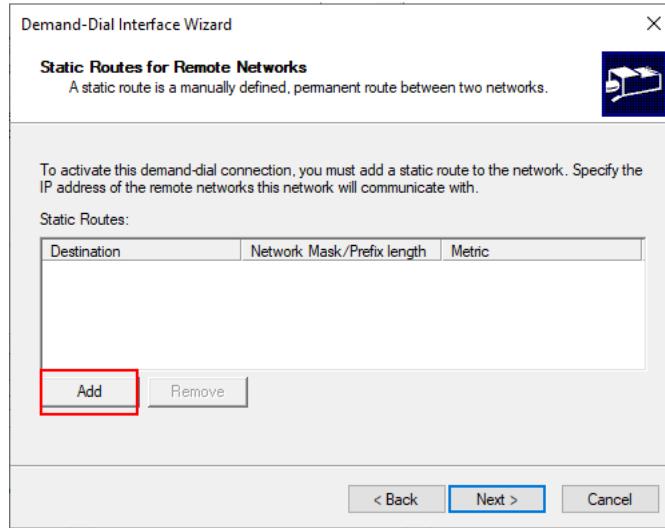
- Mantemos o route IP packets on this interface

The screenshot shows the 'Protocols and Security' step of the 'Demand-Dial Interface Wizard'. The title bar says 'Protocols and Security' and 'Select transports and security options for this connection.' Below the title, there's a section titled 'Select all that apply:' with four checkboxes:
 

- Route IP packets on this interface.
- Add a user account so a remote router can dial in
- Send a plain-text password if that is the only way to connect
- Use scripting to complete the connection with the remote router

 At the bottom of the window are 'Back', 'Next >', and 'Cancel' buttons.

- E add os IP e mascaras das vnets



- Em metric colocamos de 11

Static Route

Remote Network Support using IPv4

Destination:  IP  
Network Mask:  Mascara

Remote Network Support using IPv6

Destination:   
Prefix Length:   
Metric:

OK Cancel

Demand-Dial Interface Wizard

**Static Routes for Remote Networks**

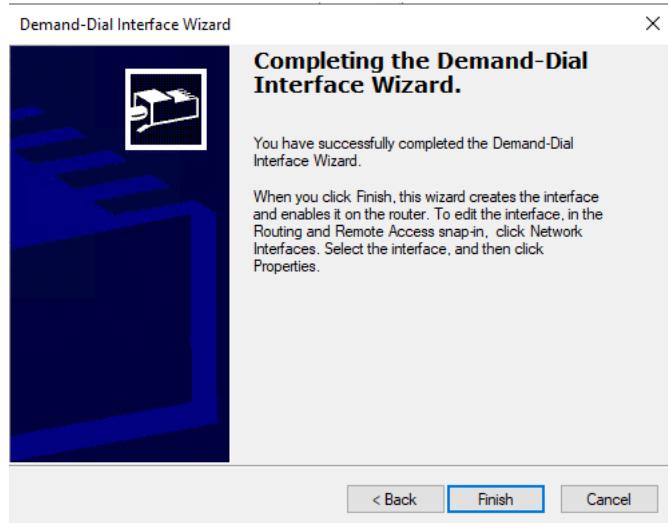
To activate this demand-dial connection, you must add a static route to the network. Specify the IP address of the remote networks this network will communicate with.

Static Routes:

| Destination | Network Mask/Prefix length | Metric |
|-------------|----------------------------|--------|
| 10.3.0.0    | 255.255.0.0                | 12     |
| 10.2.0.0    | 255.255.0.0                | 11     |
| 10.1.0.0    | 255.255.0.0                | 10     |

Add Remove < Back Next > Cancel

- Next > Finish



- Ainda em Network interfaces podemos ver o Fw-Azure porém em IPv4 teremos que pontuar as rotas da vnet novamente

| LAN and Demand Dial Interfaces | Type        | Status  | Connection State | Device Name                       |
|--------------------------------|-------------|---------|------------------|-----------------------------------|
| Loopback                       | Loopback    | Enabled | Connected        |                                   |
| Internal                       | Internal    | Enabled | Connected        |                                   |
| <b>FW-Azure</b>                | Demand-dial | Enabled | Disconnected     |                                   |
| Ethernet                       | Dedicated   | Enabled | Connected        | Microsoft Hyper-V Network Adapter |

New Static Route...  
Show IP Routing Table...  
Refresh  
View >  
Arrange Icons >  
Line up Icons  
Help

- Colocamos a interface do fw-azure e os IPs novamente das vnets

The screenshot shows two windows related to network routing configuration.

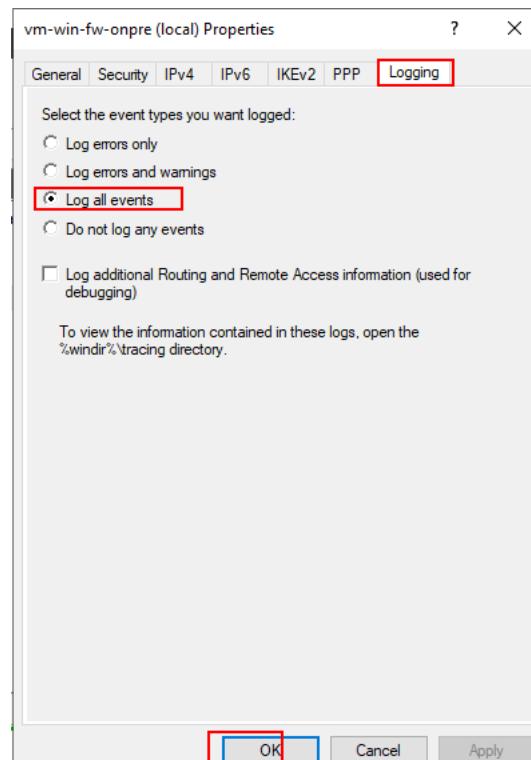
**IPv4 Static Route Dialog Box:**

- Interface:** FW-Azure (highlighted with a red box)
- Destination:** 10 . 2 . 0 . 0 (highlighted with a red arrow)
- Network mask:** 255 . 255 . 0 . 0 (highlighted with a red arrow)
- Metric:** 256
- Checkboxes:** Use this route to initiate demand-dial connections (unchecked), OK, Cancel

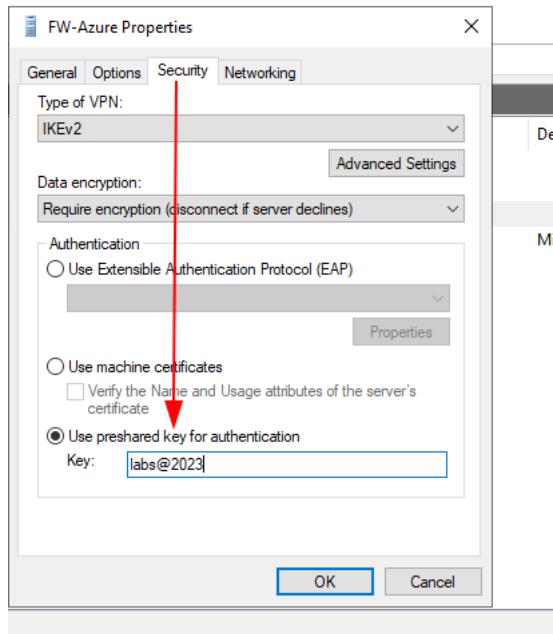
**Routing and Remote Access Snap-in - Static Routes Table:**

| Destination | Network mask | Gateway | Interface | Metric | View |
|-------------|--------------|---------|-----------|--------|------|
| 10.1.0.0    | 255.255.0.0  | None    | FW-Azure  | 256    | Both |
| 10.2.0.0    | 255.255.0.0  | None    | FW-Azure  | 256    | Both |
| 10.3.0.0    | 255.255.0.0  | None    | FW-Azure  | 256    | Both |

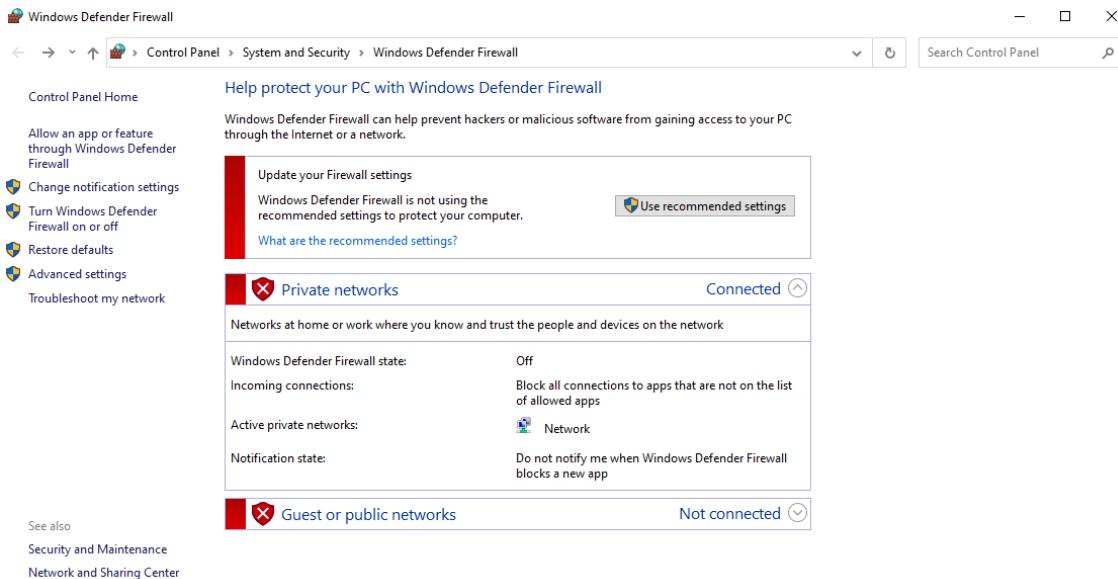
- Configurando as propriedade vm-win-fw > Logging > vamos apontar como log all events



- Já na interface fw-azure vamos em propriedades > security > use preshared key for authentication (que será utilizada ao configurar o Virtual Network gateway no azure) - No caso utilizaremos labs@2023



- Vamos desabilitar o fw para testar o ping após fecharmos a conexão



- Próximo passo será fechar a conexão do lado do azure
- Mas antes precisaremos ir na NIC da vm-win-fw-onprem > em IP configurations colocamos como IP Forwarding enabled, pois através dela que irá receber e encaminhar para o ambiente onpremises

vm-win-fw-onprem251 | IP configurations

Network interface

IP configurations

IP forwarding settings

IP forwarding

Virtual network

Gateway load balancer

IP configurations

Subnet \*

vnet-onprem

None

subnet-onprem

| Name      | IP Version | Type    | Private IP address    | Public IP address                    |
|-----------|------------|---------|-----------------------|--------------------------------------|
| ipconfig1 | IPv4       | Primary | 192.168.0.4 (Dynamic) | 157.55.193.194 (vm-win-fw-on... ***) |

- No caso o IP publico da vm está como estatico mas caso esteja dinamico alterem para estatico, assim evitamos a troca em caso de reinicialização

Home > Virtual machines > vm-win-fw-onprem | Networking > vm-win-fw-onprem251 > vm-win-fw-onprem-ip

vm-win-fw-onprem-ip | Configuration

Public IP address

IP address assignment

Static

IP address (.)

157.55.193.194

idle timeout (minutes) (.)

DNS name label (optional) (.)

.southcentralus.cloudapp.azure.com

You can use the IP address as your 'A' DNS record or DNS label as your 'CNAME' record. [Learn more about adding a custom domain to this IP address](#)

Alias record sets

Create an alias record in Azure DNS. [Learn more](#)

+ Create alias record

| Subscription | DNS zone | Name | Type | TTL |
|--------------|----------|------|------|-----|
| No results.  |          |      |      |     |

## ▼ Lab06 → Deploy Local Network Gateway

- Para concluirmos a conexão precisamos criar no azure um local network gateway
  - Local network gateway → Gateway de conexão com a rede onpremises
  - Virtual network gateway → Gateway de conexão com as redes da cloud
- Vamos criar um local network gateway
  - Colocamos o no RG da nuvem

## Create local network gateway

Basics Advanced Review + create

A local network gateway is a specific object that represents an on-premises location (the site) for routing purposes. [Learn more](#)

### Project details

Subscription \*

Visual Studio Enterprise Subscription – MPN

Resource group \*

rg-labs-cloud

Create new

### Instance details

Region \*

West US

Name \*

LNG-01

- Colocamos o IP publico da vm

The screenshot shows the Azure portal interface for a virtual machine named "vm-win-fw-onprem". The "Networking" section of the properties blade is highlighted, showing the Public IP address as 157.55.193.194 and the Network interface as "vm-win-fw-onprem251".

- E o endereçamento da rede local

The screenshot shows the "Create local network gateway" form. In the "Endpoint" section, the "IP address" field is populated with "157.55.193.194".

| Address Space(s)             |
|------------------------------|
| 192.168.0.0/16               |
| Add additional address range |

- No LNG podemos configurar e adicionar novas rotas de rede local posteriormente e podemos fechar até 30 tuneis diferentes

## Create local network gateway ...



The screenshot shows the 'LNG-01' Local network gateway overview page. The left sidebar includes sections for Overview, Activity log, Access control (IAM), Tags, Settings (Configuration, Connections, Properties, Locks), Automation (Tasks (preview), Export template), and Help (New Support Request). The main content area displays the 'Essentials' section with the following details:

| Resource group (move) | : rg-labs-cloud                               |
|-----------------------|-----------------------------------------------|
| Location              | : West US                                     |
| Subscription (move)   | : Visual Studio Enterprise Subscription – MPN |
| Subscription ID       | : afe7f77d-a295-4675-9bf9-5b6bf32b89f4        |
| Tags (edit)           | : Click here to add tags                      |

LNG-01 | Connections

Local network gateway

Add

Search connections

| Name       | Status | Connection |
|------------|--------|------------|
| No results |        |            |

Overview

Activity log

Access control (IAM)

Tags

Settings

Configuration

Connections

Properties

- Agora no Virtual network gateway
  - Vamos em conectors > site to site > VNG padrão utilizado > Selecionamos o LNG que criamos > E colocamos o shared key que criamos no vm-fw local, labs@2023> IKEv2 > OK

vng-01-cloud

Virtual network gateway

Refresh

Move

Essentials

Resource group (move) : rg-labs-c

Location : East US

Subscription (move) : Visual Studio

Subscription ID : afe7f77d

Tags (edit) : module

Health check

Perform a quick health check

Go to Resource health

Connections

Point-to-site configuration

Properties

Locks

vng-01-cloud | Connections

Virtual network gateway

Search

Add Refresh

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Configuration

Connections

Point-to-site configuration

Properties

Locks

Monitoring

Logs

Alerts

Metrics

Search connections

| Name       | Status | Connection ty |
|------------|--------|---------------|
| No results |        |               |

Home > Resource groups > rg-labs-cloud > vng-01-cloud | Connections >

### Add connection

vng-01-cloud

**1** Name \*

**2** Connection type ⓘ

\*Virtual network gateway ⓘ **3** vng-01-cloud

\*Local network gateway ⓘ **4** LNG-01

Shared key (PSK) \* ⓘ **5**

Use Azure Private IP Address ⓘ

Enable BGP ⓘ

IKE Protocol ⓘ **6**  IKEv2

Subscription

Resource group

Location ⓘ **7** East US

**OK**

vng-01-cloud | Connections

Virtual network gateway

Search Add Refresh

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Configuration

Connections

Point-to-site configuration

Properties

Locks

Monitoring

Logs

Alerts

Metrics

BGP peers

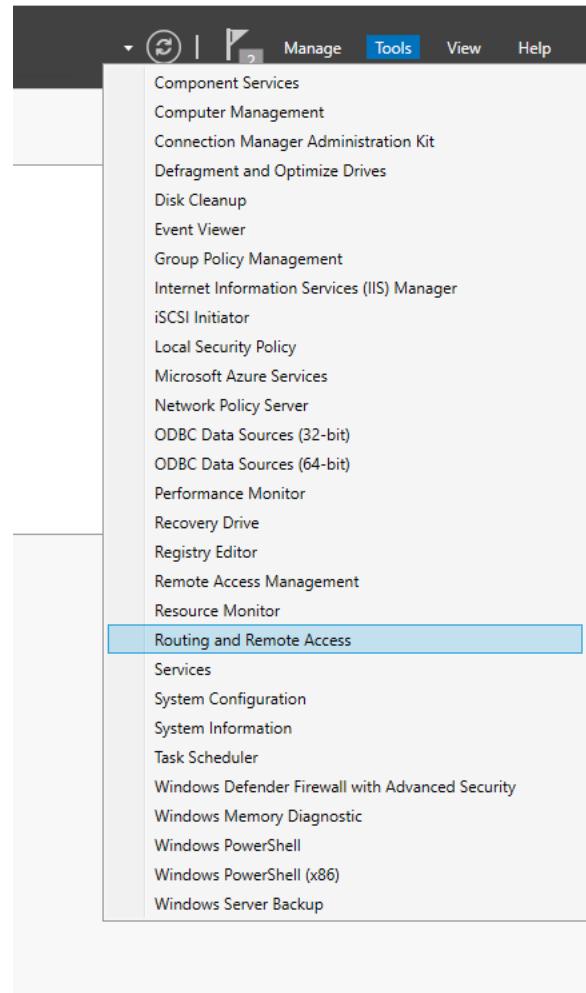
Automation

Tasks (preview)

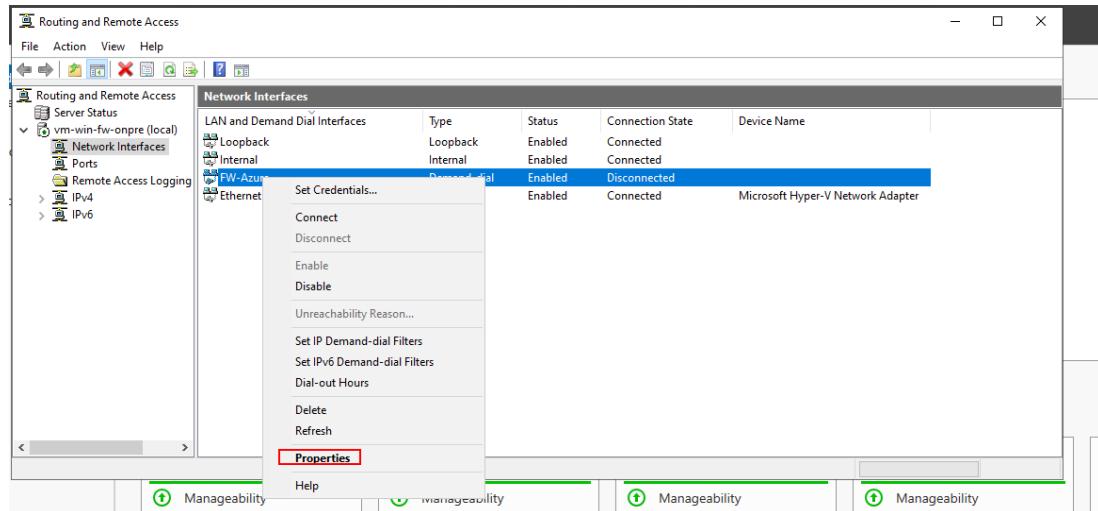
Export template

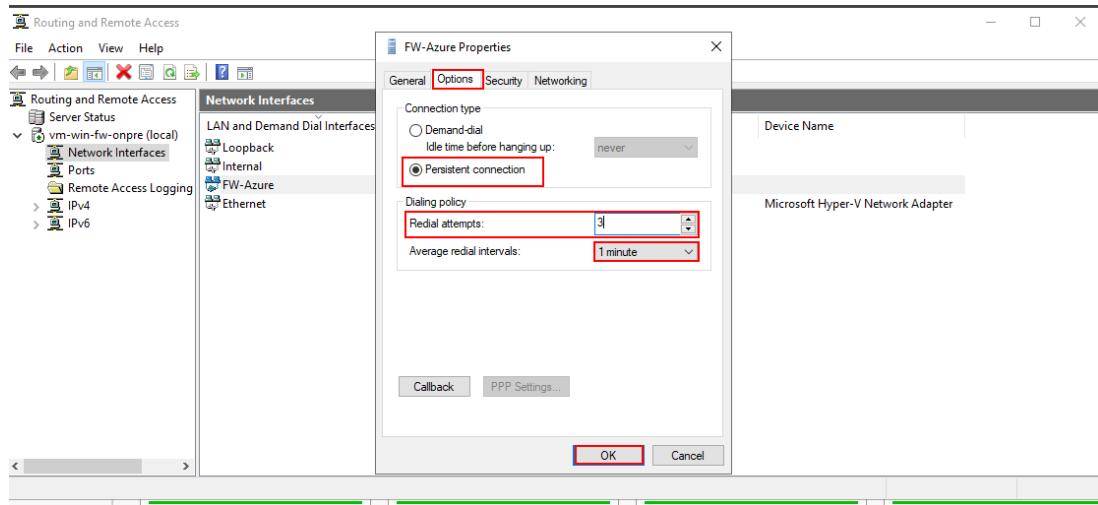
| Name          | Status   | Connection type      | Peer   |
|---------------|----------|----------------------|--------|
| VPN-OPREMISES | Updating | Site-to-site (IPsec) | LNG-01 |

- Vamos acessar a vm novamente e vamos em routing and remote access

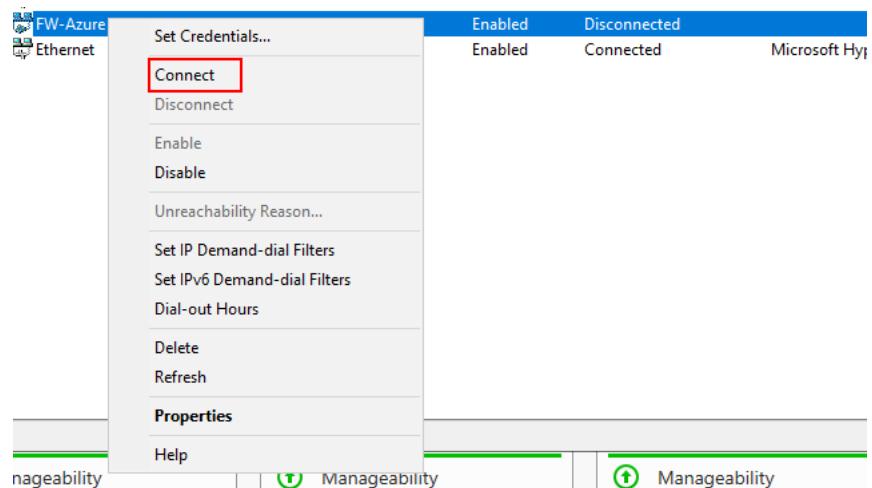


- No Network interfaces > Vamos fw-azure propriedades > Em options colocamos a opção persistent connection com até 3 tentativas por minuto

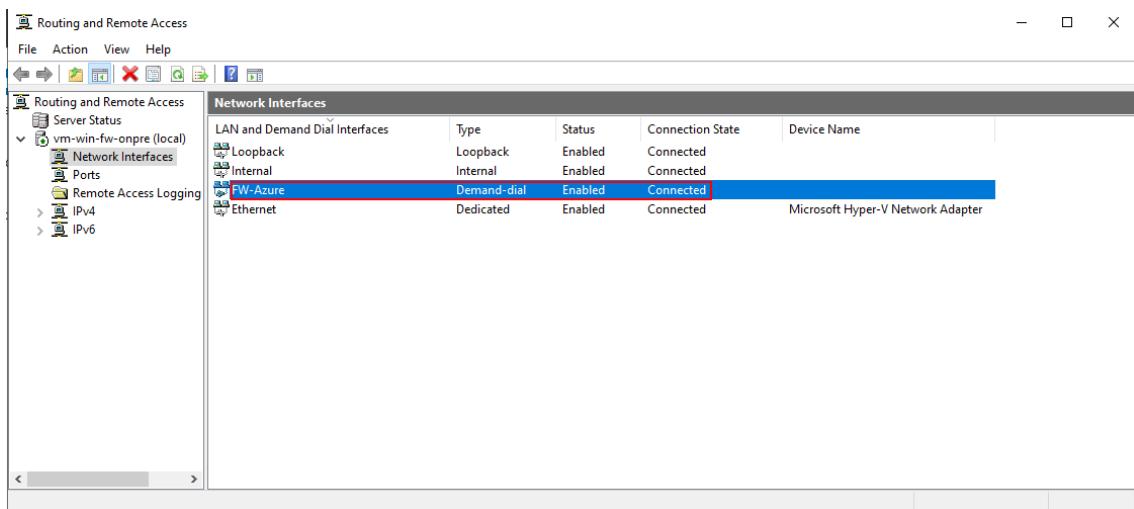




- E realizamos um connect



- No lado do firewall é mais rápido por ele já ocorrerá a conexão



- Realizando um teste de ping podemos localizar uma das vms do ambiente nuvem

```
C:\Users\az_admin>ping 10.1.0.4
Pinging 10.1.0.4 with 32 bytes of data:
Reply from 10.1.0.4: bytes=32 time=33ms TTL=63
Reply from 10.1.0.4: bytes=32 time=33ms TTL=63
Reply from 10.1.0.4: bytes=32 time=33ms TTL=63
Reply from 10.1.0.4: bytes=32 time=34ms TTL=63
Ping statistics for 10.1.0.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
 Minimum = 33ms, Maximum = 34ms, Average = 33ms
C:\Users\az_admin>
```

- Voltando no VNG Podemos ver que a conexão foi estabelecida

| Name          | Status    | Connection type      |
|---------------|-----------|----------------------|
| VPN-OPREMISES | Connected | Site-to-site (IPsec) |

- Após a conexão for estabelecida de ambos os lados podemos efetuar um acesso na vm linux
  - Conectamos na vm do linux através da vm que se encontra no ambiente onpremises
  - Realizando teste de ping com o IP da vm-fw-onpremises

```

az_admin@vm-lx-us-cloud:~$ az_admin@vm-lx-us-cloud:~$ ping 192.168.0.4
PING 192.168.0.4 (192.168.0.4) 56(84) bytes of data.
64 bytes from 192.168.0.4: icmp_seq=1 ttl=127 time=34.8 ms
64 bytes from 192.168.0.4: icmp_seq=2 ttl=127 time=35.7 ms
64 bytes from 192.168.0.4: icmp_seq=3 ttl=127 time=34.1 ms
64 bytes from 192.168.0.4: icmp_seq=4 ttl=127 time=35.1 ms
64 bytes from 192.168.0.4: icmp_seq=5 ttl=127 time=40.2 ms
64 bytes from 192.168.0.4: icmp_seq=6 ttl=127 time=34.1 ms
64 bytes from 192.168.0.4: icmp_seq=7 ttl=127 time=34.3 ms
64 bytes from 192.168.0.4: icmp_seq=8 ttl=127 time=33.9 ms
64 bytes from 192.168.0.4: icmp_seq=9 ttl=127 time=34.2 ms
64 bytes from 192.168.0.4: icmp_seq=10 ttl=127 time=34.0 ms
64 bytes from 192.168.0.4: icmp_seq=11 ttl=127 time=34.2 ms
64 bytes from 192.168.0.4: icmp_seq=12 ttl=127 time=39.8 ms
64 bytes from 192.168.0.4: icmp_seq=13 ttl=127 time=34.0 ms
64 bytes from 192.168.0.4: icmp_seq=14 ttl=127 time=33.9 ms
64 bytes from 192.168.0.4: icmp_seq=15 ttl=127 time=33.8 ms
64 bytes from 192.168.0.4: icmp_seq=16 ttl=127 time=34.7 ms
64 bytes from 192.168.0.4: icmp_seq=17 ttl=127 time=33.7 ms
64 bytes from 192.168.0.4: icmp_seq=18 ttl=127 time=33.8 ms
```
--- 192.168.0.4 ping statistics ---
18 packets transmitted, 18 received, 0% packet loss, time 17026ms
rtt min/avg/max/mdev = 33.686/34.904/40.150/1.857 ms
az_admin@vm-lx-us-cloud:~$
```

- Se testarmos um ping entre a vm do ambiente onpremises e a vm windows que se encontra na vnet Br não haverá conexão

```

Administrator: Command Prompt
C:\Users\az_admin>ping 10.3.0.4
Pinging 10.3.0.4 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.3.0.4:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\Users\az_admin>
```

- Isso ocorre porque no Peering devemos habilitar o “use this virtual network's gateway or route server” para que as rotas da outras vnets se comuniquem com o gateway da vnet hub (no caso a USA)

Home > Virtual networks > vnet-us01 | Peering >

vnet-us01-to-vnet-br01 ...

vnet-us01

This virtual network

Peering link name

vnet-us01-to-vnet-br01

Peering status

Fully Synchronized

Peering state

Succeeded

Traffic to remote virtual network ⓘ

Allow (default)

Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ

Allow (default)

Block traffic that originates from outside the remote virtual network

Virtual network gateway or Route Server ⓘ

Use this virtual network's gateway or Route Server

Use the remote virtual network's gateway or Route Server

None (default)

Remote virtual network

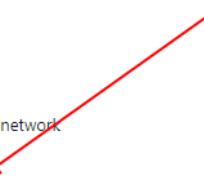
Remote Vnet Id

/subscriptions/afe7f77d-a295-4675-9bf9-5b6bf32b89f4/resourceGroups/rg-labs-cloud/providers/Microsoft.Network/vir... ⓘ

Address space

10.3.0.0/16

- É preciso habilitar dos dois lados do peering



vnet-br01-to-vnet-us01 ...

vnet-br01

This virtual network

Peering link name
vnet-br01-to-vnet-us01

Peering status
Fully Synchronized

Peering state
Succeeded

Traffic to remote virtual network ⓘ
 Allow (default)
 Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ
 Allow (default)
 Block traffic that originates from outside the remote virtual network

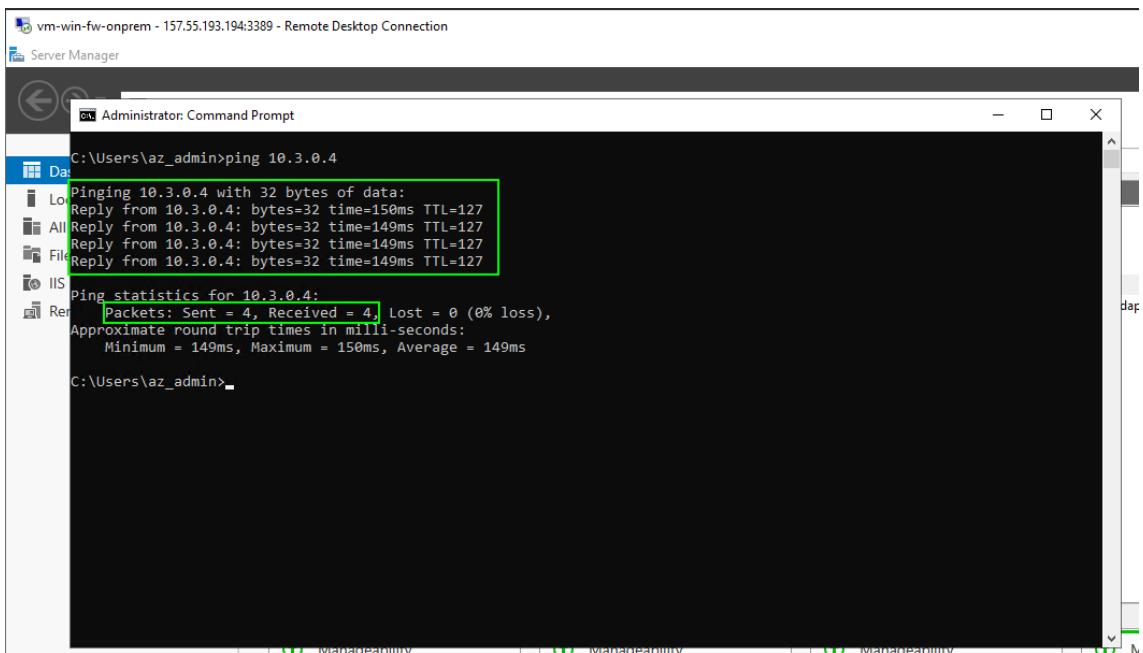
Virtual network gateway or Route Server ⓘ
 Use this virtual network's gateway or Route Server
 Use the remote virtual network's gateway or Route Server
 None (default)

Remote virtual network

Remote Vnet Id
</subscriptions/afe7f77d-a295-4675-9bf9-5b6bf32b89f4/resourceGroups/rg-labs-cloud/providers/Microsoft.Network/vir...>

Address space
10.1.0.0/16

- Após habilitarmos nos dois peerings, a vm-fw-onpremises irá encontrar qualquer vm que esteja conectada nas rede que estão pareadas com a **vnet-us01**



```
C:\Users\az_admin>ping 10.3.0.4
Pinging 10.3.0.4 with 32 bytes of data:
Reply from 10.3.0.4: bytes=32 time=150ms TTL=127
Reply from 10.3.0.4: bytes=32 time=149ms TTL=127
Reply from 10.3.0.4: bytes=32 time=149ms TTL=127
Reply from 10.3.0.4: bytes=32 time=149ms TTL=127
Ping statistics for 10.3.0.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 149ms, Maximum = 150ms, Average = 149ms
C:\Users\az_admin>
```

- Validando o effective rules podemos ver as rotas onpremises na NIC que está conectada na vnet spoke br

Home > Virtual machines > vm-win-br-cloud | Networking > vm-win-br-cloud80

vm-win-br-cloud80 | Effective routes

Network interface

[Search](#)
[Download](#)
[Refresh](#)
[Give feedback](#)

Showing only top 200 records, click Download above to see all.

Scope		Network interface (vm-win-br-cloud80)							
Associated route table: ⓘ		-							
Effective routes									
Source	↑↓	State	↑↓	Address Prefixes	↑↓	Next Hop Type	↑↓	Next Hop IP Address	↑↓
Default		Active		10.3.0.0/16		Virtual network		-	
Virtual netwo...		Active		192.168.0.0/16		Virtual network gateway		4.246.159.152	
Default		Active		0.0.0.0/0		Internet		-	
Default		Active		10.0.0.0/8		None		-	
Default		Active		100.64.0.0/10		None		-	
Default		Active		172.16.0.0/12		None		-	
Default		Active		25.48.0.0/12		None		-	
Default		Active		25.4.0.0/14		None		-	
Default		Active		198.18.0.0/15		None		-	
Default		Active		157.59.0.0/16		None		-	
Default		Active		25.33.0.0/16		None		-	
Default		Active		40.109.0.0/16		None		-	
Default		Active		104.147.0.0/16		None		-	
Default		Active		104.146.0.0/17		None		-	
Default		Active		40.108.0.0/17		None		-	
Default		Active		23.103.0.0/18		None		-	
Default		Active		25.41.0.0/20		None		-	

▼ Lab07 → Deploy VPN point-to-site

- Agora será realizado a configuração para que os usuários através da internet tenham acesso ao VNG e consequentemente no ambiente
- Usaremos o mesmo VNG e clicamos em “configure now”
- No próprio vamos em point-to-site configuration

The screenshot shows the Azure portal interface for a virtual network gateway named 'vng-01-cloud'. In the center, it says 'Point-to-site is not configured' with a 'Configure now' button highlighted by a red box. On the left, there's a sidebar with various links: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Configuration, Connections, and Point-to-site configuration (which is also highlighted with a red box). Below the sidebar are 'Address pool', 'Tunnel type', 'Authentication type', 'Root certificates', 'Revoked certificates', and 'Additional routes to advertise' fields.

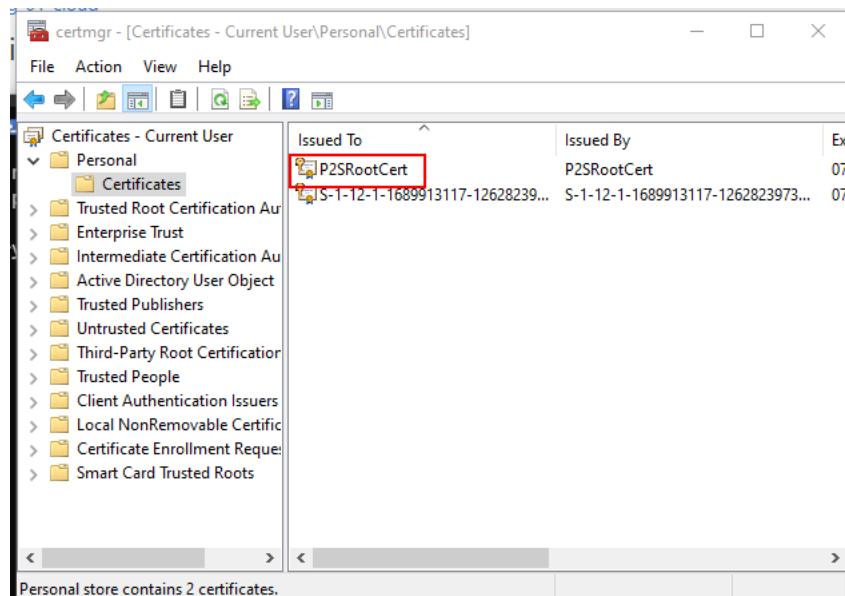
- Vamos criar um range de ips 172.16.0.0/24 para que os clientes quando fecharem a vpn irão receber > Vamos colocar o tipo de tunel IKEv2 and OpenVPN (SSL) → E setar a autenticação do tipo “Azure certificate”

This screenshot shows the 'Point-to-site configuration' blade. It includes fields for 'Address pool' (172.16.0.0/24), 'Tunnel type' (IKEv2 and OpenVPN (SSL)), 'Authentication type' (set to 'Azure certificate'), 'Root certificates' (with a 'Name' field and a 'Public certificate data' input field), 'Revoked certificates' (empty table), and 'Additional routes to advertise' (empty input field).

- No powershell em nosso computador vamos rodar o seguinte script :

```
$cert = New-SelfSignedCertificate -Type Custom -KeySpec Signature ` 
-Subject "CN=P2SRootCert" -KeyExportPolicy Exportable ` 
-HashAlgorithm sha256 -KeyLength 2048 ` 
-CertStoreLocation "Cert:\CurrentUser\My" -KeyUsageProperty Sign -KeyUsage CertSign
```

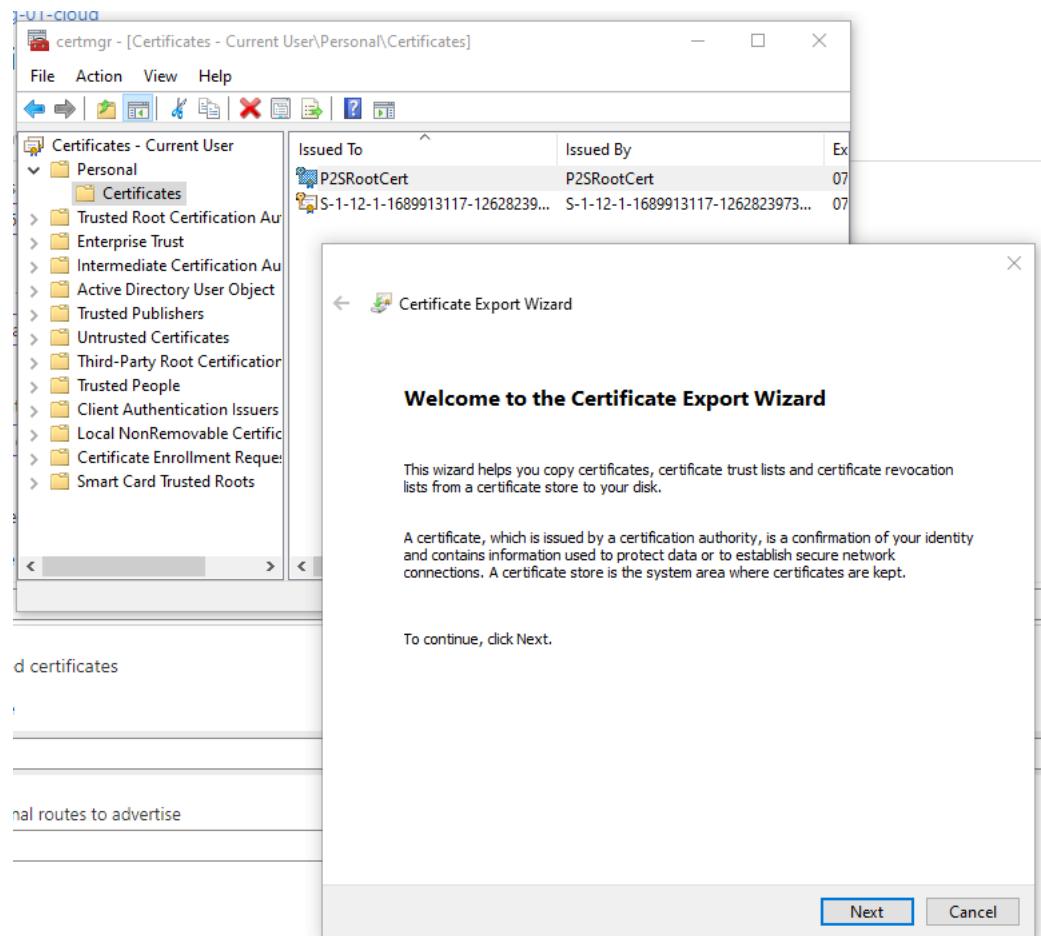
- Podemos visualizar o certificado criado através do executar + certmgr.msc



- Vamos manter o console do powershell aberto
- Precisamos de um certificado de cliente, as maquinas que forem ter acesso ao ambiente deverá ter um certificado de cliente
- Com o powershell ainda aberto rodamos o comando :

```
New-SelfSignedCertificate -Type Custom -DnsName P2SChildCert -KeySpec Signature ` 
-Subject "CN=P2SChildCert" -KeyExportPolicy Exportable ` 
-HashAlgorithm sha256 -KeyLength 2048 ` 
-CertStoreLocation "Cert:\CurrentUser\My" ` 
-Signer $cert -TextExtension @("2.5.29.37={text}1.3.6.1.5.5.7.3.2")
```

- Em seguida exportamos o certificado Raiz através do cert manager
 - Executar win+ r certmgr > Personal > Certificates > P2SRootCert > botão direito> All tasks> export



Export Private Key
You can choose to export the private key with the certificate.

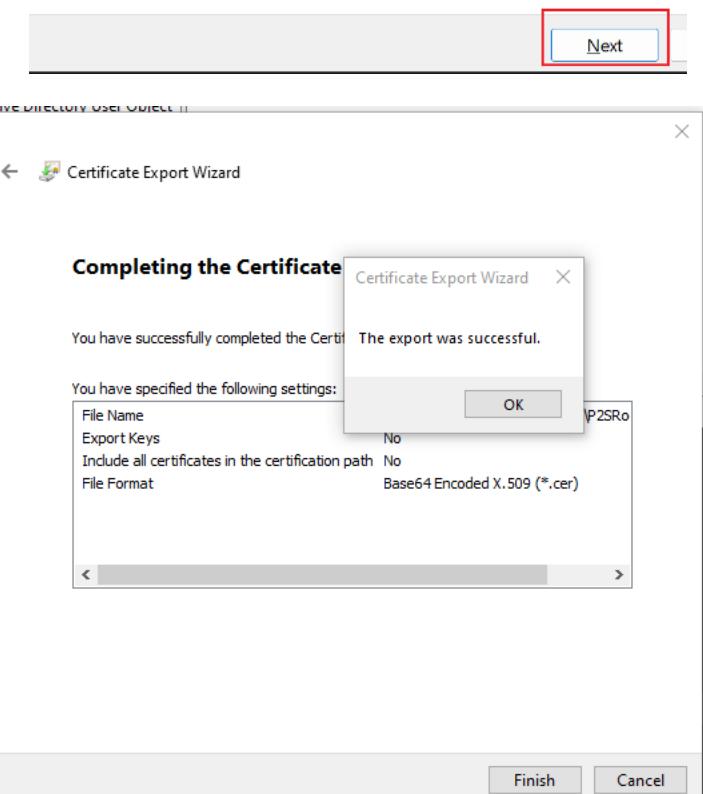
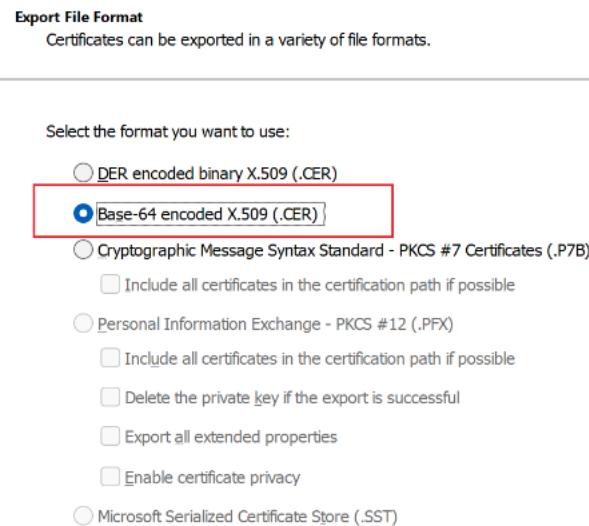
Private keys are password protected. If you want to export the private key with the certificate, you must type a password on a later page.

Do you want to export the private key with the certificate?

Yes, export the private key

No, do not export the private key

Next



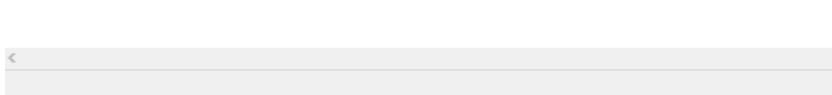
- Abrimos o arquivo com o bloco de notas e copiamos a informação para que possamos utilizar no azure

P2SRootCert - Notepad

```

File Edit Format View Help
-----BEGIN CERTIFICATE-----
MIIC5zCCAc+gAwIBAgIQQU9N1fAuL5pN9FWGGxThhjANBhkqkG9w0BAQsFADAW
MRQwEgYDVQQDAtQM1NSb290Q2VydDaeFw0yMzAzMDcxODE0MDNaFw0yNDazMDcx
ODM0MDNaMBYxFDASBgNVBAMC1AyU1Jvb3RDZXJ0MTIBiJANBhkqkG9w0BAQEF
AAOCAQ8AMIIBCgKCAQEAE1zLnfxD+x+yq3C3wDn7EAnG01mqizT2j6182ntfjgMMm
2yOY1151M3AeoF9pfbX9MHPjDMwUmF480ck88sUFzJs71MDU1XWd0Zqv0Sz07MfV
kYBqWCJBtuQMK1HTE162Fyhw82kaDvF0fH0gjb96Av5TMRY1sxmjmuQhbCCu6i
1+Zn/vvKICJ9whWr1wc1Dfo7ydDBrvgxOXGYGkz5fSLNkiPVUzLJ1rumVanzw5B
5E9o56x6Skt7GWhTAs8DxMfpSvsxqRcNs4AQbkKjmM0Dhr0V3o/t4I5LAz8HIQ
jaAjCH2Vr9B1NGNrnnWyx9L3EDVQkeXBdrQrmagZrQIDAQABozEwlzAOBgNVHQ8B
Af8EBAMCAgQwHQDVRO0BBYEFERySoToemMN01sXXcGd/ggrbsnZMA0GCSqGSIb3
DQEBCwUA4IBAQAF8A26Fk7EFF41oPfyLB1Nt80ijNLFiP8t1NA+/a+7gr1YGtW
RHs3W0jN38yj5zR8Xq1tURPDjqv0Dqp3UhdRjwV1zAVQ14fB2ab9/xjrHa4co34K
ULozbsnsbtjw0IvfwDFFjggpMqXvC0ingv13RwyLv7dzEKzS6202euHvSXGBfZs4
8VJqApZXTRmsV/5AQfgRjBkNdg8Day7PL+fcfFWZN/eHeSS71En6cu8E0COGCbiy
TiP4nbh6AdZlI17AP1zCWeYyo1o5RKDGNoeAUwmc1U7H6inVIkvFVKECZQKkSvN
iBwQ2m1zo3fdDJ/fFj3nXfu+jyHDPVt58d3
-----END CERTIFICATE-----

```



- Agora iremos adicionar esta chave no VNG

vng-01-cloud | Point-to-site configuration

Virtual network gateway

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Configuration

Connections

Point-to-site configuration

Properties

Locks

Monitoring

Logs

Alerts

Address pool *

172.16.0.0/24

Tunnel type

IKEv2 and OpenVPN (SSL)

Authentication type

Azure certificate

Root certificates

Name	Public certificate data
P2SRootCert	MIIIC5zCCAc+gAwIBAgIQQU9N1fAuL5pN9FWGGxThhjANBhkqkG9w0BAQsFADAW MRQwEgYDVQQDAtQM1NSb290Q2VydDaeFw0yMzAzMDcxODE0MDNaFw0yNDazMDcx

- Por fim vamos exportar a chave client para que possamos encaminhar para outras maquinas
 - Seguimos o mesmo procedimento porém Executar win+ r certmgr > Personal > Certificates > **P2SChildCert** > botão direito> All tasks> export

Export Private Key

You can choose to export the private key with the certificate.

Private keys are password protected. If you want to export the private key with the certificate, you must type a password on a later page.

Do you want to export the private key with the certificate?

Yes, export the private key

No, do not export the private key

Next

- Manter como estar e next

Export File Format

Certificates can be exported in a variety of file formats.

Select the format you want to use:

DER encoded binary X.509 (.CER)

Base-64 encoded X.509 (.CER)

Cryptographic Message Syntax Standard - PKCS #7 Certificates (.P7B)

Include all certificates in the certification path if possible

Personal Information Exchange - PKCS #12 (.PFX)

Include all certificates in the certification path if possible

Delete the private key if the export is successful

Export all extended properties

Enable certificate privacy

Microsoft Serialized Certificate Store (.SST)

- Em security colocamos uma senha (no caso para testes colocamos azure@2023)

Security
To maintain security, you must protect the private key to a security principal or by using a password.

Group or user names (recommended)

Password:
 Confirm password:

Encryption: TripleDES-SHA1

Next

- No caso só colocaremos após colocarmos a chave root na configuração P2S e daremos um save

vng-01-cloud | Point-to-site configuration

Virtual network gateway

Save Discard Delete Download VPN client

Address pool * 172.16.0.0/24

Tunnel type: IKEv2 and OpenVPN (SSL)

Authentication type: Azure certificate

Root certificates: P2SRootCert

Revoked certificates: Name, Thumbprint

- Em seguida vamos efetuar o download dos arquivos de configuração do cliente VPN, pode ser pelo portal

vng-01-cloud | Point-to-site configuration

Virtual network gateway

Search Save Discard Delete Download VPN client

Address pool * 172.16.0.0/24

Overview Activity log Access control (IAM)

Download VPN client

- Ou pelo cloud powershell

```

PS /home/lucas> $profile=New-AzVpnClientConfiguration -ResourceGroupName "rg-labs-cloud" -Name "vng-01-cloud" -AuthenticationMethod "EapFile"
PS /home/lucas> $profile.VPNProfileSASUrl
https://infoprodcuppl.blob.core.windows.net/vpnprofileimmutable/2ceb077-9b59-42f4-b1f2-9e7b1eeef5a8/vpoprofile/bb2c7243-8cf0-46a9-a6d1-ac321bdab80/vpnclientconfiguration.zip?sv=2018-03-28&sr=b&sig=5VVVuht3JU4w
8K1vyWz53us9LaPHnQ25K01y2By95hMw3D&st=2023-03-07T19%3A05%3A52&se=2023-03-07T20%3A05%3A57&sp=r&fileExtension=.zip
PS /home/lucas>

```

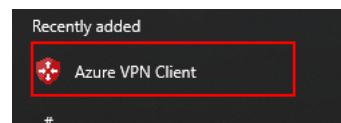
- Comando

```

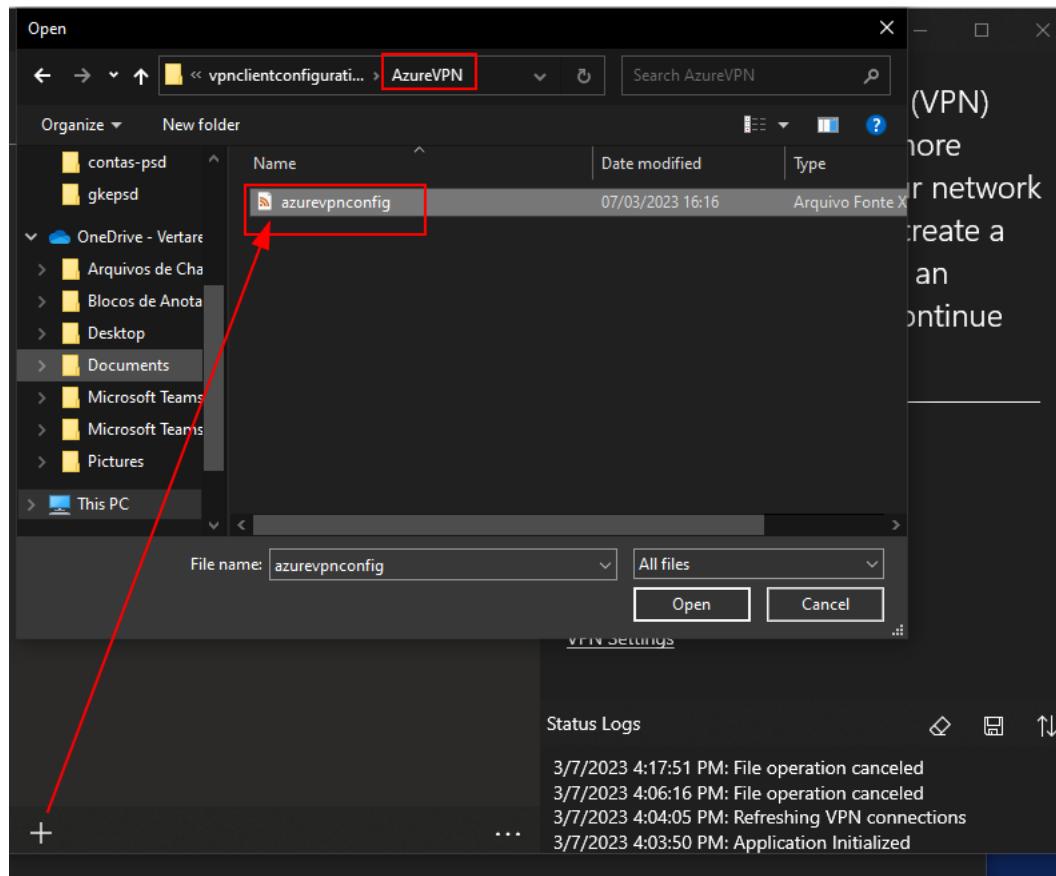
$profile=New-AzVpnClientConfiguration -ResourceGroupName "TestRG" -Name "VNet1GW" -AuthenticationMethod "EapTls"
$profile.VPNProfileSASUrl

```

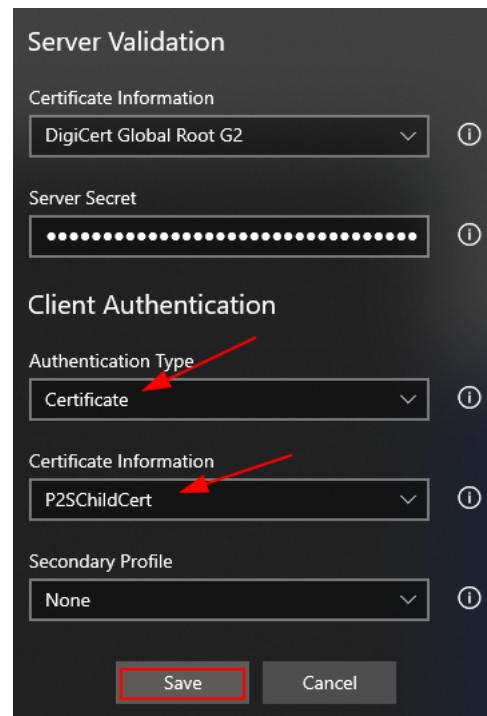
- Será feito o download do arquivo de configuração da VPN Client
- No caso o para que funcione para qualquer maquina que for ter acesso ao ambiente deverá estar instalado o certificado cliente que geramos a partir do root que no caso é o P2SChildCert
- Instalamos o Azure VPN Client



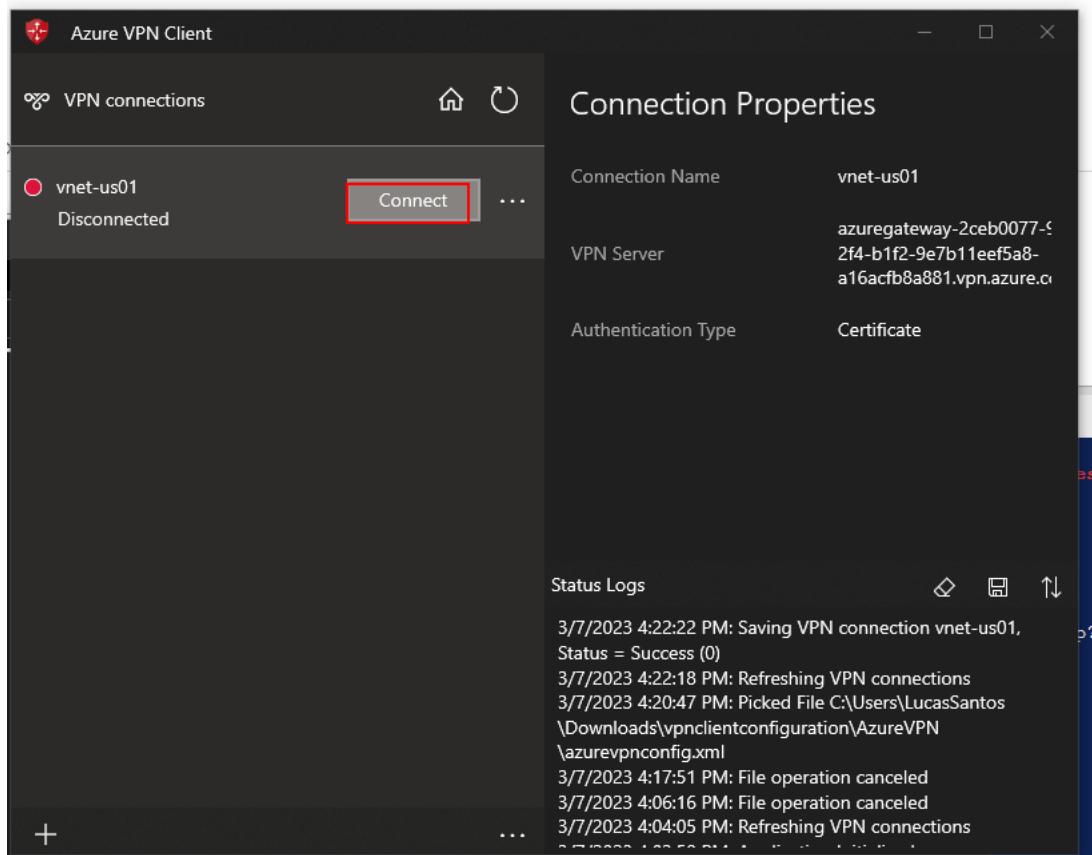
- Após instalado vamos em + > Import > Vamos até a pasta que foi baixada do VNG > E selecionamos o arquivo XML

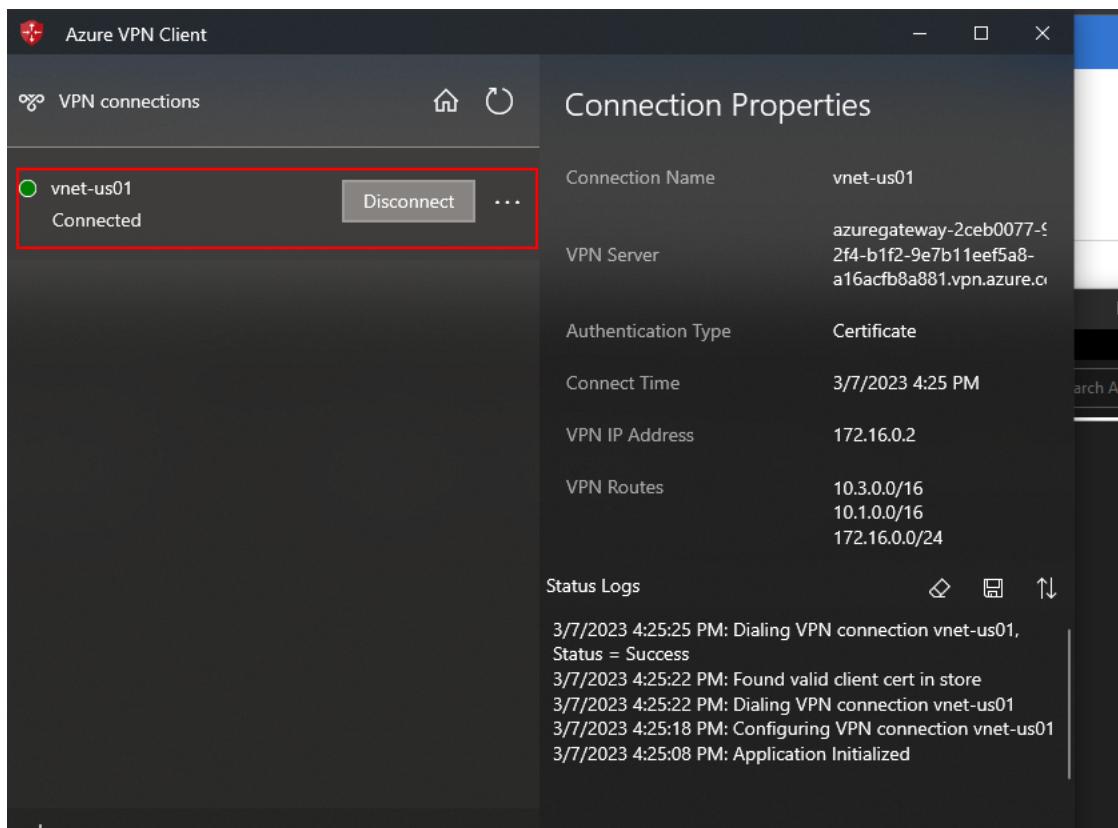


- Validamos se está tudo certo, e damos um save



- Após este procedimento a nossa conexão P2S estara quase pronta, agora poderemos dar um connect para acessar





- Rodando um `ipconfig /all` podemos verificar que é “criado um NIC” no rage que colocamos no address pool

`ud | Point-to-site configuration`

Address pool *

```

Windows PowerShell
Lease Expires . . . . . : terça-feira, 7 de março de 2023 17:15:19
Default Gateway . . . . . : 10.14.120.1
DHCP Server . . . . . : 10.14.120.1
DHCPv6 IAID. . . . . : 100718445
DHCPv6 Client DUID. . . . . : 00-01-00-01-2A-E8-AD-6A-C8-4B-D6-03-4D-0A
DNS Servers . . . . . : 208.67.222.222
                           208.67.220.220
NetBIOS over Tcpip. . . . . : Enabled

PPP adapter vnet-us01:
  Connection-specific DNS Suffix . . . . . : vnet-us01
  Description . . . . . : vnet-us01
  Physical Address . . . . . :
  DHCP Enabled . . . . . : No
  Autoconfiguration Enabled . . . . . : Yes
  IPv4 Address . . . . . : 172.16.0.2(Preferred)
  Subnet Mask . . . . . : 255.255.255.255
  Default Gateway . . . . . :
  NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter Conexão de Rede Bluetooth:
  Media State . . . . . . . . . : Media disconnected
  Connection-specific DNS Suffix . . . . . :
  Description . . . . . . . . . : Bluetooth Device (Personal Area Network)
  Physical Address . . . . . . . . . : 00-D7-6D-92-18-B3
  DHCP Enabled . . . . . . . . . : Yes
  Autoconfiguration Enabled . . . . . . . . : Yes
PS C:\Users\LucasSantos>

```

- Conseguimos encontrar todas as vms

```
PS C:\Users\LucasSantos> ping 10.1.0.4

Pinging 10.1.0.4 with 32 bytes of data:
Reply from 10.1.0.4: bytes=32 time=123ms TTL=64
Reply from 10.1.0.4: bytes=32 time=120ms TTL=64
Reply from 10.1.0.4: bytes=32 time=120ms TTL=64
Reply from 10.1.0.4: bytes=32 time=127ms TTL=64

Ping statistics for 10.1.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 120ms, Maximum = 127ms, Average = 122ms
PS C:\Users\LucasSantos> ping 10.3.0.4

Pinging 10.3.0.4 with 32 bytes of data:
Reply from 10.3.0.4: bytes=32 time=237ms TTL=128
Reply from 10.3.0.4: bytes=32 time=243ms TTL=128
Reply from 10.3.0.4: bytes=32 time=238ms TTL=128
Reply from 10.3.0.4: bytes=32 time=237ms TTL=128

Ping statistics for 10.3.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 237ms, Maximum = 243ms, Average = 238ms
PS C:\Users\LucasSantos> ping 192.168.0.4

Pinging 192.168.0.4 with 32 bytes of data:
Reply from 192.168.0.4: bytes=32 time=154ms TTL=127
Reply from 192.168.0.4: bytes=32 time=152ms TTL=127
Reply from 192.168.0.4: bytes=32 time=161ms TTL=127
Reply from 192.168.0.4: bytes=32 time=152ms TTL=127

Ping statistics for 192.168.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 152ms, Maximum = 161ms, Average = 154ms
PS C:\Users\LucasSantos> |
```

- No caso este não é o tipo mais seguro de autenticação
- Docs utilizada para realização desse procedimento

Configurar clientes VPN P2S – autenticação de certificado – Windows - Azure VPN Gateway
 Saiba como definir clientes VPN para configurações de P2S que usam a autenticação de certificado.
 Este artigo aplica-se ao Windows.

 <https://learn.microsoft.com/pt-br/azure/vpn-gateway/point-to-site-vpn-client-cert-windows#code-try-0>



Gerar e exportar certificados para P2S: PowerShell - Azure VPN Gateway
 Saiba como criar um certificado raiz autoassinado, exportar uma chave pública e gerar certificados de cliente para conexões ponto a site do Gateway de VPN.

 <https://learn.microsoft.com/pt-br/azure/vpn-gateway/vpn-gateway-certificates-point-to-site>



Definir a configuração do servidor P2S - autenticação de certificado: portal do Azure - Azure VPN Gateway
 Saiba como definir as configurações do servidor de Gateway de VPN para configurações P2S - autenticação de certificado.

 <https://learn.microsoft.com/pt-br/azure/vpn-gateway/vpn-gateway-howto-point-to-site-resource-manager-portal>



▼ Network Traffic Management

▼ Lab01 → Implementar o Azure Load Balancer

- Criaremos um novo RG

The screenshot shows the Azure portal interface for a Resource Group named 'rg-az104'. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Resource visualizer, Events, Deployments, Security, Policies, Properties, Locks, Cost analysis, Cost alerts (preview), Budgets, Advisor recommendations, Insights (preview), and Alerts. The main content area displays the 'Essentials' section with details: Subscription (move) : Visual Studio Enterprise Subscription – MPN, Subscription ID : afe7f77d-a295-4675-9bf9-5b6bf32b89f4, Tags (edit) : modulo : md06, Deployments : No deployments, Location : East US. Below this is the 'Resources' section, which is currently empty, showing 'Showing 0 to 0 of 0 records.' There are filters for Name, Type, and Location, and buttons for Create resources and Clear filters.

- Vamos criar uma nova VNet
 - Vamos trabalhar com 10.10.0.0/22
 - Criaremos duas subnets 10.10.0.0/24 e 10.10.1.0/24

Create virtual network ...

Basics Security IP addresses Tags **Review + create**

[View automation template](#)

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource Group	rg-az104
Name	vnet-az104
Region	East US

Security

Azure Bastion	Disabled
Azure Firewall	Disabled
Azure DDoS Network Protection	Disabled

IP addresses

Address space	10.10.0.0/22 (1024 addresses)
Subnet	subnet-01 (10.10.0.0/24) (256 addresses)
Subnet	subnet-02 (10.10.1.0/24) (256 addresses)



Tags

modulo mod06

- Vamos criar um NSG

Priority ↑	Name ↑	Port ↑↓	Protocol ↑↓	Source ↑↓	Destination ↑↓
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any
65500	DenyAllInBound	Any	Any	Any	Any

- Vamos atrelar as duas subnets

nsg-az104 | Subnets

Network security group

Search: Associate

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Settings

- Inbound security rules
- Outbound security rules
- Network interfaces
- Subnets** (highlighted)
- Properties
- Locks

Name	Address range
subnet-01	10.10.0.0/24
subnet-02	10.10.1.0/24

- Liberar a porta RDP

nsg-az104 | Inbound security rules

Network security group

Search: Add Hide default rules Refresh Delete Give feedback

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Settings

- Inbound security rules** (highlighted)
- Outbound security rules
- Network interfaces
- Subnets
- Properties
- Locks

Priority	Name	Port	Protocol	Source	Destination	Action
100	AllowAnyRDPinbound	3389	TCP	Any	10.10.0.0/24,10.10.1.0/24	Allow
65000	AllowVnetInbound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInbound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInbound	Any	Any	Any	Any	Deny

- Vamos criar duas vms

- B2S
- Vamos usar vm win server 2019 para ambas as vms

Image * ⓘ

Windows Server 2019 Datacenter - x64 Gen2

See all images | Configure VM generation

VM architecture ⓘ

Arm64 (radio button)

x64 (radio button) (Info) Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ

Size * ⓘ

Standard_B2s - 2 vcpus, 4 GiB memory (R\$166.62/month)

See all sizes

- Cada uma para uma subnet
 - Não vamos colocar IP publico

Create a virtual machine ...

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution.

[Learn more ↗](#)

Network interface

When creating a virtual machine, a network interface will be created for you.

Virtual network * ⓘ

vnet-az104

[Create new](#)

Subnet * ⓘ

subnet-01 (10.10.0.0/24)

[Manage subnet configuration](#)

Public IP ⓘ

None

[Create new](#)

NIC network security group ⓘ

None

Basic

Advanced

i The selected subnet 'subnet-01 (10.10.0.0/24)' is already associated to a network security group 'nsg-az104'. We recommend managing connectivity to this virtual machine via the existing network security group instead of creating a new one here.

- o Desabilitar o boot diagnostic

Create a virtual machine ...

Basics Disks Networking Management **Monitoring** Advanced Tags Review + create

Configure monitoring options for your VM.

Alerts

Enable recommended alert rules ⓘ

Diagnostics

Boot diagnostics ⓘ

- Enable with managed storage account (recommended)
- Enable with custom storage account
- Disable

Enable OS guest diagnostics ⓘ

- o vm-win-lb-01

Create a virtual machine ...

Validation passed

Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-az104
Virtual machine name	vm-win-lb-01
Region	East US
Availability options	No infrastructure redundancy required
Security type	Standard
Image	Windows Server 2019 Datacenter - Gen2
VM architecture	x64
Size	Standard B2s (2 vcpus, 4 GiB memory)
Username	azureuser
Already have a Windows license?	No
Azure Spot	No

Disks

OS disk type	Premium SSD LRS
Use managed disks	Yes
Delete OS disk with VM	Enabled
Ephemeral OS disk	No

Networking

Virtual network	vnet-az104
Subnet	subnet-01 (10.10.0.0/24)
Public IP	None
NIC network security group	None
Accelerated networking	Off
Place this virtual machine behind an existing load balancing solution?	No

Delete NIC when VM is deleted Disabled

[Create](#)

[< Previous](#)

[Next >](#)

[Download a template for automation](#)

- vm-win-lb-02

Create a virtual machine ...

Validation passed

Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-az104
Virtual machine name	vm-win-lb-02
Region	East US
Availability options	No infrastructure redundancy required
Security type	Standard
Image	Windows Server 2019 Datacenter - Gen2
VM architecture	x64
Size	Standard B2s (2 vcpus, 4 GiB memory)
Username	azureuser
Already have a Windows license?	No
Azure Spot	No

Disks

OS disk type	Premium SSD LRS
Use managed disks	Yes
Delete OS disk with VM	Enabled
Ephemeral OS disk	No

Networking

Virtual network	vnet-az104
Subnet	subnet-02 (10.10.1.0/24)
Public IP	None
NIC network security group	None
Accelerated networking	Off
Place this virtual machine behind an existing load balancing solution?	No

Delete NIC when VM is deleted Disabled

[Create](#) [< Previous](#) [Next >](#) [Download a template for automation](#)

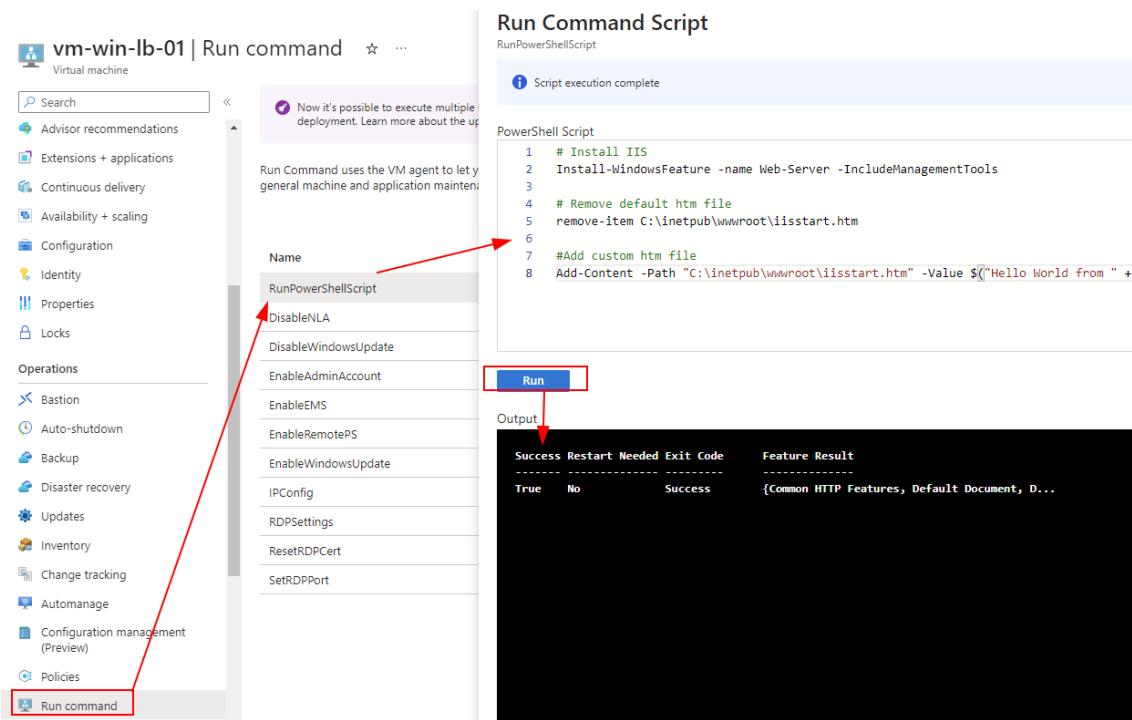
- Vamos em run command e colar o seguinte scrip para as duas vms

```
# Install IIS
Install-WindowsFeature -name Web-Server -IncludeManagementTools

# Remove default htma file
remove-item C:\inetpub\wwwroot\iisstart.htm

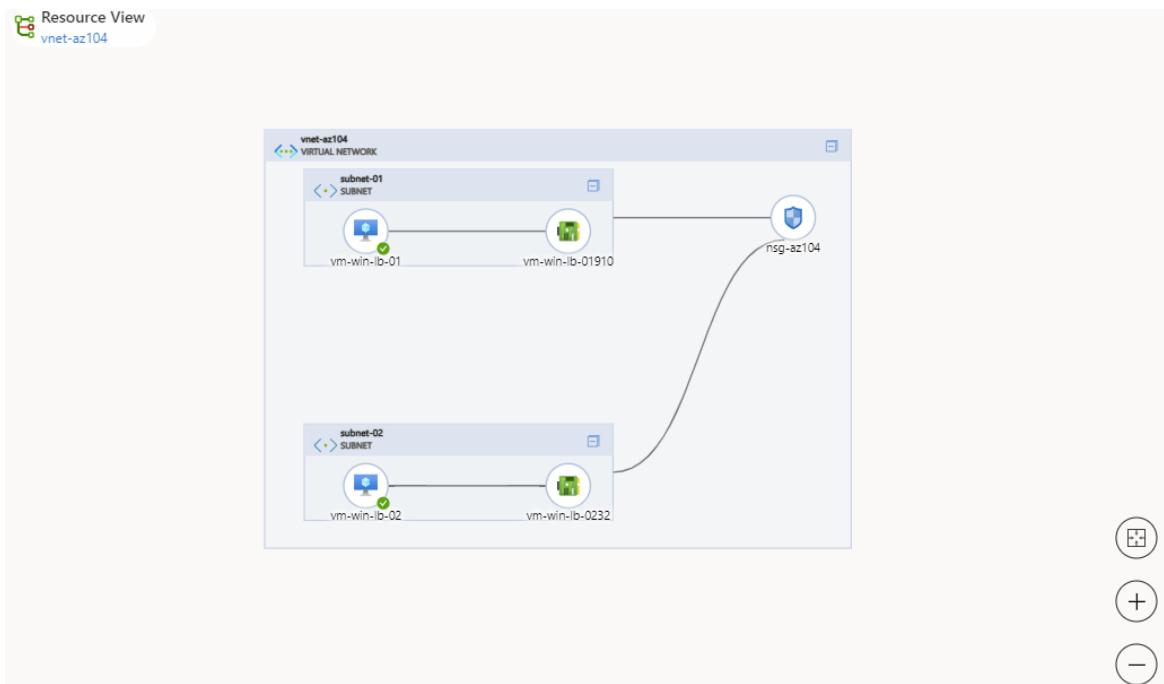
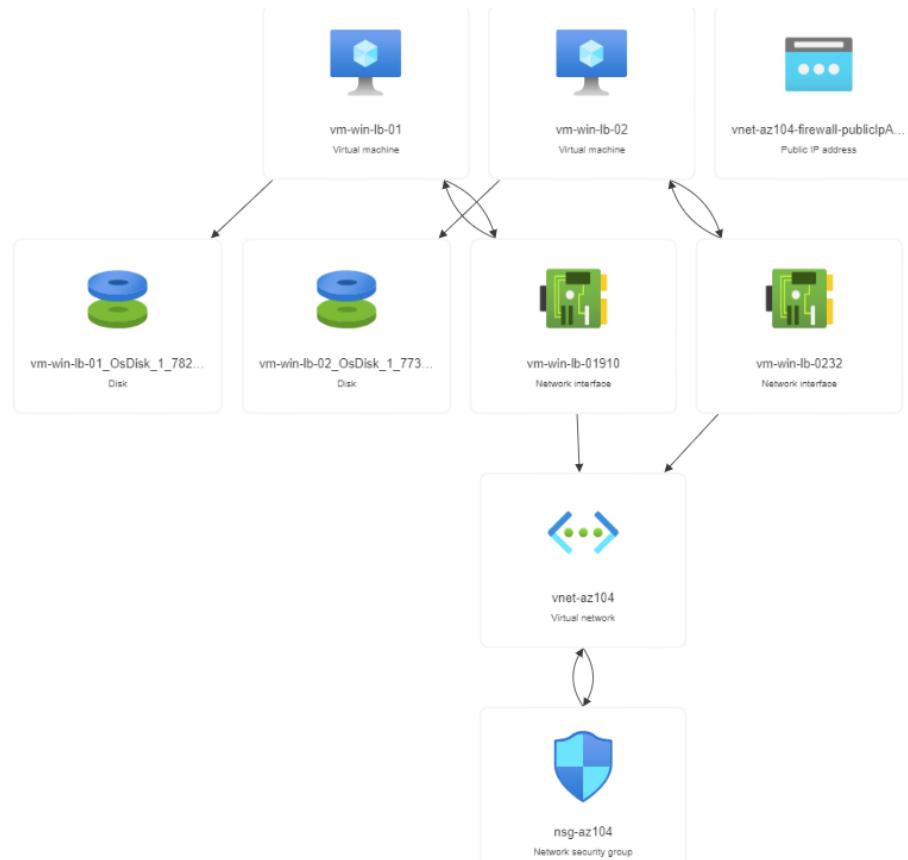
#Add custom htma file
Add-Content -Path "C:\inetpub\wwwroot\iisstart.htm" -Value $($("Hello World from " + $env:computername))
```

- Vamos instalar o IIS através desse comando o que irá nos permitir identificar para qual vm o balanceador estara jogando a carga

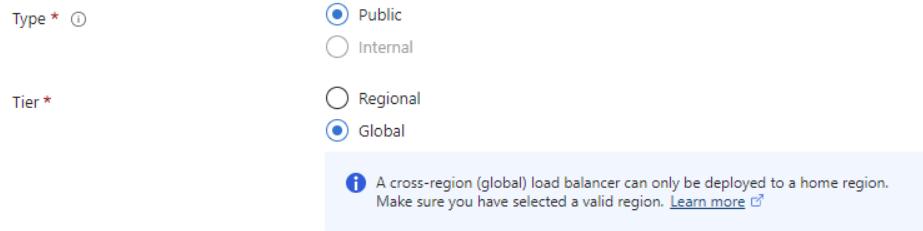


Internet Information Services - é um servidor web criado pela Microsoft para seus sistemas operacionais para servidores.

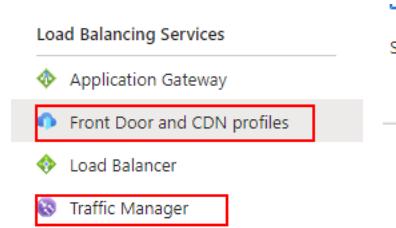
- Dessa forma o diagrama ficou da seguinte forma



- Em seguida vamos em Load Balancer e seguiremos com a criação
 - O LB atualmente é regional mas futuramente poderá ser global



- No caso o que podemos utilizar como recurso substituto é o front door e o traffic manager, pois o lb em sí é regional ou seja teria que ser criado para cada região, e usar ou o front door ou o traffic manager que irá realizar a distribuição



- O help me choose ajuda escolher a opção (lb ou app gateway)

Help me choose Service comparison Tutorial

Does your application use HTTP/HTTPS?

Application Gateway	Front Door	Load Balancer	Traffic Manager
<ul style="list-style-type: none"> Internal and public configurations Regional layer 7 load balancer SSL/TLS offloading <p>Create <input type="button" value="Show more"/></p>	<ul style="list-style-type: none"> Global layer 7 load balancer Site acceleration SSL/TLS offloading <p>Create <input type="button" value="Show more"/></p>	<ul style="list-style-type: none"> Layer 4 load balancing Internal and public configurations High availability across zones Global across Azure regions <p>Create <input type="button" value="Show more"/></p>	<ul style="list-style-type: none"> DNS-based traffic load balancer Global across Azure regions High availability <p>Create <input type="button" value="Show more"/></p>

- O SKU basic não tem SLA portanto não é ideal para ambientes de produção

Azure load balancer is a layer 4 load balancer that distributes incoming traffic among healthy virtual machine instances. Load balancers uses a hash-based distribution algorithm. By default, it uses a 5-tuple (source IP, source port, destination IP, destination port, protocol type) hash to map traffic to available servers. Load balancers can either be internet-facing where it is accessible via public IP addresses, or internal where it is only accessible from a virtual network. Azure load balancers also support Network Address Translation (NAT) to route traffic between public and private IP addresses. [Learn more](#).

Project details

Subscription *

Visual Studio Enterprise Subscription – MPN

Resource group *

rg-az104

[Create new](#)

Instance details

Name *

lb-az104-00

Region *

East US

SKU * ⓘ

- Standard
 Gateway
 Basic

 Microsoft recommends Standard SKU load balancer for production workloads.
[Learn more about pricing differences between Standard and Basic SKU](#)

- Vamos criar o IP para o frontend (ou seja a borda)

Add frontend IP configuration

Name * ✓

IP version IPv4 IPv6

IP type IP address IP prefix

Public IP address * ▼
[Create new](#)

Add a public IP address

Name * ✓

SKU Basic Standard

Tier Regional Global

Assignment Dynamic Static

Availability zone * ▼

Routing preference Microsoft network Internet

OK Cancel

Add

Basics Frontend IP configuration Backend pools Inbound rules Outbound rules Tags Review + create

A frontend IP configuration is an IP address used for inbound and/or outbound communication as defined within load balancing, inbound NAT, and outbound rules.

+ Add a frontend IP configuration

Name ↑↓

ft-lb

IP address ↑↓

pip-ft-lb (To be created)

- Vamos criar o backend pool
 - Colocamos o apontamento (que no caso seria as vms), vamos usar o NIC mas também podemos utilizar o IP Address
 - Vamos add as vms (vm não pode ter ip publico)

Add backend pool

Name *

Virtual network

Backend Pool Configuration NIC IP address

IP configurations

IP configurations associated to virtual machines and virtual machine scale sets must be in same location as the load balancer and be in the same virtual network.

<input type="button" value="Add"/>	<input type="button" value="Remove"/>				
Resource Name	Resource group	Type	IP configuration	IP Address	Availability ...
<input type="checkbox"/> vm-win-lb-01	rg-az104	Virtual machine	ipconfig1	10.10.0.4	- <input type="button" value="Delete"/>
<input type="checkbox"/> vm-win-lb-02	rg-az104	Virtual machine	ipconfig1	10.10.1.4	- <input type="button" value="Delete"/>

- Vamos criar o inbound rules, colocamos o IP, redirecionamento será na porta 80, selecionaremos o backend pool

Add load balancing rule

i A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. Only backend instances that the health probe considers healthy receive new traffic.

Name * IP Version * IPv4 IPv6Frontend IP address * Backend pool * Protocol * TCP UDPPort *

- Vamos criar um healthprob que irá checar a integridade das vms
 - Config protocol : 80| Interval - 5 | Unhealthy threshold - 2

Health probe * ⓘ

Create new

Add health probe

Info Health probes are used to check the status of a backend pool instance. If the health probe fails to get a response from a backend instance then no new connections will be sent to that backend instance until the health probe succeeds again.

Name * hp-lb-az104

Protocol * TCP

Port * ⓘ 80

Interval * ⓘ 5 seconds

Used by ⓘ

- Persistencia de sessão serve para que o tráfego se mantenha sempre no mesmo server, mas nesse caso não utilizaremos

Session persistence ⓘ

None

- Timeout → Tempo de conexão

Idle timeout (minutes) * ⓘ

4

- TCP Reset → Faz um reset dependendo do tempo e tentativa de conexão
- Floating IP → Reescreve no cabeçalho da conexão (serve para alterar o IP)
- Podemos selecionar para que a saída seja pelo mesmo IP

TCP reset

Disabled

Enabled

Floating IP [?](#)

Disabled

Enabled

Outbound source network address translation (SNAT) [?](#)

(Recommended) Use outbound rules to provide backend pool members access to the internet. [Learn more ↗](#)

Use default outbound access. This is not recommended because it can cause SNAT port exhaustion. [Learn more ↗](#)

- Inbound NAT rule → Podemos colocar dois IPs, e atribuir a outro IP, através do inbound nat rules podemos configurar por qual IP irá entregar para qual host, ou server disponível - Não usaremos

Inbound NAT rule
An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a selected backend pool.

[+ Add an inbound nat rule](#)

Name ↑↓	Frontend IP configuration ↑↓
Add a rule to get started	

- Outbound Rules → Regra de saída para sair sempre com o mesmo IP de saída e não os individuais

Create load balancer [...](#)

Basics Frontend IP configuration Backend pools Inbound rules **Outbound rules** Tags Review + create

Outbound rules

An outbound rule allocates source network access translation (SNAT) ports from Frontend IP addresses to a backend pool for outbound connections.

[+ Add an outbound rule](#)

Name ↑↓	Frontend IP configuration ↑↓	Backend pool ↑↓
Add a rule to get started		

- Após a criação podemos realizar alterações no ambiente como add mais um IP publico, e colocar regras para direcionar o novo IP publico para outras aplicações

Create load balancer ...

Validation passed

Basics Frontend IP configuration Backend pools Inbound rules Outbound rules Tags Review + create

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-az104
Name	lb-az104-06
Region	East US
SKU	Standard
Tier	Regional
Type	Public

Frontend IP configuration

Frontend IP configuration name	ft-lb
Frontend IP configuration IP address	To be created

Backend pools

Backend pool name	bk-vms-az104-06
-------------------	-----------------

Inbound rules

Load balancing rule name	rules-vms-az104
Health probe name	hp-lb-az104

Outbound rules

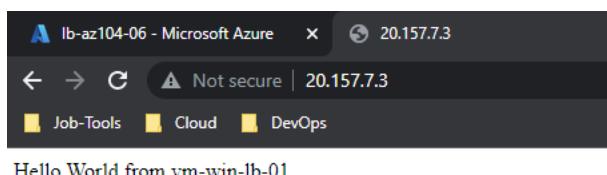
- Vamos no NSG e liberar a porta 80, pegar os dois ips privados da vm e add destino para http

[+ Add](#) [Hide default rules](#) [Refresh](#) [Delete](#) [Give feedback](#)

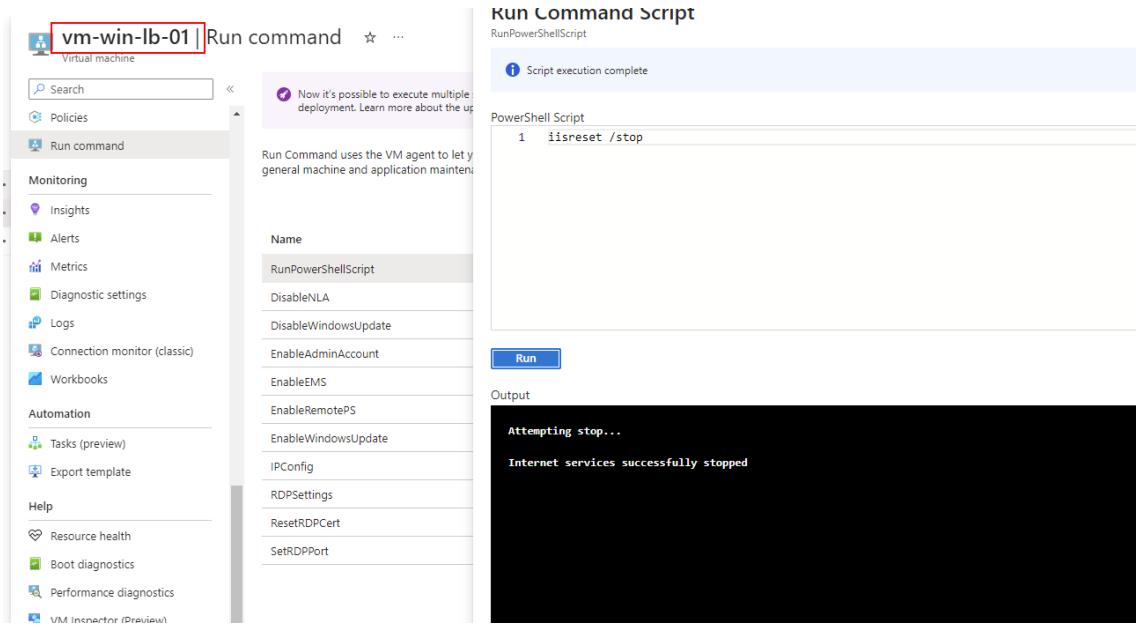
Network security group security rules are evaluated by priority using the combination of source, source port, destination, destination port, and protocol to allow or deny the traffic. A security rule can't have the same priority and direct existing rule. You can't delete default security rules, but you can override them with rules that have a higher priority. [Learn more](#)

<input type="checkbox"/> Priority ↑	Name ↑	Port ↑	Protocol ↑	Source == all	Destination == all	Action == all
<input type="checkbox"/> 100	⚠ AllowAnyRDPinbound	3389	TCP	Any	10.10.0.0/24,10.10.1.0/24	Allow
<input checked="" type="checkbox"/> 110	AllowAnyHTTPinbound	80	TCP	Any	10.10.0.4,10.10.1.4	Allow
<input type="checkbox"/> 65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
<input type="checkbox"/> 65001	AllowAzureLoadBalancerinBo...	Any	Any	AzureLoadBalancer	Any	Allow
<input type="checkbox"/> 65500	DenyAllInBound	Any	Any	Any	Any	Deny

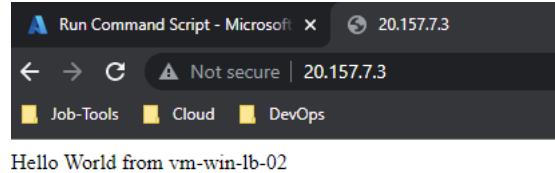
- Acessando o IP publico do LB podemos ver que carregará uma pagina informando qual VM estamos sendo direcionados



- Vamos parar o IIS usando o comando `iisreset /stop` indo em run command da vm que está sendo acessada



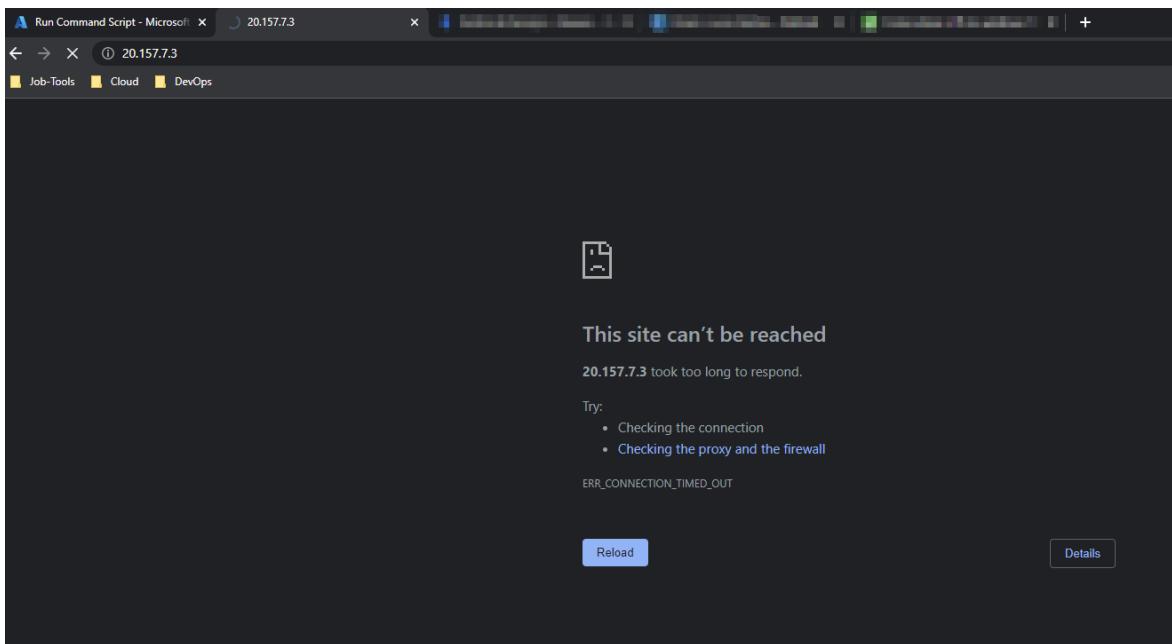
- E poderemos ver o redirecionamento sendo feito,



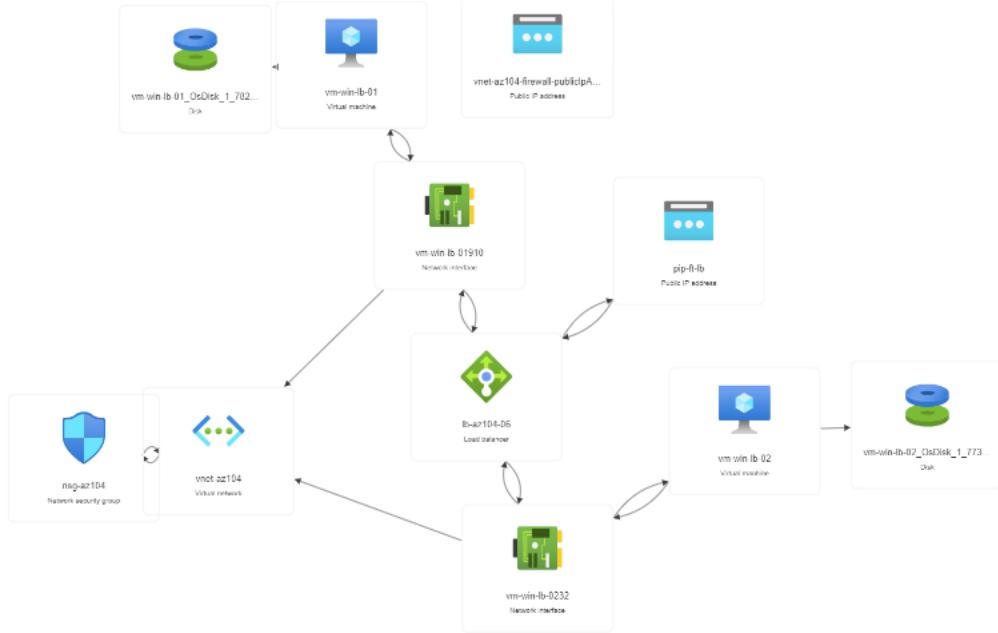
- Em seguida vamos para o IIS das duas vms

The screenshot shows the Azure portal interface for a virtual machine named 'vm-win-lb-02'. The 'Run command' blade is open, showing a list of available PowerShell scripts. One script, 'RunPowerShellScript', is selected and being run. The output window displays the command 'iisreset /stop' and its execution results, which show the Internet services successfully stopped.

- E podemos ver que não será mais possível



- Podemos ver nossa estrutura completa através do resource visualizer



▼ Lab02 → Implementar Azure Application Gateway

- Vamos utilizar a mesma estrutura de antes
- Porém vamos criar uma nova subnet para criar o APPGW
 - É um requisito ter uma subnet isolada para o APPGW, pois caso a opção de autoscalling seja habilitada o AAG pode subir instâncias automaticamente em caso de sobrecarga no tráfego de dados
 - APPGW possui a camada de segurança que utiliza o WAF
 - APPGW trabalha com SSL off load → vem o tráfego criptografado, descriptografa passando pelo APPGW e depois que o tráfego sai das vms criptografa novamente tudo pelo APPGW
 - APPGW → MultiSite e Path → dois backend e o APPGW vai direcionar de acordo com o que o user irá utilizar seja um site ou uma parte de outro site
 - Subnet que utilizaremos 10.10.2.0/24

Add subnet

X

Name *

subnet-APPGW



Subnet address range * ⓘ

10.10.2.0/27



10.10.2.0 - 10.10.2.31 (27 + 5 Azure reserved addresses)

Add IPv6 address space ⓘ

NAT gateway ⓘ

None



Network security group

nsg-az104



Route table

None



SERVICE ENDPOINTS

Create service endpoint policies to allow traffic to specific Azure resources from your virtual network over service endpoints. [Learn more](#)

Services ⓘ

0 selected



SUBNET DELEGATION

Delegate subnet to a service ⓘ

None



NETWORK POLICY FOR PRIVATE ENDPOINTS

The network policy affects all private endpoints in this subnet. Select the types of network policies that control traffic going to the private endpoints in this subnet. [Learn more](#)

Private endpoint network policy

Save

Cancel

- Não iremos associar esta subnet ao NSG, se não teremos que abrir portas específicas novamente para o funcionamento do APPGW
- Vamos deletar o LB (Porém com o APPGW podemos fazer direcionamento para o LB em si tbm sem problemas)

✓ Deleted load balancer

Successfully deleted load balancer 'lb-az104-06'.

X

a few seconds ago

- E vamos seguir com a criação APPGW

No application gateways to display

Azure Application Gateway gives you application-level routing and load balancing services that let you build a scalable and highly-available web front end in Azure. You control the size of the gateway and scale your deployment based on your needs.

Create application gateway

- Vamos deixar o Tier como standard v2 (v2 será sempre a versão mais att), este tier faz referencia ao fw do application gateway

- Tier ⓘ Standard V2
- O APPGW pode criar instancias automaticamente em caso de sobrecarga de desempenho, porém como não iremos testar conexão está opção não precisa ser habilitada

<input type="radio"/> Yes <input checked="" type="radio"/> No Enable autoscaling	<input type="text" value="2"/> Instance count
<input type="text" value="None"/> Availability zone ⓘ	

- Vamos colocar a subnet vazia que criamos

Configure virtual network

Virtual network * ⓘ	<input type="text" value="vnet-az104"/> Create new
Subnet * ⓘ	<input type="text" value="subnet-APPGW (10.10.2.0/27)"/> Manage subnet configuration

- No front end vamos utilizar o mesmo IP publico do LoadBalancer

✓ Basics 2 Frontends 3 Backends 4 Configuration 5 Tags 6 Review + create

Traffic enters the application gateway via its frontend IP address(es). An application gateway can use a public IP address, private IP address, or one of each type. ⓘ

Frontend IP address type ⓘ	<input checked="" type="radio"/> Public <input type="radio"/> Private <input type="radio"/> Both
Public IP address *	<input type="text" value="Choose public IP address"/> <input type="text" value=""/> Can be associated with this application gateway pip-ft-lb (20.157.7.3)

- No Backend, vamos criar dois pools, cada um para uma VM que irá representar um site cada uma, vamos selecionar o tipo vm e seguir com a criação dos pools

Add a backend pool.

X

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, IP addresses, domain names, or an App Service.

Name * ✓

Add backend pool without targets Yes No

Backend targets

1 item

Target type	Target
Virtual machine	vm-win-lb-01910

- Repetiremos o processo para a VM2

✓ Basics ✓ Frontends 3 Backends 4 Configuration 5 Tags 6 Review + create

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, app services, IP addresses, or fully qualified domain names (FQDN).

Add a backend pool

Backend pool	Targets	⋮
bk-appgw-vm1	> 1 target	⋮
bk-appgw-vm2	> 1 target	⋮

- Após criar o front e o back, vamos criar o routing rules, que seria as regras de direcionamento

Add a routing rule

X

Configure a routing rule to send traffic from a given frontend IP address to one or more backend targets. A routing rule must contain a listener and at least one backend target.

Rule name * ✓

Priority * ✓

- Criamos o listeners - Faz o redirecionamento

Listener name * ✓

Frontend IP * ✓

Protocol HTTP HTTPS

Port * ✓

Additional settings

Listener type Basic Multi site

Host type Single Multiple/Wildcard

Host name * ✓

Error page url Yes No

- Backend targets (que seria o pool direcionado)

Behavior of the routing rule

Target type: Backend pool Redirection
bk-appgw-vm1

Backend target*: http-bk-labvm1
Add new

Backend settings*: Add new

Path-based routing
You can route traffic from this rule's listener to different backend targets based on the URL path of the request. You can also apply a different set of Backend settings based on the URL path.

- HTTP settings - seria como o health prob

HTTP settings

Backend settings name*: http-labvm
Backend protocol: HTTP HTTPS
Backend port*: 80

Additional settings

Cookie-based affinity: Enable Disable
Connection draining: Enable Disable
Request time-out (seconds)*: 20

Override backend path: Yes No

Host name
By default, the Application Gateway sends the same HTTP host header to the backend as it receives from the client. If your backend application/service requires a specific host value, you can override it using this setting.
Override with new host name: Yes No
Create custom probes

- Ficando da seguinte forma



Create application gateway

Validation passed

Basics Frontends Backends Configuration Tags Review + create

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-az104
Name	appgw-az104
Region	East US
Tier	Standard_v2
Enable autoscaling	Disabled
Instance count	2
Availability zone	None
HTTP2	Disabled
Virtual network	vnet-az104
Subnet	subnet-APPGW (10.10.2.0/27)
Subnet address space	10.10.2.0/27

Frontends

Public IP address name	pip-ft-lb (20.157.7.3)
------------------------	------------------------

Tags

modulo	m06
--------	-----

- Vamos modificar o arquivo do IIS que está nas vms para que seja apontado para o conteúdo como se fosse um site
 - Vamos rodar em run command para as duas instancias

```
# Install IIS
Install-WindowsFeature -name Web-Server -IncludeManagementTools

# Remove default htm file
remove-item C:\inetpub\wwwroot\iisstart.htm

#Add custom htm file
Add-Content -Path "C:\inetpub\wwwroot\iisstart.htm" -Value $($www.labvm1.com " + $env:computername)
```

- E para a vm2 adicionaremos "www.labvm02.com"

Run Command Script

RunPowerShellScript

Script execution complete

PowerShell Script

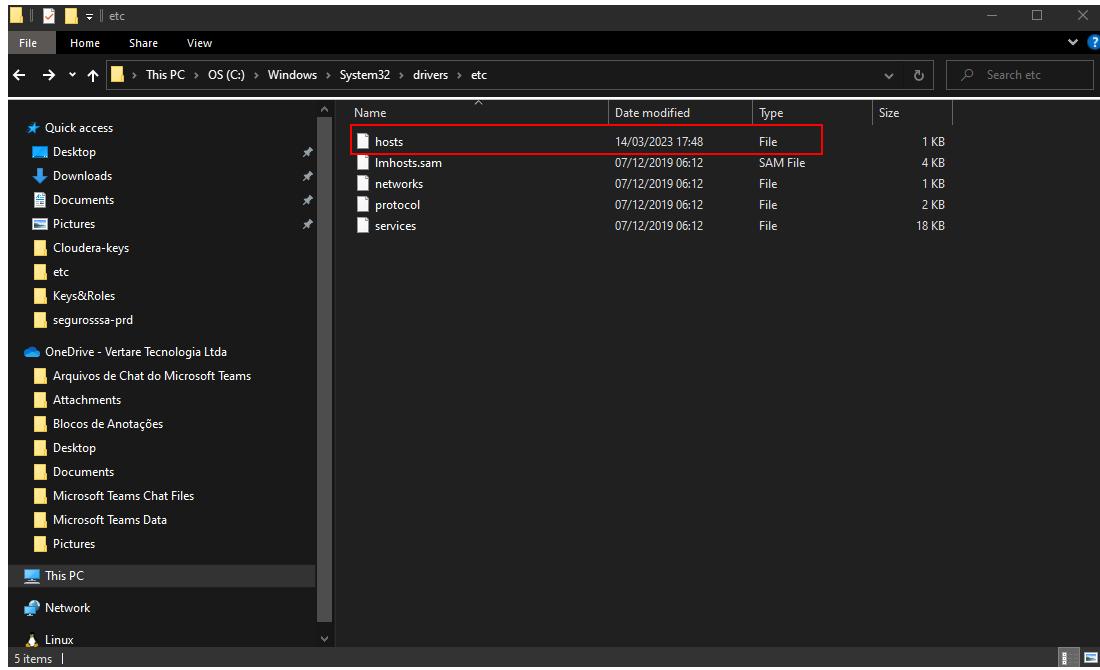
```
1 # Install IIS
2 Install-WindowsFeature -name Web-Server -IncludeManagementTools
3
4 # Remove default htm file
5 remove-item C:\inetpub\wwwroot\iisstart.htm
6
7 #Add custom htm file
8 Add-Content -Path "C:\inetpub\wwwroot\iisstart.htm" -Value $($www.labvm1.com " + $env:computername)
```

Run

Output

Success	Restart Needed	Exit Code	Feature Result
True	No	NoChangeNeeded	{}

- Para que seja realizado o direcionamento corretamente (pois os domínios no qual estamos fazendo o lab não são registrados), vamos alterar o nosso arquivo hosts, adicionaremos o IP do appgateway + o nome dos sites que será direcionado
 - No win 10 vamos copiar o arquivo host, em C:\Windows\System32\drivers\etc



- Vamos jogar na area de trabalho e editar o arquivo

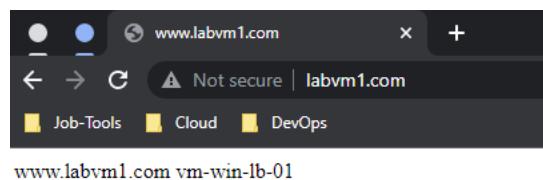
```

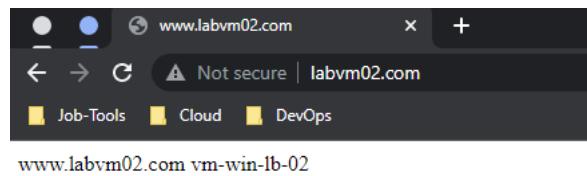
hosts - Notepad
File Edit Format View Help
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#      102.54.94.97      rhino.acme.com      # source server
#      38.25.63.10      x.acme.com          # x client host

# localhost name resolution is handled within DNS itself.
#      127.0.0.1      localhost
#      ::1            localhost
20.157.7.3 www.labvm1.com
20.157.7.3 www.labvm02.com

```

- Dps vamos jogar o arquivo la na pasta C:\Windows\System32\drivers\etc e vamos substituir os arquivos
- Agora poderemos acessar o site e validar se o direcionamento está funcionando conforme configurado

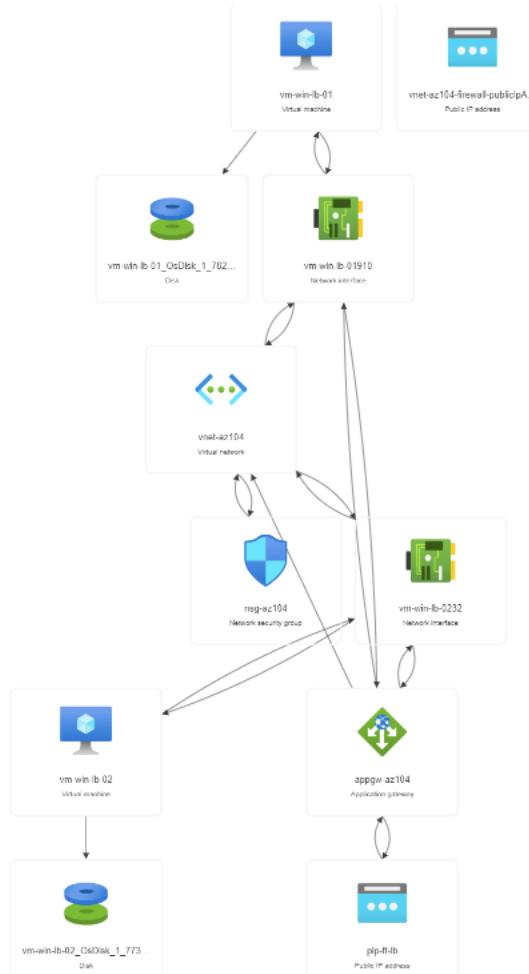




- O FW do APPGW pode ser ativada posteriormente, ele possui modos de trabalho como detecção e prevenção que irá avaliar o comportamento e posteriormente bloquear

- Podemos adicionar outros listeners, adicionar outras routing rules, tudo após a criação

- Por fim nossa estrutura com application gateway ficou dessa forma



▼ Azure Storage

▼ Lab01 → Criar e configurar Azure Storage accounts

- Vamos criar um RG

Básico	Marcações	<u>Revisar + criar</u>
Básico		
Assinatura	Visual Studio Enterprise Subscription – MPN	
Grupo de recursos	az104labs-sto	
Região	East US	
Marcações		
md	07	

- Vamos criar um storage account
 - Vamos criar todos itens na mesma região

Create a storage account ...

Basics Advanced Networking Data protection Encryption Tags Review

Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below. [Learn more about Azure storage accounts](#)

Project details

Select the subscription in which to create the new storage account. Choose a new or existing resource group to organize and manage your storage account together with other resources.

Subscription *	Visual Studio Enterprise Subscription – MPN
Resource group *	az104labs-sto
	Create new

- Colocamos um nome que seja unico

Instance details

If you need to create a legacy storage account type, please click [here](#).

Storage account name ⓘ *	azlab104sto01
Region ⓘ *	(US) East US
Deploy to an edge zone	
Performance ⓘ *	<input checked="" type="radio"/> Standard: Recommended for most scenarios (general-purpose v2 account) <input type="radio"/> Premium: Recommended for scenarios that require low latency.
Redundancy ⓘ *	Geo-zone-redundant storage (GZRS)
<input checked="" type="checkbox"/> Make read access to data available in the event of regional unavailability.	

- Perfomance → Standard
 - Standard → Mais barato, paga pelo armazenamento consumido, transação paga → Entende general purpose v2 account somente
 - Premium → Mais caro, paga pelo provisionamento, se provisionou 1TB vai pagar mesmo se não consumir tudo, não paga a transação → Se preisa IOPs → Temos opções como block blobs, files shares, ou page blobs
- Redundancia → GZR habilitado o RA (RA-GZR)
 - Premium → Temos apenas LRZ e ZRS por conta da replicação assíncrona, e por conta da alta taxa de performance do tier premium

Security

Configure security settings that impact your storage account.

Require secure transfer for REST API operations ⓘ	<input checked="" type="checkbox"/>
Allow enabling public access on individual containers ⓘ	<input checked="" type="checkbox"/>
Enable storage account key access ⓘ	<input checked="" type="checkbox"/>
Default to Azure Active Directory authorization in the Azure portal ⓘ	<input type="checkbox"/>
Minimum TLS version ⓘ	Version 1.2
Permitted scope for copy operations (preview) ⓘ	From any storage account

Blob storage

Allow cross-tenant replication ⓘ



Access tier ⓘ



Hot: Frequently accessed data and day-to-day usage scenarios



Cool: Infrequently accessed data and backup scenarios

- Advanced

- Habilitar transferência segura REST API
- Criptografia vamos permitir que a MS de as melhores permissões
- Habilitar acesso publico ao blob
- Key access é o acesso de tudo, vamos manter habilitado
- Habilitar o acesso via AzAD
- TLS é a verão da comunicação, vamos deixar na maior versão
- Access tier → hot (Maior custo de armazenamento, menor custo de acesso e escrita) ou cool (Menor custo de armazenamento, maior custo de acesso e escrita) → granularidade para os arquivos
- Az files tem até 5T, podemos habilitar o large files que possui 100TB, que só é habilitado com a tier premium do storage
- Table e queues → comunicação de processos através de mensageria

Network connectivity

You can connect to your storage account either publicly, via public IP addresses or service endpoints, or privately, using a private endpoint.

Network access *

Enable public access from all networks

Enable public access from selected virtual networks and IP addresses

Disable public access and use private access

Enabling public access from all networks might make this resource available publicly. Unless public access is required, we recommend using a more restricted access type. [Learn more](#)

Network routing

Determine how to route your traffic as it travels from the source to its Azure endpoint. Microsoft network routing is recommended for most customers.

Routing preference ⓘ *

Microsoft network routing

Internet routing

o Network

- URL → pode ser um endpoint publico, publico com acesso especifico de vnets damos acesso para as subnets em si, private endpoint no qual integramos um IP privado o roteamento pode ser pelo backbone da ms ou pela internet

Basics Advanced Networking **Data protection** Encryption Tags Review

Recovery

Protect your data from accidental or erroneous deletion or modification.

Enable point-in-time restore for containers

Use point-in-time restore to restore one or more containers to an earlier state. If point-in-time restore is enabled, then versioning, change feed, and blob soft delete must also be enabled. [Learn more](#)

Enable soft delete for blobs

Soft delete enables you to recover blobs that were previously marked for deletion, including blobs that were overwritten. [Learn more](#)

Days to retain deleted blobs ⓘ

7

Enable soft delete for containers

Soft delete enables you to recover containers that were previously marked for deletion. [Learn more](#)

Days to retain deleted containers ⓘ

7

Enable soft delete for file shares

Soft delete enables you to recover file shares that were previously marked for deletion. [Learn more](#)

Days to retain deleted file shares ⓘ

7

Tracking

Tracking

Manage versions and keep track of changes made to your blob data.

[Enable versioning for blobs](#)

Use versioning to automatically maintain previous versions of your blobs. [Learn more](#)

Consider your workloads, their impact on the number of versions created, and the resulting costs. Optimize costs by automatically managing the data lifecycle. [Learn more](#)

[Enable blob change feed](#)

Keep track of create, modification, and delete changes to blobs in your account. [Learn more](#)

Access control

[Enable version-level immutability support](#)

Allows you to set time-based retention policy on the account-level that will apply to all blob versions. Enable this feature to set a default policy at the account level. Without enabling this, you can still set a default policy at the container level or set policies for specific blob versions. Versioning is required for this property to be enabled. [Learn more](#)

- o DATA protection

- Habilitar o point-in-time de containers → ponto de restauração, mas não é o bkp
- Habilitar o soft delete para blob são para os arquivos de dentro do container, podendo reter por determinados dias
- Habilitar o soft delete para o container, mesmo esquema mas somente para o container
- Soft delete para o File share, vai pra lixeira também
- Tracking para blob é semelhante um shadow copy, versionamento dos dados para recuperação
- blob change feed, auditoria para o blob

Create a storage account

...

Basics Advanced Networking Data protection Encryption Tags Review

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource Group	az104labs-sto
Location	eastus
Storage account name	azlab104sto01
Deployment model	Resource manager
Performance	Standard
Replication	Read-access geo-zone-redundant storage (RA-GZRS)

Advanced

Enable hierarchical namespace	Disabled
Enable network file system v3	Disabled
Allow cross-tenant replication	Enabled
Access tier	Hot
Enable SFTP	Disabled
Large file shares	Disabled

Networking

Network connectivity	Public endpoint (all networks)
----------------------	--------------------------------

[Create](#) [< Previous](#) [Next >](#) [Download a template for automation](#)

- o Por fim seguimos com a criação

azlab104sto01

Overview

Essentials Região primária e a secundária que ocorre a replicação por ser RA-GZRS JSON View

Resource group (move)	: az104labs-sto	Performance	: Standard
Location	: East US	Replication	: Read-access geo-zone-redundant storage (RA-GZRS)
Primary/Secondary Location	Primary: East US, Secondary: West US	Account kind	StorageV2 (general purpose v2)
Subscription (move)	: Visual Studio Enterprise Subscription – MPN	Provisioning state	: Succeeded
Subscription ID	: afe777d-a295-4675-9bf9-5b6bf32b89f4	Created	: 5/4/2023, 9:06:44 PM
Disk state	: Primary: Available, Secondary: Available		
Tags (edit)	: md : 07		

Properties Monitoring Capabilities (7) Recommendations (0) Tutorials Tools + SDKs

Blob service

Hierarchical namespace	Disabled
Default access tier	Hot
Blob public access	Enabled
Blob soft delete	Enabled (7 days)
Container soft delete	Enabled (7 days)
Versioning	Disabled
Change feed	Disabled
NFS v3	Disabled
Allow cross-tenant replication	Enabled

Security

Require secure transfer for REST API operations	Enabled
Storage account key access	Enabled
Minimum TLS version	Version 1.2
Infrastructure encryption	Disabled

Networking

Allow access from	All networks
Number of private endpoint connections	0
Network routing	Microsoft network routing
Access for trusted Microsoft services	Yes

Só é possível trocar esta opção para outras versões, na performance premium

- Container → vai guardar os blobs

azlab104sto01 | Containers

Containers

Name	Last modified	Public access level	Lease state
\$logs	04/05/2023, 21:07:10	Private	Available

Show deleted containers

- Data migration, podemos migrar para de um storage para outro

- Network pode ser alterado a qualquer momento
 - Temos a opção de custom domain
 - E podemos definir regras de firewall

- Access key são os dados de acesso ao storage
 - Podemos rotacionar a chave
 - E usar o keyvolt para que uma aplicação tenha acesso através do mesmo

azlab104sto01 | Access keys

Storage account

Search Set rotation reminder Refresh Give feedback

Access keys authenticate your applications' requests to this storage account. Keep your keys in a secure location like Azure Key Vault, and replace them often with new keys. The two keys allow you to replace one while still using the other.

Remember to update the keys with any Azure resources and apps that use this storage account.
Learn more about managing storage account access keys

Storage account name: azlab104sto01

key1 Rotate key
Last rotated: 5/4/2023 (0 days ago)
Key: [REDACTED] Show

Connection string: [REDACTED] Show

key2 Rotate key
Last rotated: 5/4/2023 (0 days ago)
Key: [REDACTED] Show

Connection string: [REDACTED] Show

Navigation sidebar:
Data storage: Containers, File shares, Queues, Tables
Security + networking: Networking, Azure CDN, Access keys (highlighted)
Data management: Shared access signature, Encryption, Microsoft Defender for Cloud, Redundancy

- SAS
 - chave com permissionamento específico e granular, e tempo de expiração

azlab104sto01 | Shared access signature

Storage account

Search Give feedback

A shared access signature (SAS) is a URI that grants restricted access rights to Azure Storage resources. You can provide a shared access signature to clients who should not be trusted with your storage account key but whom you wish to delegate access to certain storage account resources. By distributing a shared access signature URI to these clients, you grant them access to a resource for a specified period of time.

An account-level SAS can delegate access to multiple storage services (i.e. blob, file, queue, table). Note that stored access policies are currently not supported for an account-level SAS.

Learn more about creating an account SAS

Allowed services: Blob, File, Queue, Table (all checked)

Allowed resource types: Service, Container, Object (none checked)

Allowed permissions: Read, Write, Delete, List, Add, Create, Update, Process, Immutable storage, Permanent delete (all checked)

Blob versioning permissions: Enables deletion of versions (checked)

Allowed blob index permissions: Read/Write, Filter (both checked)

Start and expiry date/time: Start 05/05/2023 09:01:14, End 05/05/2023 17:01:14

(UTC-03:00) Brasília

Allowed IP addresses: [REDACTED]

Navigation sidebar:
Queues, Tables
Security + networking: Networking, Azure CDN, Access keys, Shared access signature (highlighted)
Data management: Shared access signature, Encryption, Microsoft Defender for Cloud, Redundancy, Data protection, Object replication, Blob inventory, Static website, Lifecycle management, Azure search, Settings, Configuration

- Redundancy

Redundancy

Azure Storage redundancy copies your data so that it is protected from transient hardware failures, network or power outages, and natural disasters. If an outage renders the primary endpoint unavailable, then you can initiate a failover to the secondary endpoint to rapidly restore write access to your data.

Last failover time: -

Storage endpoints:

Location	Data center type	Status	Failover
East US	Primary	Available	-
West US	Secondary	Available	-

- Podemos preparar um failover, inverter as regiões, porém para de replicar e vira um LRS
 - Azul primaria, verde secundaria

- Configuration

Configuration

Account kind: StorageV2 (general purpose v2)

Performance: Standard

This setting cannot be changed after the storage account is created.

Secure transfer required: Enabled

Allow Blob public access: Enabled

Allow storage account key access: Enabled

Allow recommended upper limit for shared access signature (SAS) expiry interval: Enabled

Default to Azure Active Directory authorization in the Azure portal: Disabled

Minimum TLS version: Version 1.2

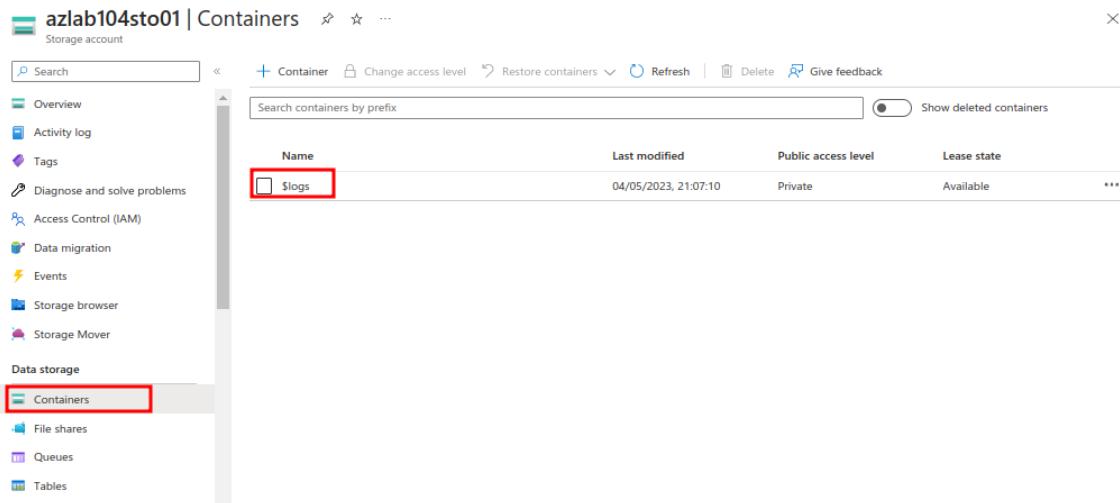
Permitted scope for copy operations (preview): From any storage account

Blob access tier (default): Hot

- Podemos alterar configurações de versão, cool pra hot, replication, etc.

▼ Lab02 → Criar e configurar um blob storage

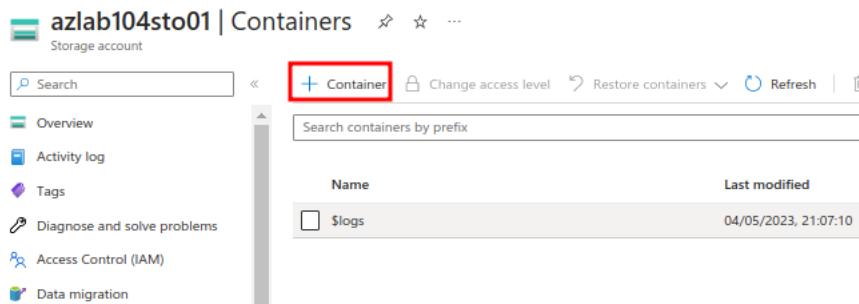
- No storage account criado vamos em container
 - Podemos ver que há alguns criados



The screenshot shows the 'Containers' blade for the storage account 'azlab104sto01'. On the left, a sidebar lists various storage services: Overview, Activity log, Tags, Diagnose and solve problems, Access Control (IAM), Data migration, Events, Storage browser, and Storage Mover. Under 'Data storage', the 'Containers' link is highlighted with a red box. The main area displays a table with one row:

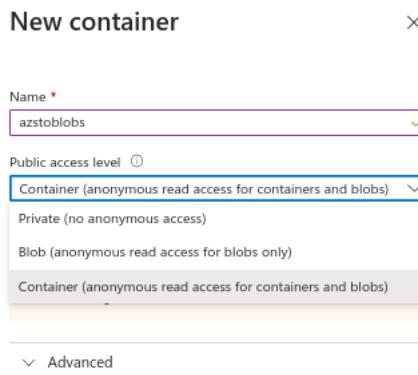
Name	Last modified	Public access level	Lease state
\$logs	04/05/2023, 21:07:10	Private	Available

- Vamos criar um novo



The screenshot shows the 'Containers' blade for the storage account 'azlab104sto01'. The left sidebar is identical to the previous screenshot. The main area shows the '\$logs' container listed. A red box highlights the '+ Container' button at the top of the table.

- Vamos deixar como blob (anonymous reaed access for blobs only)



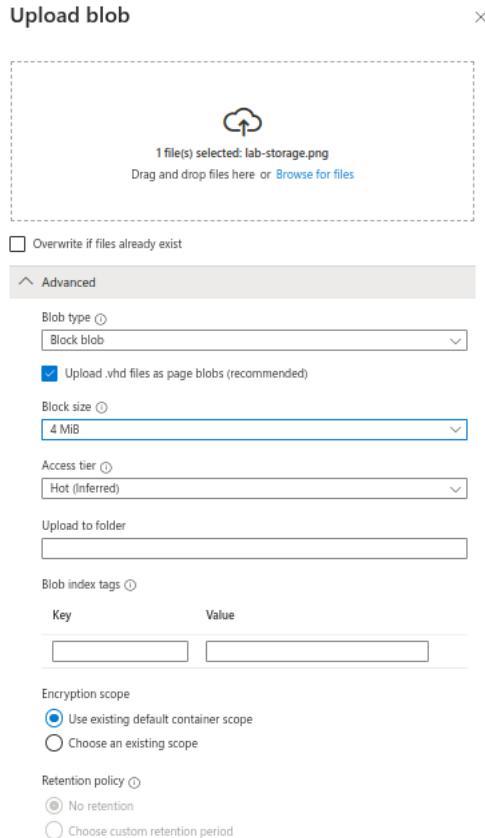
The screenshot shows the 'New container' dialog box. The 'Name' field is filled with 'azstoblobs'. The 'Public access level' dropdown is open, showing the following options:

- Container (anonymous read access for containers and blobs) (selected)
- Private (no anonymous access)
- Blob (anonymous read access for blobs only)
- Container (anonymous read access for containers and blobs)

- Podemos definir criptografia, vamo manter padrão
- Podemos bloquear alteração no blob, mas vamos manter padrão

- Após criarmos o blob podemos validar

- overview
- diagnostico
- Access control IAM
- SAS Token
- Accesss policy → Política para todos que acessarem o blob (ex colocar apenas permissão de view)
- Propriedades → URL direta do container
- Vamos realizar alguns uploads
 - Podemos fazer um overwrite sobre um arquivo antigo caso haja
 - Habilitar permissionamento de acesso ao arquivo via azad ou key
 - Vamos colocar block blob
 - Block size → Tamanho
 - Podemos definir o tier de acesso do arquivo (hot, cool, archive)
 - Podemos colocar uma pasta
 - E definir uma chave
 - Apontar periodo de retenção
 - Habilitar o shadow copy



- Após subir o arquivo

lab-storage.png ...

Blob

Save Discard Download Refresh Delete Change tier Acquire lease Break lease Give feedback

Overview Versions Snapshots Edit Generate SAS

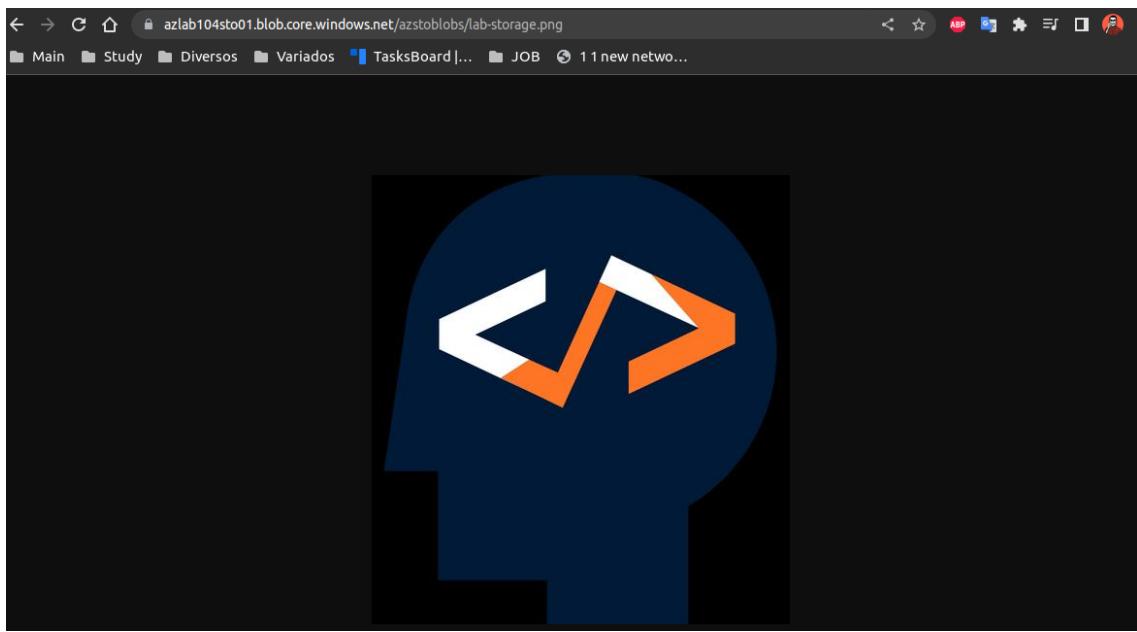
Properties

URL	https://azlab104sto01.blob.core.windows.net/lab-storage.png
LAST MODIFIED	05/05/2023, 9:46:38 AM
CREATION TIME	05/05/2023, 9:46:38 AM
VERSION ID	-
TYPE	Block blob
SIZE	63.32 KIB
ACCESS TIER	Hot (Inferred)
ACCESS TIER LAST MODIFIED	N/A
ARCHIVE STATUS	-
REHYDRATE PRIORITY	-
SERVER ENCRYPTED	true
ETAG	0x8DB4D66C4C012B6
VERSION-LEVEL IMMUTABILITY POLICY	Disabled
CACHE-CONTROL	[redacted]
CONTENT-TYPE	image/png
CONTENT-MDS	dp1juuaghCb2GZtUXJmuCA==
CONTENT-ENCODING	[redacted]
CONTENT-LANGUAGE	[redacted]
CONTENT-DISPOSITION	[redacted]
LEASE STATUS	Unlocked
LEASE STATE	Available
LEASE DURATION	-
COPY STATUS	-
COPY COMPLETION TIME	-

Undelete

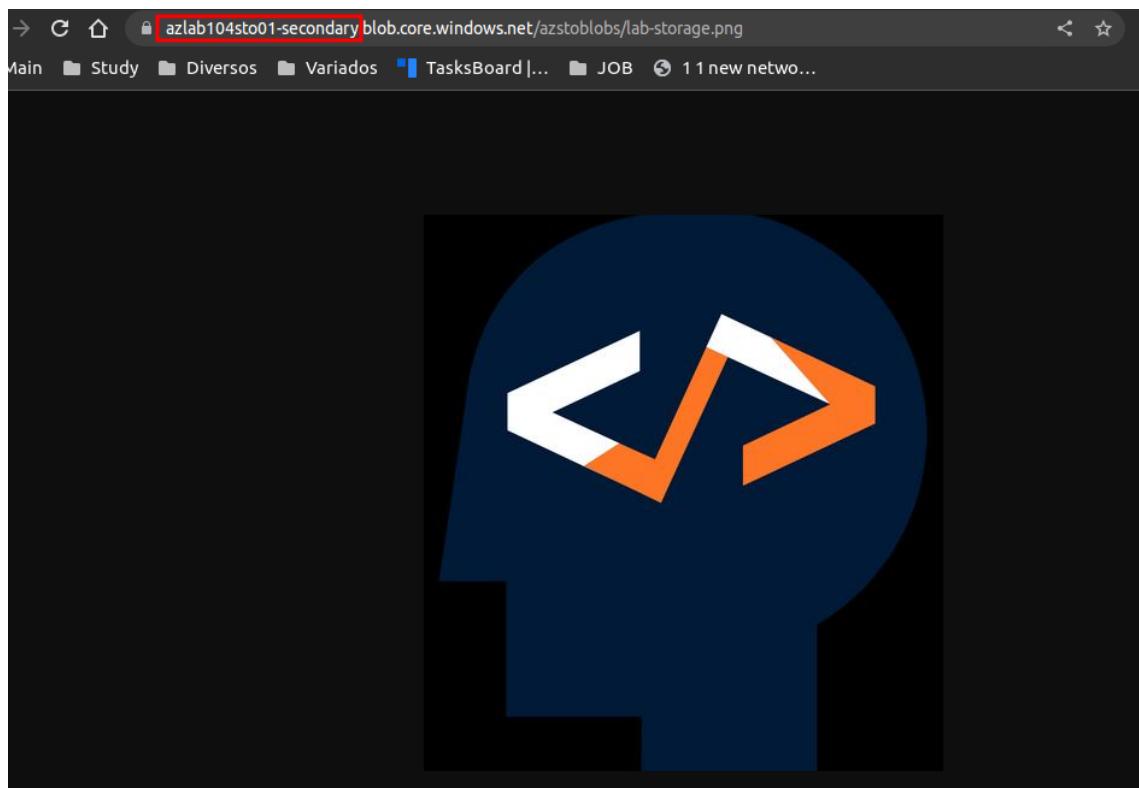
Metadata

- Temos a url do arquivo
- Versões (Qnd o shadows copy)
- Habilitar o snapshot
- Editar se for um arquivo de texto
- E habilitar o Token SAS
- Como está com blob (anonymous reaed access for blobs only), podemos pegar a url do arquivo e visualizar, e também será possível visualizar os arquivos do container



- Voltando no storage account, vamos em endpoint
- Podemos ver as URLs dos containers e files
 - Nas URLs dos container como o RA-GRS está habilitado podemos notar uma secondary que se refere a URL da copia do arquivo que se encontra em outra região
 - Se acessarmos o arquivo pelo endpoint secondary, podemos validar o arquivo que foi replicado na segunda região → West East

The screenshot shows the Azure Storage Account 'Endpoints' blade. On the left, there is a sidebar with various options: Search, Refresh, Settings, Configuration, Data Lake Gen2 upgrade, Resource sharing (CORS), Advisor recommendations, Endpoints (which is highlighted with a red box), Locks, Monitoring, and Insights. The main area displays provisioning state (Succeeded), creation date (04/05/2023, 9:06:44 PM), last failover (Never), storage account resource ID, and blob service details. It shows two endpoints: Primary endpoint (https://azlab104sto01.blob.core.windows.net/) and Secondary endpoint (https://azlab104sto01-secondary.blob.core.windows.net/). A red arrow points to the Secondary endpoint field, labeled 'RA'.



- Para Files não temos a opção de ler os arquivos na segunda região
- Em Lifecycle management
 - Podemos definir padrões de ciclo de vida no qual pode alterar o tier ou excluir um blob

The screenshot shows the Azure Storage account lifecycle management settings page. The top navigation bar includes a search bar, a 'Storage account' dropdown, and several icons for 'Storage Mover', 'Containers', 'File shares', 'Queues', 'Tables', 'Networking', 'Azure CDN', 'Access keys', 'Shared access signature', 'Encryption', 'Microsoft Defender for Cloud', 'Redundancy', 'Data protection', 'Object replication', 'Blob inventory', 'Static website', and 'Lifecycle management'. The 'Lifecycle management' option is highlighted with a red box. The main content area displays a 'List View' of lifecycle rules, with a note stating 'Lifecycle management offers a rich, rule-based policy for general purpose v2 and blob storage accounts. Use the policy to transition your data to the appropriate or updated policy may take up to 48 hours to complete.' A 'Code View' tab is also present. At the bottom, there are buttons for 'Enable', 'Disable', 'Refresh', 'Delete', and 'Give feedback'.

Add a rule ...

1 Details **2 Base blobs**

A rule is made up of one or more conditions and actions that apply to the entire storage account. Optionally, specify that rules will apply to particular blobs by limiting with filters.

Rule name *

Rule scope * Apply rule to all blobs in your storage account Limit blobs with filters

Blob type * Block blobs Append blobs

Blob subtype * Base blobs Snapshots Versions

- Funciona apenas para blobs
- Podemos definir um tempo de vida ou alterar

1 Details **2 Base blobs**

Lifecycle management uses your rules to automatically move blobs to cooler tiers or to delete them. If you create multiple rules, the associated actions must be implemented in tier order (from hot to cool storage, then archive, then deletion).

If

Base blobs were * Last modified Created

More than (days ago) *

Then

Delete the blob

+ Add conditions

- A programação é sempre após a ultima modificação ou após a criação

▼ Lab03 → Gerenciar autenticação e autorização para Azure Storage

- Haviamos efetuado o tipo de autenticação anonima, vamos alterar para o modo privado

Change access level

Change the access level of container 'azstblob'.
Public access level Private (no anonymous access)

OK **Cancel**

- Vamos criar um SAS para o container, e vamos definir um tem de expiração
 - Vamos copiar a URL (Será a qual teremos acesso)

A shared access signature (SAS) is a URI that grants restricted access to an Azure Storage container. Use it when you want to grant access to storage account resources for a specific time range without sharing your storage account key. [Learn more about creating an account SAS](#)

Container: azstoblobs

Shared access tokens

Signing method: Account key (selected) User delegation key

Key 1

Stored access policy: None

Permissions: 2 selected

- Read
- Add
- Create
- Write
- Delete
- List
- Immutable storage

Allowed IP addresses: for example, 168.1.5.65 or 168.1.5.65-168.1...

Allowed protocols: HTTPS only (selected) HTTPS and HTTP

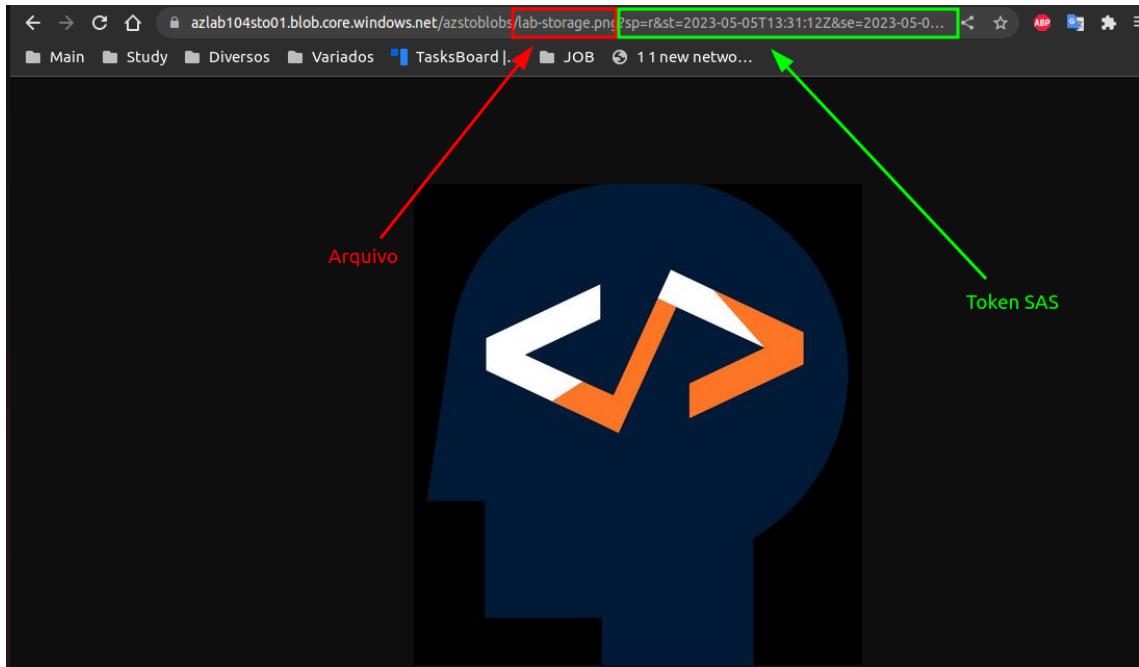
Generate SAS token and URL:

Blob SAS token: sp=r&t=2023-05-05T13:24:58Z&e=2023-05-05T13:30:58Z&sv=2022-11-02&sr=c&sig=N8%2FONMBFt1%2Fhv1dVmVl6TjHwYjZal9bvPnfFv8ow%2BEM%3D

Blob SAS URL: <https://azlab104sto01.blob.core.windows.net/azstoblobs?sp=r&t=2023-05-05T13:24:58Z&e=2023-05-05T13:30:58Z&sv=2022-11-02&sr=c&sig=N8%2FONMBFt1%2Fhv1dVmVl6TjHwYjZal9bvPnfFv8ow%2BEM%3D>

- Se colocarmos o nome do arquivo na URL poderemos ter o acesso
 - Via browser o acesso será aos arquivos portanto temos que colocar

<https://azlab104sto01.blob.core.windows.net/azstoblobs/<arquivo que estamos acessando>/tokenSAS>



- Somente através do Azure storage explorer, poderemos ter uma visualização do container
- A junção da URL com o token é a URI
- Se mudarmos o acesso via az ad, poderemos ter um erro

The screenshot shows the 'azstloblobs' container settings in the Azure portal. The 'Overview' tab is selected. A red error box at the top right states: 'You do not have permissions to list the data using your user account with Azure AD. Click to learn more about authenticating with Azure AD.' Below it, 'Authentication method: Azure AD User Account (Switch to Access key)' and 'Location: azstloblobs' are displayed.

- Para isso precisamos da role **storage data owner**, o qual podemos atribuir caso fomos owner do RG ou sub

The screenshot shows the 'Storage Blob Data Owner' role assignment configuration. It includes fields for 'Selected role' (Storage Blob Data Owner), 'Assign access to' (User, group, or service principal), and 'Members' (Lucas Santos).

The screenshot shows the 'azstloblobs | Access Control (IAM)' blade. Under 'Role assignments', it lists one assignment for 'Storage Blob Data Owner' to 'Lucas Santos'. Other tabs include 'Check access', 'Roles', 'Deny assignments', and 'Classic administrators'.

- Podemos ter duas visões com a role data owner, o modo padrão de owner e no modo do data owner no qual podemos atribuir liberações e acessos através do azad

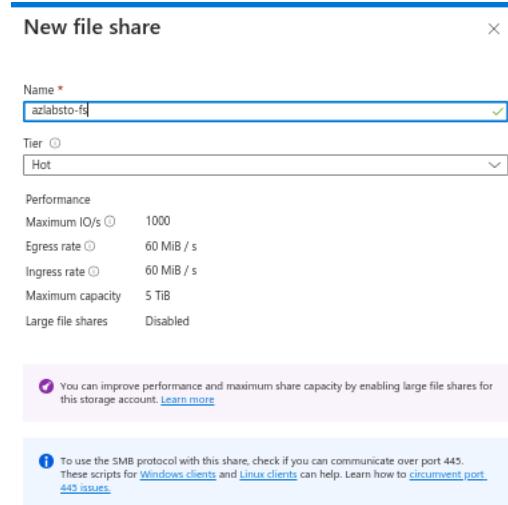
The screenshot shows the 'azstloblobs' container overview. The 'Overview' tab is selected. A green box highlights the 'Authentication method: Azure AD User Account (Switch to Access key)' message. The file 'lab-storage.png' is listed in the main content area.

- AzAd podemos atribuir de leitura (contributor) ou owner (que poderá modificar)

▼ Lab04 → Criar e configure um Azure Files shares

- No mesmo storage vamos criar um az files share
 - Funciona como compartilhamento de rede normal
- Podemos habilitar permissões NTFS e registringir com base no AD local
 - Atribuir o sto antes como objeto no AD

- Vamos criar o file share primeiramente



- Vamos colocar 1GB

Name	Modified	Tier	Quota
azlabsto-fs	05/05/2023, 10:51:27	Hot	5 TiB

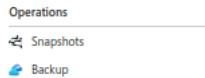
- Confirmar que está v2, e podemos escolher a tier do file storage
 - Vamos utilizar o tier hot mesmo
- Após criar podemos ver direferenças entre o container
 - Podemos estruturar pastas

Name	Type
dados-ti	Directory
lab-storage.png	File

- Podemos alterar a cota de 1024GB a qualquer momento e alterar o tier a qualquer momento também

[Edit quota](#)

- Podemos fazer a política de BKP
- Snapshot pode ser realizado e programado também



- Subimos alguns arquivos

Name
dados-ti
lab-storage.png

- Vamos criar um snapshot

Name	Date created
2023-05-05T14:11:25.000000Z	05/05/2023, 11:11:25 AM

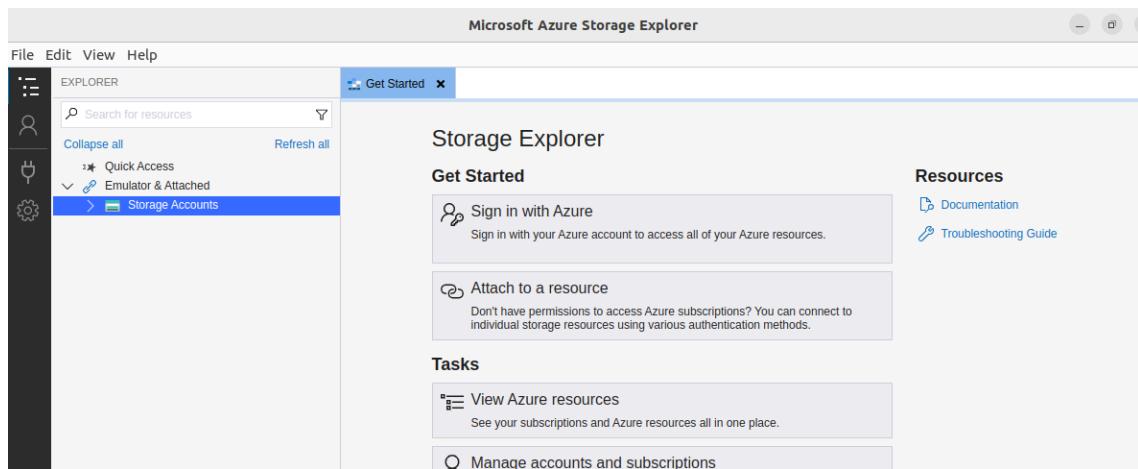
- Acessando pelo snapshot podemos conectar alterar, fazer download, etc.
- Podemos fazer o restore local ou na nuvem
- Vamos fazer o snapshot
- Vamos depois testar restaurando o arquivo a partir do snapshot

- Clicando em connect
 - Podemos fazer uma unidade de rede no windows
 - No linux e MacOS o disco será um ponto de montagem
 - A porta 445 deve estar liberada
 - Pegamos as credenciais de mapeamento, e adicionamos o no equipamento

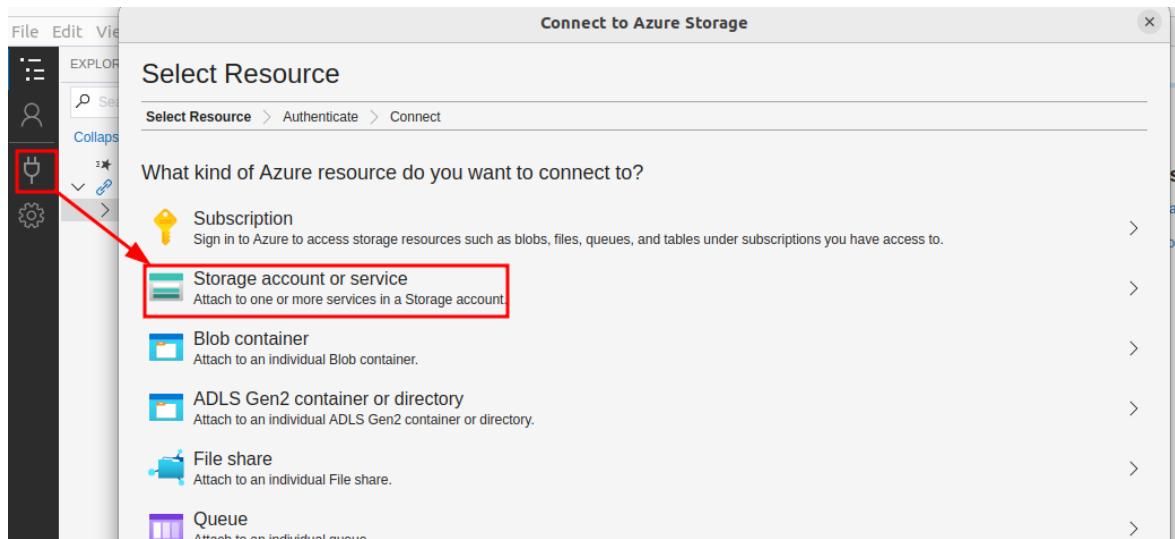
- Como deixamos o acesso publico no storage o acesso será realizado normalmente
- Porém podemos definir regras de fw e acesso

- Vamos instalar o az storage explorer
 - No caso será no linux portanto utilizaremos o comando `sudo snap install storage-explorer`
 - Em seguida rodamos o comando `sudo snap connect storage-explorer:password-manager-service :password-manager-service`

```
Lk47@Latitude-E6410:~$ sudo snap install storage-explorer
storage-explorer 1.29.0 from Microsoft Azure Storage Tools (msft-storage-tools) installed
Lk47@Latitude-E6410:~$ sudo snap connect storage-explorer:password-manager-service :password-manager-service
Lk47@Latitude-E6410:~$
```



- Podemos logar via az ad, URI, etc.
- Vamos adicionar o nosso STO ao az sto explorer



- Vamos acessar via SAS (URI) do STO

The screenshot shows the Azure Storage account 'azlab104sto01' configuration page. The 'Shared access signature' section is highlighted. Key configuration parameters include:

- Allowed services:** Blob, File, Queue, Table
- Allowed resource types:** Service, Container, Object
- Allowed permissions:** Read, Write, Delete, List, Add, Create, Update, Process, Immutable storage, Permanent delete
- Blob versioning permissions:** Enables deletion of versions
- Allowed blob index permissions:** Read/Write, Filter
- Start and expiry date/time:**
 - Start: 05/05/2023, End: 05/05/2023
 - (UTC-03:00) Brasilia
- Allowed IP addresses:** For example, 168.1.5.65 or 168.1.5.65-168.1.5.70
- Allowed protocols:** HTTPS only
- Preferred routing tier:** Basic (default)
- Signing key:** (not visible)

Below this is a 'Select Connection Method' dialog box:

Select Connection Method

Select Resource > Select Connection Method > Enter Connection Info > Summary

How will you connect to the storage account?

Connection string (Key or SAS)
 Shared access signature URL (SAS)
 Account name and key

Enter Connection Info

Select Resource > Select Connection Method > Enter Connection Info > Summary

Display name:
storage-account-2

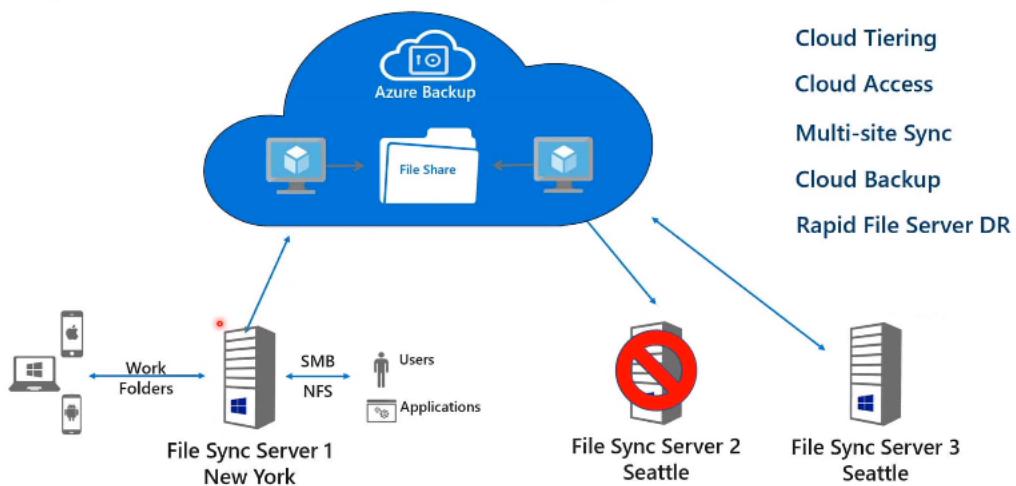
Connection string:

```
BlobEndpoint=https://azlab104sto01.blob.core.windows.net;QueueEndpoint=https://azlab104sto01.queue.core.windows.net;FileEndpoint=https://azlab104sto01.file.core.windows.net;TableEndpoint=https://azlab104sto01.table.core.windows.net;SharedAccessSignature=sv=2022-11-02&ss=bfqt&srt=sco&sp=rwldacupiyfxf&se=2023-05-05T23:45:15Z&st=2023-05-05T15:45:15Z&spr=https,http&sig=TB5kYLIPJDou%2BT%2B3KThAM72sq%2FUS64hCr58kEe%2BpAGE%3D
```

- Podemos gerenciar normalmente através do az md storage explore

- Podemo subir o vhds normalmente também para os blobs

▼ Lab05 → Configurar Azure File Sync



- File sync irá replicar para o az file share
- Assim os arquivos do servidor vai ficar como cache, e os que estarão no az irão servir como DR, caso um File server caia, o file share irá manter
- Vamos simular um ambiente onpremises, não utilizaremos VPN
- Vamos criar um RG, VNET, subnet
 - Vamos utilizar o seguinte script para a criação

```
#Criar Resource Group:  
New-AzResourceGroup -Name "RG-LAB-07" -Location "eastus2" -Tag @{Modulo="MOD07"}  
  
#Criar uma VNET:  
$virtualNetwork = New-AzVirtualNetwork `  
-ResourceGroupName "RG-LAB-07" `  
-Location "eastus2" `  
-Name "VNET-07" `  
-AddressPrefix 10.7.0.0/16
```

```

##Adicionar uma Subnet
$subnetConfig = Add-AzVirtualNetworkSubnetConfig ` 
    -Name "SUB-LAN" ` 
    -AddressPrefix 10.7.0.0/24 ` 
    -VirtualNetwork $virtualNetwork

##Setar a Subnet criada na VNET existente
$virtualNetwork | Set-AzVirtualNetwork

```

- Colar comando por vez no cloud shell
- Agora vamos seguir com a criação da VM de forma manual mesmo
 - VM basic, win server 2019, B2ms, sem boot diagnostic, vamos deixar a porta 3389 liberada

Essentials

Resource group	(move) RG-LAB-07	Operating system	: Windows (Windows Server 2019 Datacenter)
Status	: Running	Size	: Standard D2v2s v5 (2 vcpus, 4 GiB memory)
Location	: East US 2 (Zone 1)	Public IP address	: 20.15.91.244
Subscription	(move) Visual Studio Enterprise Subscription - MPN	Virtual network/subnet	: VNET-07/SUB-LAN
Subscription ID	: afe777d-a295-4675-9bf9-5b6bf32b89f4	DNS name	: Not configured
Availability zone	: 1	Health state	: -
Tags	(edit) md : 07		

Properties Monitoring Capabilities (8) Recommendations Tutorials

Virtual machine

Computer name	vm-lab-sto
Operating system	Windows (Windows Server 2019 Datacenter)
Publisher	MicrosoftWindowsServer
Offer	WindowsServer
Plan	2019-datacenter-gensecond
VM generation	V2
VM architecture	x64
Agent status	Ready
Agent version	2.7.41491.1075
Host group	None
Host	-
Proximity placement group	-
Colocation status	N/A
Capacity reservation group	-
Disk controller type	SCSI

Networking

Public IP address	20.15.91.244 (Network interface vm-lab-sto320_z1)
Public IP address (IPv6)	-
Private IP address	10.7.0.4
Private IP address (IPv6)	-
Virtual network/subnet	VNET-07/SUB-LAN
DNS name	Configure

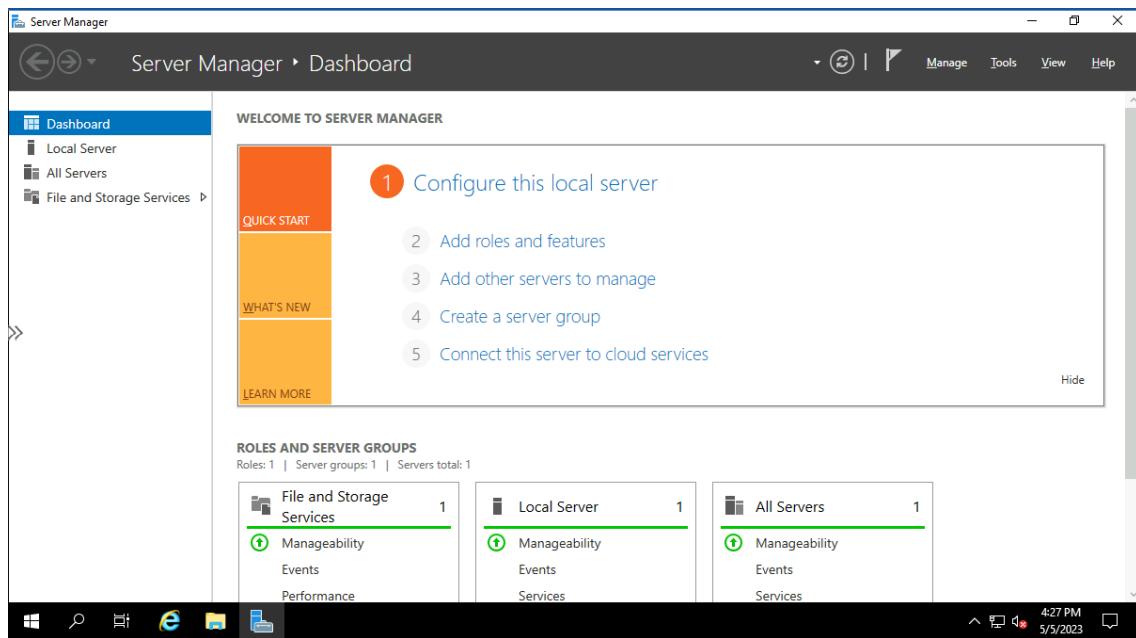
Size

Size	Standard D2v2s v5
vCPUs	2
RAM	4 GiB

Disk

OS disk	vm-lab-sto_OsDisk_1_efb29b9d8384247ab24ff176113e55e7
Encryption at host	Disabled
Azure disk encryption	Not enabled
Ephemeral OS disk	N/A
Data disks	0

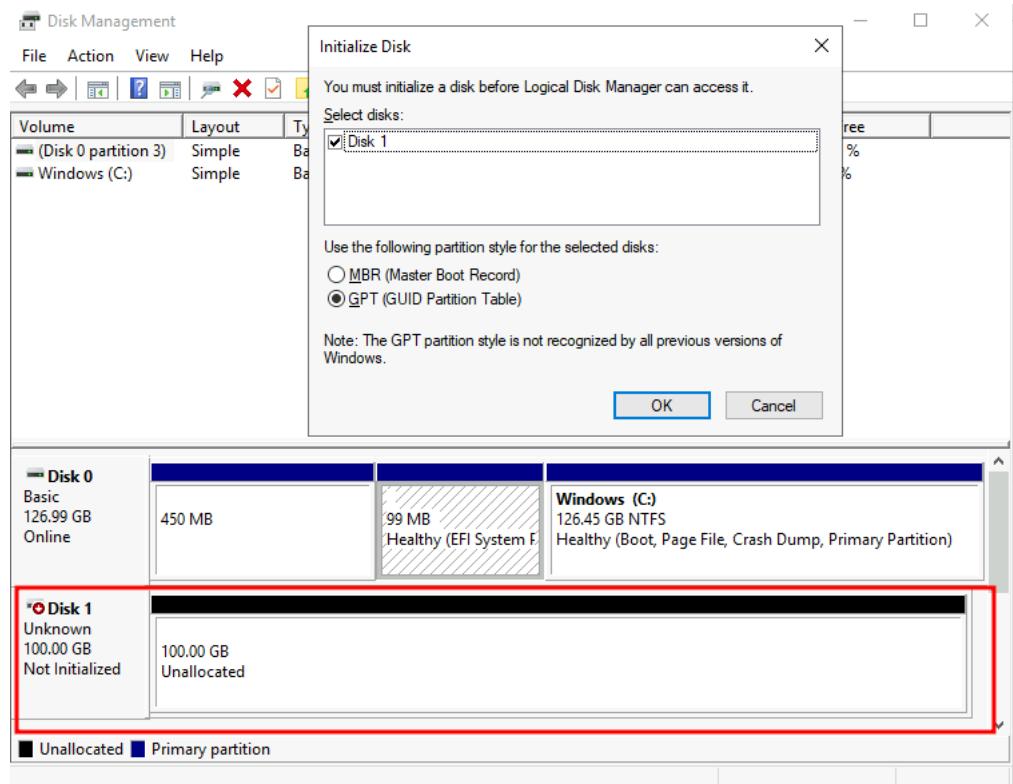
- Vamos deixar o NSG na vm mesmo
- Vamos acessar a VM



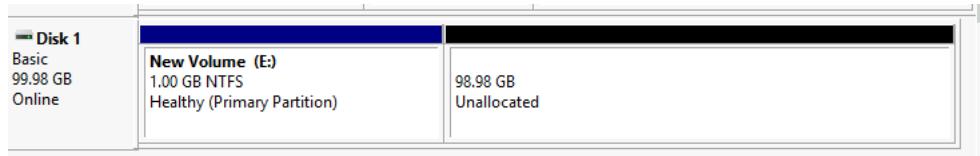
- Vamos criar um segundo disco
 - **Regra do File Sync, não pode ser o disco do OS**
- Vamos dar um attach disk na VM através do portal

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MB/s)	Encryption	Host caching
1	data-sync	Premium SSD LRS	100	500	100	SSE with PMK	Read/write

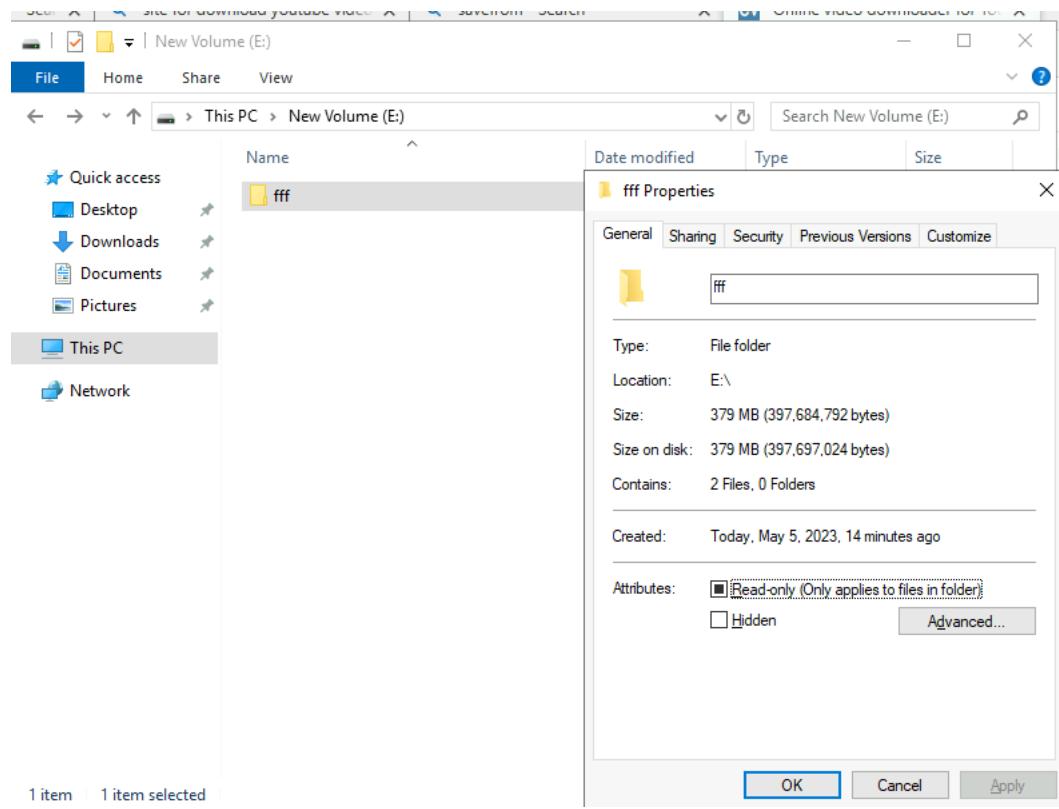
- Acessando a VM podemos ver o novo disco



- Vamos criar um volume só de 1Gb (1024)



- Pois queremos que 90% do disco deverá estar livre ao fechar o file sync, então devemos ter 200mb de arquivos, se for mais de 1GB será mas dificil para o lab
- No volume que criamos vamos gerar uma estrutura simples
 - Vamos alimentar até 300mb de arquivos (No caso usei arquivos de video para preencher o espaço)



- Após concluir vamos usar o az file sync

A screenshot of the Azure portal search results. The search bar at the top contains the text 'azure file sync'. Below the search bar, there are several categories and items:

- All (selected)
- Services (99+)
- Marketplace (2)
- Documentation (99+)
- Resources (0)
- Resource Groups (0)
- Azure Active Directory (0)

Services

- Azure Active Directory
- Azure Cosmos DB
- Azure Database for MySQL servers
- Firewalls
- Azure NetApp Files
- Azure Synapse Analytics
- Azure Arc
- Azure Databricks

Marketplace

- Azure File Sync (highlighted with a red box)
- Resilio Connect

Documentation

- Sync your file server with the cloud by using Azure File Sync
- Tutorial - Extend Windows file servers with Azure File Sync
- Azure File Sync networking considerations
- Configuring Azure File Sync network endpoints
- Sync content from a cloud folder - Azure App Service
- Microsoft Azure Storage / File Sync management client library for ...
- Azure enterprise cloud file share - Azure Architecture Center
- Options for data transfer to Azure using an appliance

Continue searching in Azure Active Directory

Deploy Azure File Sync ...

* Basics Networking Tags Review + create

Storage Sync Service Microsoft

Basics

Subscription	Visual Studio Enterprise Subscription - MPN
Resource group	az104labs-sto
Region	East US
Name	azsynclab

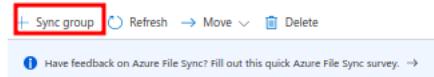
Networking

Network connectivity	All networks
----------------------	--------------

Tags

md	07
----	----

- No file sync, vamos criar um grupo de sincronização



- Selecionamos o STO (No caso azlab104sto01) que estamos trabalhando no momento e selecionamos o file share(azlabsto-fs) criado na area passada

Sync group ...

Start by specifying an Azure file share to sync with - this is the sync group's cloud endpoint.
You can specify a folder on your servers you want to sync later.

Learn more

Sync group name * sto-cloud ✓

Cloud endpoint

Subscription * Visual Studio Enterprise Subscription - MPN

Storage account * Select storage account

/subscriptions/afe7f77d-a295-4675-9bf9-5b... ✓

Azure File Share azlabsto-fs

- Ele cria um cloud endpoint

azsynclab ⌂ ⌂ ⌂ ...

Storage Sync Service

+ Sync group ⌂ Refresh → Move ⌂ Delete

Have feedback on Azure File Sync? Fill out this quick Azure File Sync survey. →

Overview

Activity log

Access control (IAM)

Tags

Settings

Network

Locks

Sync groups

Sync group name	Health	Region
sto-cloud	✓	East US

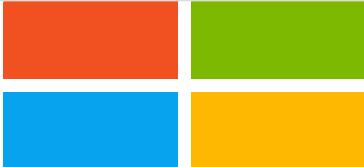
- Então vamos registrar um servidor

- Vamos baixar o client na vm (que representa o server onprem)

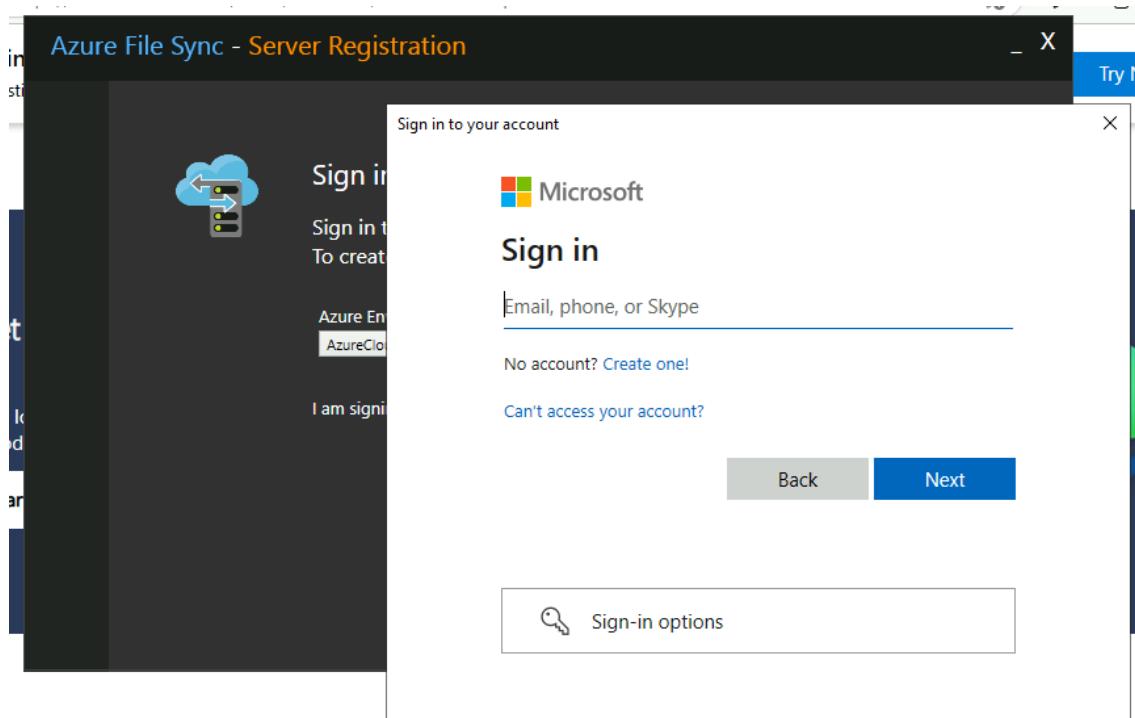
Azure File Sync Agent

The Azure File Sync agent enables data on a Windows Server to be synchronized with an Azure File share.

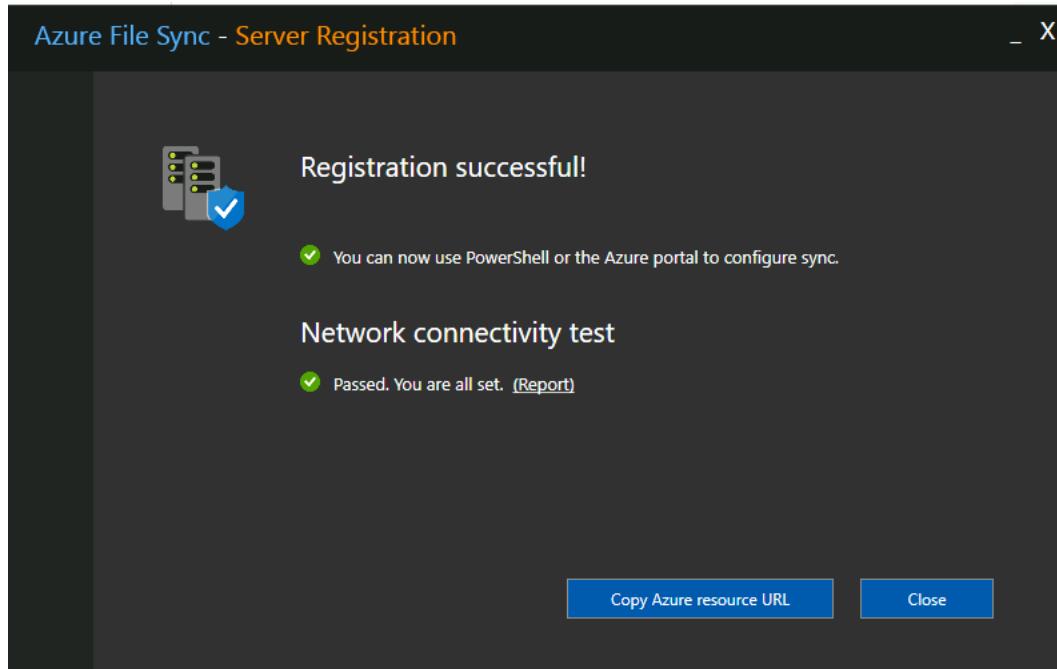
 <https://www.microsoft.com/en-us/download/details.aspx?id=57159>



- Após finalizar vamos logar para acessar a estrutura



- Após logar vamos setar a sub, o RG, e o STO Sync Group que estamos utilizando



- Assim criamos um endpoint server

Server Name	State	Type	Operating System	Agent Version	Last seen	...
vm-lab-sto	Online	Server	Windows Server 2019	16.0	05/05/2023, 2:22:38 PM	[More]

- Voltando STO sync group a conexão está realizada, agora vamos seguir com a configuração

The screenshot shows the Azure portal interface for a sync group named 'sto-cloud'. In the 'Cloud endpoint' section, there is one entry for an 'Azure File Share' named 'az104labs-sto'. Below this, the 'Server endpoints' section shows '0 server endpoints' with a note 'No items to display.' At the bottom, there are two line charts: 'Files Synced' and 'Bytes Synced', both spanning from May 3rd to May 6th, UTC-03:00. The 'Files Synced' chart has a single data point at 100, and the 'Bytes Synced' chart has a single data point at 1008.

- Vamos usar o disco e a pasta apenas
- Vamo definir uma % para preservar, no caso vamos usar 90%, ou seja, 10% vai ficar no onprem (em cache) e 90% vai ficar na nuvem, isso do volume total do disco
- Vamos pontar que permaneçam os dados que foram acessados nos ultimos 30 dias
- Após isso seguimos com created

The screenshot shows the configuration page for the 'vm-lab-sto' sync group. Under 'Cloud Tiering', the 'Enable cloud tiering' option is selected. Under 'Volume Free Space Policy', the 'Always preserve the specified percentage of free space on the volume' option is selected with a value of 90. Under 'Date Policy', the 'Enabled' button is selected. Under 'Initial Sync', the 'Merge the content of this server path with the content in the Azure file share' option is selected.

- Pode levar até 30 minutos para configurar e sincronizar
- Os arquivos que vão sendo encaminhado para nuvem, podemos ver que os arquivos vão ficando com um

Name	Date modified	Type
lab-storage	5/5/2023 2:01 PM	PNG

- Em event viewer em applications, filesync, podemos ver os logs do que está sendo executado no momento

Level	Date and Time	Source	Event ID	Task Category
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Verbose	5/5/2023 6:06:53 PM	Management	6	GetNextJob
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Information	5/5/2023 6:06:53 PM	Management	1	None
Verbose	5/5/2023 6:06:53 PM	Management	5	GetNextJob
Information	5/5/2023 6:06:53 PM	Management	1	None

- No STO Sync Group podemos ver metricas dos grupos

The screenshot shows the Azure portal interface for managing sync groups. At the top, there's a navigation bar with 'Home', 'Sync groups', and 'sto-cloud'. Below it, there are buttons for 'Add cloud endpoint', 'Add server endpoint', 'Refresh', and 'Delete sync group'. The main area is divided into sections: 'Cloud endpoint' and 'server endpoints'.

Cloud endpoint:

- Azure File Share: azlabsto-fs
- Provisioning State: ✓
- Resource group: az104labs-sto
- Change Enumeration: ↑↓

1 server endpoints:

Server	Sync & tiering health	Files Not Syncing	Path	Cloud Tiering	Low disk space mode	Last Status
vm-lab-sto	Healthy	0	E:\fff	Enabled		05/05/2023, 3:07:05 PM

Files Synced and **Bytes Synced** charts (5 de mai. UTC-03:00):

- Files Synced:** Download from sto-cloud: 4, Upload to sto-cloud: 3.
- Bytes Synced:** Upload to sto-cloud: 397,68 MB, Download from sto-cloud: 0 B.

- Quando colocamos uma arquivo no azure para aparecer no file server, pode demorar até 24 para aparecer em ambos os ambientes
- Após concluir podemos ver os arquivos marcados, caso abrirmos algum arquivo, o mesmo será baixado novamente no ambiente onprem e será desmarcado



▼ Lab06 → Gerenciar o acesso à rede para Azure Storage

- Após realizarmos a configuração do Az File Sync, o ponto de acesso será o azure e não o File Server mais
- Se validarmos em nosso STO do file share, podemos ver todos os arquivos

The screenshot shows the Azure portal interface for managing file shares. At the top, there's a search bar and a toolbar with 'Connect', 'Upload', 'Add directory', 'Refresh', 'Delete share', 'Change tier', and 'Edit quota'. The main area is divided into sections: 'Overview' and 'Operations'.

Overview:

- Search bar: lab-storage
- File list:

Name	Type	Size
.SystemShareInformation	Directory	***
dados-ti	Directory	***
lab-storage.png	File	63.32 KiB
question.png	File	58.4 KiB
teste.txt	File	0 B
SALÁRIOS PARA PROGRAMADORES EM 2023 - Resultado 3ª Pesquisa Salarial do Código Fonte TV...	File	189.63 MiB
SALÁRIOS PARA PROGRAMADORES EM 2023 - Resultado 3ª Pesquisa Salarial do Código Fonte TV...	File	189.63 MiB

- Podemos mapear a unidade de rede do azure

The screenshot shows the Azure Storage Explorer interface. On the left, a file share named 'azlabsto-fs' is selected, displaying a list of files and folders. On the right, the 'Connect' section is shown for Windows, with options for drive letter ('Z'), authentication method ('Active Directory' or 'Storage account key' selected), and a 'Show Script' button.

- Em firewall virtual network, vamos definir redes específicas
 - No caso definimos apenas a subnet em sí
 - Podemos validar somente o IP também. Vamos utilizar de nosso computador

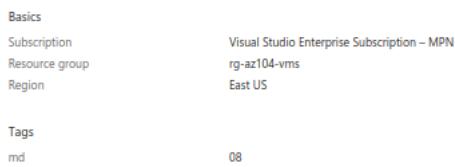
The screenshot shows the 'Firewalls and virtual networks' section in the Azure portal. It displays the configuration for public network access, which is set to 'Enabled from selected virtual networks and IP addresses'. Below this, there's a table for managing virtual networks, showing no networks selected. The 'Firewall' section allows adding IP ranges. The 'Resource instances' section lets you specify resource instances for access. The 'Exceptions' section contains checkboxes for various access permissions.

- E o arquivo irá subir normalmente
- Quando a VM está dentro da estrutura do azure, as conexões são feitas dentro do backbone, agora no caso do acesso de acesso externo, como no caso através do meu computador, a conexão ocorre através da internet.

▼ Azure Virtual Machines

▼ Lab01 → Implante availability set virtual com 2 máquinas no portal do Azure.

- Vamos criar primeiramente um RG



- Seguindo a ordem de criação de infraestrutura, vamos criar uma vnet e uma subnet
 - vnet → 10.8.0.0/16
 - subnet → 10.8.0.0/24
 - Não modificaremos nada em security
 - Seguimos com a criação padrão

Create virtual network ...

Basics Security IP addresses Tags Review + create

[View automation template](#)

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource Group	rg-az104-vms
Name	vnet-vms-104
Region	East US

Security

Azure Bastion	Disabled
Azure Firewall	Disabled
Azure DDoS Network Protection	Disabled

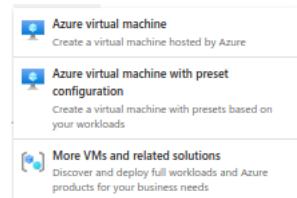
IP addresses

Address space	10.8.0.0/16 (65536 addresses)
Subnet	subnet-vm (10.8.0.0/24) (256 addresses)

Tags

md 08

- Após criar, vamos seguir com a criação da vm
 - Podemos criar uma vm predefinida (Uma forma de criação mais rápida)
 - Podemos reservar a partir do menu de criação da vm. São itens que podemos comprar de forma anual, assim podemos ter descontos.



- Vamos seguir com a criação normal

Create a virtual machine

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *	Visual Studio Enterprise Subscription – MPN
Resource group *	rg-az104-vms
Create new	
Instance details	
Virtual machine name *	vm-lab-01
Region *	(US) East US
Availability options	Availability set
<p>Availability set *</p> <p>Based on your input, you might want to consider creating this resource as a virtual machine scale set, which allows you to manage, configure and scale load balanced virtual machines. Create as VMSS</p> <p>Security type</p> <p>Image *</p> <p>VM architecture</p> <p>Run with Azure Spot discount</p> <p>Size *</p>	
<p>Administrator account</p> <p>Review + create < Previous Next : Disks ></p>	

- Vamos criar uma Availability options
 - Para garantir falha de hardware ou datacenter
- Vamos utilizar o Availability set

- | | |
|---|------------------|
| Availability options | Availability set |
| <ul style="list-style-type: none"> ▪ Que vai ser para garantir falha de hardware, que protege de falha de rack em um unico datacenter ▪ Vamos utilizar o padrão 2 fault domains, e 5 update domains | |

Create availability set

Group two or more VMs in an availability set to ensure that at least one is available during planned or unplanned maintenance events. [Learn more](#)

Name *	avb-set-eastus
Fault domains	2
Update domains	5
Use managed disks	No (Classic) Yes (Aligned)

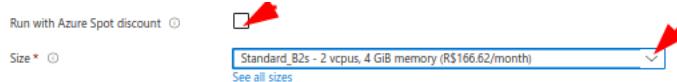
- Vamos utilizar um windows server 2019

Image *	Windows Server 2019 Datacenter - x64 Gen2
See all images Configure VM generation	

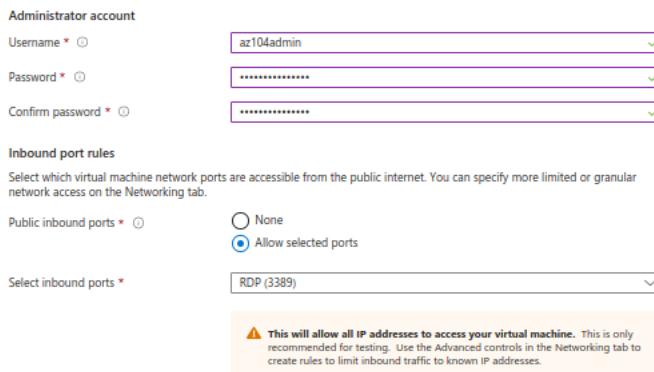
- Mas também podemos utilizar uma imagem publica (do marketplace) ou privada (imagens criadas ou enviadas para nuvem) → Se subirmos um vhd, podemos usar nossas proprias imagens personalizada



- Spot Instance → Compartilhamento de performance com o azure (Não utilizaremos)
- Size → B2s



- Colocaremos os dados de acesso
- Vamos permitir o 3389 e a porta 80



- Parte de discos
 - Podemos personalizar o size ou alterar pelas opções, podemos alterar o tipo de armazenamento SSD ou HDD
 - Podemos attachar um disco existente
 - Podemos usar um disco gerenciado ou não gerenciado (não gerenciado teríamos que criar um STO para armazenar as informações)
 - Podemos definir a criptografia

The screenshot shows the 'Disks' tab of the Azure VM creation interface. At the top, there are tabs for Basics, Disks (which is selected), Networking, Management, Monitoring, Advanced, Tags, and Review + create. Below the tabs, a note states: "Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. Learn more".

VM disk encryption: A note says "Encryption at host is not registered for the selected subscription. Learn more about enabling this feature".

OS disk:

- OS disk type: Premium SSD (locally-redundant storage)
- Delete with VM: Checked
- Key management: Platform-managed key
- Enable Ultra Disk compatibility: Unchecked (Note: Ultra disk is not supported with Availability Sets or VMSS.)

Data disks for vm-lab-01: A table with columns LUN, Name, Size (GiB), Disk type, Host caching, and Delete with VM.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM
	Create and attach a new disk				Attach an existing disk

Advanced:

- Use managed disks: Checked
- Ephemeral OS disk: None (radio button selected)
- Public IP: (new) vm-lab-01-ip
- NIC network security group: Basic (radio button selected)

- Networking

- Selecioneamos a vnet e subnet
- Vamos manter o ip publico
- Vamos colocar o NSG direto na placa de rede

Network interface: A note says "When creating a virtual machine, a network interface will be created for you."

Virtual network: vnet-vms-104 (dropdown)

Subnet: subnet-vm (10.8.0.0/24) (dropdown)

Public IP: (new) vm-lab-01-ip (dropdown)

NIC network security group: Basic (radio button selected)

- Aceleração de rede → Cria um tamho de placa de rede maior
- Load balancing, podemos add diretamente no backend pool

Enable accelerated networking The selected VM size does not support accelerated networking.

Load balancing
You can place this virtual machine in the backend pool of an existing Azure load balancing solution. [Learn more](#)

Load balancing options None Azure load balancer Supports all TCP/UDP network traffic, port-forwarding, and outbound flows. Application gateway Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.

- o Gerenciamento

- Identity → Podemos criar uma autenticação para a máquina
- AAD → Podemos incluir a vm diretamente no domínio da organização
- Shutdown → Programação para desligar
- BKP → podemos criar uma política de bkp
- Guest OS update → Podemos usar o orquestrador do sistema operacional (MS em si)

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Configure management options for your VM.

Microsoft Defender for Cloud
Microsoft Defender for Cloud provides unified security management and advanced threat protection across hybrid cloud workloads. [Learn more](#)

Your subscription is protected by Microsoft Defender for Cloud basic plan.

Identity
Enable system assigned managed identity

Azure AD
Login with Azure AD
RBAC role assignment of Virtual Machine Administrator Login or Virtual Machine User Login is required when using Azure AD login. [Learn more](#)

Auto-shutdown
Enable auto-shutdown
Shutdown time
Time zone
Notification before shutdown
Email *

Backup
Enable backup

Site Recovery
Enable Disaster Recovery

Guest OS updates
Enable hotpatch
Hotpatch is not available for this image. [Learn more](#)
Patch orchestration options
Some patch orchestration options are not available for this image. [Learn more](#)

- o Monitoring

- Boot diagnostic vamos deixar ativado
- Logs de OS podemos deixar off

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Configure monitoring options for your VM.

Alerts
Enable recommended alert rules

Diagnostics

- Boot diagnostics Enable with managed storage account (recommended) (selected)
- Enable with custom storage account
- Disable

Enable OS guest diagnostics

- o Advanced

- Podemos selecionar um script ou um cliente para rodar após a criação
- Podemos escrever um script
- Podemos criar um host dedicado
- Geração de máquinas → G1 e G2

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Add additional configuration, agents, scripts or applications via virtual machine extensions or cloud-init.

Extensions
Extensions provide post-deployment configuration and automation.
Extensions Select an extension to install

VM applications
VM applications contain application files that are securely and reliably downloaded on your VM after deployment. In addition to the application files, an install and uninstall script are included in the application. You can easily add or remove applications on your VM after create. [Learn more ↗](#)

Select a VM application to install

Custom data
Pass a script, configuration file, or other data into the virtual machine **while it is being provisioned**. The data will be saved on the VM in a known location. [Learn more about custom data for VMs ↗](#)

Custom data

💡 Your image must have a code to support consumption of custom data. If your image supports cloud-init, custom-data will be processed by cloud-init.
[Learn more about custom data for VMs ↗](#)

User data
Pass a script, configuration file, or other data that will be accessible to your applications **throughout the lifetime of the virtual machine**. Don't use user data for storing your secrets or passwords. [Learn more about user data for VMs ↗](#)

Enable user data

Performance (NVMe)

Enable capabilities to enhance the performance of your resources.

Higher remote disk performance with NVMe

The selected size is not supported for NVMe. See supported size families.

Host

Azure Dedicated Hosts allow you to provision and manage a physical server within our data centers that are dedicated to your Azure subscription. A dedicated host gives you assurance that only VMs from your subscription are on the host, flexibility to choose VMs from your subscription that will be provisioned on the host, and the control of platform maintenance at the level of the host. [Learn more](#)

Host group No host groups found

Dedicated hosts cannot be used with availability sets.

Capacity reservations

Capacity reservations allow you to reserve capacity for your virtual machine needs. You get the same SLA as normal virtual machines with the security of reserving the capacity ahead of time. [Learn more](#)

Capacity reservation group None Capacity reservation group cannot be set on a virtual machine which is part of an availability set.

Proximity placement group

Proximity placement groups allow you to group Azure resources physically closer together in the same region. [Learn more](#)

Proximity placement group No proximity placement groups found

- Por fim seguimos com a criação

CreateVm-MicrosoftWindowsServer.WindowsServer-201-20230506072135 | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview

Your deployment is complete

Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe... Start time: 06/05/2023, 07:36:25
 Subscription: Visual Studio Enterprise Subscription – MPN Correlation ID: 543f377c-e702-462e-a759-57d3110c3f9a

Resource group: rg-az104-vms

Deployment details

Next steps

Setup auto-shutdown Recommended
 Monitor VM health, performance and network dependencies Recommended
 Run a script inside the virtual machine Recommended

Go to resource Create another VM

- Após a VM ter sido criada, vamos criar outra novamente
- Vamos em template, vamos fazer o deploy para uma nova vm

```

1   "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
2   "contentVersion": "1.0.0.0",
3   "parameters": {
4     "location": {
5       "type": "String"
6     },
7     "networkInterfaceName": {
8       "type": "String"
9     },
10    "networkSecurityGroupName": {
11      "type": "String"
12    },
13    "networkSecurityGroupRules": {
14      "type": "Array"
15    },
16    "subnetName": {
17      "type": "String"
18    },
19    "virtualNetworkId": {
20      "type": "String"
21    },
22    "publicIpAddressName": {
23      "type": "String"
24    },
25    "publicIpAddressType": {
26      "type": "String"
27    },
28    "publicIpAddressSku": {
29      "type": "String"
30    },
31    "pipDeleteOption": {
32      "type": "String"
33    },
34    "virtualMachineName": {
35      "type": "String"
36  }

```

- Só iremos alterar algumas informações como o nome ou que façam referencia para a primeira vm

Custom deployment ...

Deploy from a custom template

Subscription * Visual Studio Enterprise Subscription – MPN

Resource group * rg-az104-vms

Instance details

Region *	(US) East US
Location *	eastus
Network Interface Name *	vm-lab-01540
Network Security Group Name *	vm-lab-01-nsg
Network Security Group Rules *	[{"name": "RDP", "properties": {"priority": 300, "protocol": "TCP", "access": "All...}}
Subnet Name *	subnet-vm
Virtual Network Id *	/subscriptions/afe7f77d-a295-4675-9bf9-5b6bf32b89f4/resourceGrou...
Public Ip Address Name *	vm-lab-02-ip
Public Ip Address Type *	Static
Public Ip Address Sku *	Standard
Pip Delete Option *	Delete
Virtual Machine Name *	vm-lab-02
Virtual Machine Computer Name *	vm-lab-02
Virtual Machine RG *	rg-az104-vms
Os Disk Type *	Premium_LRS
Os Disk Delete Option *	Delete
Virtual Machine Size *	1x Standard_B2s 2 vcpus, 4 GB memory

- E seguimos com a criação

Microsoft.Template-20230506074820 | Overview

Deployment

Overview Inputs Outputs Template

Your deployment is complete

Deployment name : Microsoft.Template-20230506074820
 Subscription : Visual Studio Enterprise Subscription – MPN
 Resource group : rg-az104-vms

Start time : 5/6/2023, 7:48:26 AM
 Correlation ID : 608834f5-be52-4f6e-859a-00f144c1be32

Deployment details

Next steps

- Por fim duas vms foram criadas

Virtual machines

Vertare Tecnologia Ltda (vertare.com.br)

Showing 1 to 2 of 2 records.

<input type="checkbox"/>	Name ↑↓	Type ↑↓	Subscription ↑↓	Resource group ↑↓	Location ↑↓	Status ↑↓	Operating system ↑↓	Size ↑↓	Public IP address ↑↓	Disk
<input type="checkbox"/>	vm-lab-01	Virtual machine	Visual Studio Enterpr...	RG-AZ104-VMS	East US	Running	Windows	Standard_B2s	20.102.80.46	1
<input type="checkbox"/>	vm-lab-02	Virtual machine	Visual Studio Enterpr...	rg-az104-vms	East US	Running	Windows	Standard_B2s	20.124.233.126	1

- Podemos validar monitoramento, Opções de capacidades, temos recomendações, treinamentos, logs para validar modificações, access control, parte de configuração, com networking, connect, disks, size, security, advisor

recommendations, extensions, etc,

- Trocar IP deve ser pelo portal do azure mesmo e não de dentro da vm

Home > Virtual machines > vm-lab-01 | Networking >

vm-lab-01539 ⋮

Network interface

Search

Move Delete Refresh Edit accelerated networking

Overview

Resource group (move) : rg-az104-vms
Location (move) : East US
Subscription (move) : Visual Studio Enterprise Subscription - MPN
Subscription ID : afe777d-a295-4675-9bf9-5b6bf32b89f4
Accelerated networking : Disabled
Virtual network/subnet : vnet-vms-104/subnet-vm

Private IPv4 address : 10.8.0.4
Public IPv4 address : 20.102.80.46 (vm-lab-01-ip)
Private IPv6 address : -
Public IPv6 address : -
Attached to : vm-lab-01 (Virtual machine)
vm-lab-01-nsg (Network security group)

Tags (edit) : m : 08

Type : Regular

Activity log

Access control (IAM)

Tags

Settings

IP configurations

DNS servers

Network security group

Properties

Locks

Monitoring

Insights

Alerts

Metrics

Diagnostic settings

Automation

Tasks (preview)

Export template

Support + troubleshooting

Effective security rules

Effective routes

New Support Request

- Podemos remover e adicionar discos

vm-lab-01 | Disks ⋮

Virtual machine

Search

Save Discard Refresh Additional settings Feedback Troubleshoot

OS disk

Swap OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
vm-lab-01_OsDisk_1_7b19b9e077c473	Premium SSD LRS	127	500	100	SSE with PMK

Data disks

Filter by name

Showing 0 of 0 attached data disks

Create and attach a new disk Attach existing disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
No data disks attached						

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Networking

Connect

Windows Admin Center

Disks

Size

Microsoft Defender for Cloud

Advisor recommendations

Extensions + applications

Availability + scaling

Configuration

Identity

Properties

- Podemos dar um resize do tamanho da maquina, a mesma ficara indisponivel durante o processo

If the virtual machine is currently running, changing its size will cause it to be restarted. Stopping the virtual machine may reveal additional sizes.

Showing 420 VM sizes. Subscription: Visual Studio Enterprise Region: East US Current size: Standard_B2s Learn more about VM sizes

VM Size ↑↓	Type ↑↓	vCPUs ↑↓	RAM (GiB) ↑↓	Data disks ↑↓	Max IOPS ↑↓	Temp
Most used by Azure users						
DS1_v2 ↗	General purpose	1	3.5	4	3200	7
D2s_v3 ↗	General purpose	2	8	4	3200	16
D2as_v4 ↗	General purpose	2	8	4	3200	16
B2s ↗	General purpose	2	4	4	1280	8
B1s ↗	General purpose	1	1	2	320	4
B2ms ↗	General purpose	2	8	4	1920	16
DS2_v2 ↗	General purpose	2	7	8	6400	14
B4ms ↗	General purpose	4	16	8	2880	32
D4s_v3 ↗	General purpose	4	16	8	6400	32
DS3_v2 ↗	General purpose	4	14	16	12800	28
D8s_v3 ↗	General purpose	8	32	16	12800	64
> D-Series v5					The latest generation D family sizes recommended for your general purpose needs	
> D-Series v4					The 4th generation D family sizes for your general purpose needs	
> B-Series					Ideal for workloads that do not need continuous full CPU performance	
> E-Series v5					The latest generation E family sizes for your high memory needs	

Resize

- Segurança temos com base no security group

Feedback Attach network interface Detach network interface

vm-lab-01539

IP configuration (ipconfig1 (Primary))

Network Interface: vm-lab-01539 Effective security rules Troubleshoot VM connection issues Topology
Virtual network/subnet: vnet-vms-104/subnet-vm NIC Public IP: 20.102.80.4 NIC Private IP: 10.8.0.4 Accelerated networking: Disabled

Inbound port rules Outbound port rules Application security groups Load balancing

Network security group vm-lab-01-nsg (attached to network interface: vm-lab-01539)
Impacts 0 subnets, 2 network interfaces

Priority	Name	Port	Protocol	Source	Destination
300	⚠️ RDP	3389	TCP	Any	Any
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any
65500	DenyAllInBound	Any	Any	Any	Any

- Advisor trás recomendações de segurança e custo para o ambiente como um todo, mas ele aparece nas opções de vms também

vm-lab-01 | Advisor recommendations

Your recommendations have been loaded

Recommendation Status equals Active

Resource Group equals All

Type equals All

Commitments equals 3 years, 30 days

You are following all of our recommendations for the selected subscriptions and resources.

See list of all recommendations

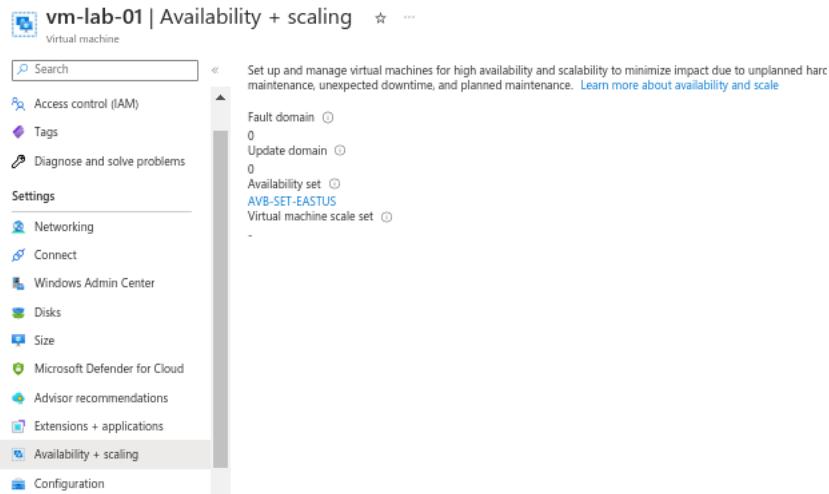
- Extensões → Podemos usar scripts personalizados ou existentes no marketplace para instalar programas e etc

vm-lab-01 | Extensions + applications

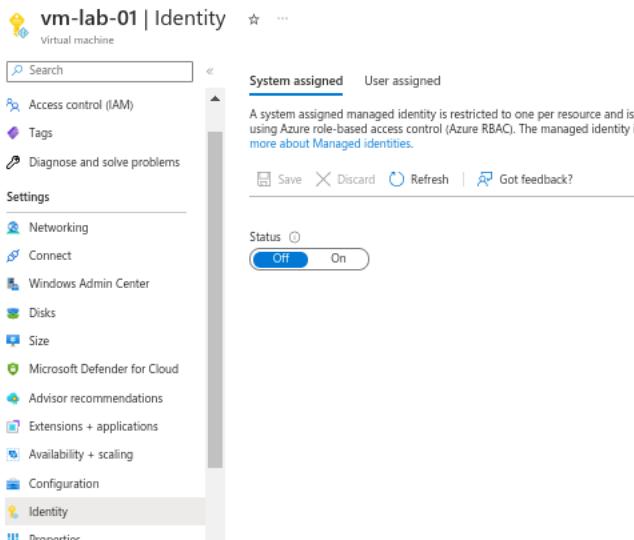
Extensions

Name	Type	Version	Status

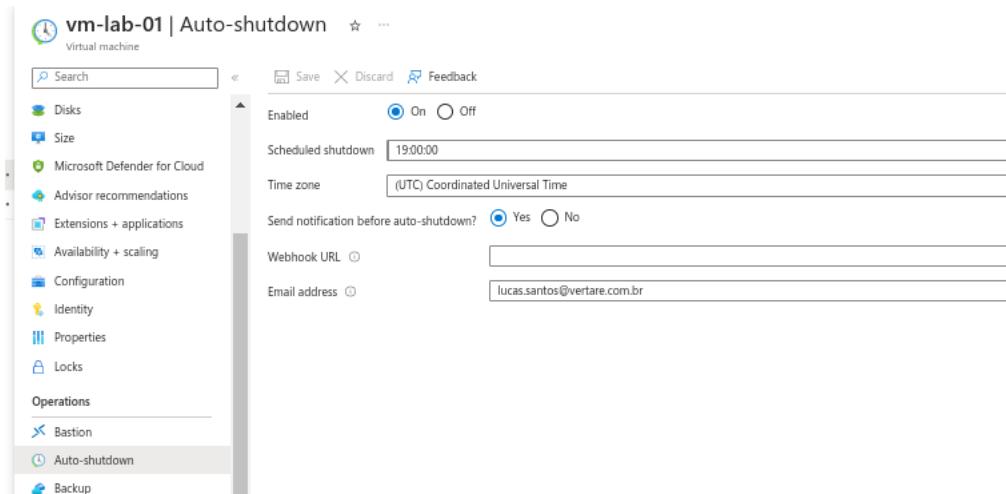
- AvSet → podemos ver as vms e a distribuição



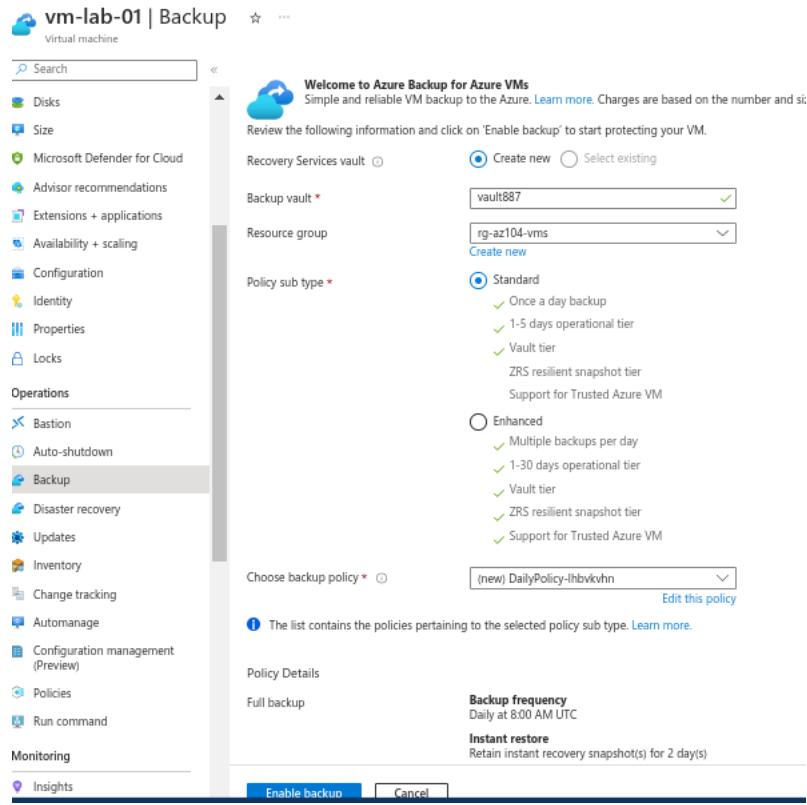
- Identity → Podemos criar uma identidade, como um app service ou um user assigned



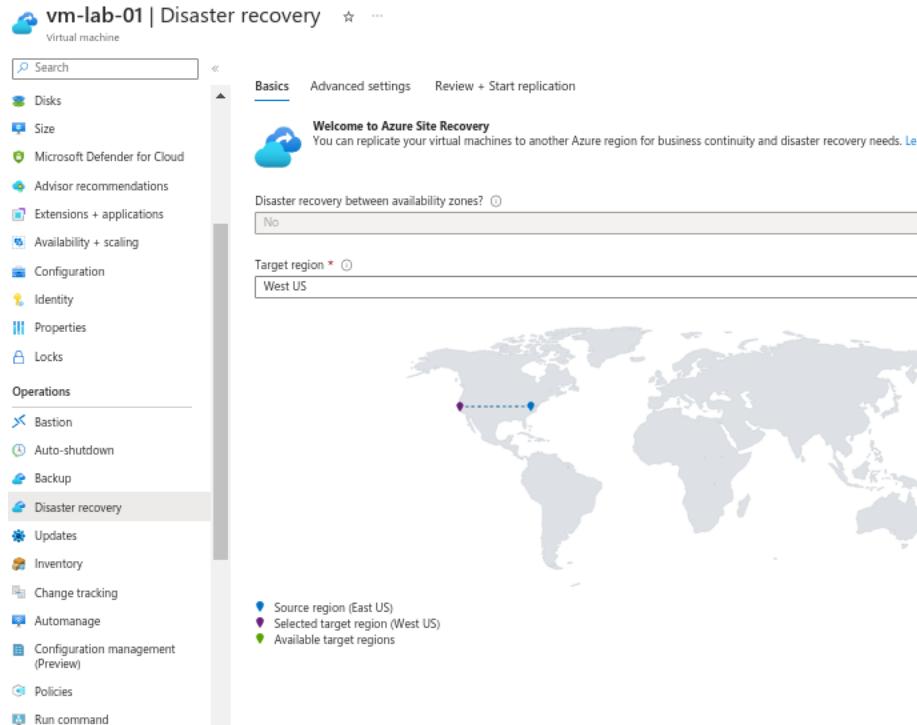
- Auto-shutdown → Para desligar a vm automaticamente



- BKP → Para entrar em uma política de bkp



- Disaster recovery → Cópia da vm para outra região



- Podemos rodar comandos pré definidos ou personalizados

Name	Description
RunPowerShellScript	Executes a PowerShell script
DisableNLA	Disable Network Level Authentication
DisableWindowsUpdate	Disable Windows Update Automatic Updates
EnableAdminAccount	Enable administrator account
EnableEMS	Enable EMS
EnableRemotePS	Enable remote PowerShell
EnableWindowsUpdate	Enable Windows Update Automatic Updates
IPConfig	List IP configuration
RDPSettings	Verify RDP Listener Settings
ResetRDPCert	Restore RDP Authentication mode to defaults
SetRDPPort	Set Remote Desktop port

- Insights → Monitoramento com analises diretas da azure, pago e precisa ser habilitado

Get more visibility into the health and performance of your virtual machine

With an Azure virtual machine you get host CPU, disk and up/down state of your VMs out of the box. Enabling additional monitoring capabilities provides insights into the performance and dependencies for your virtual machines.

You will be billed based on the amount of data ingested and your data retention settings. It can take between 5-10 minutes to configure the virtual machine and the monitoring data to appear.

The map data set collected with Azure Monitor for VMs is intended to be infrastructure data about the resources being deployed and monitored. For details on data collected please [click here](#).

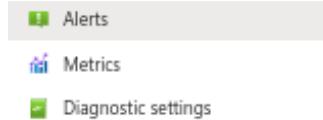
Enable

Having difficulties enabling Azure Monitors for VM? [Troubleshoot](#)

Have more questions?

[Learn more about virtual machine monitoring](#) (beta)
[What is VM Insights?](#) (beta)
[Learn more about pricing](#) (beta)
[Support Matrix](#) (beta)

- Alertas, metricas, configurações de diagnosticos, logs
- Conection monitor → Vemos os serviços e trafego de rede
- Automation, tasks → Podemos criar tarefas para ligar e desligar a vm



- Podemos baixar o template da vm

```

1  "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
2  "contentVersion": "1.0.0.0",
3  "parameters": {
4    "virtualMachines_vm_lab_01_name": {
5      "defaultValue": "vm-lab-01",
6      "type": "String"
7    },
8    "availabilitySets_AVB_SET_EASTUS_externalId": {
9      "defaultValue": "/subscriptions/afe7f77d-a295-4675-9bf9-5b6bf32b89f4/resourceGroups/providers/Microsoft.Compute/availabilitySets/AVB-SET-EASTUS",
10     "type": "String"
11   },
12   "disks_vm_lab_01_OsDisk_1_7b19b9e077cf47378170ab414a6781ad_externalId": {
13     "defaultValue": "/subscriptions/afe7f77d-a295-4675-9bf9-5b6bf32b89f4/resourceGroups/providers/Microsoft.Compute/disks/vm-lab-01_OsDisk_1_7b19b9e077cf47378170ab414a6781ad",
14     "type": "String"
15   },
16   "networkInterfaces_vm_lab_01539_externalId": {
17     "defaultValue": "/subscriptions/afe7f77d-a295-4675-9bf9-5b6bf32b89f4/resourceGroups/providers/Microsoft.Network/networkInterfaces/vm-lab-01539",
18     "type": "String"
19   }
20 },
21 "variables": {},
22 "resources": [
23   {
24     "type": "Microsoft.Compute/virtualMachines",
25     "apiVersion": "2023-03-01",
26     "name": "[parameters('virtualMachines_vm_lab_01_name')]",
27     "location": "eastus",
28     "tags": {
29       "m": "08"
30     },
31     "properties": {
32

```

- Resource Health → Mostra a saúde da vm

Resource health watches your resource and tells you if it's running as expected. [Learn more](#)

Available

There aren't any known Azure platform problems affecting this virtual machine.

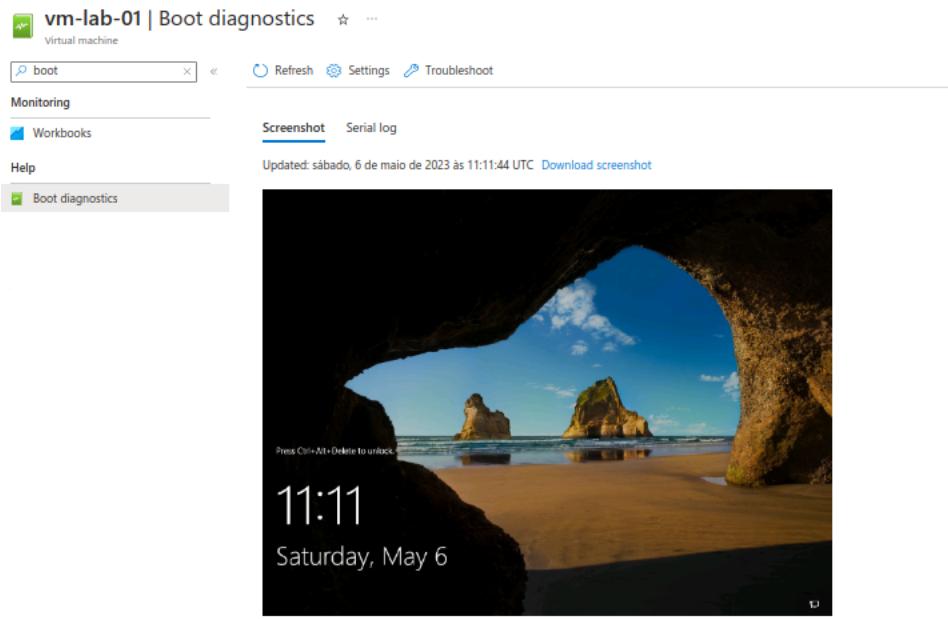
What actions can you take?

- If you're having problems, use the [Troubleshoot tool](#) to get recommended solutions.

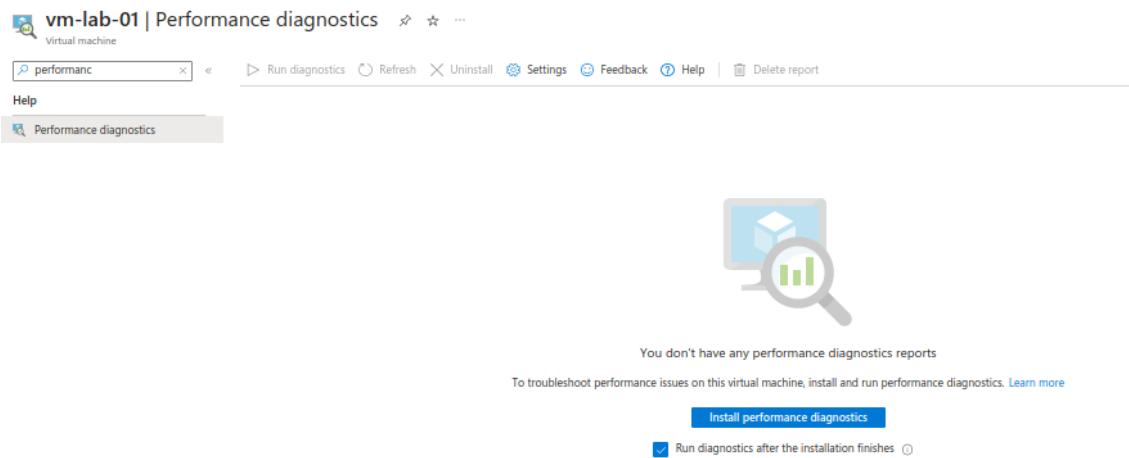
Health history

Date	Description
> 05/06/2023	1 2 health event(s)

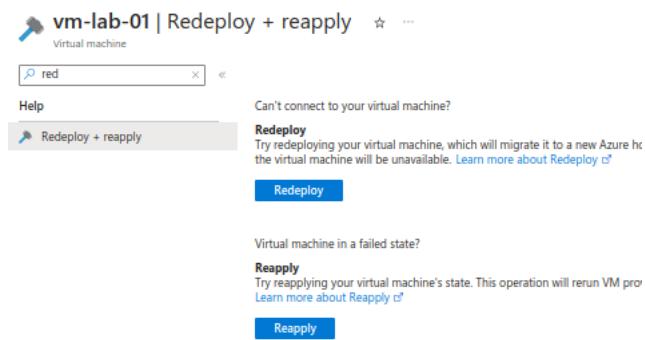
- Boot diagnostic → Mostra como está a VM, se a problema de inicialização e etc.



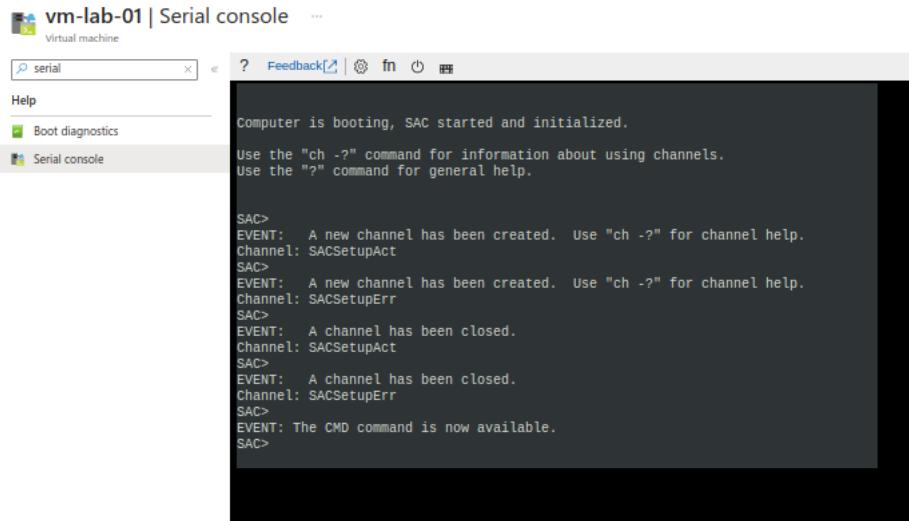
- Performance diagnostics → Agente para validar melhorias de performance



- Redeploy → Reseta o deploy e implanta em outro hardware do datacenter



- Serial console → Acesso via console com comandos de baixo nível



- Connection monitor → Resoluções de problema

⚠ Starting 1 July 2021, you will not be able to add new connection monitors in Connection Monitor (classic) but you can continue to use existing connection monitors created prior to 1 July 2021. We're retiring Connection Monitor (classic) on 29 February 2024. Migrate to the new Connection Monitor before 29 February 2024.

[Learn how to migrate to Connection Monitor](#)

[Learn more about deprecation of Connection Monitor \(classic\)](#)

Name	Subscription	Resource Group	Virtual Machine
Filter by name	Visual Studio Enterprise Subscription - MPN	All resource groups	1 virtual machines
Name	Source	Destination	Status
↑↓	↑↓ port	↑↓ port	↑↓ Interval (seconds)

No results.

- Vamos habilitar o guest + Host update → Irá validar updates disponíveis na vm, podemos schedulear as atualizações

Updates

Customize how and when you receive guest and host updates for your virtual machine.

Guest OS updates

Updates using Update management center (Preview)

Apply OS updates for or check compliance of your Azure and Arc virtual machines instantly. Leverage rebootless update capabilities as available for your Windows Server VM on Azure.

[Go to Updates using Update management center](#)

Updates using Automation

The current version of Update Management uses Azure Automation to manage updates and patching for virtual machines.

[Go to Updates using automation](#)

Host OS updates

Planned maintenance

Pre-emptively apply host maintenance during the planned maintenance window.

[Go to Planned maintenance](#)

Change update settings

Update management center (Preview)

Change patch orchestration for Azure machines, or machines will not get patched by schedules. [Learn more](#)

To continue patching Azure machines as per configured schedules, please change patch orchestration to "Customer Managed Schedules (Preview)". This will set Patch mode to "AutomaticByPlatform" and BypassPlatformSafetyChecksOnUserSchedule to "true", which machines are patched using your configured schedules and are not autopatched. This change is not applicable to Arc-enabled servers.

Select the update settings that you want to change for the machines. The selected update settings will be applied to all applicable selected machines. [Learn more](#)

Note: Patch orchestration is not applicable to Arc-enabled servers. To schedule updates on Azure machines, please change patch orchestration to "Customer Managed Schedules (Preview)". This will set Patch mode to "AutomaticByPlatform" and BypassPlatformSafetyChecksOnUserSchedule to "true", which will ensure machines are patched using your configured schedules and are not autopatched. [Learn more](#)

Showing 1 of 1 selected resources

+ Add machine

Filter by machine name... Resource type : All Periodic assessment : All Hotpatch : All Patch orchestration : All

Windows (1)

Machine Name	Resource type	Periodic assessment	Hotpatch	Patch orchestration
vm-lab-01	Azure virtual machine	Select and apply to all Enable (current)	Select and apply to all Not available	Select and apply to all Windows automatic updates (current)

- Inventory e change tracking → joga logs da vm



- Vamos habilitar, um valida o que tem na vm e o outro mostra as modificações feitas

Inventory (vm-lab-01 - VM)

 **Inventory**

Enable consistent control and compliance of this VM with Change Tracking and Inventory.

This service is included with Azure virtual machines and Azure Arc machines. You only pay for logs stored in Log Analytics.

This service requires a Log Analytics workspace and an Automation account. You can use your existing workspace and account or let us configure the nearest workspace and account for you.

Log Analytics workspace location

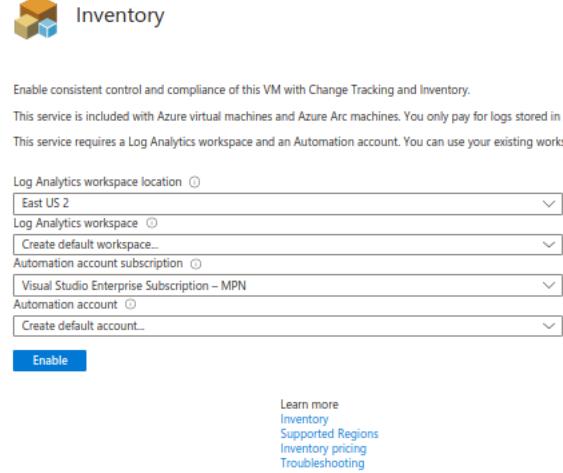
Log Analytics workspace

Automation account subscription

Automation account

Enable

Learn more
Inventory
Supported Regions
Inventory pricing
Troubleshooting



▼ Lab02 → Configure as máquinas virtuais do Azure usando extensões de máquina virtual.

- Para este procedimento vamos habilitar o inventory e o change track em nossas vms

vm-lab-01 | Inventory

 **Virtual machine**

Search

Manage multiple machines Log Analytics Edit Settings

Size Microsoft Defender for Cloud Advisor recommendations Extensions + applications Availability + scaling Configuration Identity Properties Locks

Bastion Auto-shutdown Backup Disaster recovery Updates

Inventory

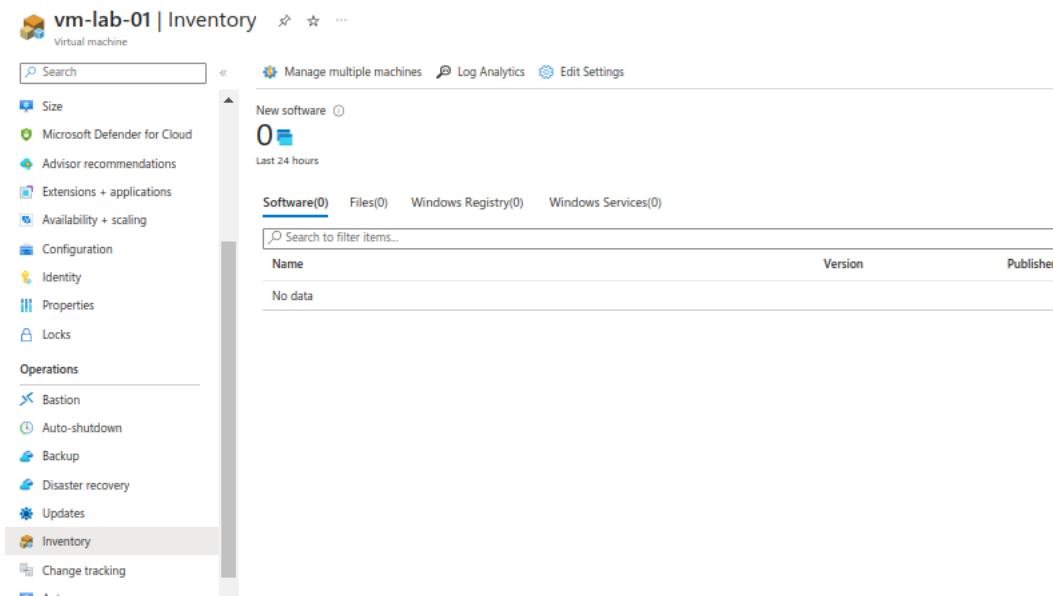
Change tracking

New software Last 24 hours

Software(0) Files(0) Windows Registry(0) Windows Services(0)

Search to filter items...

Name	Version	Publisher
No data		



The screenshot shows the Azure portal's 'Change tracking' page for a virtual machine named 'vm-lab-01'. The left sidebar lists various management options like Size, Microsoft Defender for Cloud, Advisor recommendations, etc. The main area has a search bar and filters for 'Change Types' (4 selected) and 'Time Range' (Last 24 hours). A 'Events' section lists categories: Files, Registry, Software, and Windows Services. Below this are two loading indicators: 'Changes (Loading...)' and 'Events (Loading...)'. A search bar follows, and then a table with columns: Resource Name, Change Type, Machine, Time Generated, and Category.

- No guest update podemos agendar updates para serem instalados, pontuar as janelas de manutenção, pontuar restart e etc.

The screenshot shows the Azure portal's 'Updates' section for a virtual machine. The left sidebar includes 'Updates' under the 'Operations' category. The main area has a summary message about patch orchestration: 'Change patch orchestration for Azure machines, or machines will not get patched by schedules.' It also mentions 'Manage VM updates at scale with the new Update management center experience. Try it now →'. Below this, there's a note: 'There is no assessment done in last 7 days. Assess now to get the latest data.' The 'Recommended updates' tab is selected, showing sections for 'Operating system (guest) updates' and 'Other updates'. The 'Operating system (guest) updates' table has columns: Total updates, Critical updates, Security updates, and Other updates. The 'Other updates' table has columns: Update name, Classifications, Severity (MSRC), KB ID, Reboot required, Published date, and Open query. A search bar and filter buttons are at the top of the update tables.

- Vamos instalar o IIS na vm através das extenções
- Utilizamos o seguinte script

```
# Install IIS
Install-WindowsFeature -name Web-Server -IncludeManagementTools

# Remove default htma file
remove-item C:\inetpub\wwwroot\iisstart.htm

#Add custom htma file
Add-Content -Path "C:\inetpub\wwwroot\iisstart.htm" -Value $($("Hello World from " + $env:computername))
```

- Vamos criar um aquivo .ps1 com ele



- Vamos em Extensions, e vamos em adicionar

The screenshot shows the 'Extensions' tab in the Azure portal. At the top, there's a message about Log Analytics agents reaching end of support by August. Below it is a search bar labeled 'Search to filter items...'. A table lists extensions, with the first one, 'MicrosoftMonitoringAgent', visible. At the top left of the table area, a red box highlights the '+ Add' button.

- Iremos ver que já uma extensão que no caso pertence ao monitoramento do azure
- Vamos em custom script extension

The screenshot shows the 'Install an Extension' search results. A single result is listed: 'Custom Script Extension' by Microsoft Corp. It's described as a 'Custom Script handler extension for Windows'. A 'Load more' button is at the bottom.

- Para utilizar o nosso arquivo > Vamos criar um STO v2 Custom script mesmo, LRS, > Vamos criar um container > E vamos subir no container o arquivo com o script

The screenshot shows the 'Create storage account' configuration page. The 'Name' field is set to 'stoscript'. The 'Account kind' is set to 'StorageV2 (general purpose v2)'. Other settings include 'Standard' for performance, 'Locally-redundant storage (LRS)' for replication, '(US) East US' for location, and 'rg-az104-vms' for resource group. The 'Minimum TLS version' is set to 'Version 1.2'.

The screenshot shows the Azure portal interface for managing storage accounts and containers.

Storage accounts screen:

- Shows a list of storage accounts: `cs2100320020771a3f2` and `stoscript`.
- A red box highlights the `scripts` container in the list.

Containers screen:

- Shows the contents of the `scripts` container, which contains a single item: `Instala_IIS.ps1`.

Upload blob dialog:

- Shows a cloud icon with an upward arrow and the text "Drag and drop files here or Browse for files".
- A checkbox for "Overwrite if files already exist" is present.
- An "Advanced" section is collapsed.
- Upload status: "Instala_IIS.ps1" is being uploaded, progress: 283 B / 283 B.
- Feedback link: "Give feedback".

- Após subir o script, vamos fazer o deploy

Configure Custom Script Extension Extension ...

Create Review + create

Script file (Required) *

"Instala_IIS.ps1"

[Browse](#)

Arguments (Optional)

[Review + create](#)

[< Previous](#)

[Next : Review + create >](#)

Configure Custom Script Extension Extension ...

Validation Passed

Create [Review + create](#)

Create

Script file (Required)

Instala_IIS.ps1

Arguments (Optional)

[Create](#)

[< Previous](#)

[Next](#)

- Em networking vamos add regra de inbound para a porta 80

vm-lab-01-nsg | Inbound security rules

Network security group security rules are evaluated by priority using the combination of source, source port, destination port, and protocol to allow or deny the traffic. A security rule can't have the same priority and direction as an existing rule. You can't delete default security rules, but you can override them with rules that have a higher priority. [Learn more](#)

Priority ↑	Name ↑	Port ↑	Protocol ↑	Source ↑	Destination ↑	Action ↑
300	RDP	3389	TCP	Any	Any	Allow
310	AllowAnyHTTPInbound	80	TCP	Any	Any	Allow
65000	AllowVnetInbound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerIn...	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny

- Após o deploy ter finalizado podemos validar testando nosso IIS acessando o IP publico da vm

vm-lab-01 Virtual machine

Essentials

- Resource group (move) : RG-AZ104-VMs
- Status : Running
- Location : East US
- Subscription (move) : Visual Studio Enterprise Subscription - MPN
- Subscription ID : afe7f77d-a295-4675-9bf9-5bd0f32b89f4
- Operating system : Windows (Windows Server 2019 Datacenter)
- Size : Standard B2s (2 vcpus, 4 GiB memory)
- Public IP address : 20.102.80.46
- Virtual network/subnet : vnet-vm-104/subnet-vm
- DNS name : Not configured
- Health state : -

Networking

Public IP address	20.102.80.46	Network interface vm-lab-01539
Private IP address (IPv6)	-	
Private IP address (IPv4)	10.8.0.4	
Virtual network/subnet	vnet-vm-104/subnet-vm	

vm-lab-01 - Microsoft Azure 20.102.80.46

Not secure | 20.102.80.46

Job-Tools Cloud DevOps

Hello World from vm-lab-01

▼ Lab03 → Dimensione o tamanho de máquina para Azure VM.

- Vamos realizar o resize na vm2

vm-lab-02

Virtual machine

Host group: None

Host: -

Proximity placement group: -

Colocation status: N/A

Capacity reservation group: -

Disk controller type: SCSI

Size

Size: Standard_B2s

vCPUs: 2

RAM: 4 GiB

Disk

OS disk: vm-lab-02_OsDisk_1_a4ae9dbf27bb42bc8ccb52d2b79747a

Encryption at host: Disabled

Azure disk encryption: Not enabled

If the virtual machine is currently running, changing its size will cause it to be restarted. Stopping the virtual machine may reveal additional sizes.

Search by VM size... vCPUs : All RAM (GiB) : All Display cost : Monthly Add filter

Showing 420 VM sizes. Subscription: Visual Studio Enterprise Subscription – MPN Region: East US Current size: Standard_B2s Group by series

VM Size ↑	Type ↑	vCPUs ↑	RAM (GiB) ↑	Data disks ↑	Max IOP
Most used by Azure users ↗ The most used sizes by users in Azure					
DS1_v2 ↗	General purpose	1	3.5	4	3200
D2s_v3 ↗	General purpose	2	8	4	3200
D2as_v4 ↗	General purpose	2	8	4	3200
B2s ↗	General purpose	2	4	4	1280

Resize

- Vamos em size e vamos alterar para uma D2s_v3 e vamos clicar em resize

VM Size ↑ Type ↑ vCPUs ↑ RAM (GiB) ↑ Data disks ↑

Most used by Azure users ↗ The most used sizes by users in Azure

DS1_v2 ↗	General purpose	1	3.5	4
D2s_v3 ↗	General purpose	2	8	4
D2as_v4 ↗	General purpose	2	8	4
B2s ↗	General purpose	2	4	4
B1s ↗	General purpose	1	1	2
B2ms ↗	General purpose	2	8	4

Prices presented are estimates in BRL that include only Azure infrastructure costs and any discounts for the subscription location. The prices don't include any applicable software costs. Final charges will appear in your local currency in the analysis and billing views. [View Azure pricing calculator.](#)

Resize

- A vm irá ficar indisponível
- E validando novamente o tamanho terá sido alterado

vm-lab-02

Virtual machine

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Connect

Windows Admin Center

Disk

Size

Plan: 2019-datacenter-gensecond

VM generation: V2

VM architecture: x64

Agent status: Ready

Agent version: 2.7.41491.1083

Host group: None

Host: -

Proximity placement group: -

Colocation status: N/A

Capacity reservation group: -

Disk controller type: SCSI

Private IP address (IPv6): -

Virtual network/subnet: vnet-vms-104/subnet-vm

DNS name: Configure

OS disk: vm-lab-02_OsDisk_1_a4ae9dbf27bb42bca8cdb52d2b79747a

Size: Standard D2s v3
2 vCPUs
8 GiB

▼ Lab04 → Implante zone-resilient scale sets usando Azure portal.

- Vamos criar um scale set

Home > rg-az104-vms > Marketplace >

Virtual machine scale set

Microsoft | Azure Service

★ 3.8 (116 ratings)

Plan: Virtual machine scale set

Create

Overview Plans Usage Information + Support Ratings + Reviews

Azure virtual machine scale sets let you create and manage a group of identical, load balanced VMs. The number of VM instances can automatically increase or decrease to respond to demand or a defined schedule. Scale sets provide high availability to your applications, and allow you to centrally manage, configure, and update a large number of VMs. With virtual machine scale sets, you can build large-scale services for areas such as compute, big data, and container workloads. (Portal VMSS version 7.1.7)

- Easy to create and manage multiple VMs
- Provides high availability and application resiliency
- Allows your application to automatically scale as resource demand changes
- Works at large-scale

More products from Microsoft [see All](#)

Firewall Microsoft Azure Attestation Service endpoint policy Azure Kubernetes Service

- Iremos criar uma vm normal, e a partir da primeira as demais serão replicadas

- Sem zona de disponibilidade
- Win server 2019
- Vamos usar a B2s
- add user e senha
- Disco premium
- Vamos usar a mesma VNET

Basics	
Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-az104-vms
Virtual machine scale set name	vnet-vmss-104
Region	East US
Orchestration mode	Flexible
Availability zone	None
Image	Windows Server 2019 Datacenter - Gen2
Size	Standard B2s (2 vcpus, 4 GiB memory)
Security type	Standard
Username	admin_az104
Fault domain count	1
Spot	
Azure Spot	No
Instance	
Initial instance count	1
Already have a Windows license?	No
Disks	
OS disk type	Premium SSD LRS
Use managed disks	Yes
Ephemeral OS disk	No

- Não vamos habilitar o IP publico e vamos manter a porta 80 aberta

Network interface

Name *
vnet-vmss-104-nic01

Virtual network
vnet-vmss-104

Subnet *
subnet-vm (10.8.0.0/24)

NIC network security group
 None
 Basic
 Advanced

Public inbound ports *
 None
 Allow selected ports

Select inbound ports *
HTTP (80)

Public IP address
 Disabled Enabled

Accelerated networking
 Disabled Enabled

Networking		
Virtual network	vnet-vmss-104	
Network interfaces	vnet-vmss-104-nic01	
Load balancing	Yes	

- Vamos colocar um load balancer

[Learn more about VMSS networking](#)

Virtual network configuration

Azure Virtual Network (VNet) enables many types of Azure resources to securely communicate with each other, the internet, and on-premises networks. [Learn more about VNets](#)

Virtual network * (New) rg-az104-vms-vnet (recommended) [Create virtual network](#)

Network interface

A network interface enables an Azure virtual machine to communicate with internet, Azure, and on-premises resources. A VM can have one or more network interfaces.

Create new nic	Delete			
NAME	CREATE PUBL...	SUBNET	NETWORK SECURIT...	ACCELERATED N...
rg-az104-vms-vnet-nic...	Yes	default (10.0.0.0/20)	Basic	Off Edit

Load balancing

You can place this virtual machine in the backend pool of an existing Azure load balancing solution. [Learn more](#)

Load balancing options (None) [Azure load balancer](#) [Application gateway](#)

To allow traffic from your load balancing product, please update the appropriate port configuration on your network security group associated with your network interface.

Select a load balancer * No existing load balancers in current subscription and location. [Create a load balancer](#)

- Que irá apontar para os scale sets
- Vamos criar um LB diretamente na criação da vm

Create a load balancer

Details such as subscription and resource group will be inherited from the virtual machine that you're creating. A default IP backend pool, and load balancer rule will be created on your behalf, though certain configurations can be changed if desired.

Load balancer name *	lb-azlab-scaleset
Type *	<input checked="" type="radio"/> Public Provides outbound connections for virtual machines inside your virtual network using public load balancers.
Protocol *	<input checked="" type="radio"/> TCP <input type="radio"/> UDP
Rules	
Rules	<input checked="" type="checkbox"/> Load balancer rule <input checked="" type="checkbox"/> Inbound NAT rule
Load balancer rule	
A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. Only backend instances that the health probe considers healthy receive new traffic.	
Port *	80
Backend port *	80
Inbound NAT rule	

Load balancer rule

A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. Only backend instances that the health probe considers healthy receive new traffic.

Port *	80
Backend port *	80

Inbound NAT rule

An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a specific virtual machine.

Frontend port range start *	50000
Backend port *	3389

[Create](#) [Cancel](#)

- Scalling
 - Começar com uma VM
 - Vamos usar o custom
 - Minimo 1, max 4
 - Scale out → 75% de CPU, 5 minutos, deploy de 1 vm
 - Scale in → 25% CPU, descrease 1 vm
 - Scale in policy → Vamos deixar default

Initial instance count * 1 ✓

Scaling

Scaling policy Manual Custom

Minimum number of instances * 1

Maximum number of instances * 4 ✓

Scale out

CPU threshold (%) * 75

Duration in minutes * 5 ✓

Number of instances to increase by * 1 ✓

Scale in

CPU threshold (%) * 25

Number of instances to decrease by * 1 ✓

Predictive autoscaling (preview)

Enable predictive autoscaling forecast

Diagnostic logs

Collect diagnostic logs from Autoscale

Scale-In policy

Configure the order in which virtual machines are selected for deletion during a scale-in operation.
[Learn more about scale-in policies.](#) ↗

Scale-in policy Default - Balance across availability zones and fault domains, then delete V... ✓

[Review + create](#) [< Previous](#) [Next : Management >](#)

- Boot diagnostic desabilitado
- Health → Vamos deixar desabilitado
- Advanced → default

Management	
Upgrade mode	Manual
Boot diagnostics	Off
Microsoft Defender for Cloud	Free
System assigned managed identity	Off
Login with Azure AD	Off
Enable overprovisioning	Off
Enable automatic OS upgrades	Off
Enable hotpatch	Off
Patch orchestration options	Automatic by OS (Windows Automatic Updates)

Scaling	
Scaling	Yes
Minimum number of instances	1
Maximum number of instances	4
Scale out CPU threshold (%)	75
Number of instances to increase by	1
Scale in CPU threshold (%)	25
Number of instances to decrease by	1

Health	
Enable application health monitoring	false

Advanced	
Enable scaling beyond 100 instances	Yes
Proximity placement group	None
Spreading algorithm	1
Extensions	None
VM applications	None
Cloud init	No
Disk controller type	SCSI
Capacity reservation group	None

- Review e create

CreateVmss-MicrosoftWindowsServer.WindowsServer-2-20230513071123 | Overview

Your deployment is complete

Deployment name : CreateVmss-MicrosoftWindowsServer.WindowsServer-2-20230513071123 Start time : 5/13/2023, 7:15:51 AM

Subscription : Visual Studio Enterprise Subscription – MPN Correlation ID : c6a47263-6b32-47b5-976a-b0a4b1bf24d6

Resource group : rg-az104-vms

Deployment details

Resource	Type	Status	Operation details
az-vm-scalesetautoscale	Microsoft.Insights/autoscaleSetting	Created	Operation details
az-vm-scaleset	Virtual machine scale set	OK	Operation details
basicNsgvnet-vms-104-nic01	Network security group	OK	Operation details

Next steps

[Go to resource](#)

Give feedback

Tell us about your experience with deployment

- Podemos ver as instâncias

vm-azscaleset | Instances

Virtual machine scale set

Search

Start | Restart | Stop | Reimage | Delete | Refresh

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Instances

Networking

Scaling

Disks

Instance	Computer name	Type	Status	Provisioning state
vm-azscaleset_ab75b3a9	vm-azscalING5LJ	VM	Running	Succeeded

- Vamos adicionar o script em nossa no nosso scale set da mesma forma que fizemos com a vm-lab-01

vm-azscaleset | Extensions + applications

Virtual machine scale set

Search

Add | Refresh

Extensions

VM Applications

Settings

Extensions + applications

Automation

Export template

Search to filter items...

Name	Type	Version
No resource extensions found.		

Configure Custom Script Extension Extension ...

Create

Script file (Required) * ⓘ "Instala_IIS.ps1"

Browse

Arguments (Optional) ⓘ

- No caso um ponto importante na regra inbound do NSG é especificar a subnet no destination, já que o scale set não terá IPs internos variados

Add inbound security rule

basicNsgvnet-vms-104-nic01

Source (1)
Any

Source port ranges (1)
*

Destination (1)
IP Addresses

Destination IP addresses/CIDR ranges (1)
10.8.0.0/24

Service (1)
HTTP

Destination port ranges (1)
80

Protocol
 Any
 TCP
 UDP
 ICMP

Add Cancel Give feedback

- Validando o IP público do loadbalancer já seremos direcionados para a vm do scaleset

Not secure | 52.170.148.85

Registry Dashboard | Alura ... WhatsApp Sign in to GitHub ... YouTube

Hello World from vm-azscalNGG5LJ

Start Restart Stop Reimage Delete Refresh

Search virtual machine instances

Instance	Computer name	Type	Status
vm-azscaleset_ab75b3a9	vm-azscalNGG5LJ	VM	Running

- Agora vamos acessar a vm-lab-01 (que é o jump para acesso as instancias do scale set) que criamos anteriormente
 - IP privado da vm do scaleset

vm-azscaleset_ab75b3a9

Virtual machine

Overview

Status: Running

Location: East US

Subscription (move): Visual Studio Enterprise Subscription – MPN

Subscription ID: afe7f77d-a295-4675-9bf9-5b6bf32b89f4

Tags (edit)

Click here to add tags

Properties | **Monitoring** | **Capabilities (8)** | **Recommendations** | **Tutorials**

Virtual machine

- Computer name: vm-azscaleset_ab75b3a9
- Operating system: Windows (Windows Server 2019 Datacenter)
- Publisher: MicrosoftWindowsServer
- Offer: WindowsServer

Networking

- Public IP address: 52.170.148.85 (Load balancer)
- Public IP address (IPv6): -
- Private IP address: **10.8.0.5**

Manager > File and Storage Services > Servers

Servers

All servers | 1 total

Server Name	IPv4 Address	Manageability
vm-lab-01	10.8.0.4	Online - Performance

Remote Desktop Connection

Computer: **10.8.0.5**

User name: None specified

You will be asked for credentials when you connect.

Show Options Connect Help

EVENTS

All events | 0 total

- Vamos instalar o Heavy Load para estressar a instancia

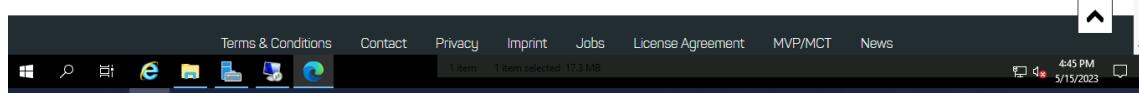
Free Stress Test Tool HeavyLoad | JAM Software

HeavyLoad - Benchmark tool for a stress test on your PC.

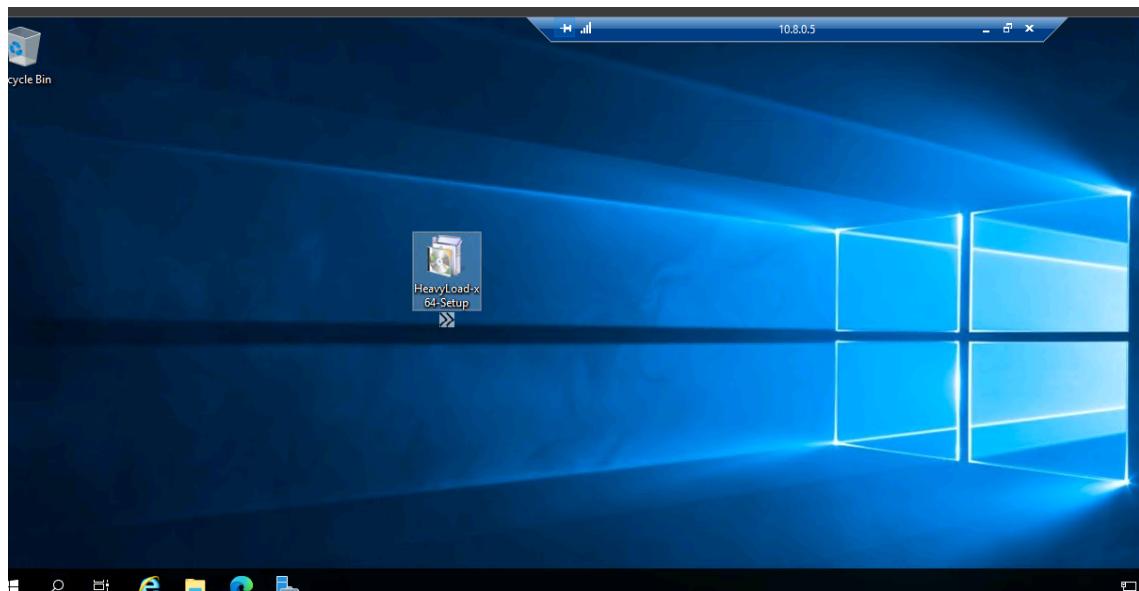
jam <https://www.jam-software.com/heavyl>



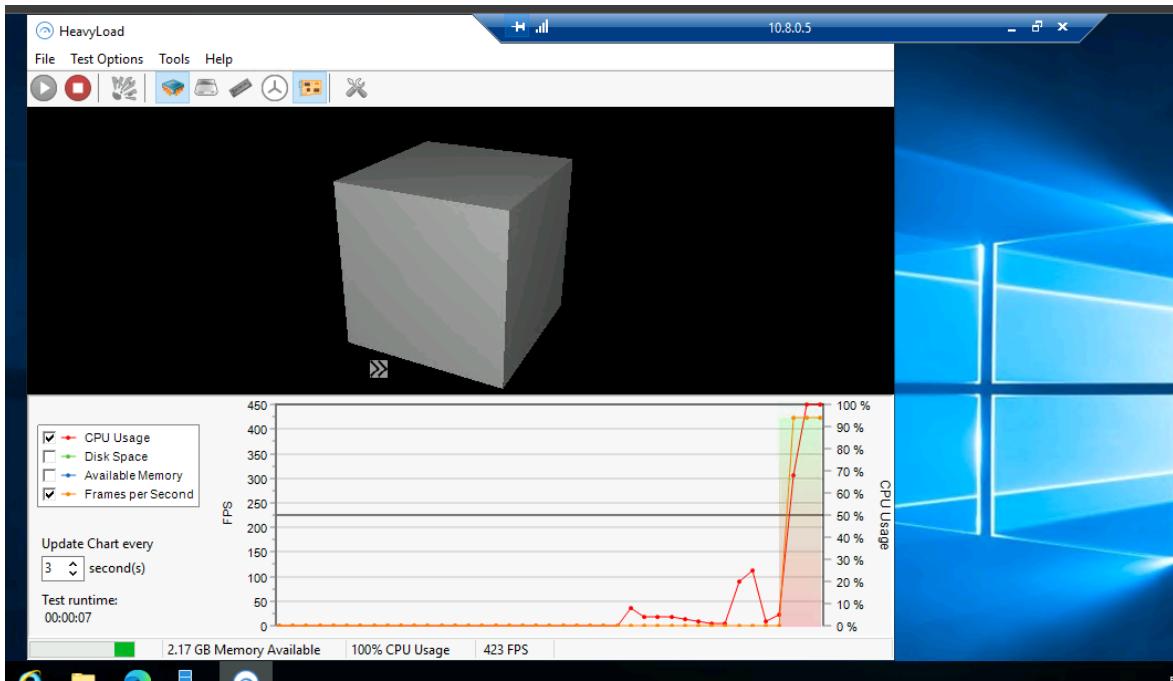
The screenshot shows a Microsoft Edge browser window with two tabs open. The active tab is titled "Welcome to Microsoft Edge" and displays a download page for "HeavyLoad Download". The page has a dark header with the "jamSOFTware" logo and navigation links like "Products", "Free Trial", "Support", "Contact", "Shop", "Customer Area", and "Feature Voting". A "Download Freeware" section is shown, featuring a dropdown menu with "HeavyLoad v3.9" selected, showing "HeavyLoad-x64-Setup.exe" (17.38 MB). A green "Download" button is at the bottom right. Below the dropdown, there's a note about Microsoft MVP/MCT offers.



- No caso efetuei o download no jump server e copiei para a vm scaleset



- Vamos stressa a vCPU até 100%



- Voltando para o scale set podemos acompanhar o deploy das instâncias

The screenshot shows the Azure portal interface for a 'vm-azscaleset' virtual machine scale set. The left sidebar has options for Access control (IAM), Tags, Diagnose and solve problems, Settings (with Instances selected), Networking, and Scaling. The main area shows a table of virtual machine instances:

Instance	Computer name	Type	Status	Provisioning state
vm-azscaleset_ab75b3a9	vm-azscalNGG5LJ	VM	Running	Updating
vm-azscaleset_e58a1fd7	vm-azscal7CB0O9	VM	Creating	Creating
vm-azscaleset_f0d76ee3	vm-azscal47EW4D	VM	Creating	Creating

- No HTTP do IIS, podemos ver qual instancia está sendo acessada

The screenshot shows the Azure portal interface for the same 'vm-azscaleset'. The left sidebar shows Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings (with Instances selected), Networking, and a link to the Instances blade. The main area shows the same table of instances. Below the table, a browser window is open to the URL '52.170.148.85'. The page content reads 'Hello World from vm-azscal47EW4D'.

- Pausando o heavy Load, as instâncias criadas vão sendo encerradas e deletadas

The screenshot shows a Windows desktop environment. In the top-left corner, there is a window titled "HeavyLoad" which displays monitoring tools. On the right side of the screen, there is a "vm-azscaleset" blade from the Azure portal under the "Instances" section. The blade lists two virtual machine instances: "vm-azscaleset_ab75b3a9" and "vm-azscaleset_f0d76ee3". The first instance is marked as "Running" and "Updating", while the second is marked as "Creating".

Instance	Computer name	Type	Status	Provisioning state
vm-azscaleset_ab75b3a9	vm-azscalNGG5LJ	VM	Running	Updating
vm-azscaleset_f0d76ee3	vm-azscal47EW4D	VM	Creating	Creating

▼ Lab05 → Dimensione o tamanho do storage para Azure VM scale sets

- Podemos fazer um resize normalmente como se fosse uma vm unica
- A alteração será no tamplate e as vms serão reiniciadas
 - O ideal é realizar o reimage (Irá efetuar um redeploy da instancia)

VM Size	Type	vCPUs	RAM (GiB)	Data disks	Max IOPS	Temp
DS1_v2	General purpose	1	3.5	4	3200	7
D2s_v3	General purpose	2	8	4	3200	16
D2as_v4	General purpose	2	8	4	3200	16
B2s	General purpose	2	4	4	1280	8
B1s	General purpose	1	1	2	320	4
B2ms	General purpose	2	8	4	1920	16
DS2_v2	General purpose	2	7	8	6400	14
P4ms	General purpose	4	16	8	2000	32

Prices presented are estimates in BRL that include only Azure infrastructure costs and any discounts for the subscription and location. The prices don't include any applicable software costs. Final charges will appear in your local currency in cost analysis and billing views. [View Azure pricing calculator.](#)

- Podemos também realizar alterações no scaling

Default* Profile1

Delete warning: The very last or default recurrence rule cannot be deleted. Instead, you can disable autoscale to turn off autoscale.

Scale mode: Scale based on a metric (radio button selected) / Scale to a specific instance count (radio button unselected).

Rules:

- Scale out: When vm-azscaleset (Average) Percentage CPU > 75 Increase count by 1
- Scale in: When vm-azscaleset (Average) Percentage CPU < 25 Decrease count by 1

+ Add a rule

Instance limits: Minimum * 1, Maximum * 4, Default * 1

Schedule: This scale condition is executed when none of the other scale condition(s) match

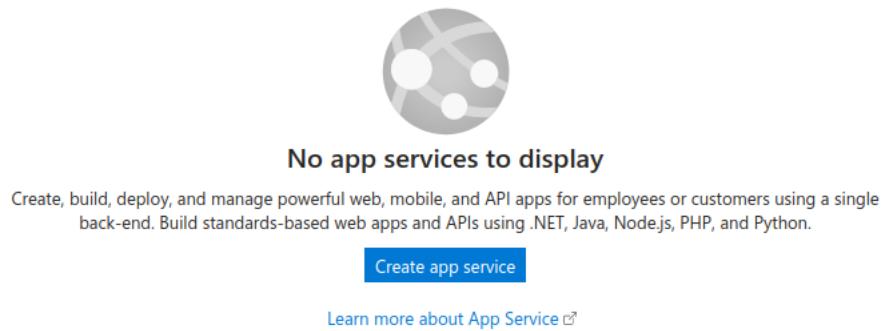
- E podemos criar uma segunda regra
 - Para atribuir uma nova regra temos que atribuir uma condição

▼ Serverless Computing

▼ Lab01 -Implement web apps

- Vamos criar um RG para este lab

- Não criaremos a rede pois estaremos utilizando um PaaS
- Vamos criar nossa estrutura do app service



- Devemos colocar um nome unico
- Podemos escolher entre codigo ou container, no caso vamos trabalhar com o codigo
- Vamos trabalhar com PHP 8.0
- Vamos hospedar em Linux
- Vamos fazer na zona east us 2
- Vamos escolher o plano
 - Cada plano tem suas especificidades
 - Vamos usar o basic b1 (Padrão mesmo)

Create Web App ...

Resource Group * [Create new](#)

Instance Details
Need a database? [Try the new Web + Database experience.](#)

Name * [.azurewebsites.net](#)

Publish * Code Docker Container Static Web App

Runtime stack *

Operating System * Linux Windows

Region *
Not finding your App Service Plan? Try a different region or select your App Service Environment.

Pricing plans
App Service plan pricing tier determines the location, features, cost and compute resources associated with your app.
[Learn more](#)

Linux Plan (East US 2) * [Create new](#)

Pricing plan [Explore pricing plans](#)

Zone redundancy

Basics Deployment Networking Monitoring Tags Review + create

Enable GitHub Actions to continuously deploy your app. GitHub Actions is an automation framework that can build, test, and deploy your app whenever a new commit is made in your repository. If your code is in GitHub, choose your repository here and we will add a workflow file to automatically deploy your app to App Service. If your code is not in GitHub, go to the Deployment Center once the web app is created to set up your deployment. [Learn more](#)

GitHub Actions settings

Continuous deployment Disable Enable

GitHub Actions details

Select your GitHub details, so Azure Web Apps can access your repository. You must have write access to your chosen repository to deploy with GitHub Actions.

GitHub account	Authorize
Organization	Select organization
Repository	Select repository
Branch	Select branch

Workflow configuration

File with the GitHub Actions workflow configuration.

Info Complete the Basics tab and the form above to preview the GitHub Actions workflow file.

[Review + create](#) [< Previous](#) [Next : Networking >](#)

Basics Deployment **Networking** Monitoring Tags Review + create

Web Apps can be provisioned with the inbound address being public to the internet or isolated to an Azure virtual network. Web Apps can also be provisioned with outbound traffic able to reach endpoints in a virtual network, be governed by network security groups or affected by virtual network routes. By default, your app is open to the internet and cannot reach into a virtual network. These aspects can also be changed after the app is provisioned. [Learn more](#)

Enable public access * On Off

Enable network injection * On Off

Summary

 Web App by Microsoft	Basic (B1) sku Estimated price - 68.09 BRL/Month
--	--

Details

Subscription	afe7f77d-a295-4675-9bf9-5b6bf32b89f4
Resource Group	rg-az104-labs
Name	az104-webapplab
Publish	Code
Runtime stack	PHP 8.0

App Service Plan (New)

Name	ASP-rgaz104labsas-8c6d
Operating System	Linux
Region	East US 2
SKU	Basic
Size	Small
ACU	100 total ACU
Memory	1.75 GB memory

Monitoring

Application Insights	Not enabled
----------------------	-------------

Deployment

Continuous deployment	Not enabled / Set up after app creation
-----------------------	---

- Feito isso seguimos com a criação do web app
- Concluido o deployment, temos a URL da aplicação e jogamos no browser que irá apresentar uma pagina da MS

The screenshot shows the Azure portal interface for the 'az104-webapplab' web app. The left sidebar has sections like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, and Events (preview). The main panel shows 'Essentials' details: Resource group (rg-az104-labsas), Status (Running), Location (East US 2), Subscription (Visual Studio Enterprise Subscription – MPN), Subscription ID (afe7f77d-a295-4675-9bf9-5b6bf32b89f4), Default domain (az104-webapplab.azurewebsites.net), App Service Plan (ASP-rgaz104labsas-Bc6d (B1:1)), Operating System (Linux), and Health Check (Not Configured). Below this are tabs for Properties, Monitoring, Logs, Capabilities, Notifications, and Recommendations, with 'Web app' selected. At the bottom, there's a browser window titled 'about:blank' showing a dark-themed dashboard with links to Main, Study, Diversos, Variados, JOB, and Google Agenda.



Your web app is running and waiting for your content

Your web app is live, but we don't have your content yet. If you've already deployed, it could take up to 5 minutes for your content to show up, so come back soon.



 Supporting Node.js, Java, .NET and more

Haven't deployed yet?
Use the deployment center to publish code or set up continuous deployment.

Starting a new web site?
Follow our Quickstart guide to get a web app ready quickly.

[Quickstart](#)

- Vamos criar um slot de testes agora
 - Os slots servem para que todo o código que estou jogando no github estamos encaminhando diretamente para o ambiente de teste(staging) primeiro, quando criamos um slot podemos inverter o ambiente de teste para prod e vice e versa
 - Primeiramente vamos alterar o plan atual para standard

- o Cada plan tem recursos diferentes, no caso utilizaremos o P1V2 que possui os slots

Plan Type	Plan Name	Total ACU	Memory	Compute Equivalent	Price (BRL/Month)
Dev / Test	P1V2	210	3.5 GB	Dv2-Series compute equivalent	404.53 (Estimated)
Production	P2V2	420	7 GB	Dv2-Series compute equivalent	809.08 (Estimated)
Isolated	P3V2	840	14 GB	Dv2-Series compute equivalent	1614.12 (Estimated)
Production	P2V3	195	16 GB	4 vCPU	905.19 (Estimated)
Production	P3V3	195	32 GB	8 vCPU	1810.38 (Estimated)

Included features

Every app hosted on this App Service plan will have access to these features:

- Custom domains / SSL
- Auto scale
- Staging slots
- Daily backups

Included hardware

Every instance of your App Service plan will include the following hardware configuration:

- Azure Compute Units (ACU)
- Memory
- Storage

- o Agora após alterado podemos add um slot

The screenshot shows the 'Deployment Slots' section of the Azure portal. At the top, there are buttons for 'Save', 'Discard', '+ Add Slot' (which is highlighted with a red box and has a red arrow pointing to it), 'Swap', 'Logs', and 'Refresh'. To the right, there's a 'Name' field set to 'az104-webapp-staging' with the URL 'az104-webapplab-az104-webapp-staging.azurewebsites.net' below it. A dropdown menu says 'Clone settings from:' with 'Do not clone settings' selected. Below this, a table lists deployment slots:

NAME	STATUS
az104-webapplab PRODUCTION	Running

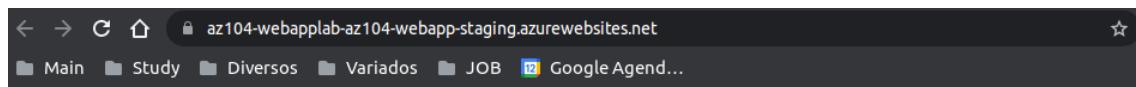
- Se validarmos em deployment slots podemos ver o de prod e o staging que criamos agr

The screenshot shows the 'Deployment Slots' section of the Azure portal. The table now includes the 'az104-webapp-staging' slot:

NAME	STATUS	APP SERVICE PLAN	TRAFFIC %
az104-webapplab PRODUCTION	Running	ASP-rgaz104labsas-8c6d	100
az104-webapplab-az104-webapp-staging	Running	ASP-rgaz104labsas-8c6d	0

- Se validarmos o staging podemos ver que teremos uma nova URL

The screenshot shows the 'az104-webapp-staging' App Service Overview page. On the left, there's a sidebar with 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Microsoft Defender for Cloud', and 'Events (preview)'. The main area shows the 'Essentials' section with details like Resource group (rg-az104-labsas), Status (Running), Location (East US 2), Subscription (Visual Studio Enterprise Subscription – MPN), Subscription ID (afef777d-a295-4675-9bf9-5b6bf32b89f4), and Tags (Click here to add tags). A red arrow points to the 'Default domain' field, which contains 'az104-webapplab-az104-webapp-staging.azurewebsites.net'. Other fields shown include App Service Plan (ASP-rgaz104labsas-8c6d (P1v2: 0)), Operating System (Linux), and Health Check (Not Configured). At the bottom, there are tabs for Properties, Monitoring, Logs, Capabilities, Notifications, and Recommendations.



Your web app is running and waiting for your content

Your web app is live, but we don't have your content yet. If you've already deployed, it could take up to 5 minutes for your content to show up, so come back soon.



`</>` Supporting Node.js, Java, .NET and more

Haven't deployed yet?
Use the deployment center to publish code or set up continuous deployment.

Starting a new web site?
Follow our Quickstart guide to get a web app ready quickly.

[Quickstart](#)

- Agora vamos definir as configurações de implantação de aplicativos da web
 - Vamos em deployment center
 - Podemos fazer CI/CD ou manual
 - Vamos escolher local git, e vamos escolher app service build

The screenshot shows the Azure portal interface for managing an app service slot named 'az104-webapp-staging'. The left sidebar includes links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, Events (preview), Deployment slots, Deployment Center (which is currently selected), and Settings. The main content area is titled 'az104-webapp-staging (az104-webapplab/az104-webapp-staging) | App Service (Slot)'. It features tabs for Settings, Logs, and FTPS credentials. Under the Settings tab, there is a 'Source*' section with a dropdown menu. The dropdown menu is expanded, showing options: 'Continuous Deployment (CI/CD)', 'GitHub', 'Bitbucket', 'Local Git' (which is highlighted with a red box), 'Azure Repos', 'Manual Deployment (Push)', and 'External Git'. The 'Continuous Deployment (CI/CD)' section also lists 'GitLab' and 'Jenkins'.

- Vamos copiar a URL que será onde iremos subir para o staging

Save Discard Browse Manage publish profile Sync Leave Feedback

Settings Logs Local Git/FTPS credentials

Deploy and build code from your preferred source and build provider. [Learn more](#)

Source Local Git [Disconnect](#)

Local Git

Git Clone Uri <https://az104-webapplab-az104-webapp-staging.scm.azurewebsites.net:443/az104-webapplab.git>

Build

Build provider App Service Build Service

Runtime stack PHP

Version PHP 8.0

- Agora iremos implantar o código para o slot de testes
 - Vamos utilizar o powershell para este procedimento para baixar o conteúdo do git
 - Vamos rodar um `git clone https://github.com/Azure-Samples/php-docs-hello-world`, iremos baixar uma aplicação php
 - Vamos setar esse comando `Set-Location -Path $HOME/php-docs-hello-world/` - O comando muda o diretório atual para a pasta "`$HOME/php-docs-hello-world/`" como padrão

```
PS /home/lucas> git clone https://github.com/Azure-Samples/php-docs-hello-world
Cloning into 'php-docs-hello-world'...
remote: Enumerating objects: 26, done.
remote: Total 26 (delta 0), reused 0 (delta 0), pack-reused 26
Receiving objects: 100% (26/26), 5.64 KiB | 5.64 MiB/s, done.
Resolving deltas: 100% (6/6), done.
PS /home/lucas> Set-Location -Path $HOME/php-docs-hello-world/
PS /home/lucas/php-docs-hello-world> ls
index.php LICENSE README.md
PS /home/lucas/php-docs-hello-world>
```

- Voltando no portal vamos em deployment credentials, podemos pegar a que já existe, porém podemos criar um usuário de acesso.

az104-webapp-staging (az104-webapplab/az104-webapp-staging) | Deployment Center

App Service (Slot)

Search Save Discard Browse Manage publish profile Sync Leave Feedback

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Microsoft Defender for Cloud Events (preview)

Deployment Deployment slots Deployment Center

Settings Configuration Authentication

Local Git/FTPS credentials *

App Service supports multiple technologies to access, publish and modify the content of your app. FTPS credentials can be scoped to the application or the user.

FTPS endpoint <https://waws-prod-bn1-193.ftp.azurewebsites.windows.net/site/wwwroot>

Git Clone Uri <https://az104-webapplab-az104-webapp-staging.scm.azurewebsites.net:443...>

Application scope

Application scope credentials are auto-generated and provide access only to this specific app or deployment slot. These credentials can be used with FTPS, Local Git and WebDeploy. They cannot be configured manually, but can be reset anytime. [Learn more](#)

FTPS Username az104-webapplab_az104-webapp-staging\\$az104-webapplab_az104-weba...

Local Git Username \$az104-webapplab_az104-webapp-staging

Password [Reset](#)

User scope

User scope credentials are defined by you, the user, and can be used with all the apps to which you have access. These credentials can be used with FTPS, Local Git and WebDeploy. Authenticating to an FTPS endpoint using user-level credentials requires a username in the following format: 'az104-webapplab-az104-webapp-staging\your username'. Authenticating with Git requires only the username '(your username)' defined below. [Learn more](#)

Username	usr-az104sas
Password	***** <input type="button" value="Reset"/>
Confirm Password	***** <input type="button" value=""/>

- Com as credenciais, vamos realizar o seguinte comando `git remote add [deployment_user_name] [git_clone_url]`

```
PS /home/lucas/php-docs-hello-world> ls
index.php LICENSE README.md
PS /home/lucas/php-docs-hello-world> git remote add usr-az104sas https://az104-webapplab-az104-webapp-staging.scm.azurewebsites.net:443/az104-webapplab.git
error: remote usr-az104sas already exists
PS /home/lucas/php-docs-hello-world> | No caso já adicionamos
```

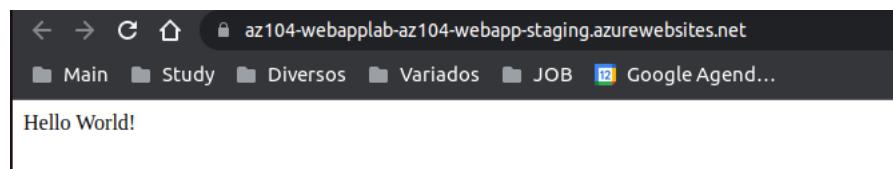
- Por fim `git push [deployment_user_name] master + credential que criamos`

```
PS /home/lucas/php-docs-hello-world> git push usr-az104sas master
Username for 'https://az104-webapplab-az104-webapp-staging.scm.azurewebsites.net:443': usr-az104sas
Password for 'https://usr-az104sas@az104-webapplab-az104-webapp-staging.scm.azurewebsites.net:443':
Everything up-to-date
PS /home/lucas/php-docs-hello-world> |
```

- Feito isso estaremos realizando o deployment
- No deployment center podemos ver que o deploy foi concluido

Time	Commit ID	Commit Author	Status	Message
Saturday, May 20, 2023 (1)	df425ea	docs	Success (Active)	Update README.md

- Indo na URL do staging podemos ver o hello world



- Agora vamos trocar os slots de teste para produção
 - Vamos em deployment slots
 - Vamos clicar em swap, selecionamos o que irá trocar, no caso será do staging para prd

The screenshot shows the Azure portal interface for managing deployment slots. In the top navigation bar, there is a 'Search' bar, 'Save', 'Discard', 'Add Slot' (with a red arrow pointing to it), 'Swap' (highlighted with a red box), 'Logs', and 'Refresh' buttons. Below the navigation bar, the 'Deployment' section is selected, showing 'Deployment slots' (highlighted with a red box) and 'Deployment Center'. On the left, a sidebar lists 'Settings' (Configuration, Authentication, Application Insights, Identity, Backups), 'Deployment slots' (selected), and 'Logs'. The main content area is titled 'Deployment Slots' and contains a brief description: 'Deployment slots are live apps with their own hostnames. App content and configurations elements can be swapped between two deployment slots, including the production slot.' Below this is a table showing two slots:

NAME	STATUS	APP SERVICE PLAN	TRAFFIC %
az104-webapplab (PRODUCTION)	Running	ASP-rgaz104labsas-8c6d	100
az104-webapplab-az104-webapp-staging	Running	ASP-rgaz104labsas-8c6d	0

A modal dialog box titled 'Swap' is open. It has fields for 'Source' (set to 'az104-webapplab-az104-webapp-staging') and 'Target' (set to 'PRODUCTION' which is highlighted with a red box). There is an info message: 'Swap with preview can only be used with sites that have deployment slot settings enabled'. A checkbox 'Perform swap with preview' is present. Below this is a 'Config Changes' section with a summary: 'This is a summary of the final set of configuration changes on the source and target deployment slots after the swap has completed.' A table shows 'Source Changes' (highlighted with a red box) and 'Target Changes' (highlighted with a red box). The table has columns: SETTING, TYPE, OLD VALUE, and NEW VALUE. The table body contains a single row: 'No Changes'. At the bottom of the dialog are 'Swap' and 'Close' buttons.

- As páginas não ficaram indisponíveis em nenhum momento
- Feito isso o que estava em prd vai para staging e o que estava em staging vai para prd

az104-webapplab | Deployment slots

Web App

Search Save Discard Add Slot Swap Logs Refresh

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Microsoft Defender for Cloud Events (preview)

Deployment Deployment slots Deployment Center

Deployment Slots

Deployment slots are live apps with their own hostnames. App content and configurations elements can be swapped between two deployment slots, including the production slot.

NAME	STATUS	APP SERVICE PLAN	TRAFFIC %
az104-webapplab PRODUCTION	Running	ASP-rgaz104labsas-8c6d	100
az104-webapplab-az104-webapp-staging	Running	ASP-rgaz104labsas-8c6d	0

az104-webapplab-az104-webapp-staging.azurewebsites.net

Main Study Diversos Variados JOB Google Agenda...



Your web app is running and waiting for your content

Your web app is live, but we don't have your content yet. If you've already deployed, it could take up to 5 minutes for your content to show up, so come back soon.

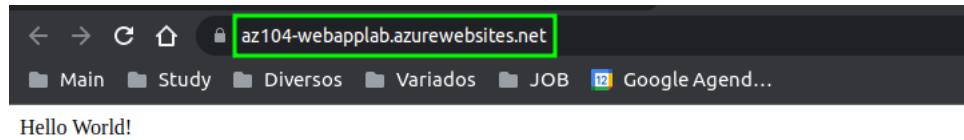


 Supporting Node.js, Java, .NET and more

Haven't deployed yet?
Use the deployment center to publish code or set up continuous deployment.

Starting a new web site?
Follow our Quickstart guide to get a web app ready quickly.

[Quickstart](#)



-
- Agora vamos configurar o autoscaling do azure web app
 - Vamos primeiramente até a subscription confirmar se o resource provider microsoft.insights está registrado
 - Caso não esteja, registre

A screenshot of the Azure portal's "Resource providers" page. On the left, there is a sidebar with various settings like Programmatic deployment, Resource groups, and Resource providers. The "Resource providers" item is highlighted with a red box. The main pane shows a table with one row for "microsoft.insights".

Provider	Status
microsoft.insights	Registered

A red arrow points from the "microsoft.insights" entry in the table towards the "Status" column, which contains the word "Registered".

- Verificado vamos no web app, e vamos no scale out, e vamos configurar em rule based e custom autoscale

az104-webapplab | Scale out (App Service plan)

Web App

Search Current instance 1

Scaling

App service provides multiple features that help applications perform their best when scaling demand changes. You can choose to scale your resource manually to a specific instance count, or via a custom Autoscale rule based policy that scales based on metric(s) thresholds, or schedule instance count which scales during designated time window. You can also use Automatic Scaling features which enables platform managed scale in and scale out for your apps based on incoming HTTP traffic.

[Learn more about Azure Autoscale, Automatic Scaling or view the how-to video.](#)

Scale out method

Manual
Maintain a constant instance count for your application

Automatic (preview)
Platform managed scale up and down based on traffic

Rules Based
User defined rules to scale on a schedule or based on any app metric

Rule based scaling will be ignored if Automatic scaling is enabled. [Manage rules based scaling](#)

Scaling

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Platform managed scale up and down based on traffic

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User defined rules to scale on a schedule or based on any app metric

Rule based scaling will be ignored if Automatic scaling is enabled. [Manage rules based scaling](#)

Choose how to scale your resource

Manual scale
Maintain a fixed instance count

Custom autoscale
Scale on any schedule, based on any metrics

Custom autoscale

- Vamos deixar o scale mode como scale band on a metric

- Delete warning
- Info** The very last or default recurrence rule cannot be deleted. Instead, you can disable auto-scale off autoscale.
- Scale mode Scale based on a metric Scale to a specific instance count
- Vamos criar uma regra, vamos trabalhar com máxima, vamos trabalhar com metrica de CPU, em operator vamos deixar 15%, tempo vamos deixar como 2 minutos, vamos trabalhar com máxima, add uma vm, minimo de 1 maximo 2 e o default 1 instancia

CpuPercentage (Average)
5,67 %

Enable metric divide by instance count ✓

Operator * Greater than Metric threshold to trigger scale action * ✓
15 %

Duration (minutes) * * Time grain (minutes) (i)
2 1

⚠ Setting a duration less than 5 minutes may generate transient metric spikes that leads to unexpected scaling actions. For best results, the duration should be set at least to 5 minutes.

Time grain statistic * (i) Time aggregation * (i)
Average Average

Action
Operation * Cool down (minutes) * * (i)
Increase count by 1

instance count * 1

✓

Update **Delete**

Default* Auto created default scale condition ✓ (i) (d)

Delete warning

Info The very last or default recurrence rule cannot be deleted. Instead, you can disable auto-scale off autoscale.

Scale mode Scale based on a metric Scale to a specific instance count

Rules (i) It is recommended to have at least one scale in rule. To create new rules, click [Add a rule](#)

Scale out
When ASP-rgaz104labsas-8c... (Average) CpuPercentage > 15 Increase count by 1

+ Add a rule

Instance limits Minimum * (i) Maximum * (i) Default * (i)
1 2 1

Schedule This scale condition is executed when none of the other scale condition(s) match

- Feito isso a regra estará pronta

- Vamos criar uma regra de scale in para poder reduzir
 - Regra minimo, menor que 10%, decrease count by 1 minuto, irá reduzir uma instancia,

CpuPercentage (Average)
6,25 %

Enable metric divide by instance count

Operator * Less than Metric threshold to trigger scale action * 10 %

Duration (minutes) * 1 Time grain (minutes) * 1

⚠ Setting a duration less than 5 minutes may generate transient metric spikes that leads to unexpected scaling actions. For best results, the duration should be set at least to 5 minutes.

Time grain statistic * Average Time aggregation * Average

Action

Operation * Decrease count by Cool down (minutes) * 1

instance count * 1

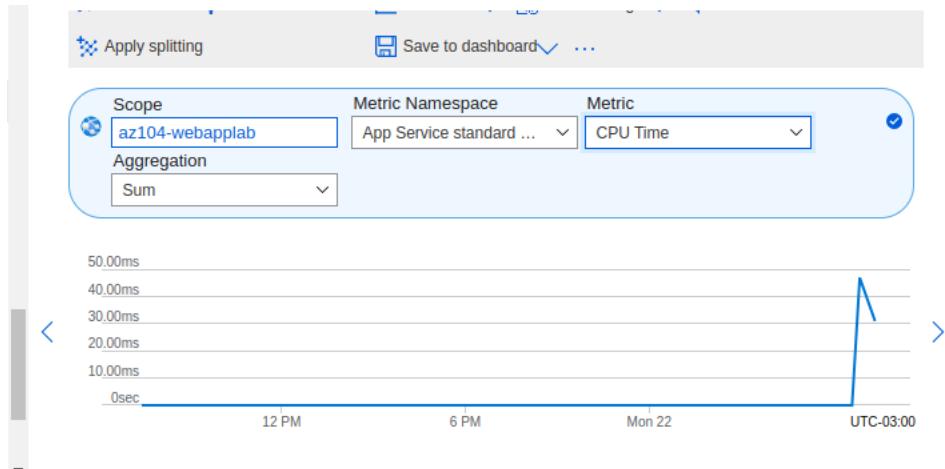
Update Delete

Scale mode	<input checked="" type="radio"/> Scale based on a metric <input type="radio"/> Scale to a specific instance count
Rules	Scale out When ASP-rgaz104labsas-8c... (Average) CpuPercentage > 15 Increase count by 1
	Scale in
	When ASP-rgaz104labsas-8c... (Minimum) CpuPercentage < 50 Decrease count by 1
+ Add a rule	
Instance limits	Minimum * 1 Maximum * 2 Default * 1
Schedule	This scale condition is executed when none of the other scale condition(s) match

- Vamos testar abrindo o powershell e gerar requisições infinitas para o http do web app
- Vamos add a variavel `$rgName = 'rg-az104-labsas'` e `$webapp = Get-AzWebApp -ResourceGroupName $rgName`

```
PS /home/lucas> $rgName = 'rg-az104-labsas'
PS /home/lucas> $webapp = Get-AzWebApp -ResourceGroupName $rgName
```

- Vamos em process explorer para acompanhar as sessões de IS



- Feito isso vamos rodar `while ($true) { Invoke-WebRequest -Uri $webapp.DefaultHostName }`
 - Vai ficar repetindo acesso ao site do webapp

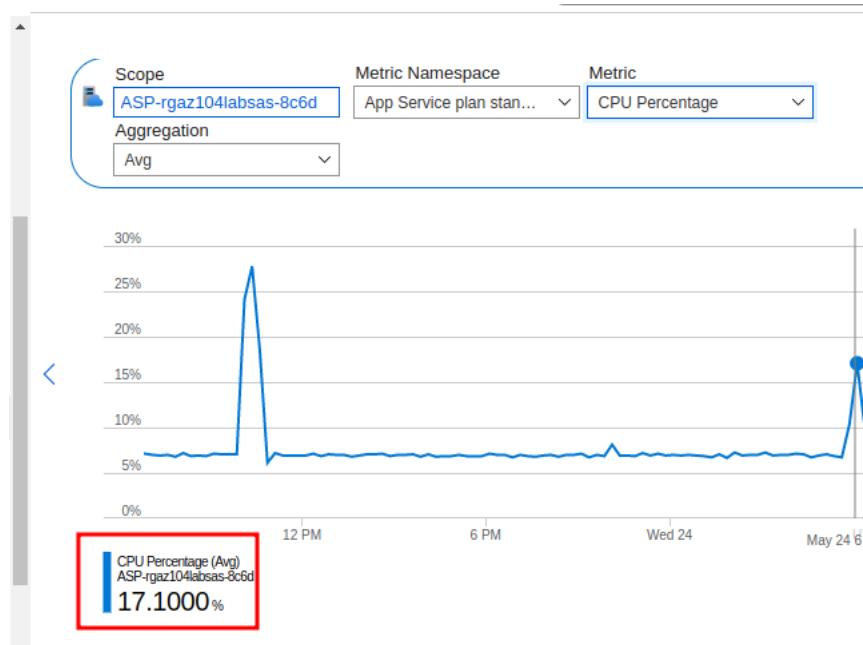
```
PS /home/lucas> while ($true) { Invoke-WebRequest -Uri $webapp.DefaultHostName }
```

```
Hello World!
Headers : {[Date, System.String[]], [Server, System.String[]], [Transfer-Encoding, System.String[]], [X-Powered-By, System.String[]]...}
Images : {}
InputFields : {}
Links : {}
RawContentLength : 12
RelationLink : {}

StatusCode : 200
StatusDescription : OK
Content : Hello World!
RawContent : HTTP/1.1 200 OK
             Date: Mon, 22 May 2023 10:27:46 GMT
             Server: nginx/1.22.1
             Transfer-Encoding: chunked
             X-Powered-By: PHP/8.0.28
             Content-Type: text/html; charset=utf-8

Hello World!
Headers : {[Date, System.String[]], [Server, System.String[]], [Transfer-Encoding, System.String[]], [X-Powered-By, System.String[]]...}
Images : {}
InputFields : {}
Links : {}
RawContentLength : 12
RelationLink : {}
```

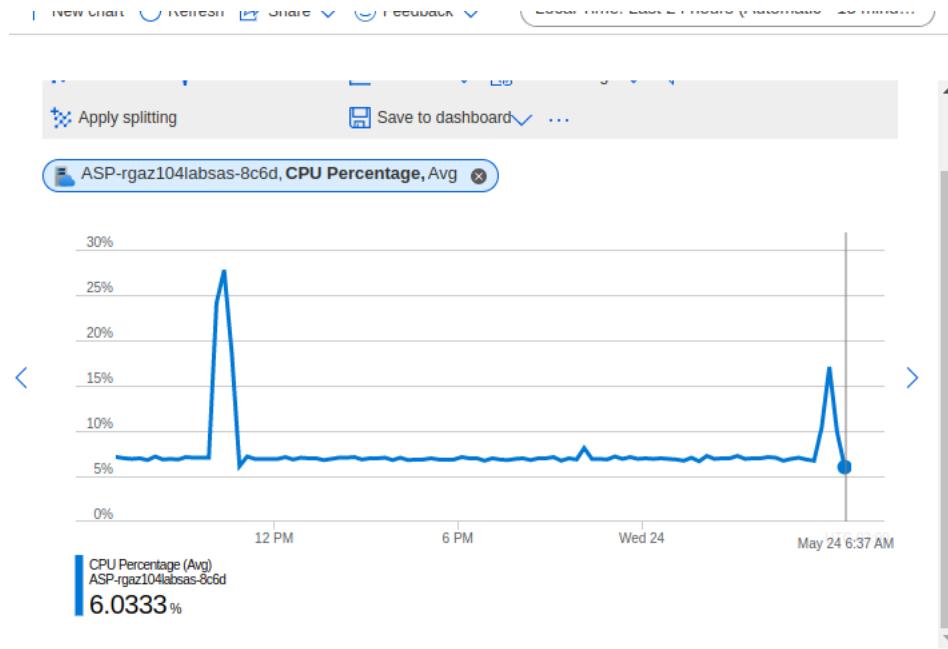
- Em metricas podemos validar o aumento da utilização da CPU no service plan



- Podemos ver no service plan que outra instancia apareceu

The screenshot shows the Azure portal's service plan configuration for 'ASP-rgaz104labsas-8c6d'. On the left, a sidebar lists options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Events (preview), Apps, File system storage, Networking, and Scale up (App Service plan). The 'Overview' tab is selected. In the main pane, there's a search bar, a delete button, and a 'Send us your feedback' link. Below these are sections for Resource group (rg-az104-labsas), Pricing plan (P1v2), and Instance count (2). Other details include Status (Ready), Location (East US 2), Subscription (Visual Studio Enterprise Subscription – MPN), Subscription ID (afe7f77d-a295-4675-9bf9-5b6bf32b89f4), Tags (Click here to add tags), and various performance metrics like CPU Percentage, Memory Percentage, and Data In.

- Parando o processo com o tempo a vm que foi criada será encerrada
- Em metricas podemos ver a redução



- E no plan podemos ver que agora voltamos com apenas uma instancia

ASP-rgaz104labsas-8c6d | Scale out (App Service plan)

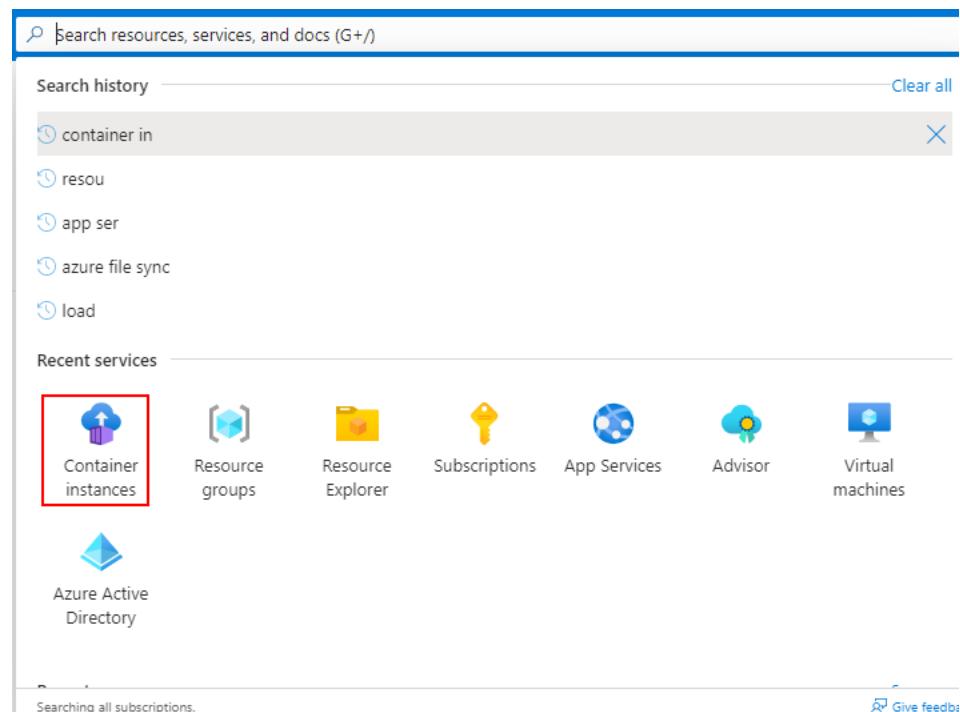
Pricing plan

Current plan	Premium v2 P1V2 (Change) 0.554 BRL/hour (404.532 BRL/month)
Memory (GB)	3.5
Maximum scale (instance)	30
Current instance	1

Scaling

▼ Lab02 - Implement Azure container instances

- Vamos implantar uma img docker usando a instânci do container do azure e executar um teste de acesso
 - Vamos usar o mesmo RG, e vamos criar uma container instance
 - Vamos definir o nome , e vamos usar um quickstart imagens



Create container instance

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ Visual Studio Enterprise Subscription – MPN

Resource group * ⓘ rg-az104-labsas

[Create new](#)

Container details

Container name * ⓘ containerlab-az104

Region * ⓘ (US) East US

Availability zones ⓘ None

SKU Standard

Image source * ⓘ

Quickstart images

Azure Container Registry

Other registry

- Vamos usar a image microsoft/aci-helloworld (linux), podemos mudar o tamanho mas vamos manter padrão

Run with Azure Spot discount ⓘ

Image * ⓘ

mcr.microsoft.com/azuredocs/aci-helloworld:latest (Linux)

Size * ⓘ

1 vcpu, 1.5 GiB memory, 0 gpus

[Change size](#)

- Vamos trabalhar com uma rede publica, porém podemos usar uma vnet e subnet
 - Porta 80 será a que ficará liberada

Create container instance ...

Basics Networking Advanced Tags Review + create

Choose between three networking options for your container instance:

- 'Public' will create a public IP address for your container instance.
- 'Private' will allow you to choose a new or existing virtual network for your container instance. This is not yet available for Windows containers.
- 'None' will not create either a public IP or virtual network. You will still be able to access your container logs using the command line.

Networking type Public Private None

DNS name label

DNS name label scope reuse

Ports

Ports	Ports protocol
80	TCP

- Política de restart vamos manter padrão e seguimos com a criação

Basics Networking **Advanced** Tags Review + create

Configure additional container properties and variables.

Restart policy

Environment variables

Mark as secure	Key	Value
<input type="text" value="No"/>	<input type="text"/>	<input type="text"/>

Command override

Example: ["/bin/bash", "-c", "echo hello; sleep 100000"]

Key management Microsoft-managed keys (MMK) Customer-managed keys (CMK)

Microsoft.ContainerInstances-20230524173657 | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview Inputs Outputs Template

Your deployment is complete

Deployment name : Microsoft.ContainerInstances-20230524173657
 Subscription : Visual Studio Enterprise Subscription – MPN
 Resource group : rg-az104-labsas
 Start time : 5/24/2023, 5:43:48 PM
 Correlation ID : dbc109f9-8e41-4552-b0b0-a2c3441004f3

Deployment details
 Next steps

Go to resource

Give feedback

Tell us about your experience with deployment

- Podemos ver que o container estará já em execução e poderemos acessar o ip público e validar no browser

containerlab-az104

Container instances

Search Start Restart Stop Delete Refresh

Overview Activity log Access control (IAM) Tags

Containers Identity Properties Locks

Monitoring

Essentials

Resource group (move)	SKU
rg-az104-labsas	Standard
Status	OS type
Running	Linux
Location	IP address (Public)
East US	20.246.225.229
Subscription (move)	FQDN
Visual Studio Enterprise Subscription – MPN	---
Subscription ID	Container count
afe7f77d-a295-4675-9bf9-5b6bf32b89f4	1
Tags (edit)	
Click here to add tags	

Not secure | 20.246.225.229

Registry person study ChatGPT: Optimizin...

Welcome to Azure Container Instances!

- Em containers podemos ver o que criamos, podemos ver os events, propriedade, logs e também podemos conectar no container

Events

Name	Type	First timestamp	Last timestamp	Message	Count
Started	Normal	24/05/2023, 17:44:14...	24/05/2023, 17:44:14...	Started container	1
Pulled	Normal	24/05/2023, 17:44:05...	24/05/2023, 17:44:05...	Successfully pulled i...	1
Pulling	Normal	24/05/2023, 17:44:04...	24/05/2023, 17:44:04...	pulling image "mcr....	1

Choose Start Up Command

/bin/bash /bin/sh Custom

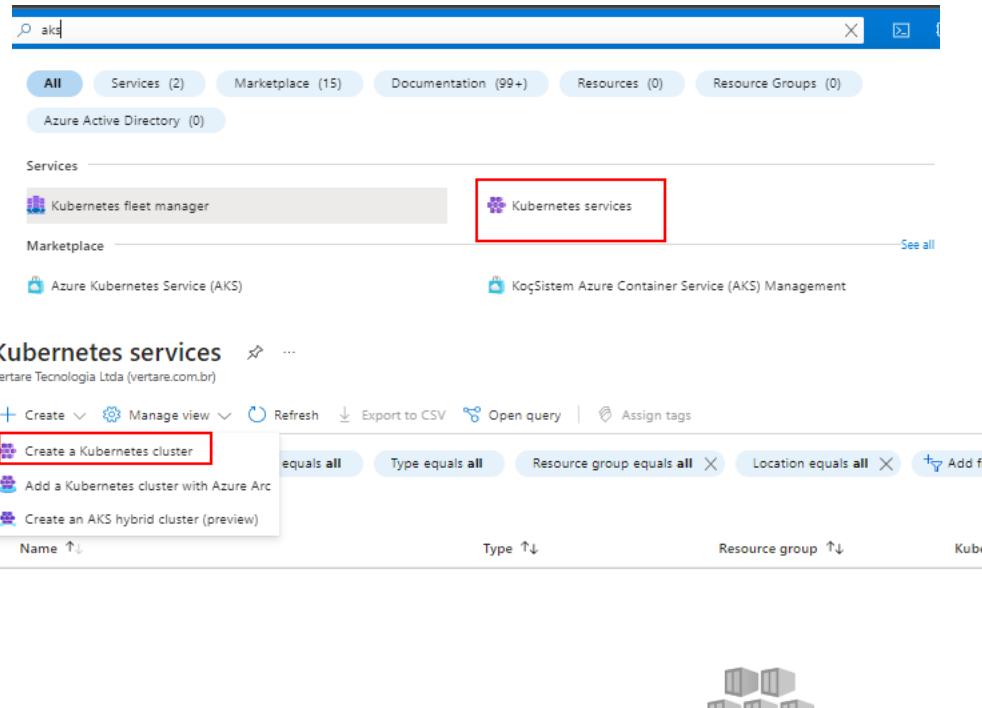
Connect

- No caso nos conectamos usando o /bin/sh

```
/usr/src/app # ls
index.html      index.js       node_modules      package-lock.json  package.json
/usr/src/app #
```

▼ Lab03 - Implement Azure Kubernetes Service

- Iremos implantar um cluster AKS e realizar algumas tarefas de gerenciamento



- No mesmo RG vamos criar um kubernetes cluster
- Podemos escolher configurações de cluster no caso vamos optar pelo padrão standard
- Vamos colocar em 3 zonas
 - Vamos usar 99,95% de disponibilidade

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Resource group * (arrow pointing to this field)

Cluster details

Cluster preset configuration (arrow pointing to this field)

To quickly customize your Kubernetes cluster, choose one of the preset configurations above. You can modify these configurations at any time.
[Learn more and compare presets](#)

Kubernetes cluster name *

Region *

Availability zones (arrow pointing to this field)

Zone 1
Zone 2
Zone 3

AKS pricing tier

Kubernetes version *

Automatic upgrade

- Vamos escolher o tamanho da VM como DS2_v2
- Podemos escolher o escalonamento como autoscale e definir a quantidade de nodes que irão subir
- Node pool, será o conjunto de vms, podemos criar node pools com maquinas e tamanhos diferentes

AKS pricing tier ⓘ Standard

Kubernetes version * ⓘ 1.25.6 (default)

Automatic upgrade ⓘ Enabled with patch (recommended)

Primary node pool

The number and size of nodes in the primary node pool in your cluster. For production workloads, at least 3 nodes are recommended for resiliency. For development or test workloads, only one node is required. If you would like to add additional node pools or to see additional configuration options for this node pool, go to the 'Node pools' tab above. You will be able to add additional node pools after creating your cluster. [Learn more about node pools in Azure Kubernetes Service](#)

Node size * ⓘ Standard DS2 v2
💡 Standard DS2_v2 is recommended for standard configuration.
[Change size](#)

Scale method * ⓘ Autoscale
💡 Autoscaling is recommended for standard configuration.

Node count range * ⓘ 1 — 5

[Review + create](#) [< Previous](#) [Next : Node pools >](#)

- Podemos habilitar o acesso como AAD porém vamos manter padrão

Create Kubernetes cluster ...

Basics Node pools Access Networking Integrations Advanced Tags Review + create

Resource identity ⓘ System-assigned managed identity
By default, Azure uses a managed identity. To use a service principal, use the CLI.
[Learn more ⓘ](#)

Choose between local accounts or Azure AD for authentication and Azure RBAC or Kubernetes RBAC for your authorization needs.

Authentication and Authorization ⓘ Local accounts with Kubernetes RBAC

Local accounts with Kubernetes RBAC
Use built-in Kubernetes role-based access control for authorization checks on the cluster.

Azure AD authentication with Kubernetes RBAC
Use Azure AD for authentication and Kubernetes native RBAC for authorization.

Azure AD authentication with Azure RBAC
Use Azure role assignments for authorization checks on the cluster.

- Podemos usar o kubenet(SAS) ou azure CNI(redes que criarei e configurarei) referente ao network

You can choose between two networking options: 'Kubenet' or 'Azure CNI'.

- The **kubenet** networking plug-in creates a new VNet for your cluster using default values.
- The **Azure CNI** networking plug-in allows clusters to use a new or existing VNet with customizable addresses. Application pods are connected directly to the VNet, which allows for native integration with VNet features.

Learn more about networking in Azure Kubernetes Service

Network configuration **Kubenet** Azure CNI

DNS name prefix *

Traffic routing

Load balancer Standard

Security

Enable private cluster

Set authorized IP ranges

Network policy **None** Calico Azure

- Em integração podemos integrar com um container registry do azure, e podemos habilitar o azure monitoring, vamos deixar padrão

Basics Node pools Access Networking **Integrations** Advanced Tags Review + create

Connect your AKS cluster with additional services.

Microsoft Defender for Cloud
Microsoft Defender for Cloud provides unified security management and advanced threat protection across hybrid cloud workloads. [Learn more](#)

Your subscription is protected by Microsoft Defender for Cloud basic plan.

Azure Container Registry
Connect your cluster to an Azure Container Registry to enable seamless deployments from a private image registry. [Learn more about Azure Container Registry](#)

Container registry

Azure Monitor
In addition to the CPU and memory metrics included in AKS by default, you can enable Container Insights for more comprehensive data on the overall performance and health of your cluster. Billing is based on data ingestion and retention settings.
[Learn more about container performance and health monitoring](#) [Learn more about pricing](#)

Container Insights

Enable Container Logs
Azure monitor is recommended for standard configuration.

Review + create **< Previous** **Next : Advanced >**

- No caso não iremos criar o nosso cluster pelo portal vamos utilizar os seguintes comandos no cloud CLI

- Validar Providers registrados:

```
az provider show -n Microsoft.OperationsManagement -o table
az provider show -n Microsoft.OperationalInsights -o table
```

```

Bash
lucas [ ~ ]$ az provider show -n Microsoft.OperationsManagement -o table
Namespace          RegistrationPolicy   RegistrationState
Microsoft.OperationsManagement RegistrationRequired Registered
lucas [ ~ ]$ az provider show -n Microsoft.OperationalInsights -o table
Namespace          RegistrationPolicy   RegistrationState
Microsoft.OperationalInsights RegistrationRequired Registered
lucas [ ~ ]$

```

- Criar Cluster AKS, vamos criar no mesmo RG:

```
az aks create --resource-group "rg-az104-labsas" --name AKSLAB-AZ104 --node-count 1 --enable-addons monitoring --generate-ssh-keys
```

```

lucas [ ~ ]$ az aks create --resource-group "rg-az104-labsas" --name AKSLAB-AZ104 --node-count 1 --enable-addons monitoring --generate-ssh-keys
SSH key files '/home/lucas/.ssh/id_rsa' and '/home/lucas/.ssh/id_rsa.pub' have been generated under ~/.ssh to allow SSH access to the VM. If using machines without permanent storage like Azure Cloud Shell without an attached file share, back up your keys to a safe location
Resource provider 'Microsoft.ContainerService' used by this operation is not registered. We are registering for you.
Registration succeeded.
| Running ..

```

- Após concluir ele passa todo o JSON do recurso

```

lucas [ ~ ]$ az aks create --resource-group "rg-az104-labsas" --name AKSLAB-AZ104 --node-count 1 --enable-addons monitoring --generate-ssh-keys
SSH key files '/home/lucas/.ssh/id_rsa' and '/home/lucas/.ssh/id_rsa.pub' have been generated under ~/.ssh to allow SSH access to the VM. If using machines without permanent storage like Azure Cloud Shell without an attached file share, back up your keys to a safe location
Resource provider 'Microsoft.ContainerService' used by this operation is not registered. We are registering for you.
Registration succeeded.
{
  "addonProfiles": null,
  "addonProfiles": {
    "omsagent": {
      "config": {
        "logAnalyticsWorkspaceResourceID": "/subscriptions/afe7f77d-a295-4675-9bf9-5b6bf32b89f4/resourceGroups/DefaultResourceGroup-EUS/providers/Microsoft.OperationalInsights/workspaces/afe7f77d-a295-4675-9bf9-5b6bf32b89f4-EUS",
        "useAADAuth": "True"
      },
      "enabled": true,
      "identity": null
    }
  },
  "agentPoolProfiles": [
    {
      "availabilityZones": null,
      "count": 1,
      "creationData": null,
      "currentOrchestratorVersion": "1.25.6",
      "enableAutoScaling": false,
      "enableEncryptionAtHost": false,
      "enableFips": false,
      "enableNodePublicIP": false,
      "enableUltraSSD": false,
      "gpuInstanceProfile": null,
      "hostGroupId": null,
      "osType": "Ubuntu"
    }
  ],
  "kubernetesVersion": "1.25.6"
}

```



- Após criar podemos verificar a versão do nosso cluster, podemos ver todar as propriedades

AKS AKSLAB-AZ104

Resource group : rg-az104-labsas

Status : Succeeded (Running)

Kubernetes version : 1.25.6

Tags (edit) : Click here to add tags

Get started Properties Monitoring Capabilities (3) Recommendations Tutorials

Kubernetes services

- Encryption type : Encryption at-rest with a platform-managed key
- Virtual node pools : Not enabled

Networking

- API server address : akslab-az1-rg-az104-labsas-afe7f-dwgckp1.hcp.eastus.azmk8s.io
- Network type (plugin) : Kebnet
- Pod CIDR : 10.244.0.0/16
- Service CIDR : 10.0.0.0/16
- DNS service IP : 10.0.0.10
- Docker bridge CIDR : -
- Network Policy : None

Node pools

- Node pools : 1 node pool
- Kubernetes versions : 1.25.6
- Node sizes : Standard_DS2_v2

- No caso em um cluster kubernetes temos os nós que são as vms, os pods que seria onde armazena os containers

Home > Resource groups > rg-az104-labs > AKSLAB-AZ104 | Node pools > nodepool1

nodepool1 | Nodes

Node pool

Search Refresh Show details

Overview

Nodes Configuration

Filter by node name Enter the full node name

Node	Status	Kubernetes version	Node image version	Container runtime version
aks-nodepool1-27530479-vmss000000	Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.17.1+azure-1

- Podemos adicionar outro node pool, e podemos reconfigurar os nodes já existentes

AKSLAB-AZ104 | Node pools

Add node pool Refresh Start Stop Upgrade Kubernetes Update image Scale node pool Delete Troubleshoot

Tags Diagnose and solve problems Microsoft Defender for Cloud

Kubernetes resources Namespaces Workloads Services and ingresses Storage Configuration

Settings **Node pools** Cluster configuration

Node pool Provisioning state Power state Node count Mode Kubernetes version Node size Operating system

nodepool1 Succeeded Running 1/1 ready System 1.25.6 Standard_DS2_v2 Linux

nodepool1 | Overview

Upgrade Kubernetes Update image Scale node pool Delete Refresh Give feedback

Overview Nodes Configuration

Essential

Provisioning state : Succeeded	Cluster : AKSLAB-AZ104
Power state : Running (1/1 nodes ready)	Operating system : Linux
Availability zones : None	Kubernetes version : 1.25.6
Mode : System	Node count : 1 node
	Node size : Standard_DS2_v2

Properties Monitoring

Node pool

Max pods per node	110	Taints	None
Public IPs per node	Disabled	Labels	None
Autoscaling	Disabled		
Azure Spot Instance	Disabled		
Maximum price	N/A		
Scale eviction policy	N/A		
Node Image version	AKSUbuntu-2204gen2containerd-202305.15.0		
Proximity placement group	N/A		

Configuration

Mode	System
Minimum count	Default

- Em workload podemos ver os pods

Name	Namespace	Ready	Up-to-date	Available	Age
ama-logs-rs	kube-system	✓ 1/1	1	1	43 minutes
coredns	kube-system	✓ 2/2	2	2	43 minutes
coredns-autoscaler	kube-system	✓ 1/1	1	1	43 minutes
connectivity-agent	kube-system	✓ 2/2	2	2	43 minutes
metrics-server	kube-system	✓ 2/2	2	2	43 minutes

- Podemos alterar a versão do cluster

Kubernetes version: 1.25.6

[Manual upgrade](#) [Upgrade version](#)

- Em policies podemos configurar

Onboard to Azure Policy for Azure Kubernetes Service (AKS)

With this integration, you can apply at-scale enforcements and safeguards for AKS clusters in a centralized, consistent manner through Azure Policy.

[Enable add-on](#)

- Agora vamos acessar o cluster

The screenshot shows the Azure portal interface for the 'AKSLAB-AZ104' resource group. The left sidebar lists various services like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, Kubernetes resources, Namespaces, Workloads, Services and Ingresses, and Storage. The main content area displays the 'Essentials' section for the Kubernetes service, including details such as Resource group: 'rg-az104-labasas', Status: 'Succeeded (Running)', Location: 'East US', Subscription: 'Visual Studio Enterprise Subscription - MPN', Subscription ID: 'afe77fd-a295-4675-9bf9-5b6bf32b89f4', and Tags (edit). Below this, tabs for Get started, Properties, Monitoring, Capabilities (3), Recommendations, and Tutorials are visible. A 'Kubernetes services' section shows Encryption type: 'Encryption at-rest with a platform-managed key' and Virtual node pools: 'Not enabled'. At the top, a navigation bar includes a search bar, a 'Create' button, and a 'Connect' button (which is highlighted with a red box). To the right, a panel titled 'Connect to AKSLAB-AZ104' provides instructions for connecting using Cloud shell or Azure CLI. It includes a 'Cloud shell' tab, a 'Set cluster context' section with a 'Set the cluster subscription' input field containing the command 'az account set --subscription afe77fd-a295-4675-9bf9-5b6bf32b89f4' (with a red arrow pointing to it), a 'Download cluster credentials' section with a command 'az aks get-credentials --resource-group rg-az104-labasas --name AKSLAB-AZ104', and a 'Sample commands' section.

- Baixar credenciais:

```
az aks get-credentials --resource-group rg-az104-labsas --name AKSLAB-AZ104
```

- Vamos validar as instâncias do kubernetes

- Validar deploy de nodes:

```
kubectl get nodes
```

```
lucas [ ~]$ kubectl get nodes
NAME           STATUS  ROLES   AGE    VERSION
aks-nodepool1-27530479-vmss000000  Ready   agent   46m   v1.25.6
lucas [ ~]$
```

- No caso não temos nenhum deploy

- Vamos criar um arquivo yml, no qual utilizaremos para encaminhar para o nosso AKS

- Criar arquivo YAML

code azure-vote.yaml

- Vamos utilizar o seguinte yml abaixo

```

apiVersion: apps/v1
kind: Deployment
metadata:
  name: azure-vote-back
spec:
  replicas: 1
  selector:
    matchLabels:
      app: azure-vote-back
  template:
    metadata:
      labels:
        app: azure-vote-back
    spec:
      nodeSelector:
        "kubernetes.io/os": linux
      containers:
        - name: azure-vote-back
          image: mcr.microsoft.com/oss/bitnami/redis:6.0.8
          env:
            - name: ALLOW_EMPTY_PASSWORD
              value: "yes"
          resources:
            requests:
              cpu: 100m
              memory: 128Mi
            limits:
              cpu: 250m
              memory: 256Mi
          ports:
            - containerPort: 6379
              name: redis
      ---
apiVersion: v1
kind: Service
metadata:
  name: azure-vote-back
spec:
  ports:
    - port: 6379
  selector:
    app: azure-vote-back
  ---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: azure-vote-front
spec:
  replicas: 1
  selector:
    matchLabels:
      app: azure-vote-front
  template:
    metadata:
      labels:
        app: azure-vote-front
    spec:
      nodeSelector:
        "kubernetes.io/os": linux
      containers:
        - name: azure-vote-front
          image: mcr.microsoft.com/azuredocs/azure-vote-front:v1
          resources:
            requests:
              cpu: 100m
              memory: 128Mi
            limits:
              cpu: 250m
              memory: 256Mi
          ports:
            - containerPort: 80
          env:
            - name: REDIS
              value: "azure-vote-back"
      ---
apiVersion: v1
kind: Service
metadata:
  name: azure-vote-front

```

```

spec:
  type: LoadBalancer
  ports:
  - port: 80
  selector:
    app: azure-vote-front

```

- Neste yaml estamos subindo dois deployment um que roda de forma terceira, e o outro irá criar um load balancer

```

1 apiVersion: apps/v1
2 kind: deployment
3 metadata:
4   name: azure-vote-back
5 spec:
6   replicas: 1
7   selector:
8     matchLabels:
9       app: azure-vote-back
10  template:
11    metadata:
12      labels:
13        app: azure-vote-back
14    spec:
15      nodeSelector:
16        kubernetes.io/os: linux
17      containers:
18        - name: azure-vote-back
19          image: mcr.microsoft.com/oss/bitnami/redis:6.0.8
20          env:
21            - name: ALLOW_EMPTY_PASSWORD
22              value: "yes"
23      resources:

```

- Vamos usar o comando abaixo

- Deploy da aplicação configurada no arquivo yaml

```
kubectl apply -f azure-vote.yaml
```

```

lucas [ ~ ]$ kubectl apply -f azure-vote.yaml
deployment.apps/azure-vote-back created
service/azure-vote-back created
deployment.apps/azure-vote-front created
service/azure-vote-front created
lucas [ ~ ]$

```

- Feito isso podemos usar alguns comandos para ver os nodes, pods, service, etc.

- IP DE ACESSO

```
kubectl get service azure-vote-front --watch
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
azure-vote-front	LoadBalancer	10.0.14.142	104.45.188.71	80:30092/TCP	25s

- VALIDAR DEPLOYS

```
kubectl get deployments
```

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
azure-vote-back	1/1	1	1	47s
azure-vote-front	1/1	1	1	47s

- VALIDAR PODS

```
kubectl get pods --show-labels
```

NAME	READY	STATUS	RESTARTS	AGE	LABELS
azure-vote-back-84ff4ffd4b-rjsd8	1/1	Running	0	62s	app=azure-vote-back,pod-template-hash=84ff4ffd4b
azure-vote-front-579fd797d7-xndth	1/1	Running	0	62s	app=azure-vote-front,pod-template-hash=579fd797d7

- VALIDAR CONSUMO DE HARDWARE DOS NODES

```
kubectl top nodes
```

```

lucas [ ~ ]$ kubectl top nodes
NAME          CPU(cores)   CPU%   MEMORY(bytes)   MEMORY%
aks-nodepool1-27530479-vmss000000  1237m      65%   2612Mi      57%
lucas [ ~ ]$ 

```

- Podemos ver o yaml no próprio portal

The screenshot shows two main parts of the Azure Kubernetes Service (AKS) portal.

Top Portion: The "Deployments" tab is selected under the "Workloads" section. A table lists several deployments, including "ama-logs-rs", "coredns", "coredns-autoscaler", "konnnectivity-agent", "metrics-server", "azure-vote-back", and "azure-vote-front". Each row shows the deployment name, namespace, ready status (e.g., 1/1), up-to-date status, available status, and age (e.g., 50 minutes).

Bottom Portion: The "YAML" tab is selected for the "azure-vote-back" deployment. The YAML code defines a Deployment resource with the following specifications:

```

kind: Deployment
apiVersion: apps/v1
metadata:
  name: azure-vote-back
  namespace: default
  uid: 2a4e9aac-f932-4eae-bd04-57ebf91b9f51
  resourceVersion: '11536'
  generation: 1
  creationTimestamp: '2023-05-25T16:56:24Z'
  annotations:
    deployment.kubernetes.io/revision: '1'
    kubectl.kubernetes.io/last-applied-configuration: >
      {"apiVersion": "apps/v1", "kind": "Deployment", "metadata": {"annotations": {}, "name": "azure-vote-back", "namespace": "default"}, "spec": {"replicas": 1, "selector": {"matchLabels": {"app": "azure-vote-back"}}, "template": {"metadata": {"labels": {"app": "azure-vote-back"}}, "spec": {"containers": [{"env": [{"name": "ALLOW_EMPTY_PASSWORD", "value": "yes"}], "image": "mcr.microsoft.com/oss/bitmrm/redis:16.0.8", "name": "azure-vote-back", "ports": [{"containerPort": 6379, "name": "redis"}], "resources": {"limits": {"cpu": "250m", "memory": "256Mi"}, "requests": {"cpu": "100m", "memory": "128Mi"}}, "nodeSelector": {"kubernetes.io/os": "linux"}}}}}, "managedFields": [
      {
        "manager": "kubectl-client-side-apply",
        "operation": "Update",
        "apiVersion": "apps/v1",
        "time": "2023-05-25T16:56:24Z",
        "fieldsType": "FieldsV1"
      }
    ]
}

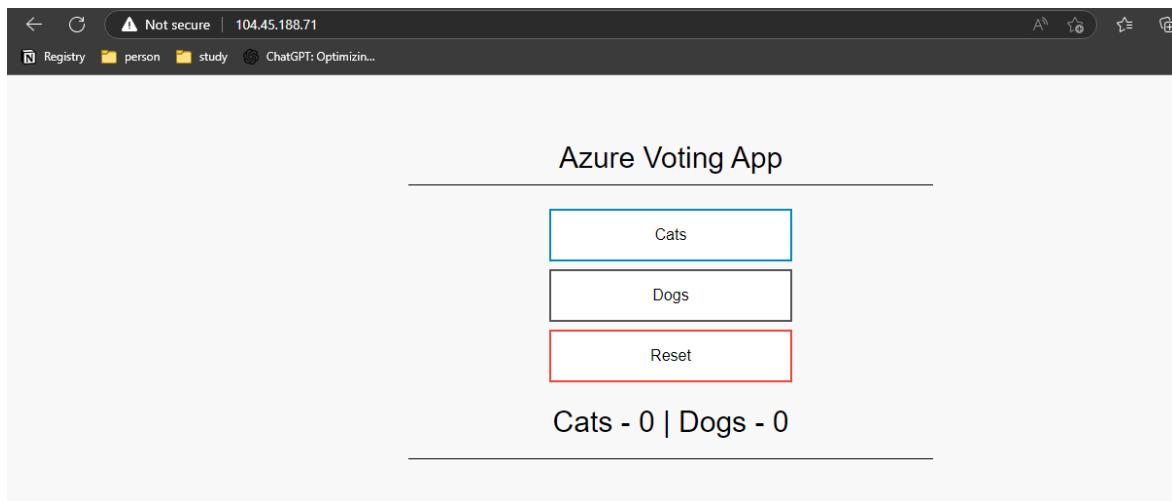
```

- Podemos visualizar nossa aplicação

```

lucas [ ~ ]$ kubectl get service azure-vote-front --watch
NAME           TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
azure-vote-front   LoadBalancer   10.0.14.142   104.45.188.71   80:30092/TCP   3m8s

```



- Podemos configurar uma replica dos pods

- SCALE PODS

```
kubectl scale --replicas=2 deployment/azure-vote-front
kubectl scale --replicas=2 deployment/azure-vote-back
```

```
lucas [ ~ ]$ kubectl scale --replicas=2 deployment/azure-vote-front
deployment.apps/azure-vote-front scaled
lucas [ ~ ]$ kubectl scale --replicas=2 deployment/azure-vote-back
deployment.apps/azure-vote-back scaled
lucas [ ~ ]$
```

<input type="checkbox"/> azure-vote-back	default	✓ 2/2	2	2	5 minutes
<input type="checkbox"/> azure-vote-front	default	✓ 2/2	2	2	5 minutes

- Vamos subir agora 10 replicas, podemos ver o aumento de escalonamento nas métricas

- `kubectl scale --replicas=10 deployment/azure-vote-front`

azure-vote-front | Overview

Deployment

Pods	Replica sets
<input type="checkbox"/> azure-vote-front-579fd797d7-xndth	✓ 1/1
<input type="checkbox"/> azure-vote-front-579fd797d7-zx4kw	✓ 1/1
<input type="checkbox"/> azure-vote-front-579fd797d7-2pttn	✓ 1/1
<input type="checkbox"/> azure-vote-front-579fd797d7-6sjlh	✓ 1/1
<input type="checkbox"/> azure-vote-front-579fd797d7-8419j	⚠ 0/1
<input type="checkbox"/> azure-vote-front-579fd797d7-dld4h	⚠ 0/1
<input type="checkbox"/> azure-vote-front-579fd797d7-fscws	⚠ 0/1
<input type="checkbox"/> azure-vote-front-579fd797d7-gvmr6	⚠ 0/1
<input type="checkbox"/> azure-vote-front-579fd797d7-h5dw9	⚠ 0/1
<input type="checkbox"/> azure-vote-front-579fd797d7-j5l7p	✓ 1/1

- Em event podemos validar os pods que apresentaram problema

```

1 kind: Event
2 apiVersion: v1
3 metadata:
4   name: azure-vote-front-579fd797d7-8419j.176271906de207fa
5   namespace: default
6   uid: 82f123c8-04b7-44e5-a5fc-bd1029021ea2
7   resourceVersion: '12536'
8   creationTimestamp: '2023-05-25T17:01:15Z'
9   managedFields:
10     - manager: kube-scheduler
11       operation: Update
12       apiVersion: v1
13       time: '2023-05-25T17:01:15Z'
14       fieldsType: FieldsV1
15       fieldsV1:
16         f:count: {}
17         f:firstTimestamp: {}

```

- No caso os pods estão apresentando problemas pois não possuem CPU e memória suficiente para completar a criação, neste caso precisaremos escalonar os nodes
- Podemos escalar os nodes também da seguinte forma

```
az aks scale --resource-group rg-az104-labsas --name AKSLAB-AZ104 --node-count 2
```

lucas [~]\$ az aks scale --resource-group rg-az104-labsas --name AKSLAB-AZ104 --node-count 2
[|] Running ..

- No caso vai demorar um pouco não é tão rápido quanto escalar um pod pois estamos criando um outro recurso

```
lucas [ ~ ]$ az aks scale --resource-group rg-az104-labsas --name AKSLAB-AZ104 --node-count 2
{
  "aadProfile": null,
  "addonProfiles": {
    "omsagent": {
      "config": {
        "logAnalyticsWorkspaceResourceID": "/subscriptions/afe7f77d-a295-4675-9bf9-5b6bf32b89f4/resourceGroups/DefaultResourceGroup-EUS/providers/Microsoft.OperationalInsights/workspaces-afe7f77d-a295-4675-9bf9-5b6bf32b89f4-EUS",
        "useAADAuth": "True"
      },
      "enabled": true,
      "identity": null
    }
  },
  "agentPoolProfiles": [
    {
      "availabilityZones": null,
      "count": 2,
      "creationData": null
    }
  ]
}
```

Node pool	Provisioning state	Power state	Node count	Mode	Kubernetes version	Node size
nodepool1	Succeeded	Running	2/2 ready	System	1.25.6	Standard_DS2_v2

- Podemos ver que com este novo node, os pods que estavam com problema antes subiram normalmente

- Vamos modificar no portal para escalar de autoscale

- Como teste de estresse vamos instanciar 50 pods

o `kubectl scale --replicas=50 deployment/azure-vote-back`

```
image:container . null
lucas [ ~ ]$ kubectl scale --replicas=50 deployment/azure-vote-back
deployment.apps/azure-vote-back scaled
lucas [ ~ ]$
```

Name	Namespace	Ready	Up-to-date	Available
ama-logs-rs	kube-system	✓ 1/1	1	1
coredns	kube-system	✓ 2/2	2	2
coredns-autoscaler	kube-system	✓ 1/1	1	1
connectivity-agent	kube-system	✓ 2/2	2	2
metrics-server	kube-system	✓ 2/2	2	2
azure-vote-back	default	⚠ 10/50	50	10
azure-vote-front	default	✓ 10/10	10	10

- Acompanhando os nodes podemos validar o processo de criação dos nodes, e podemos ver a criação dos containers aumentando

Node	Status	Kubernetes version	Node image version	Container runtime version
aks-nodepool1-27530479-vmss000000	✓ Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1
aks-nodepool1-27530479-vmss000001	✓ Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1
aks-nodepool1-27530479-vmss000002	⚠ Not ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1
aks-nodepool1-27530479-vmss000004	⚠ Not ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1

Node	Status	Kubernetes version	Node image version	Container runtime version
aks-nodepool1-27530479-vmss000000	✓ Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1
aks-nodepool1-27530479-vmss000001	✓ Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1
aks-nodepool1-27530479-vmss000002	✓ Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1
aks-nodepool1-27530479-vmss000003	✓ Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1
aks-nodepool1-27530479-vmss000004	✓ Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1
aks-nodepool1-27530479-vmss000005	✓ Ready	1.25.6	AKSUbuntu-2204gen2containerd-202305.15.0	containerd://1.7.1+azure-1

The screenshot shows the AKS Workloads blade in the Azure portal. The left sidebar has sections like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, Kubernetes resources (Namespaces, Workloads, Services and ingresses, Storage, Configuration), and a search bar. The main area shows Deployments, Pods, Replica sets, Stateful sets, Daemon sets, Jobs, and Cron jobs. Under Deployments, there's a table with columns: Name, Namespace, Ready, Up-to-date, Available. Two rows are highlighted with a red border: 'azimuth-vote-back' in the default namespace with 50/50 ready and 10/10 available, and 'azimuth-vote-front' also in the default namespace with 10/10 available.

- Agora vamos diminuir a quantidade scale dos pods

- `kubectl scale --replicas=10 deployment/azimuth-vote-back`

```
lucas [ ~ ]$ kubectl scale --replicas=10 deployment/azimuth-vote-back
deployment.apps/azimuth-vote-back scaled
lucas [ ~ ]$
```

- Podemos identificar em qual node os pods estão rodando

- `kubectl get pod -o=custom-columns=NODE:.spec.nodeName,POD:.metadata.name`

```
deployment.apps/azimuth-vote-back scaled
lucas [ ~ ]$ kubectl get pod -o=custom-columns=NODE:.spec.nodeName,POD:.metadata.name
NODE POD
aks-nodepool1-27530479-vmss000000 azure-vote-back-84ff4ffd4b-26zv8
aks-nodepool1-27530479-vmss000001 azure-vote-back-84ff4ffd4b-64vwd
aks-nodepool1-27530479-vmss000001 azure-vote-back-84ff4ffd4b-6m2f8
aks-nodepool1-27530479-vmss000001 azure-vote-back-84ff4ffd4b-b8w1k
aks-nodepool1-27530479-vmss000001 azure-vote-back-84ff4ffd4b-btz55
aks-nodepool1-27530479-vmss000001 azure-vote-back-84ff4ffd4b-dv896
aks-nodepool1-27530479-vmss000000 azure-vote-back-84ff4ffd4b-fzwbh
aks-nodepool1-27530479-vmss000001 azure-vote-back-84ff4ffd4b-gqq2r
aks-nodepool1-27530479-vmss000000 azure-vote-back-84ff4ffd4b-rjsd8
aks-nodepool1-27530479-vmss000001 azure-vote-back-84ff4ffd4b-tbb2x
aks-nodepool1-27530479-vmss000000 azure-vote-front-579fd797d7-2pttn
aks-nodepool1-27530479-vmss000000 azure-vote-front-579fd797d7-6sjlh
aks-nodepool1-27530479-vmss000001 azure-vote-front-579fd797d7-8419j
aks-nodepool1-27530479-vmss000001 azure-vote-front-579fd797d7-dld4h
aks-nodepool1-27530479-vmss000001 azure-vote-front-579fd797d7-fscws
aks-nodepool1-27530479-vmss000001 azure-vote-front-579fd797d7-gvmr6
aks-nodepool1-27530479-vmss000001 azure-vote-front-579fd797d7-h5dw9
aks-nodepool1-27530479-vmss000000 azure-vote-front-579fd797d7-j5l7p
aks-nodepool1-27530479-vmss000000 azure-vote-front-579fd797d7-xndth
aks-nodepool1-27530479-vmss000000 azure-vote-front-579fd797d7-zx4kw
```

- O AKS sobe as vms em 10s porém pode demorar até 10m para reduzir

The screenshot shows the AKS Node pool 'nodepool1' interface. At the top, there's a search bar, a refresh button, and a 'Show taints' link. Below that, there are tabs for 'Overview', 'Nodes' (which is selected), and 'Configuration'. A filter bar allows you to 'Filter by node name' and enter a 'full node name'. The main table lists six nodes, each with a green 'Ready' status and version 1.25.6.

Node	Status	Kubernetes version
aks-nodepool1-27530479-vmss000000	Ready	1.25.6
aks-nodepool1-27530479-vmss000001	Ready	1.25.6
aks-nodepool1-27530479-vmss000002	Ready	1.25.6
aks-nodepool1-27530479-vmss000003	Ready	1.25.6
aks-nodepool1-27530479-vmss000004	Ready	1.25.6
aks-nodepool1-27530479-vmss000005	Ready	1.25.6

▼ Data Protection

▼ Lab01 - Criar um recovery Services Vault

- Vamos criar com base em um template do github

- <https://github.com/Azure/azure-quickstart-templates/tree/master/quickstarts/microsoft.compute/vm-simple-windows>

The screenshot shows the GitHub README.md page for the 'vm-simple-windows' template. It includes a table with metadata and deployment instructions.

description	page_type	products	urlFragment	languages
This template allows you to deploy a simple Windows VM using a few different options for the Windows version, using the latest patched version. This will deploy an A2 size VM in the resource group location and return the FQDN of the VM.	sample	azure azure-resource-manager	vm-simple-windows	bicep json

Deploy a simple Windows VM

Azure Public Test Date: 2023.05.26 | Azure Public Test Result: pass

Azure US Gov Test Date: 2023.05.27 | Azure US Gov Test Result: pass

Best Practice Check: pass | CredScan Check: Not Tested

Bicep Version: 0.17.1

Buttons: Deploy to Azure (highlighted with a red box), Deploy to Azure Gov, Visualize

This template allows you to deploy a simple Windows Generation 2 VM using a few different options for the Windows version, using the latest patched version. This will deploy a D2s_v3 size VM in the resource group location and return the fully qualified domain name of the VM.

- Vamos criar o RG, a partir do template

Deploy a simple Windows VM

Azure quickstart template

Twitter / resources Edit template Edit parameters Visualize

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * (New) rg-dataprotection-md10

Resource group * (New) rg-dataprotection-md10

Instance details

Region * East US

Admin Username * az104-admin

Admin Password *
Dns Label Prefix vmbkp01
Public Ip Name myPublicIP

Review + create < Previous Next : Review + create >

- Vamos manter o mesmo tamanho

OS Version 2022-datacenter-azure-edition

Vm Size Standard_D2s_v5

- E vamos seguir com a criação da vm

Microsoft.Template-20230603125017 | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview

Deployment is in progress

Deployment name : Microsoft.Template-20230603125017
Subscription : Visual Studio Enterprise Subscription – MPN
Resource group : rg-dataprotection-md10
Start time : 6/3/2023, 12:50:21 PM
Correlation ID : 0d0283d4-cba9-4ef1-bb76-0ccc5c6bdef8

Deployment details

Resource	Type	Status	Operational
myPublicIP	Public IP address	OK	Operational
bootdiags5hh2...	Storage account	Accepted	Operational
myPublicIP	Public IP address	OK	Operational
default-NSG	Network security group	OK	Operational

 Microsoft.Template-20230603125017 | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview Inputs Outputs Template

Your deployment is complete

Deployment name : Microsoft.Template-20230603125017
Subscription : Visual Studio Enterprise Subscription – MPN
Resource group : rg-dataprotection-md10
Start time : 6/3/2023, 12:50:21 PM
Correlation ID : 0d0283d4-cba9-4ef1-bb76-0ccc5c6bdef8

> Deployment details
▼ Next steps

Go to resource group

Give feedback

 Tell us about your experience with deployment

- A VNET e a Subnet serão criadas automaticamente

 MyVNET | Address space

Virtual network

Search Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Address space

Address space	Address range	Address count
10.0.0.0/16	10.0.0.0 - 10.0.255.255	65,536

Add additional address range

Peered virtual network address space

Peering name	Peered to	Address space	Address range
No results.			

MyVNET | Subnets

Virtual network

Search

+ Subnet + Gateway subnet Refresh Manage users Delete

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Address space

Connected devices

Subnets

Name	IPv4	IPv6	Available IP
Subnet	10.0.0.0/24	-	250

- Após criarmos a vm, vamos seguir com a criação de um recovery service vault

Search resources, services, and docs (G/)

Home >

Recovery Services vaults

Vertare Tecnologia Ltda (vertare.com.br)

+ Create Manage view Refresh Export to CSV Open query Assign to

Filter for any field... Subscription equals all Resource group equals all X Add

Showing 0 to 0 of 0 records.

No groups

Name	Type	Vault status	Resource group
------	------	--------------	----------------

- Para os bkps sempre é necessário a criação desse recurso

Create Recovery Services vault ...

* Basics Networking Tags Review + create

Project Details

Select the subscription and the resource group in which you want to create the vault.

Subscription * ⓘ

Visual Studio Enterprise Subscription – MPN

Resource group * ⓘ

rg-dataprotection-md10

[Create new](#)

Instance Details

Vault name * ⓘ

rsv-dataprotection-md10

Region * ⓘ

East US



Cross Subscription Restore is enabled by default for all vaults. Visit vault 'Properties' to disable the same. [Learn more](#).

[Review + create](#)

[Next: Networking](#)

* Basics Networking Tags Review + create

Network connectivity

You can connect to this Recovery Services vault either publicly, via public IP addresses, or privately, using a private endpoint.

Connectivity method

Allow public access from all networks

Deny public access and allow private access

Microsoft.RecoveryServicesV2-1685808092841 | Overview

Deployment

Search: Delete Cancel Redeploy Download Refresh

Overview (selected)

Inputs

Outputs

Template

Your deployment is complete

Deployment name : Microsoft.RecoveryServicesV2-1685808092841
Subscription : Visual Studio Enterprise Subscription – MPN
Resource group : rg-dataprotection-md10
Start time : 6/3/2023, 1:02:03 PM
Correlation ID : cec6d2f6-80fe-492f-8030-9b1be009b9e8

> Deployment details

< Next steps

Go to resource

Give feedback

rsv-dataprotection-md10

Recovery Services vault

Search: Backup Enable Site Recovery Delete Refresh Feedback

Overview (selected)

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

- Identity
- Networking
- Properties
- Locks

Getting started

- Backup
- Site Recovery

Essentials

For backups, try our new Backup Center. It offers Azure Backup customers a unified view of Recovery Services Vaults used for backup in Azure. It also provides improved sorting and filtering along with new governance capabilities. Click here to get the new experience.

What's new

- A new and improved way to enable Azure Site Recovery on your VMware machines is now generally available →
- Site Recovery replicated items and jobs views across subscriptions, regions and vaults are now available →
- Azure Backup Metrics are now in public preview →
- Multi-user authorization for Azure Backup is now generally available →
- Multiple backups a day for Azure Files is now in public preview →
- Enhanced experience for archive is now generally available →
- Backup for Azure Managed Disk is now Generally Available →

- Após a criação do recovery service vault podemos ver algumas opções como:
 - Podemos criar um plano de backup, podemos validar o gerenciamento dos backups
 - Podemos também habilitar site recovery

The screenshot shows the Azure Recovery Services vault interface for 'rsv-dataprotection-md10'. The top navigation bar includes a cloud icon, the vault name, and a star icon. Below the navigation is a search bar and a toolbar with 'Backup' (highlighted with a red box), 'Enable Site Recovery', 'Delete', and 'Refresh' buttons. A tooltip for 'Backup' explains that it offers a new Backup Center for Azure Backup custom Vaults. The left sidebar lists 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', and 'Diagnose and solve problems'. The main content area has a 'Essentials' section with 'Overview' (selected), 'Backup', and 'Site Recovery' tabs.

- Podemos definir identidades específicas para o acesso ao vault

The screenshot shows the 'Identity' settings page for the 'rsv-dataprotection-md10' vault. The top navigation bar includes a key icon, the vault name, and a star icon. Below the navigation is a search bar and a toolbar with 'Save', 'Discard', 'Refresh', and 'Got feedback?' buttons. The left sidebar lists 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', and 'Diagnose and solve problems'. The main content area shows the 'System assigned' tab selected under 'User assigned (preview)'. It contains a description about system-assigned managed identities being restricted to one per resource and tied to the lifecycle of the resource. The status switch is set to 'Off'.

- Podemos definir um endpoint privado

The screenshot shows the 'Networking' settings page for the 'rsv-dataprotection-md10' vault. The top navigation bar includes a network icon, the vault name, and a star icon. Below the navigation is a search bar and a toolbar with 'Approve', 'Reject', 'Remove', and 'Refresh' buttons. The left sidebar lists 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', and 'Diagnose and solve problems'. The main content area shows the 'Private access' tab selected under 'Public access'. It contains a description about private endpoints allowing access from a virtual network. The 'Private endpoint connections' section shows a table with columns: 'Private endpoint', 'Connection name', 'Sub-resource', and 'Subnet'. The table displays 'No results'.

- No bkp podemos configurar para determinados tipos de recursos

The screenshot shows the Azure Recovery Services vault interface for the vault 'rsv-dataprotection-md10'. The left sidebar includes options like 'Backup', 'Site Recovery', 'Protected items' (with 'Backup items' and 'Replicated items' sub-options), 'Manage' (with 'Backup policies'), and 'Monitoring'. The right pane has a search bar and a dropdown for 'Where is your workload running?' with 'Azure' selected. A prominent blue 'Backup' button is at the bottom.

- Podemos validar os tipos de bkps que estão sendo realizados

The screenshot shows the 'Backup items' blade for the same vault. The left sidebar lists 'Protected items' (Backup items, Replicated items), 'Manage' (Backup policies, Backup Infrastructure, Site Recovery infrastructure, Recovery Plans, Backup Reports), and 'Monitoring'. The right pane features a message about the new Backup Center, followed by a table of backup management types and their counts:

BACKUP MANAGEMENT TYPE	BACKUP ITEM COUNT
Azure Virtual Machine	0
Azure Backup Agent	0
Azure Backup Server	0
DPM	0
Azure Storage (Azure Files)	0
SQL in Azure VM	0
SAP HANA in Azure VM	0

- Podemos validar a parte de replicas

Last refreshed at: 03/06/2023, 13:06:26

Finished loading data from service.

Name	Replication Health	Status	Active location	Failover Health
No replicated items found.				

- Podemos definir ou modificar políticas de bkp → Definir um agendamento de bkp

Name	Policy sub type	Policy type
HourlyLogBackup	-	SQL Server in Azure VM
DefaultPolicy	Standard	Azure Virtual Machine
EnhancedPolicy	Enhanced	Azure Virtual Machine

- Bkp de infraestrutura é possível

BACKUP MANAGEMENT TYPE	PROTECTED SERVER COUNT
Azure Backup Server	0
DPM	0
Azure Backup Agent	0
Workload in Azure VM	0

- Podemos criar um site recovery para a infraestrutura em sí tbm

Site Recovery infrastructure

rsv-dataprotection-md10

Search <>

Overview

For Azure virtual machines

- Network mapping
- Replication policies
- Extension update settings

For VMware & Physical machines

- ASR replication appliances
- Replication policies
- Mobility agent update settings

For System Center VMM

- VMM Servers
- Network mapping
- Replication policies

For Hyper-V Sites

Manage your Site Recovery infrastructure



For Azure virtual machines

Network mapping

Replication policies

Extension update settings

For VMware & Physical machines

ASR replication appliances

Replication policies

Mobility agent update settings

For System Center VMM

VMM Servers

Network mapping

Replication policies

- Recovery plan, plano de recuperação

rsv-dataprotection-md10 | Recovery Plans (Site Recovery)

Recovery Services vault

Search <>

+ Recovery plan

Filter items...

Name	Source	Target	Current job	Successful
To failover virtual machines individually, go to Replicated Items. To failover multiple virtual machines together, go to Recovery Plan.				

Backup plans

Backup Infrastructure

Site Recovery infrastructure

Recovery Plans (Site Recovery)

- Podemos validar os reports

The screenshot shows the Azure Recovery Services vault interface. The left sidebar has 'Backup Reports' selected under 'Monitoring'. The main area is titled 'Get Started' and includes a message about customizable reporting templates. It features sections for 'Select Log Analytics Workspace', 'Subscriptions' (with dropdowns for 'All' and 'Workspaces'), and 'What happened to the Power'. A large green button labeled 'Create alert rule' is visible.

- E podemos definir alertas

The screenshot shows the Azure Recovery Services vault interface with 'Alerts' selected in the left sidebar. The main area displays a message about setting up alert rules for resources, with a large green exclamation mark icon. Buttons for 'Create alert rule', 'Alert rules', 'Action groups', 'Alert processing rules', and 'Columns' are visible.

▼ Lab02 - Implementar bkp em nível de máquina virtual do azure

- Vamos configurar o bkp da vm que criamos
 - Vamos em bkp, e selecionamos Azure
 - Workload da vm

Where is your workload running?

Azure

What do you want to backup?

Virtual machine

Step: Configure Backup

Backup

- No caso vamos escolher o tier como enhanced pois nos permitira mais opções

Policy sub type *	<input type="radio"/> Standard	<input checked="" type="radio"/> Enhanced
	<ul style="list-style-type: none">✓ Once a day backup✓ 1-5 days operational tier✓ Vault tierZRS resilient snapshot tierSupport for Trusted Azure VM	<ul style="list-style-type: none">✓ Multiple backups per day✓ 1-30 days operational tier✓ Vault tier✓ ZRS resilient snapshot tier✓ Support for Trusted Azure VM

- Vamos criar uma politica para as vms

Backup policy * ⓘ

(new) policy-dataprotection-md10

[Edit this policy](#)

- O primeiro bkp sempre é full dps ele vai incrementar apenas, vamos deixar diario
- Vamos configurar o snapshot para 2 dias
- Vamos configurar o bkp diario por 30 dias para manter o mês

Create policy

Azure Virtual Machine

Recovery points can be automatically moved to the vault-archive tier using backup policy. Learn more. →

Policy name ⓘ ✓

Backup schedule

Frequency * Time * Timezone *

Instant restore ⓘ

Retain instant recovery snapshot(s) for Day(s) ⓘ

Retention range

Retention of daily backup point

At For Day(s)

Retention of weekly backup point

Not Configured

OK

- Vamos selecionar a VM, podemos marcar apenas o disco, no caso vamos fazer o bkp da vm inteira

Home > Microsoft Azure Virtual Machines > Select virtual machines

Configure rsv-dataprotection-rg

The list contains 1 item

Discovering virtual machines that can be backed up, are in the same region as vault and not protected by another policy.

Filter items by name

Virtual machine name	Resource Group
<input checked="" type="checkbox"/> simple-vm	rg-dataprotection-md10

< Previous Page 1 of 1 Next >

Virtual machines

Name

No virtual machines

Add



Virtual machines

Name	Resource group	Disks (Preview)	Include future disks (Pre...)
simple-vm	rg-d dataprotection-md10	2 selected	<input checked="" type="checkbox"/>
Add			

ConfigureProtection-1685809172511 | Overview

Deployment

Search [Delete](#) [Cancel](#) [Redeploy](#) [Download](#) [Refresh](#)

- [Overview](#)
- [Inputs](#)
- [Outputs](#)
- [Template](#)

Your deployment is complete

Deployment name : ConfigureProtection-1685809172511
Subscription : Visual Studio Enterprise Subscription – MPN
Resource group : rg-d dataprotection-md10
Start time : 6/3/2023, 1:19:37 PM
Correlation ID : c57da152-2b9c-4547-abcd-eee088b47c0b

> Deployment details

▽ Next steps

[Go to resource](#)

- Após concluir podemos ver em bkp item a vm marcada no workload

rsv-d dataprotection-md10 | Backup items

Recovery Services vault

Search [Refresh](#)

- [Diagnose and solve problems](#)
- [Settings](#)
- [Identity](#)
- [Networking](#)
- [Properties](#)
- [Locks](#)
- [Getting started](#)
- [Backup](#)
- [Site Recovery](#)
- [Protected items](#)
- [Backup items](#)

For backups, try our new Backup Center. It offers Azure Backup customers a unified experience for backup in Azure. It also provides improved sorting and filtering along with other enhancements.

Primary Region Secondary Region

BACKUP MANAGEMENT TYPE	BACKUP ITEM COUNT
Azure Virtual Machine	1
Azure Backup Agent	0
Azure Backup Server	0
DPM	0
Azure Storage (Azure Files)	0
SQL in Azure VM	0

- Podemos iniciar o bkp imediatamente ou stopar o bkp na vm

Backup Items (Azure Virtual Machine) ...

rsv-datatprotection-md10

Refresh Add Filter

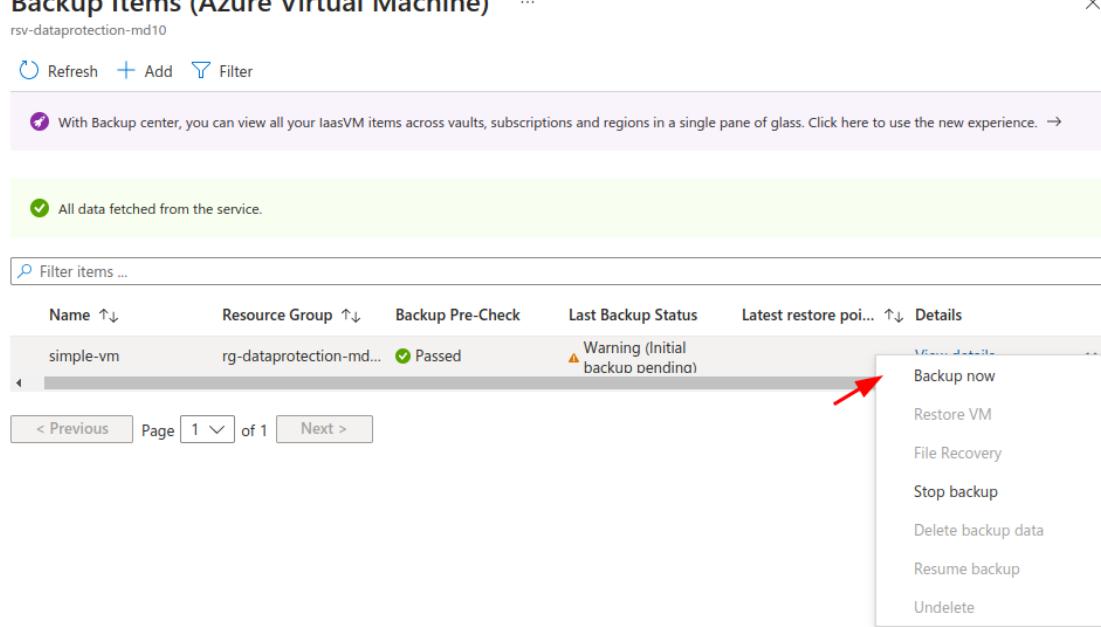
With Backup center, you can view all your IaaSVM items across vaults, subscriptions and regions in a single pane of glass. Click here to use the new experience. →

All data fetched from the service.

Filter items ...

Name ↑↓	Resource Group ↑↓	Backup Pre-Check	Last Backup Status	Latest restore poi... ↑↓	Details
simple-vm	rg-datatprotection-md...	Passed	Warning (Initial backup pending)		 Backup now Restore VM File Recovery Stop backup Delete backup data Resume backup Undelete

< Previous Page 1 of 1 Next >



- Sempre que for remover um recurso com politica de bkp, deve-se stopar o bkp
- Vamos realizar o bkp manual

Backup now ...

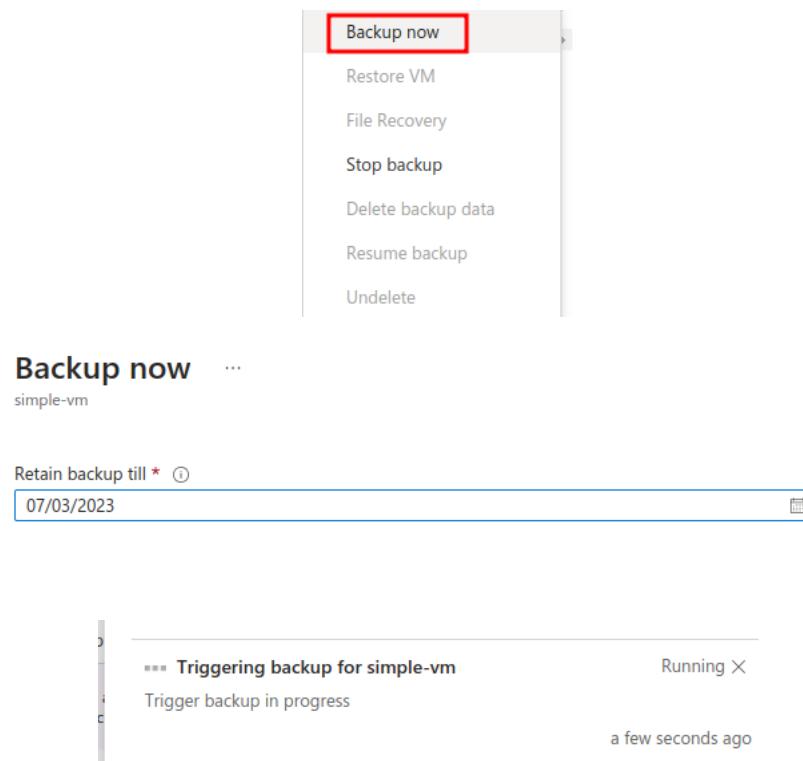
simple-vm

Retain backup till * ⓘ

07/03/2023 

Triggering backup for simple-vm Running X

Trigger backup in progress a few seconds ago



Triggering backup for simple-vm

Backup triggered successfully. Please monitor progress in backup jobs page.

a few seconds ago

- Em bkp jobs podemos ver o bkp sendo realizado, o bkp pode demorar até 30 minutos

Backup jobs

Refresh Select columns Feedback

Azure Site Recovery jobs can now be viewed across subscriptions, regions, vaults etc.. Click here to view all replication jobs. →

Datasource subscrip...	== Visual Studio Enterprise Subscription ...	Datasource resource group	== All	Datasource location	== All		
Datasource type	== Azure Virtual machines	Vault	== All	Time range	Last 24 hours		
Operation	== 2 selected	Status	In Progress				
<p>Displaying backup jobs in the Primary Region below. Use the Instance Region filter above to view the jobs in Secondary Region.</p> <input type="checkbox"/> Only show information about datasources which I have access to Learn more .							
<input type="text"/> Filter by backup instance							
1-1 of 1 items							
Backup instance	↑↓	Datasource subs...	Datasource reso...	Datasource loca...	Operation	Status	Vault
simple-vm		Visual Studio Enterpr...	rg-dataprotection-m...	East US	On-demand backup	In progress	rsv-dataprotecti

- Após concluir o bkp podemos ver o bkp já realizado no ambiente

Backup

simple-vm

Refresh Cancel Deploy Template Feedback

Job details

VM Name	simple-vm
Recovery Point Expiry Time in UTC	7/3/2023 4:23:54 PM
Backup Size	10358 MB
Activity ID	9b4b4669-c06f-4377-bab1-753b367ad03d

Sub tasks

Name	Status	Duration
Take Snapshot	Completed	00:08:36
Transfer data to vault	Completed	01:03:34

▼ Lab03 - Implantar bkp de arquivos e pastas em máquina on-premises com cliente MARS

- Vamos demonstrar como realizar o bkp de uma maquina onpremisses

- Vamos escolher agora em backup goal o onpremises
- No caso vamos selecionar bkp de arquivos e pastas

- Em prepara infraestrutura podemos ver os passos para a realização, no caso baixar o instalar o client, baixar o agent que seria a chave do vault

Step: Prepare Infrastructure

[Prepare Infrastructure](#)

Prepare infrastructure

Recovery Services Agent

Please follow the steps mentioned below.

1. Install Recovery Services agent
[Download Agent for Windows Server or Windows Client](#)

2. Download vault credentials to register the server to the vault. Vault credentials will expire after 10 days.

Already downloaded or using the [latest Recovery Services Agent](#)

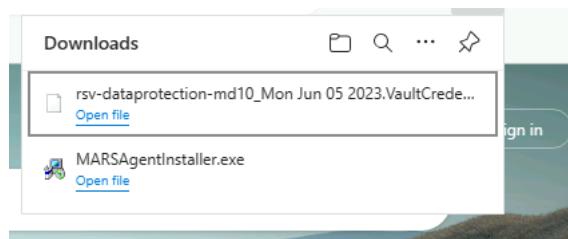
[Download](#)

3. Schedule backup using Recovery Services Agent UI. [Learn More](#)

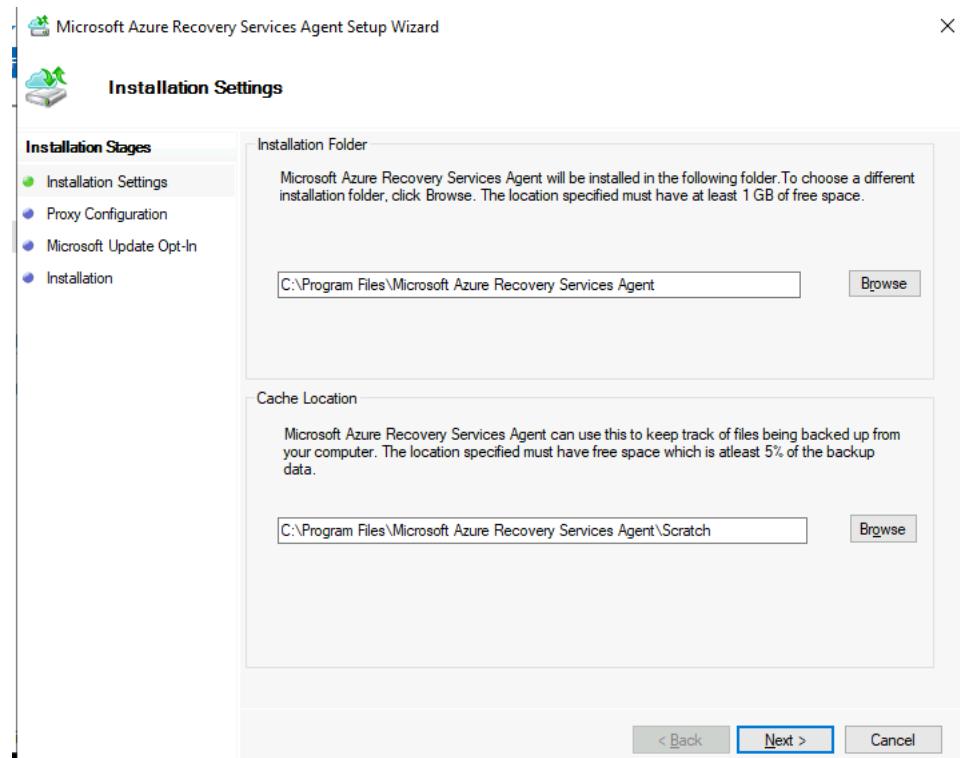
4. Once the backups are scheduled, you can use backup jobs page to monitor the backups. [Browse jobs page](#)

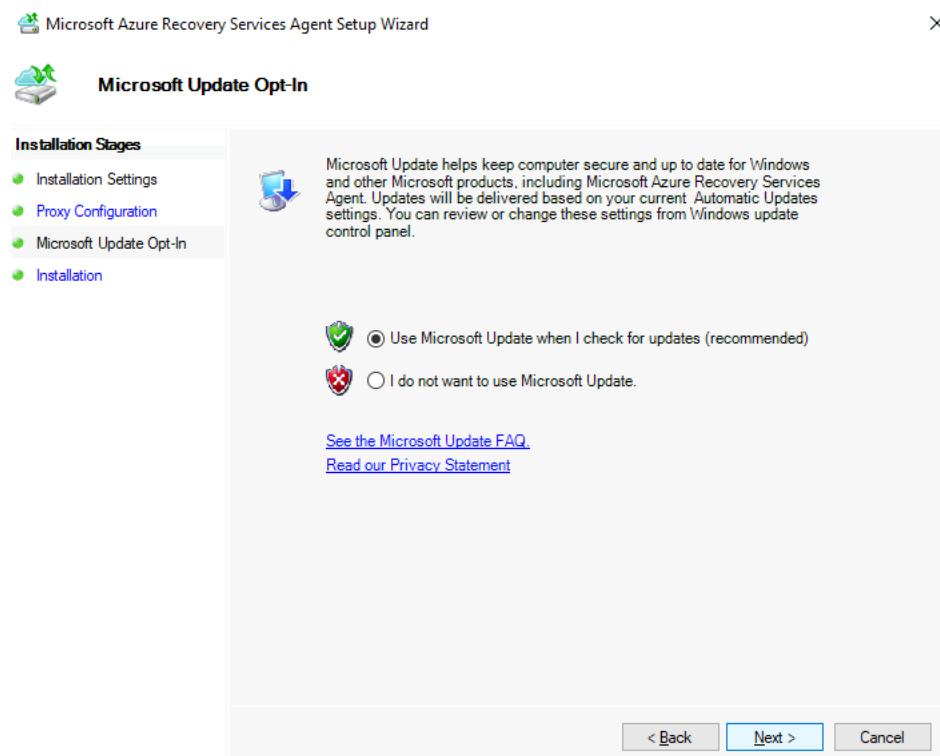
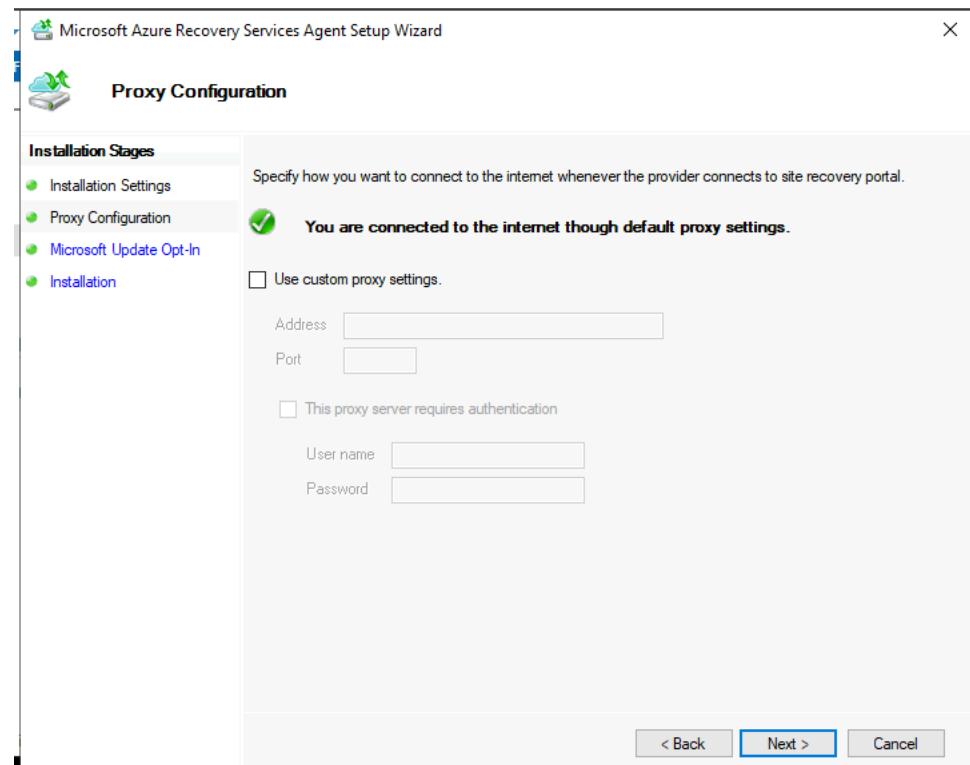
5. You can also Configure Notifications from alerts page to receive email alerts for backup failures. [Browse alerts page](#)

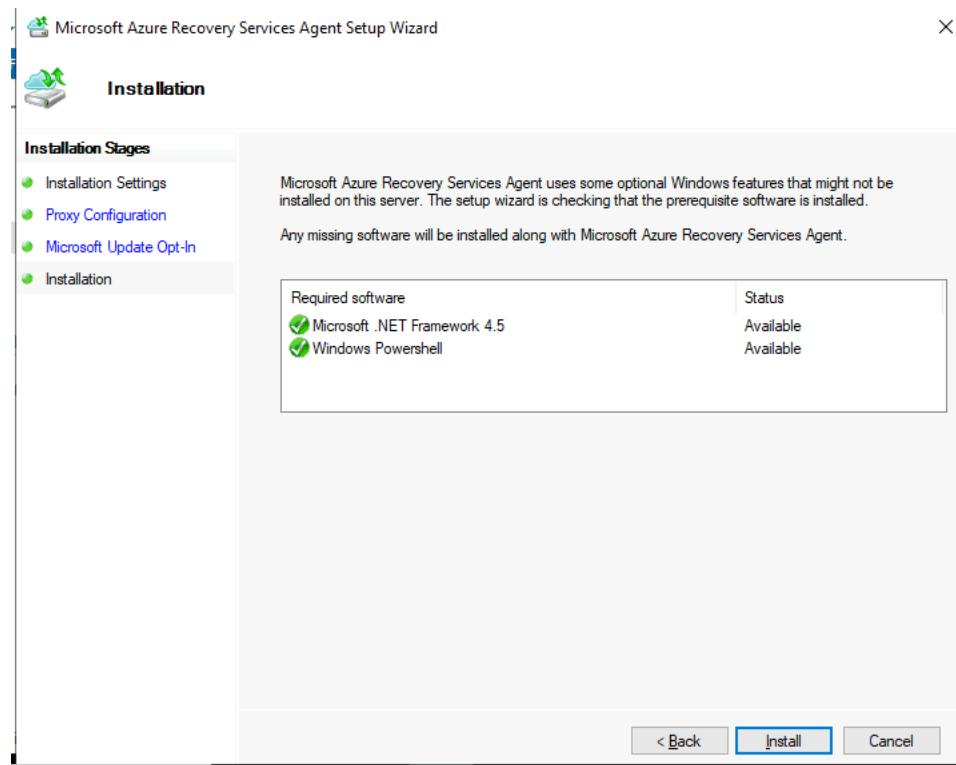
- Vamos realizar o download e seguir com a instalação em nossa maquina (Ou em uma VM para fins de teste)
- Em seguida vamos baixar as credenciais, e selecionar na tela de insalação do mars



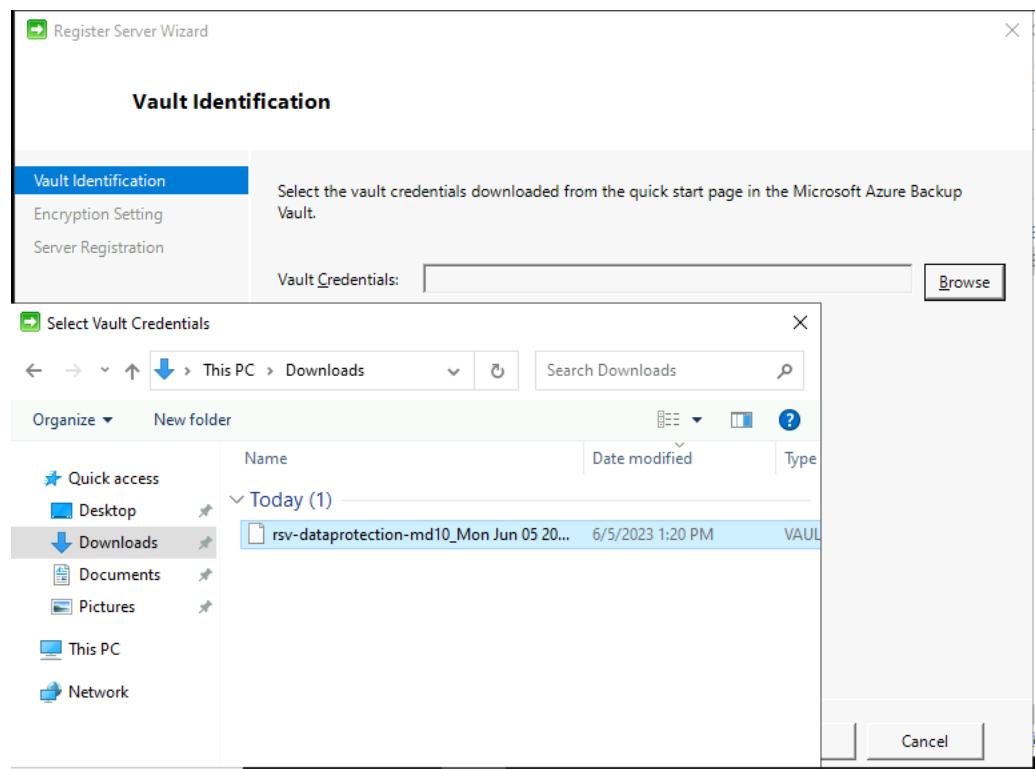
- Vamo seguir com a instalação padrão

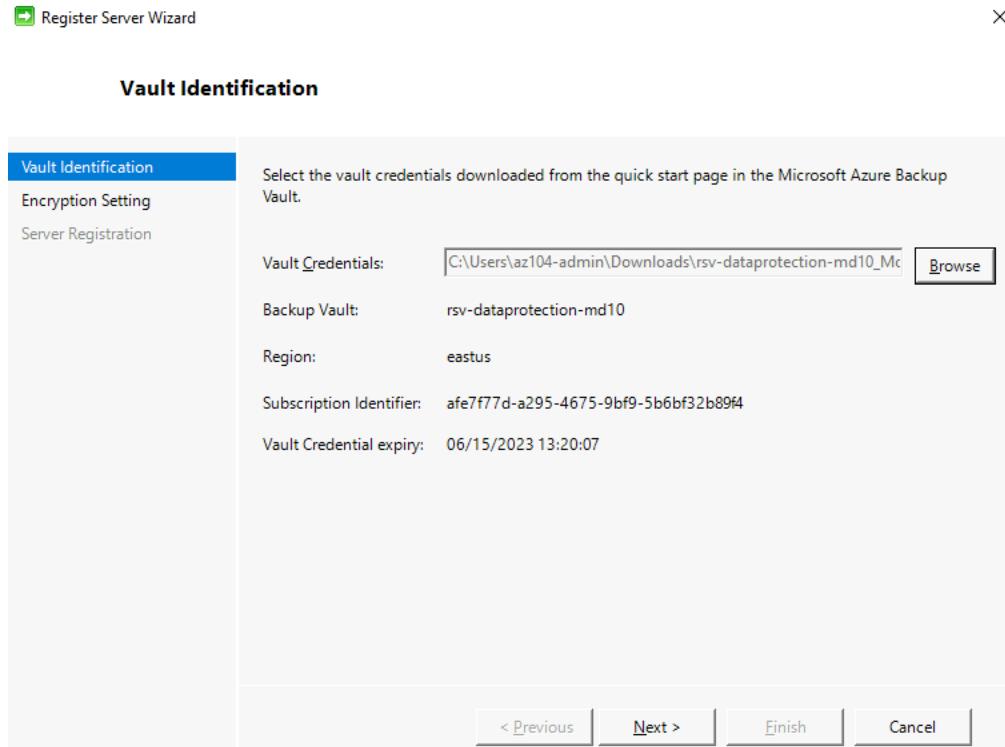




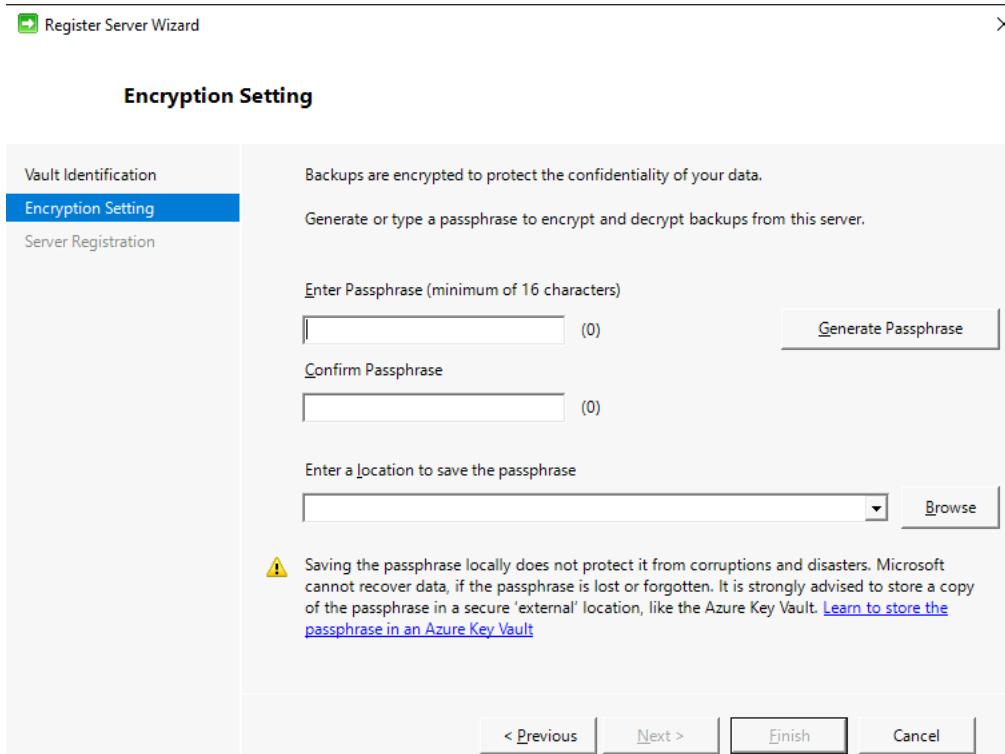


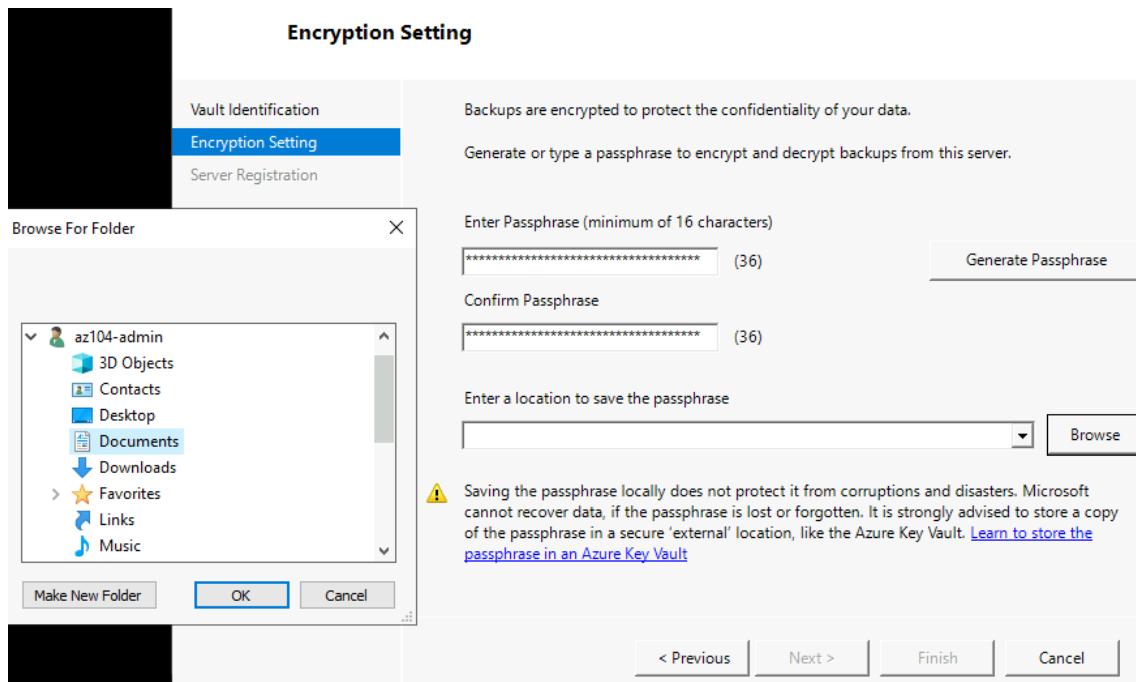
- Vamos setar a key que baixamos para registrar nosso MARS com o nosso az recovery vault





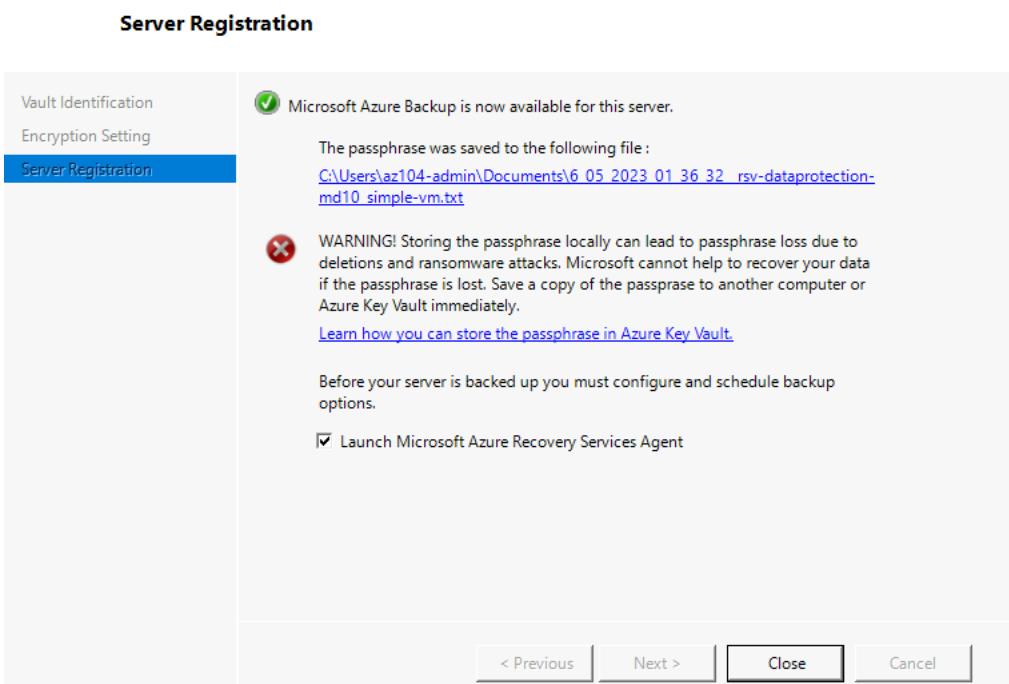
- Em seguida vamos definir a criptografia e salvar em alguma pasta, no caso documents
 - Podemos salvar está key criptografada no az vault



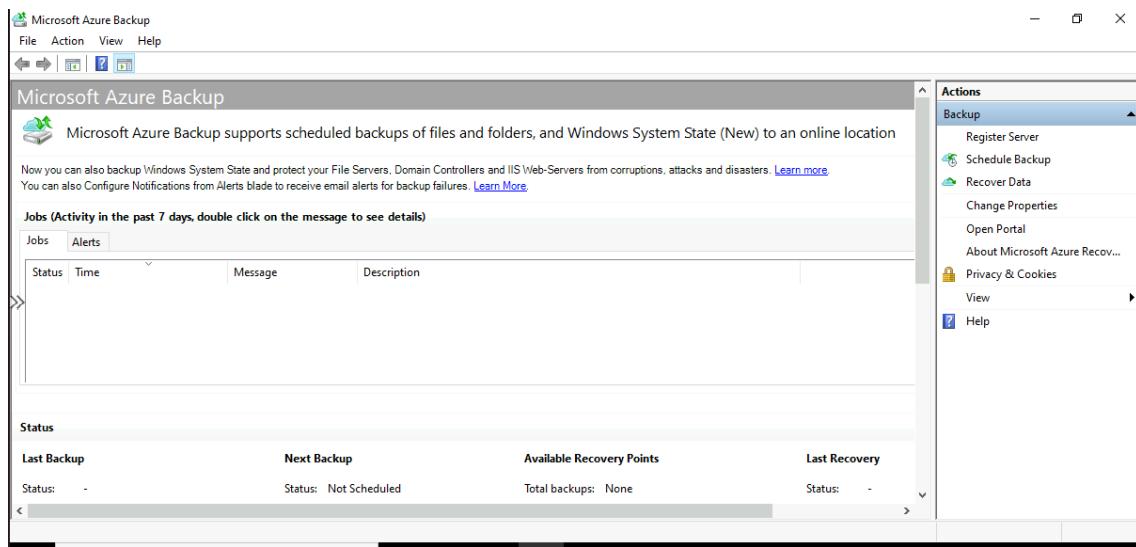


- Feito isso o nosso registro estará completo

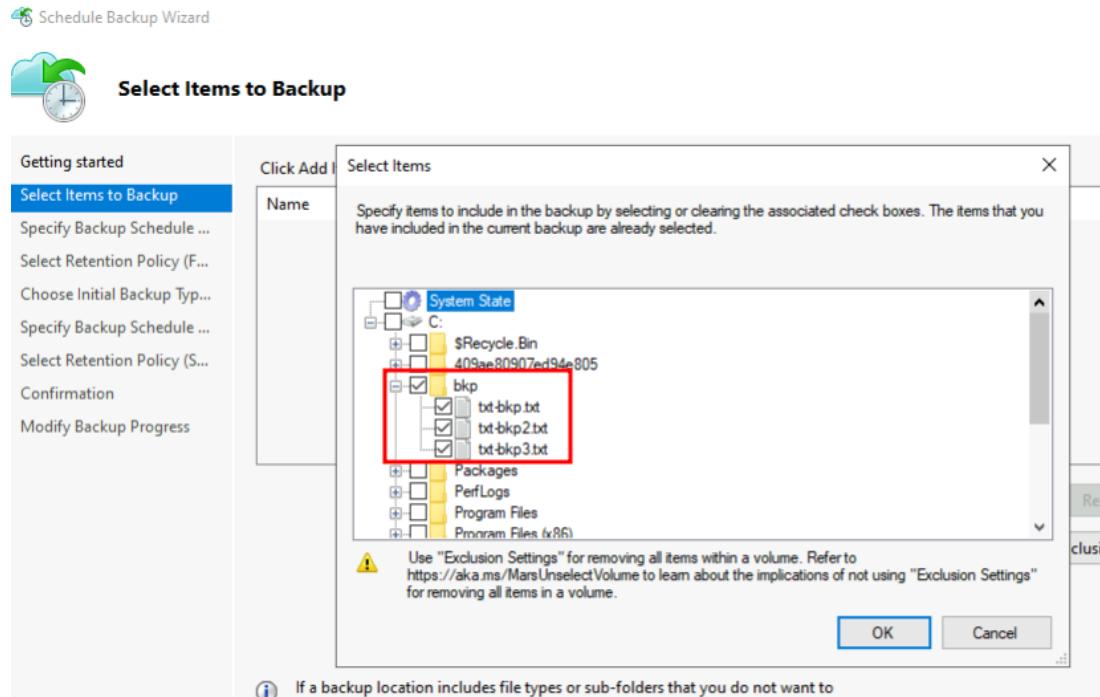
Register Server Wizard



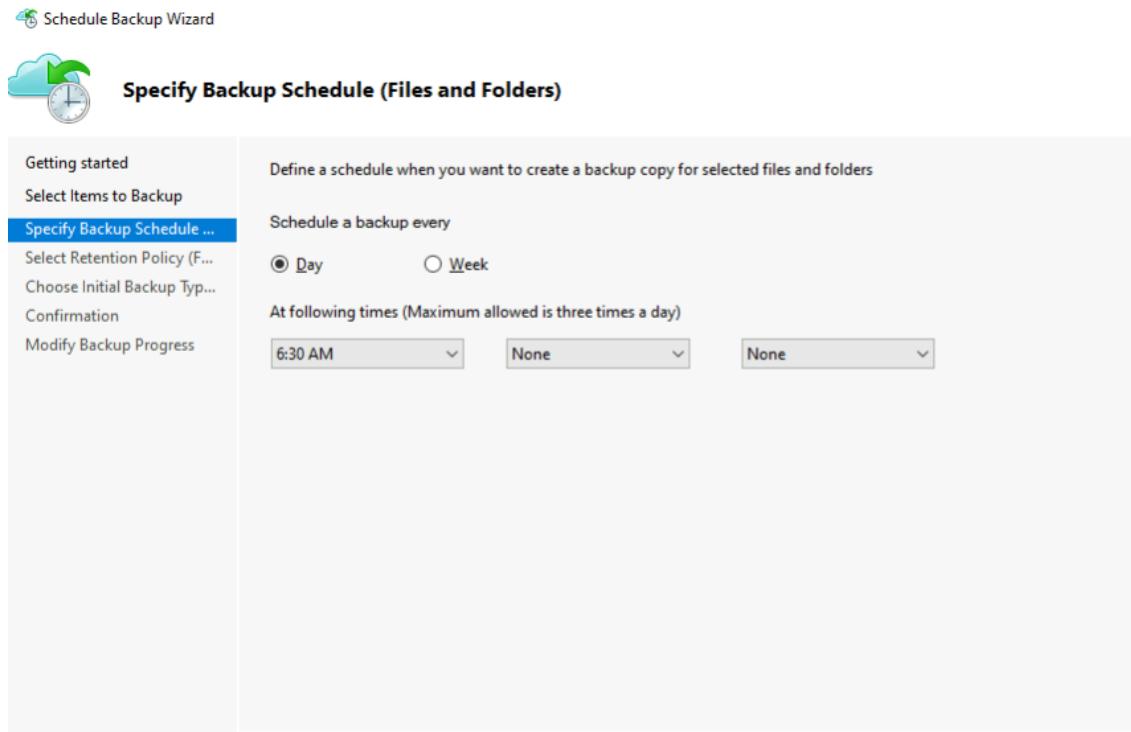
- Feito isso, podemos configurar todo o backup através do proprio client e não pelo portal do azure
 - Podemos selecionar arquivos específicos para salvar
 - Vamo em schedule backup



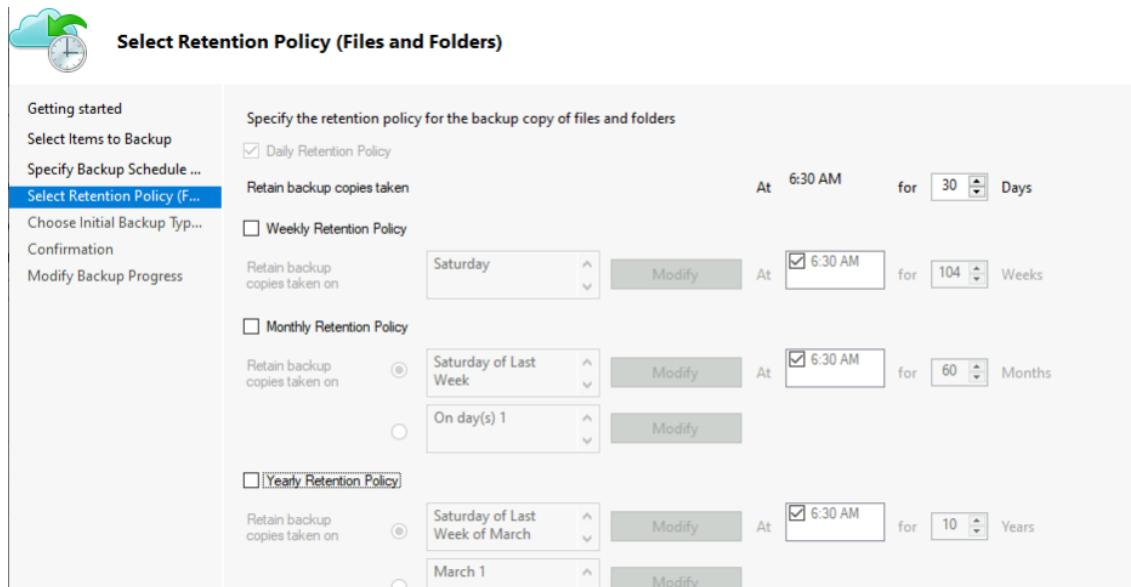
- Vamos selecionar uma pasta



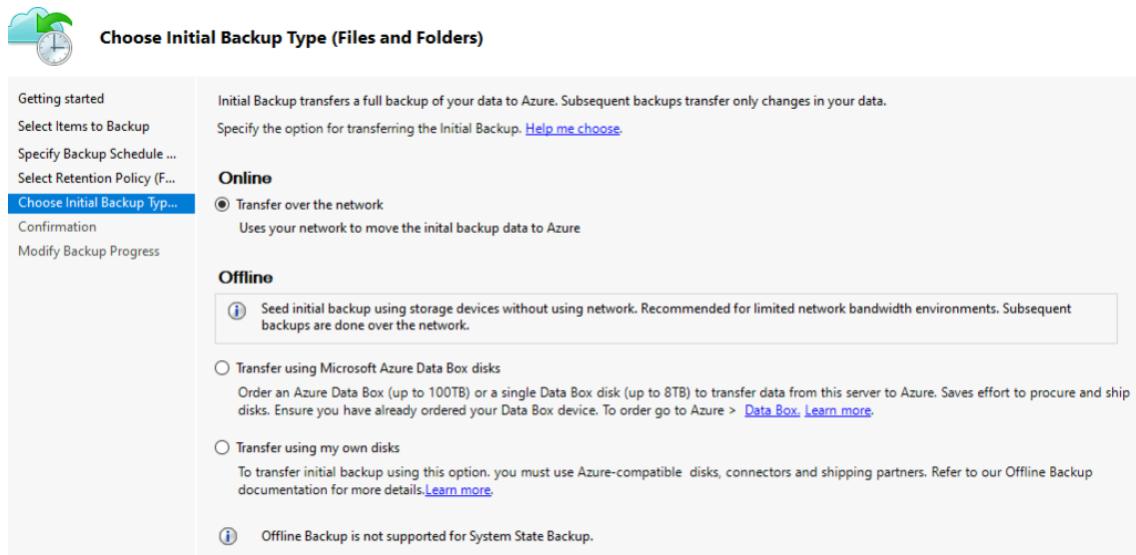
- Vamos definir o agendamento, podemos definir 3 agendamentos no Mars, vamos definir padrão diário



- Definimos também a política de retenção pelo próprio mars, no caso vamos deixar como 30 dias

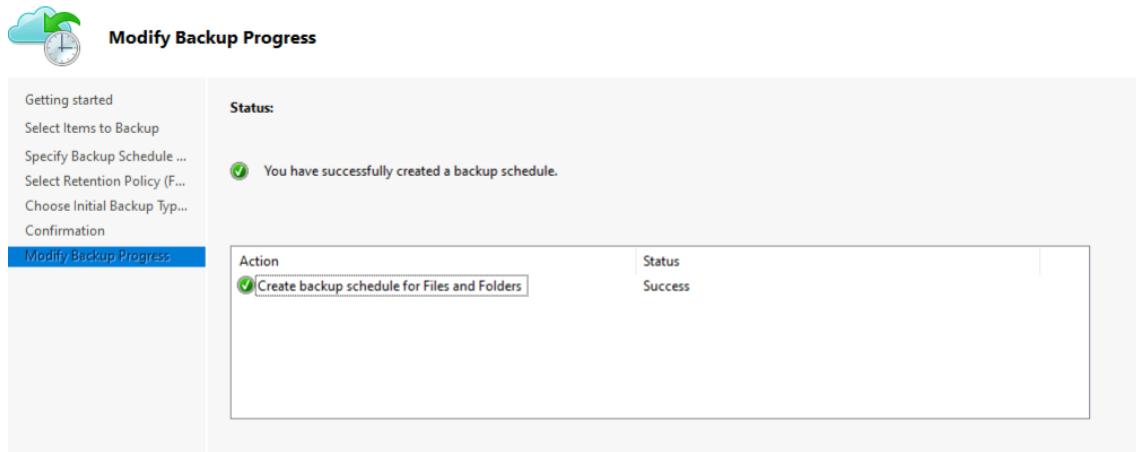


- Vamos selecionar a transferência online no caso, mas podemos enviar por data box para o datacenter



The screenshot shows the 'Choose Initial Backup Type (Files and Folders)' step in a backup wizard. The left sidebar lists steps: Getting started, Select Items to Backup, Specify Backup Schedule ..., Select Retention Policy (F...), Choose Initial Backup Typ..., Confirmation, and Modify Backup Progress. 'Choose Initial Backup Typ...' is selected. The main area has two sections: 'Online' (selected) which says 'Transfer over the network' and 'Uses your network to move the initial backup data to Azure'; and 'Offline' which includes options for 'Transfer using Microsoft Azure Data Box disks' (described as ordering an Azure Data Box or disk), 'Transfer using my own disks' (described as using Azure-compatible disks), and a note that 'Offline Backup is not supported for System State Backup.'

- Em seguida seguimos concluindo



The screenshot shows the 'Modify Backup Progress' step. The left sidebar lists steps: Getting started, Select Items to Backup, Specify Backup Schedule ..., Select Retention Policy (F...), Choose Initial Backup Typ..., Confirmation, and Modify Backup Progress. 'Modify Backup Progress' is selected. The main area shows a status message: 'Status: You have successfully created a backup schedule.' Below it is a table:

Action	Status
Create backup schedule for Files and Folders	Success

- Feito isso o backup no onpremises está configurado

rsv-dataprotection-md10 | Backup items

Recovery Services vault

Search Refresh

Properties Locks

Getting started

Backup Site Recovery

Protected items

Backup items (selected)

Replicated items

Manage

Backup policies

Backup Infrastructure

Site Recovery infrastructure

For backups, try our new Backup Center. It offers Azure Backup customers a unified view of Recovery Services used for backup in Azure. It also provides improved sorting and filtering along with new governance capabilities. Click here to get the new experience.

Primary Region Secondary Region

BACKUP MANAGEMENT TYPE	BACKUP ITEM COUNT
Azure Virtual Machine	1
Azure Backup Agent (highlighted)	1
Azure Backup Server	0
DPM	0
Azure Storage (Azure Files)	0
SQL in Azure VM	0
SAP HANA in Azure VM	0

- Vamos seleccionar para realizar o backup manual

Actions

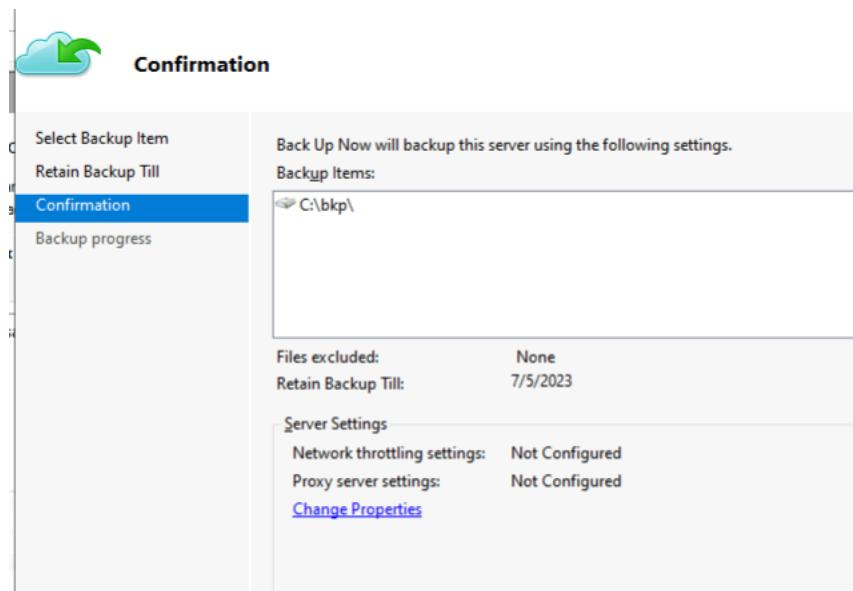
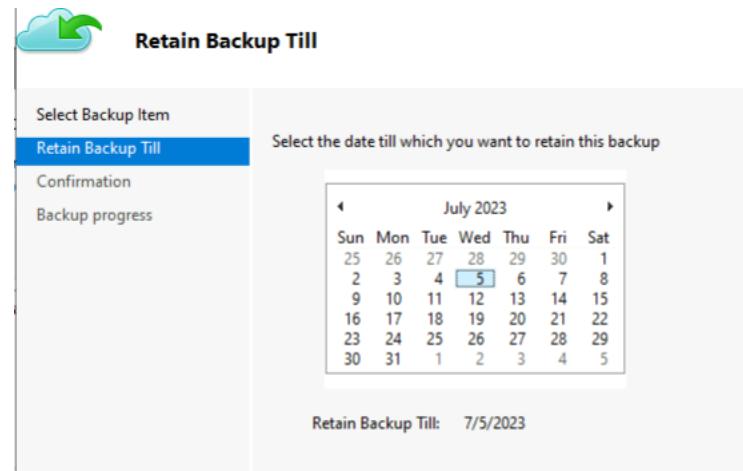
Backup Register Server Schedule Backup Back Up Now (highlighted) Recover Data Change Properties

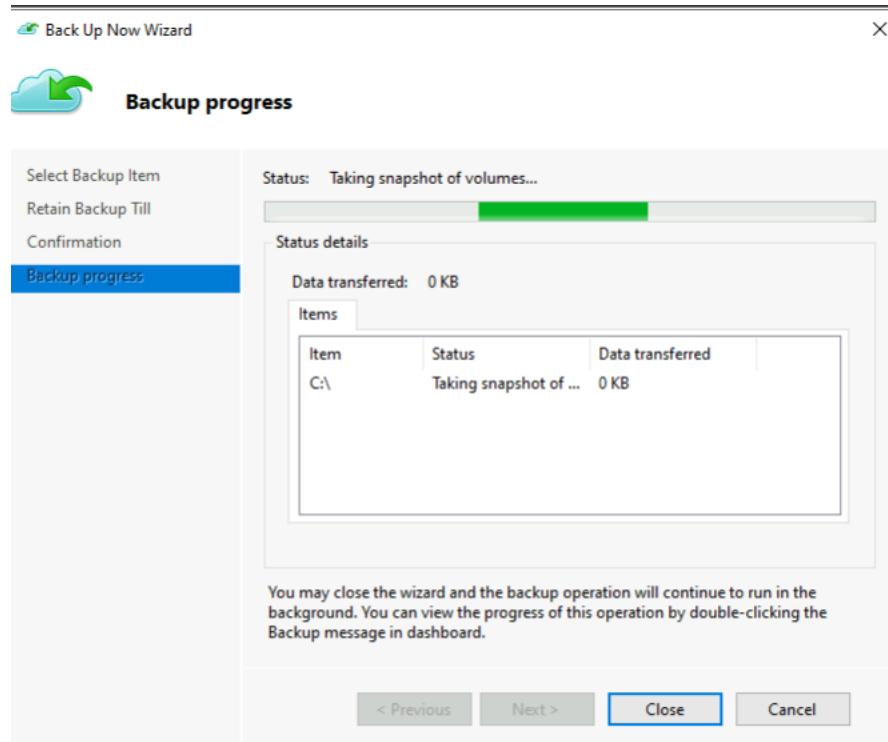
Select Backup Item

Select Backup Item Retain Backup Till Confirmation Backup progress

What do you want to back up?

Files and Folders System State Policy is paused or not created





Microsoft Azure Backup

Microsoft Azure Backup supports scheduled backups of files and folders, and Windows

Now you can also backup Windows System State and protect your File Servers, Domain Controllers and IIS Web-Servers from co

You can also Configure Notifications from Alerts blade to receive email alerts for backup failures. [Learn More](#).

Jobs (Activity in the past 7 days, double click on the message to see details)

Jobs	Alerts		
Status	Time	Message	Description
✓	6/5/2023 1:45 PM	Backup	Job completed.

- Após concluir o backup, indo no portal podemos ver o client e que há uma maquina com bkp agent

Backup Items (Azure Backup Agent) ...

rsv-dataprotection-md10

⟳ Refresh + Add ⚙ Filter

All data fetched from the service.

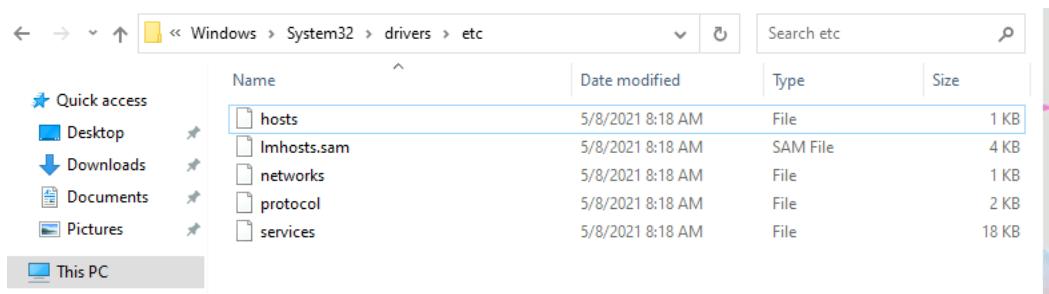
Filter items ...

Backup item ↑↓	Protected server ↑↓	Last backup	Last backup time ↑↓	Details
CA	simple-vm.	-	31/12/2000, 22:00:00	View details ⋮

< Previous Page 1 of 1 Next >

▼ Lab04 - Execute a recuperação da VM

- Vamos realizar o restore de um backup em nossa vm
 - Vamos primeiramente alterar a vm
 - Vamos remover o arquivo host da maquina em windows > system32 > drivers > etc



- Vamos voltar para o portal do azure e vamos em bkp agent, e vm

Home > Resource groups > rg-dataprotection-md10 > VMs > simple-vm > Backup history

Backup Items (Azure Virtual Machine) ...

rsv-dataprotection-md10

⟳ Refresh + Add ⚙ Filter

With Backup center, you can view all your IaaSVM items across vaults, subscriptions and regions in a single pane of glass. Click here to use the new experience. →

All data fetched from the service.

Filter items ...

Name ↑↓	Resource Group ↑↓	Backup Pre-Check	Last Backup Status	Latest restore poi... ↑↓	Details
simple-vm	rg-dataprotection-md...	Passed	Success	05/06/2023, 05:13:55	View details ⋮

< Previous Page 1 of 1 Next >

- Podemos restaurar a vm ou os arquivos

simple-vm

Backup Item

Backup now Restore VM File Recovery Stop backup Resume backup Delete backup data ...

For backups, try our new Backup Center. It offers Azure Backup customers a unified view of Recovery Services Vaults used for backup in Azure. It also provides improved sorting and filtering along with new governance capabilities. Click here to get the new experience.

Essentials

Recovery services vault
[rsv-dataprotection-md10](#)

Subscription ([move](#))
[Visual Studio Enterprise Subscription – MPN](#)

Subscription ID
afe7f77d-a295-4675-9bf9-5b6bf32b89f4

Alerts (in last 24 hours)
[View alerts](#)

Jobs (in last 24 hours)
[View jobs](#)

Backup Pre-Check

Passed

Last backup status

Success 05/06/2023, 05:13:52

Backup policy

[policy-dataprotection-md10](#)

Oldest restore point
03/06/2023, 13:24:00 (1 day(s) ago)

Recovery points

This list is filtered for last 30 days of recovery points. To recover from recovery point older than 30 days, as well as vault-archive, [click here](#).

- No caso iremos restaurar o arquivo

simple-vm

Backup Item

Backup now Restore VM File Recovery Stop backup

For backups, try our new Backup Center. It offers Azure Backup customers a unified view of Recovery Services Vaults used for backup in Azure. It also provides improved sorting and filtering along with new governance capabilities. Click here to get the new experience.

File Recovery

simple-vm

Step 1: Select recovery point

Restore point *

No restore point selected

Select

File Recovery

simple-vm

Step 1: Select recovery point

Restore point *

Select

Select restore point

simple-vm

Start Date	End Date	Recovery point consistency	
05/22/2023	06/05/2023	All restore points	
CRASH CONSISTENT	APPLICATION CONSISTENT	FILE-SYSTEM CONSISTENT	
Time	Consistency	Recovery Type	Expiry time
05/06/2023, 5:13:55 AM	Application Consistent	Snapshot and Vault-Standard	
04/06/2023, 5:16:35 AM	Application Consistent	Snapshot and Vault-Standard	06/06/2023, 8:16:35 AM
03/06/2023, 1:24:00 PM	Application Consistent	Snapshot and Vault-Standard	03/07/2023, 4:23:54 PM

File Recovery

simple-vm

Step 1: Select recovery point

Restore point *

03/06/2023, 1:24:00 PM

Select

Step 2: Download script to browse and recover files

This script will mount the disks from the selected recovery point **as local drives on the machine where it is run**. These drives will remain mounted for 12 hours.

Download Executable *

Requires password to run



Step 3: Unmount the disks after recovery

Unmount disks and close the connection to the recovery point.

Unmount Disks

- Para isso teremos que baixar o agent de file recovery que irá mapear uma unidade de rede através de um script, e essa unidade terá os arquivos do nossa VM recuperados de um bkp anterior

Please wait...

Generating script and password... Your download will start within a minute. You will require this password to run the script...

Step 2: Download script to browse and recover files

This script will mount the disks from the selected recovery point **as local drives on the machine where it is run**. These drives will remain mounted for 12 hours.

Download Executable *

Requires password to run



- Vamos baixar o instalador e vamos jogar na vm

Home >

File Recovery

simple-vm

Download

Your script file is ready to download.

[Download](#) [Cancel](#)

This script will mount the disks from the selected recovery point **as local drives on the machine where it is run**. These drives will remain mounted for 12 hours.

[Download Executable *](#)

✓ Download completed.

Requires password to run [largedisk_0_simple-vm_1_eus_3424086549260034543_215710431327_ee243...](#)

Step 3: Unmount the disks after recovery

The screenshot shows a web-based file recovery interface. At the top, there's a navigation bar with 'Home' and a back arrow. Below it is a section titled 'File Recovery' with a sub-section 'simple-vm'. A large 'Download' button is prominent. A message says 'Your script file is ready to download.' Below the button is a note about mounting disks as local drives. A progress bar indicates 'Download Executable *' is completed. A message 'Requires password to run' is followed by a long file path. At the bottom, a bold instruction 'Step 3: Unmount the disks after recovery' is displayed. Below this, a terminal window is open with a command line. The command 'ro' is typed, followed by 'Please enter the password from the portal as is and press enter:' and a password field containing 'f7db15fb6ab'. A red arrow points from the password field down to the terminal window. The terminal also shows 'Download completed.' and a 'Copied' message. The background of the interface includes a sidebar with 'Downloads' and other system status information.

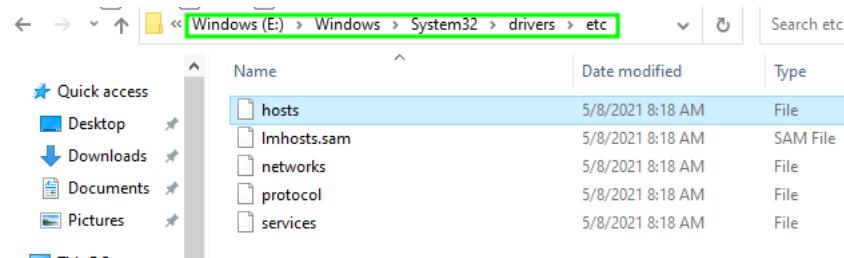
- No caso irá montar um disco com todo o BKP do sistema operacional

```

Administrator: Windows PowerShell
Checking for required cipher suite: DONE
Checking for Large Disks: DONE
Checking for Storage Pools: DONE
Connecting to recovery point using iSCSI
0
1
iSCSI target prepared
0
1
Connection succeeded!
Please wait while we attach volumes of the recovery point.
***** Open Explorer to browse for files.
> After recovery, to remove the disks and close the connection to the recovery point, run step 3 of the portal.
1 recovery volumes attached
E:\Windows
Mounting ILR Disk to path
Mounting ILR Disk to path
***** Open Explorer to browse for files.
After recovery, to remove the disks and close the connection to the recovery point, run step 3 of the portal.
Press 'Q/q' key to exit ...

```

- Vamos na pasta em que se encontra o host e podemos visualizalo lá



- Se houvesse mais discos na vm, ele ira trazer outros discos tbm
- Após o procedimento, podemos desmontar o disco pelo portal

Step 3: Unmount the disks after recovery

Unmount disks and close the connection to the recovery point.

Unmount Disks

Step 3: Unmount the disks after recovery

Unmount disks and close the connection to the recovery point.

Unmount Disks

✓ Unmount successful.

- Agora vamos restaurar a VM

simple-vm

Backup Item

Backup now Restore VM File Recovery Stop backup Resume backup Delete backup data

For backups, try our new Backup Center. It offers Azure Backup customers a unified view of Recovery Services Vaults used for backup, improved sorting and filtering along with new governance capabilities. Click here to get the new experience.

^ Essentials

Recovery services vault [rsv-dataprotection-md10](#)

Subscription ([move](#)) [Visual Studio Enterprise Subscription – MPN](#)

Subscription ID afe7f77d-a295-4675-9bf9-5b6bf32b89f4

Alerts (in last 24 hours) [View alerts](#)

Backup Pre-Check
Passed

Last backup status
Success 05/06/2023, 05:13:52

Backup policy [policy-dataprotection-md10](#)

Oldest restore point
03/06/2023, 13:24:00 (1 day(s) ago)

- Podemos restaurar a vm existente ou criar uma nova

Restore Virtual Machine

simple-vm

Restore allows you to restore VM/disks from a selected Restore Point.

Restore point * [Select](#)

Data Store Snapshot and Vault-Standard

Restore configuration

Create new Replace existing

ⓘ To create an alternate configuration when restoring your VM (from the following menus), use PowerShell cmdlets.

Restore Type *

Virtual machine name *

Subscription (Preview) *

- Vamos selecionar o restore de disco da vm

Restore configuration

Create new
 Replace existing

Info: The disk(s) from the selected restore point will replace the disk(s) in your existing VM. [Learn more about In-Place Restore.](#)

Restore Type:

Staging Location *: [Can't find your storage account?](#)

Info: The identities listed here are based on the MSI configurations in the corresponding Recovery services vault. [Learn more.](#)

Identities: Disabled

Restore

- É importante que a vm esteja desligada para esse procedimento

simple-vm

Virtual machine

Search

Connect Start Restart Stop Capture Delete Refresh

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Essentials

Resource group ([move](#))
rg-dataprotection-md10

Status
Stopped (deallocated)

Operating system
Windows

Size
Standard D2s v5 (2 vcpus, 8 GiB m)

Location
East US

Public IP address
[20.228.138.154](#)

- Feito isso vamos realizar o restore e aguardar

Restore Virtual Machine

simple-vm

Restore configuration

- Create new
 Replace existing

i The disk(s) from the selected restore point will replace the disk(s) in your existing VM. [Learn more about In-Place Restore.](#)

Restore Type [?](#)

Replace Disk(s)

Staging Location [*](#) [?](#)

cs2100320020771a3f2 (StandardLRS)



[Can't find your storage account?](#)

i The identities listed here are based on the MSI configurations in the corresponding Recovery services vault. [Learn more.](#)

Identities [?](#)

Disabled

Restore

*** Triggering restore for simple-vm

Running

Trigger restore in progress.

a few seconds ago

Restore

simple-vm



Refresh

Cancel

Deploy Template

Feedback

Target VM Name

Target Storage Account Name cs2100320020771a3f2

Recovery point time 6/3/2023 4:24:00 PM

Target resource group rg-dataprotection-md10

Activity ID b0c2cf81-730b-4904-a653-bf8fc810a044

Job status

Job progress

99% completed (00:02:00 remaining)

Sub tasks

Name	Status	Details
Transfer data from vault	Completed	1.12 TBs / 1.12 TBs Transferred
Update the virtual machine	In progress	

- Após concluir, vamos validar a vm

Restore ...

simple-vm

Refresh Cancel Deploy Template Feedback

Target VM Name	simple-vm
Target Storage Account Name	cs2100320020771a3f2
Recovery point time	6/3/2023 4:24:00 PM
Target resource group	rg-datatransfer-md10
Activity ID	b0c2cf81-730b-4904-a653-bf8fc810a044

Job status

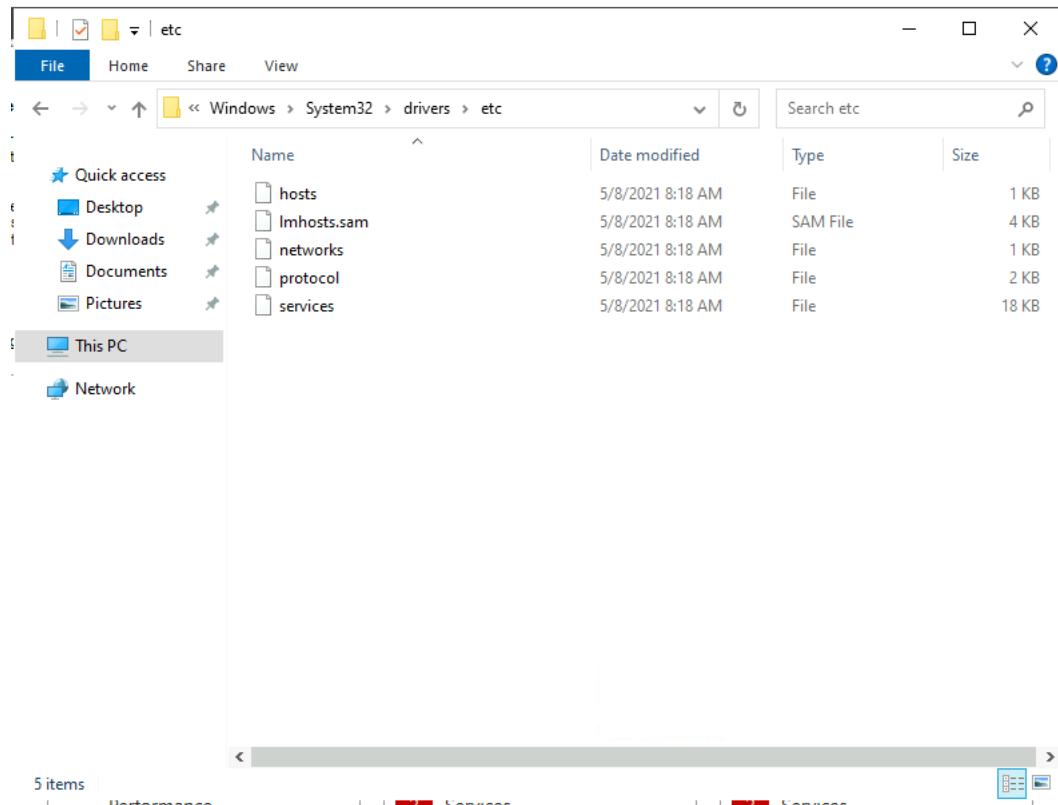
Job progress

100% completed

Sub tasks

Name	Status	Details
Transfer data from vault	✓ Completed	1.12 TBs / 1.12 TBs Transferred
Update the virtual machine	✓ Completed	

- E a mesma restaurou normalmente



▼ Lab05 - Execute a recuperação de arquivos da máquina on-premises

- Vamos recuperar os arquivos de nosso computador onpremises
 - Vamos até a pasta em que está ocorrendo a recuperação

	Name	Date modified	
access	409a29907ed94e805	6/5/2023 1:29 PM	F
top	bkp	6/3/2023 5:32 PM	F
nloads	Packages	6/3/2023 5:01 PM	F
iments	PerfLogs	5/8/2021 8:20 AM	F
res	Program Files	6/5/2023 1:27 PM	F

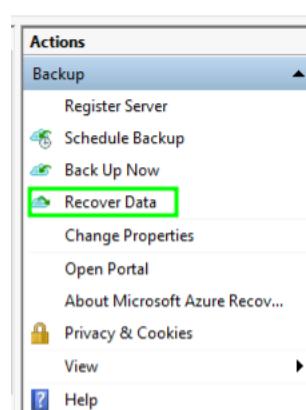
- E vamos excluir todos os arquivos

Name	Date modified	Type	Size
txt-bkp	6/3/2023 5:31 PM	Text Document	0 KB
txt-bkp2	6/3/2023 5:32 PM	Text Document	0 KB
txt-bkp3	6/3/2023 5:32 PM	Text Document	0 KB

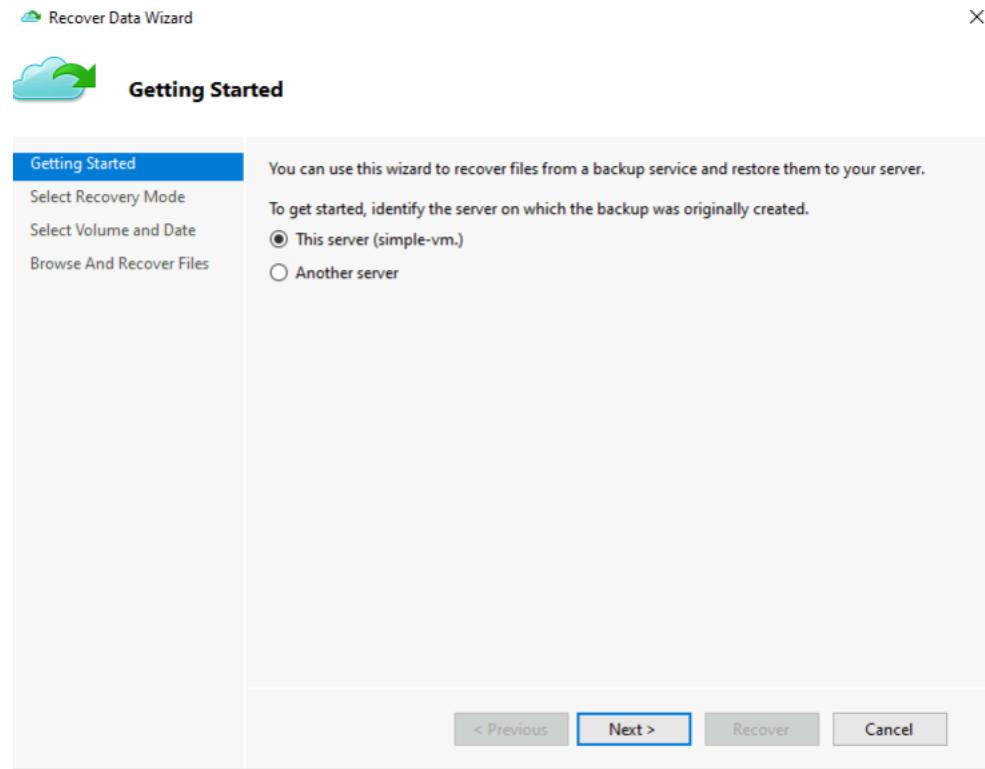
This PC > Windows (C:) > bkp

Name	Date modified	Type
		This folder is empty.

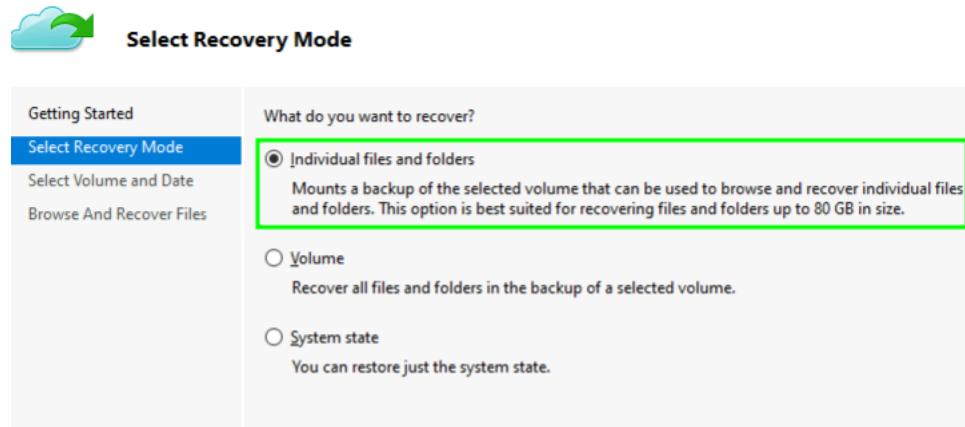
- Vamos no Mars, e vamos em recuperar dados



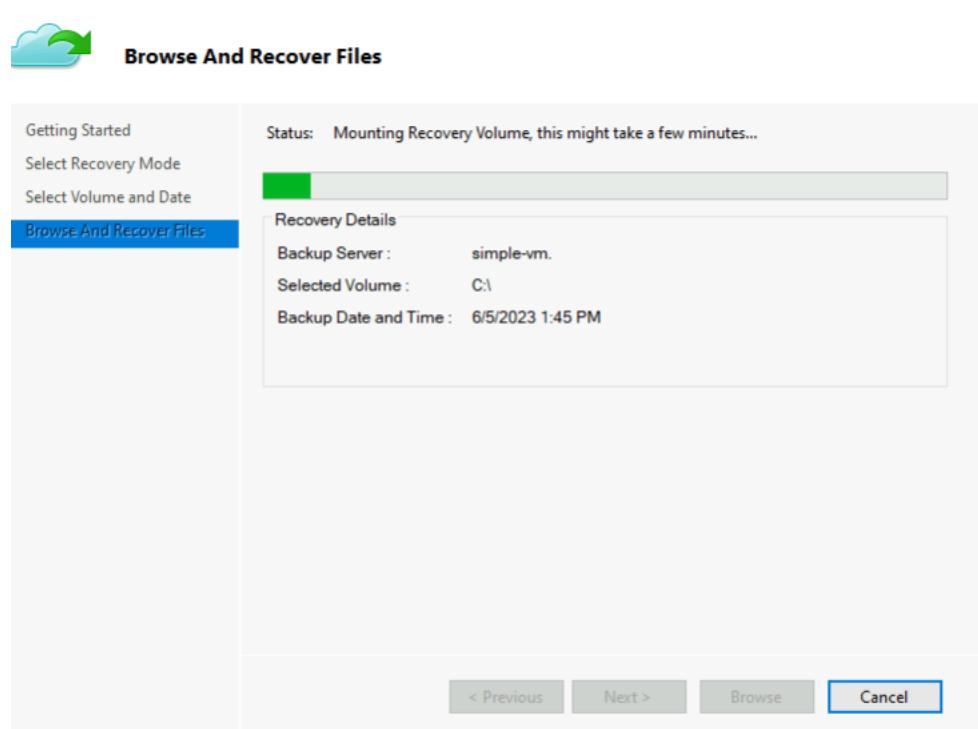
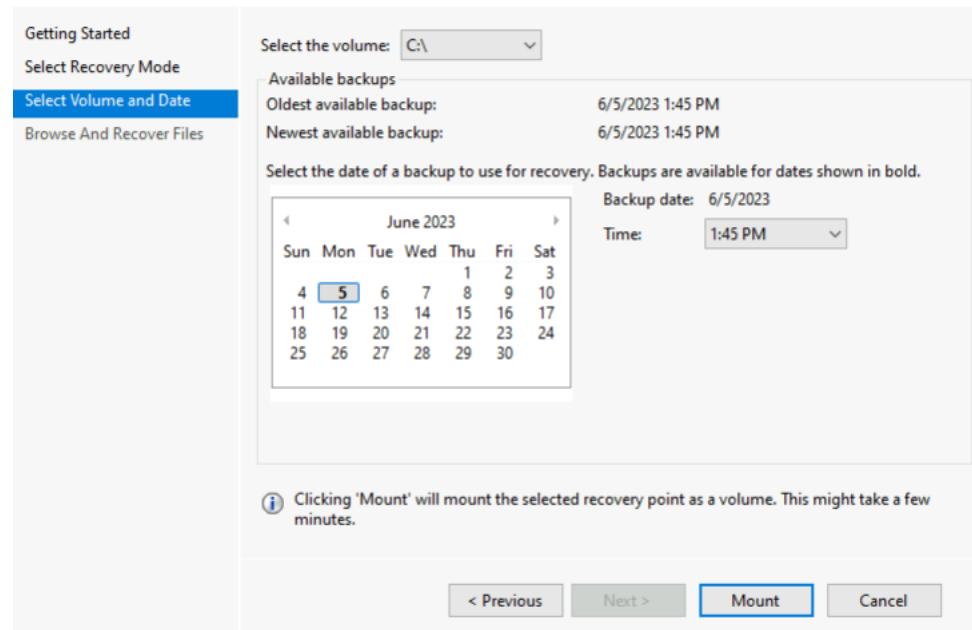
- Podemos selecionar desta maquina ou de outra (Esta opção é para caso nós tenhamos que recuperar em outro computador)

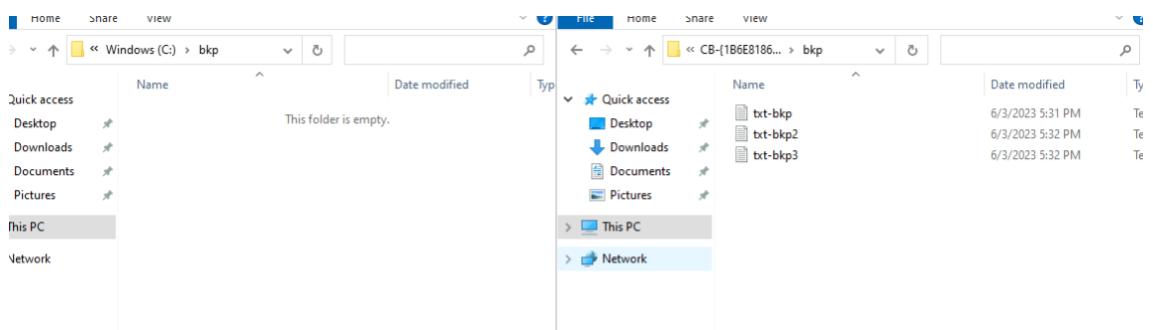
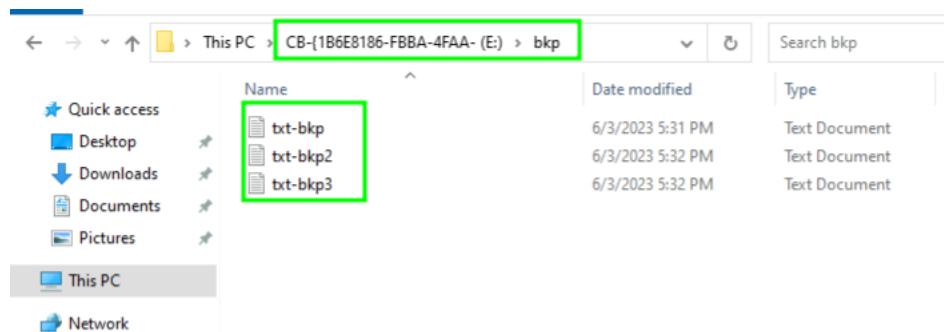
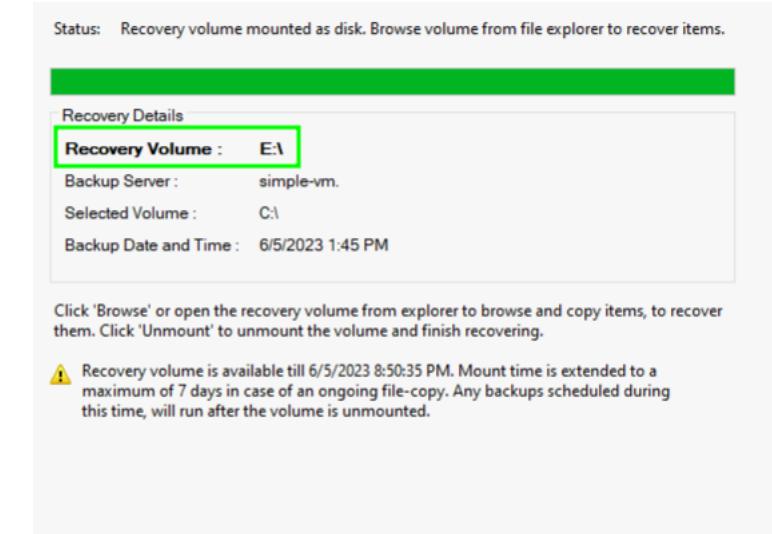


- Vamos selecionar a pasta de arquivos

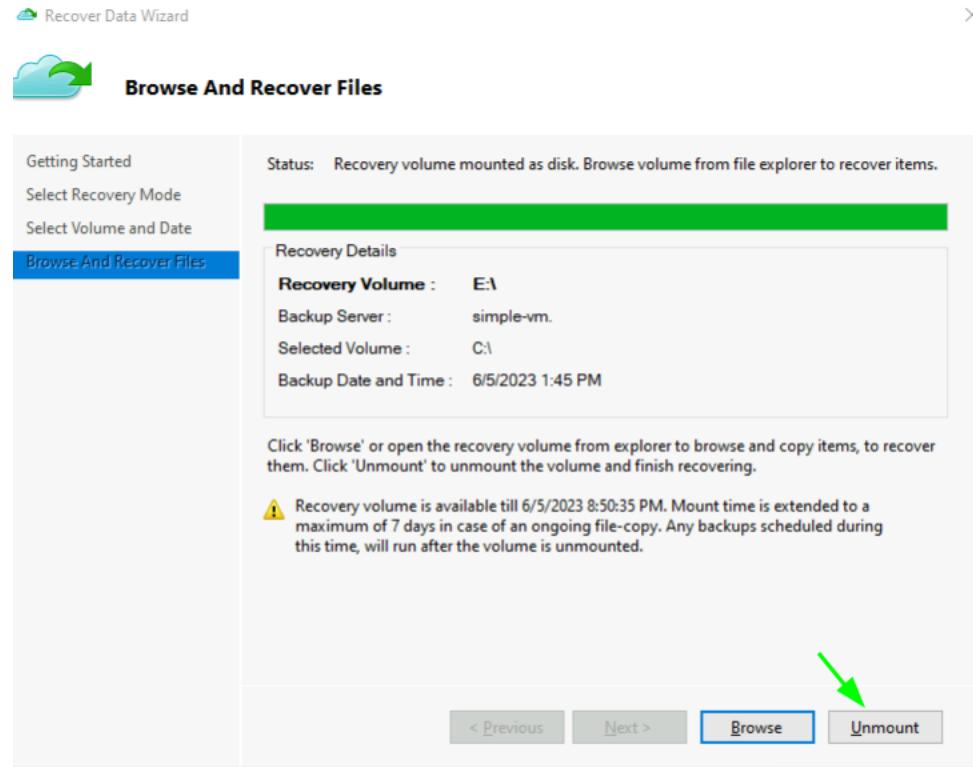


- Vamos selecionar o backup, e ele irá montar um VHD (assim como no caso da vm), e pelo disco já montado em nossa maquina, podemos validar e mover todos os arquivos recuperados para a nossa maquina novamente





- Em seguida após recuperar os dados podemos desmontar o disco criado no proprio mars

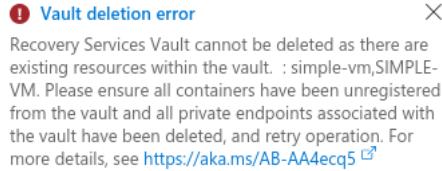


- No mars toda atividade de bkp e recuperação são feitas via client

The screenshot shows the Microsoft Azure Backup interface. The main area displays a list of completed jobs: one recovery job at 6/5/2023 2:50 PM and one backup job at 6/5/2023 1:45 PM. The 'Actions' menu on the right is expanded, showing options like 'Backup', 'Schedule Backup', 'Back Up Now', 'Recover Data', 'Change Properties', 'Open Portal', 'About Microsoft Azure Recov...', 'Privacy & Cookies', 'View', and 'Help'. A green arrow points to the 'Recover Data' option in the menu.

▼ Lab06 - Revise a funcionalidade do softdelete do azure recovery services

- Se tentarmos deletar o Recovery service vault iremos receber um erro



- No caso um passo que precisamos fazer é desabilitar o soft delete
 - O soft delete permite manter os dados excluídos por 13 dias

Security Settings

rsv-datatoprotectio-md10

Save Discard

If you have enabled [Azure multi-factor authentication](#), you will be required to additionally authenticate using another device (for example, a mobile phone) while signing in to the Azure portal.

Soft Delete (For workloads running in Azure)
Enable this setting to protect backup data for Azure VM, SQL Server in Azure VM and SAP HANA in Azure VM from accidental deletes. [Learn More](#)

Enable **Disable**

All Future deletes will be immediate and will not have soft delete protection. [Learn more](#).
This action will not impact items already in soft deleted state. If you wish to delete these permanently with immediate effect please refer to the documentation. [Learn more](#).

Security Features (For workloads running on-premises)
Enable this setting to protect hybrid backups against accidental deletes and add additional layer of authentication for critical operations. Refer [this link](#) for minimum agent version requirement to enable this setting. [Learn more](#).

Enable **Disable**

- Em seguida precisamos seguir os demais passos para e apagar RSV

Step 2: Stop Backup and Delete Cloud Protected Items

Backup items ⓘ [Go to Backup Items](#) | View procedure steps

Step 3: Cleanup associations of Servers and Storage Accounts

Servers and Storage accounts ⓘ [Go to Backup Infrastructure](#) | View procedure steps

Step 4: Disable Replication for Site Recovery Replicated Items

Site Recovery Items ⓘ [Go to Replicated Items](#)

Step 5: Clean up dependencies related to your Site Recovery Replicated Items

Replication Policies, Servers ⓘ [Go to documentation](#)

Step 6: Remove Private Endpoint Connections

Private Endpoint Connections ⓘ [Go to Private Endpoints](#)

- Para que possamos deletar o recurso recovery service vault a primeira coisa que deve ser feito é dar um stop job e limpar todos os backups

Backup Items (Azure Virtual Machine)

rsv-dataprotection-md10

⟳ Refresh + Add ⚙ Filter

With Backup center, you can view all your IaaSVM items across vaults, subscriptions and regions in a single pane of glass. Click here to use the new experience. →

✓ All data fetched from the service.

Filter items ...

Name ↑↓	Resource Group ↑↓	Backup Pre-Check	Last Backup Status	Latest restore poi... ↑↓	Details
simple-vm	rg-dataprotection-md...	✓ Passed	⚠ Warning (Backup disabled)	05/06/2023, 11:32:57	View details

- Agora seguiremos com o delete

- No caso do Mars vamos deletar o backup

Azure Backup Agent

1

Backup Items (Azure Backup Agent)

rsv-dataprotection-md10

⟳ Refresh + Add ⚙ Filter

✓ All data fetched from the service.

Filter items ...

Backup item ↑↓	Protected server ↑↓	Last backup	Last backup time ↑↓	Details
C:\	simple-vm.	✓ Success	05/06/2023, 11:50:37	View details

C:\ on simple-vm. ...

Backup Item

Essentials

Recovery services vault
[rsv-dataprotection-md10](#)

Computer name
[simple-vm.](#)

Last backup status
Success

Last refreshed at
05/06/2023, 11

Item Type
File-Folders

Monitoring

- BKP local é mais fácil de apagar

simple-vm. ...

Protected Servers

Connect

Essentials ^

Recovery services vault
[rsv-dataprotection-md10](#)

Computer name
[SIMPLE-VM.](#)

Item type

Backup items
C:\

Last backup status
Success

Last refreshed at
05/06/2023, 11:56:08

Version information
2.0.9251.0

Backup policy
Backup policy

Usage

Backup item

1

- Porém vamos deixar esta opção desabilitada também para evitar erros

Security Features (For workloads running on-premises)
Enable this setting to protect hybrid backups against accidental deletes and add additional layer of authentication for critical operations. Refer [this link](#) for minimum agent version requirement to enable this setting. [Learn more](#).

[Enable](#) [Disable](#)

Deletion Successful
Successfully completed the operation.

- Feito isso todos os Backups Items irão se encontrar zerados

Backup Items

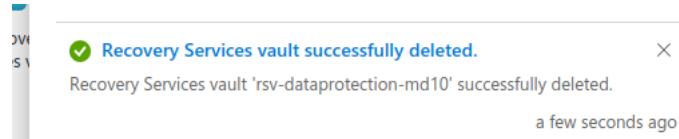
Refresh

For backups, try our new Backup Center. It offers Azure Backup customers a unified view of Recovery Services Vaults with improved sorting and filtering along with new governance capabilities. Click here to get the new experience.

Primary Region Secondary Region

BACKUP MANAGEMENT TYPE	BACKUP ITEM COUNT
Azure Virtual Machine	0
Azure Backup Agent	0
Azure Backup Server	0
DPM	0
Azure Storage (Azure Files)	0
SQL in Azure VM	0
SAP HANA in Azure VM	0

- Estando com todos os backups zerados, podemos apagar o recovery service vault por completo



▼ Monitoring

▼ Lab01 - Criar ambiente para laboratório

- Vamos criar a partir dos JSONs para criar os RGs e VMs e VNets
- No caso serão 4 JSONs, 2 Templates e 2 parameters, iremos criar dois RGs com esses JSON
 - Template e Parameters 01
 - Parameters-01

```
{
    "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentParameters.json#",
    "contentVersion": "1.0.0.0",
    "parameters": {
        "adminUsername": {
            "value": "admin.rafael"
        },
        "adminPassword": {
            "value": null
        },
        "dnsLabelPrefix": {
            "value": "vm01lab11tftec"
        },
        "publicIpAddress": {
            "value": "VM01-LAB11-IP"
        },
        "vmSize": {
            "value": "Standard_B2s"
        },
        "location": {
            "value": "eastus2"
        }
    }
}
```

```
    }
}
```

▪ Tamplate-01

```
{
    "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
    "contentVersion": "1.0.0.0",
    "parameters": {
        "adminUsername": {
            "type": "string",
            "metadata": {
                "description": "Username for the Virtual Machine."
            }
        },
        "adminPassword": {
            "type": "securestring",
            "minLength": 12,
            "metadata": {
                "description": "Password for the Virtual Machine."
            }
        },
        "dnsLabelPrefix": {
            "type": "string",
            "defaultValue": "[toLowerCase(concat(parameters('vmName'), '-', uniqueString(resourceGroup().id, parameters('vmName'))))]",
            "metadata": {
                "description": "Unique DNS Name for the Public IP used to access the Virtual Machine."
            }
        },
        "publicIpName": {
            "type": "string",
            "defaultValue": "myPublicIP",
            "metadata": {
                "description": "Name for the Public IP used to access the Virtual Machine."
            }
        },
        "publicIPAllocationMethod": {
            "type": "string",
            "defaultValue": "Dynamic",
            "allowedValues": [
                "Dynamic",
                "Static"
            ],
            "metadata": {
                "description": "Allocation method for the Public IP used to access the Virtual Machine."
            }
        },
        "publicIpSku": {
            "type": "string",
            "defaultValue": "Basic",
            "allowedValues": [
                "Basic",
                "Standard"
            ],
            "metadata": {
                "description": "SKU for the Public IP used to access the Virtual Machine."
            }
        },
        "OSVersion": {
            "type": "string",
            "defaultValue": "2019-Datacenter",
            "allowedValues": [
                "2008-R2-SP1",
                "2012-Datacenter",
                "2012-R2-Datacenter",
                "2016-Nano-Server",
                "2016-Datacenter-with-Containers",
                "2016-Datacenter",
                "2019-Datacenter",
                "2019-Datacenter-Core",
                "2019-Datacenter-Core-smalldisk",
                "2019-Datacenter-Core-with-Containers",
                "2019-Datacenter-Core-with-Containers-smalldisk",
                "2019-Datacenter-smalldisk",
                "2019-Datacenter-with-Containers",
                "2019-Datacenter-with-Containers-smalldisk"
            ],
            "metadata": {
```

```

        "description": "The Windows version for the VM. This will pick a fully patched image of this given Windows version."}
    },
    "vmSize": {
        "type": "string",
        "defaultValue": "Standard_D2_v3",
        "metadata": {
            "description": "Size of the virtual machine."
        }
    },
    "location": {
        "type": "string",
        "defaultValue": "[resourceGroup().location]",
        "metadata": {
            "description": "Location for all resources."
        }
    },
    "vmName": {
        "type": "string",
        "defaultValue": "VM01-LAB11",
        "metadata": {
            "description": "Name of the virtual machine."
        }
    }
},
"variables": {
    "storageAccountName": "[concat('bootdiags', uniquestring(resourceGroup().id))]",
    "nicName": "VMNic01",
    "addressPrefix": "10.1.0.0/16",
    "subnetName": "Subnet",
    "subnetPrefix": "10.1.0.0/24",
    "virtualNetworkName": "VNET-01",
    "subnetRef": "[resourceId('Microsoft.Network/virtualNetworks/subnets', variables('virtualNetworkName'), variables('subnetName'))]",
    "networkSecurityGroupName": "default-NSG"
},
"resources": [
{
    "type": "Microsoft.Storage/storageAccounts",
    "apiVersion": "2019-06-01",
    "name": "[variables('storageAccountName')]",
    "location": "[parameters('location')]",
    "sku": {
        "name": "Standard_LRS"
    },
    "kind": "Storage",
    "properties": {}
},
{
    "type": "Microsoft.Network/publicIPAddresses",
    "apiVersion": "2020-06-01",
    "name": "[parameters('publicIPName')]",
    "location": "[parameters('location')]",
    "sku": {
        "name": "[parameters('publicIpSku')]"
    },
    "properties": {
        "publicIPAllocationMethod": "[parameters('publicIPAllocationMethod')]",
        "dnsSettings": {
            "domainNameLabel": "[parameters('dnsLabelPrefix')]"
        }
    }
},
{
    "type": "Microsoft.Network/networkSecurityGroups",
    "apiVersion": "2020-06-01",
    "name": "[variables('networkSecurityGroupName')]",
    "location": "[parameters('location')]",
    "properties": {
        "securityRules": [
            {
                "name": "default-allow-3389",
                "properties": {
                    "priority": 1000,
                    "access": "Allow",
                    "direction": "Inbound",
                    "destinationPortRange": "3389",
                    "protocol": "Tcp",
                    "sourcePortRange": "*",
                    "sourceAddressPrefix": "*",
                    "destinationAddressPrefix": "*"
                }
            }
        ]
    }
}
]

```

```

        }
    ],
},
{
    "type": "Microsoft.Network/virtualNetworks",
    "apiVersion": "2020-06-01",
    "name": "[variables('virtualNetworkName')]",
    "location": "[parameters('location')]",
    "dependsOn": [
        "[resourceId('Microsoft.Network/networkSecurityGroups', variables('networkSecurityGroupName'))]"
    ],
    "properties": {
        "addressSpace": {
            "addressPrefixes": [
                "[variables('addressPrefix')]"
            ]
        },
        "subnets": [
            {
                "name": "[variables('subnetName')]",
                "properties": {
                    "addressPrefix": "[variables('subnetPrefix')]",
                    "networkSecurityGroup": {
                        "id": "[resourceId('Microsoft.Network/networkSecurityGroups', variables('networkSecurityGroupName'))]"
                    }
                }
            }
        ]
    }
},
{
    "type": "Microsoft.Network/networkInterfaces",
    "apiVersion": "2020-06-01",
    "name": "[variables('nicName')]",
    "location": "[parameters('location')]",
    "dependsOn": [
        "[resourceId('Microsoft.Network/publicIPAddresses', parameters('publicIPName'))]",
        "[resourceId('Microsoft.Network/virtualNetworks', variables('virtualNetworkName'))]"
    ],
    "properties": {
        "ipConfigurations": [
            {
                "name": "ipconfig1",
                "properties": {
                    "privateIPAllocationMethod": "Dynamic",
                    "publicIPAddress": {
                        "id": "[resourceId('Microsoft.Network/publicIPAddresses', parameters('publicIPName'))]"
                    },
                    "subnet": {
                        "id": "[variables('subnetRef')]"
                    }
                }
            }
        ]
    }
},
{
    "type": "Microsoft.Compute/virtualMachines",
    "apiVersion": "2020-06-01",
    "name": "[parameters('vmName')]",
    "location": "[parameters('location')]",
    "dependsOn": [
        "[resourceId('Microsoft.Storage/storageAccounts', variables('storageAccountName'))]",
        "[resourceId('Microsoft.Network/networkInterfaces', variables('nicName'))]"
    ],
    "properties": {
        "hardwareProfile": {
            "vmSize": "[parameters('vmSize')]"
        },
        "osProfile": {
            "computerName": "[parameters('vmName')]",
            "adminUsername": "[parameters('adminUsername')]",
            "adminPassword": "[parameters('adminPassword')]"
        },
        "storageProfile": {
            "imageReference": {
                "publisher": "MicrosoftWindowsServer",
                "offer": "WindowsServer",
                "sku": "[parameters('OSVersion')]",
                "version": "latest"
            }
        }
    }
}

```

```

        },
        "osDisk": {
            "createOption": "FromImage",
            "managedDisk": {
                "storageAccountType": "StandardSSD_LRS"
            }
        },
        "dataDisks": [
            {
                "diskSizeGB": 1023,
                "lun": 0,
                "createOption": "Empty"
            }
        ]
    },
    "networkProfile": {
        "networkInterfaces": [
            {
                "id": "[resourceId('Microsoft.Network/networkInterfaces', variables('nicName'))]"
            }
        ]
    },
    "diagnosticsProfile": {
        "bootDiagnostics": {
            "enabled": true,
            "storageUri": "[reference(resourceId('Microsoft.Storage/storageAccounts', variables('storageAccountName')), '2018-06-01').primaryEndpoints.blob]"
        }
    }
],
"outputs": {
    "hostname": {
        "type": "string",
        "value": "[reference(parameters('publicIPName')).dnsSettings.fqdn]"
    }
}
}

```

- Tamplate e Parameters 02

- Parameter-02

```

{
    "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentParameters.json#",
    "contentVersion": "1.0.0.0",
    "parameters": {
        "adminUsername": {
            "value": "admin.rafael"
        },
        "adminPassword": {
            "value": null
        },
        "dnsLabelPrefix": {
            "value": "vm02lab11tftec"
        },
        "publicIpName": {
            "value": "VM02-LAB11-IP"
        },
        "vmSize": {
            "value": "Standard_B2s"
        },
        "location": {
            "value": "eastus2"
        }
    }
}

```

- Tamplate-02

```

{
    "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
    "contentVersion": "1.0.0.0",
    "parameters": {
        "adminUsername": {

```

```

        "type": "string",
        "metadata": {
            "description": "Username for the Virtual Machine."
        }
    },
    "adminPassword": {
        "type": "securestring",
        "minLength": 12,
        "metadata": {
            "description": "Password for the Virtual Machine."
        }
    },
    "dnsLabelPrefix": {
        "type": "string",
        "defaultValue": "[toLowerCase(concat(parameters('vmName'),'-', uniqueString(resourceGroup().id, parameters('vmName'))))]",
        "metadata": {
            "description": "Unique DNS Name for the Public IP used to access the Virtual Machine."
        }
    },
    "publicIpName": {
        "type": "string",
        "defaultValue": "myPublicIP",
        "metadata": {
            "description": "Name for the Public IP used to access the Virtual Machine."
        }
    },
    "publicIPAllocationMethod": {
        "type": "string",
        "defaultValue": "Dynamic",
        "allowedValues": [
            "Dynamic",
            "Static"
        ],
        "metadata": {
            "description": "Allocation method for the Public IP used to access the Virtual Machine."
        }
    },
    "publicIpSku": {
        "type": "string",
        "defaultValue": "Basic",
        "allowedValues": [
            "Basic",
            "Standard"
        ],
        "metadata": {
            "description": "SKU for the Public IP used to access the Virtual Machine."
        }
    },
    "OSVersion": {
        "type": "string",
        "defaultValue": "2019-Datacenter",
        "allowedValues": [
            "2008-R2-SP1",
            "2012-Datacenter",
            "2012-R2-Datacenter",
            "2016-Nano-Server",
            "2016-Datacenter-with-Containers",
            "2016-Datacenter",
            "2019-Datacenter",
            "2019-Datacenter-Core",
            "2019-Datacenter-Core-smalldisk",
            "2019-Datacenter-Core-with-Containers",
            "2019-Datacenter-Core-with-Containers-smalldisk",
            "2019-Datacenter-smalldisk",
            "2019-Datacenter-with-Containers",
            "2019-Datacenter-with-Containers-smalldisk"
        ],
        "metadata": {
            "description": "The Windows version for the VM. This will pick a fully patched image of this given Windows Version."
        }
    },
    "vmSize": {
        "type": "string",
        "defaultValue": "Standard_D2_v3",
        "metadata": {
            "description": "Size of the virtual machine."
        }
    },
    "location": {
        "type": "string",
        "defaultValue": "[resourceGroup().location]"
    }
}

```

```

        "metadata": {
            "description": "Location for all resources."
        }
    },
    "vmName": {
        "type": "string",
        "defaultValue": "VM02-LAB11",
        "metadata": {
            "description": "Name of the virtual machine."
        }
    }
},
"variables": {
    "storageAccountName": "[concat('bootdiags', uniquestring(resourceGroup().id))]",
    "nicName": "VMNic02",
    "addressPrefix": "10.2.0.0/16",
    "subnetName": "Subnet",
    "subnetPrefix": "10.2.0.0/24",
    "virtualNetworkName": "VNET-02",
    "subnetRef": "[resourceId('Microsoft.Network/virtualNetworks/subnets', variables('virtualNetworkName'), variables('location'))]",
    "networkSecurityGroupName": "default-NSG"
},
"resources": [
{
    "type": "Microsoft.Storage/storageAccounts",
    "apiVersion": "2019-06-01",
    "name": "[variables('storageAccountName')]",
    "location": "[parameters('location')]",
    "sku": {
        "name": "Standard_LRS"
    },
    "kind": "Storage",
    "properties": {}
},
{
    "type": "Microsoft.Network/publicIPAddresses",
    "apiVersion": "2020-06-01",
    "name": "[parameters('publicIPName')]",
    "location": "[parameters('location')]",
    "sku": {
        "name": "[parameters('publicIpSku')]"
    },
    "properties": {
        "publicIPAllocationMethod": "[parameters('publicIPAllocationMethod')]",
        "dnsSettings": {
            "domainNameLabel": "[parameters('dnsLabelPrefix')]"
        }
    }
},
{
    "type": "Microsoft.Network/networkSecurityGroups",
    "apiVersion": "2020-06-01",
    "name": "[variables('networkSecurityGroupName')]",
    "location": "[parameters('location')]",
    "properties": {
        "securityRules": [
            {
                "name": "default-allow-3389",
                "properties": {
                    "priority": 1000,
                    "access": "Allow",
                    "direction": "Inbound",
                    "destinationPortRange": "3389",
                    "protocol": "Tcp",
                    "sourcePortRange": "*",
                    "sourceAddressPrefix": "*",
                    "destinationAddressPrefix": "*"
                }
            }
        ]
    }
},
{
    "type": "Microsoft.Network/virtualNetworks",
    "apiVersion": "2020-06-01",
    "name": "[variables('virtualNetworkName')]",
    "location": "[parameters('location')]",
    "dependsOn": [
        "[resourceId('Microsoft.Network/networkSecurityGroups', variables('networkSecurityGroupName'))]"
    ],
    "properties": {

```

```

    "addressSpace": {
        "addressPrefixes": [
            "[variables('addressPrefix')]"
        ]
    },
    "subnets": [
        {
            "name": "[variables('subnetName')]",
            "properties": {
                "addressPrefix": "[variables('subnetPrefix')]",
                "networkSecurityGroup": {
                    "id": "[resourceId('Microsoft.Network/networkSecurityGroups', variables('networkSecur:)"
                }
            }
        }
    ]
},
{
    "type": "Microsoft.Network/networkInterfaces",
    "apiVersion": "2020-06-01",
    "name": "[variables('nicName')]",
    "location": "[parameters('location')]",
    "dependsOn": [
        "[ resourceId('Microsoft.Network/publicIPAddresses', parameters('publicIPName'))]",
        "[ resourceId('Microsoft.Network/virtualNetworks', variables('virtualNetworkName'))]"
    ],
    "properties": {
        "ipConfigurations": [
            {
                "name": "ipconfig1",
                "properties": {
                    "privateIPAllocationMethod": "Dynamic",
                    "publicIPAddress": {
                        "id": "[resourceId('Microsoft.Network/publicIPAddresses', parameters('publicIPName'))]"
                    },
                    "subnet": {
                        "id": "[variables('subnetRef')]"
                    }
                }
            }
        ]
    }
},
{
    "type": "Microsoft.Compute/virtualMachines",
    "apiVersion": "2020-06-01",
    "name": "[parameters('vmName')]",
    "location": "[parameters('location')]",
    "dependsOn": [
        "[ resourceId('Microsoft.Storage/storageAccounts', variables('storageAccountName'))]",
        "[ resourceId('Microsoft.Network/networkInterfaces', variables('nicName'))]"
    ],
    "properties": {
        "hardwareProfile": {
            "vmSize": "[parameters('vmSize')]"
        },
        "osProfile": {
            "computerName": "[parameters('vmName')]",
            "adminUsername": "[parameters('adminUsername')]",
            "adminPassword": "[parameters('adminPassword')]"
        },
        "storageProfile": {
            "imageReference": {
                "publisher": "MicrosoftWindowsServer",
                "offer": "WindowsServer",
                "sku": "[parameters('OSVersion')]",
                "version": "latest"
            },
            "osDisk": {
                "createOption": "FromImage",
                "managedDisk": {
                    "storageAccountType": "StandardSSD_LRS"
                }
            },
            "dataDisks": [
                {
                    "diskSizeGB": 1023,
                    "lun": 0,
                    "createOption": "Empty"
                }
            ]
        }
    }
}

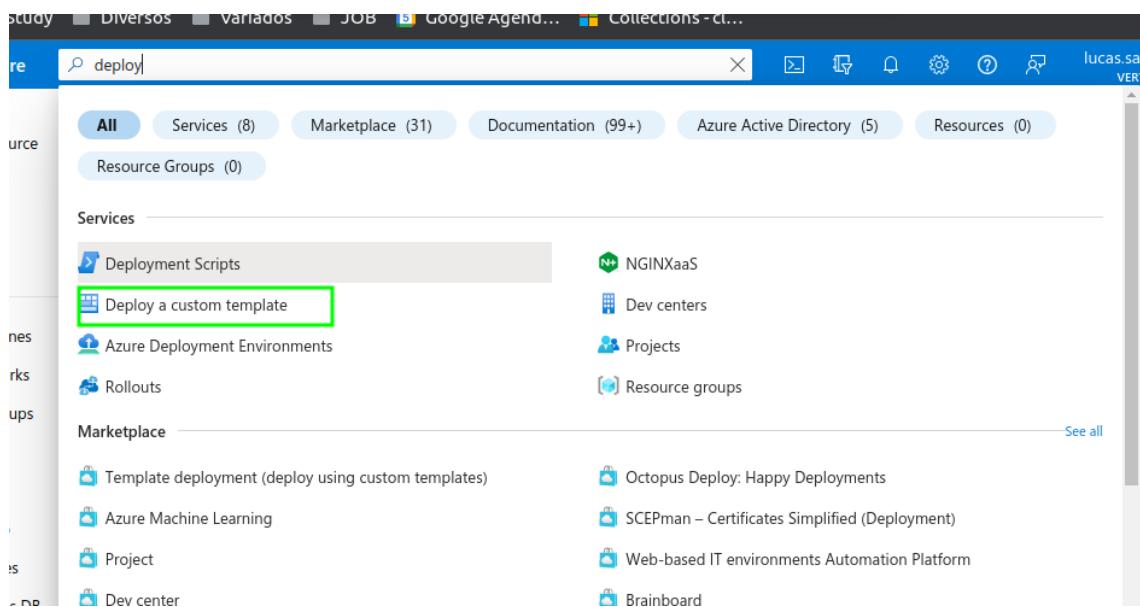
```

```

        ],
      },
      "networkProfile": {
        "networkInterfaces": [
          {
            "id": "[resourceId('Microsoft.Network/networkInterfaces', variables('nicName'))]"
          }
        ]
      },
      "diagnosticsProfile": {
        "bootDiagnostics": {
          "enabled": true,
          "storageUri": "[reference(resourceId('Microsoft.Storage/storageAccounts', variables('storageAccountName')))]"
        }
      }
    },
    "outputs": {
      "hostname": {
        "type": "string",
        "value": "[reference(parameters('publicIPName')).dnsSettings.fqdn]"
      }
    }
  }
}

```

- Salveos em arquivos
- Vamos em deploy from a custom template



Custom deployment ...

Deploy from a custom template

Select a template Basics Review + create

Automate deploying resources with Azure Resource Manager templates in a single, coordinated operation. Create or select a template below to get started. [Learn more about template deployment ↗](#)

 Build your own template in the editor

Common templates

-  Create a Linux virtual machine
-  Create a Windows virtual machine
-  Create a web app

- Vamos em load file, vamos subir nossos arquivos

Edit template ...

Edit your Azure Resource Manager template

+ Add resource ↑ Quickstart template  Load file  Download

```
1 {  
2   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploy  
3   "contentVersion": "1.0.0.0",  
4   "parameters": {},  
5   "resources": []  
6 }
```

- Subimos sempre o template primeiro e salvamos

Name	Size	Type	Modified
parameters_MOD11_01.json	582 bytes	Program	sex
parameters_MOD11_02.json	582 bytes	Program	sex
template_MOD11_01.json	10,4 kB	Program	sex
template_MOD11_02.json	10,4 kB	Program	sex

```

1  {
2      "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
3      "contentVersion": "1.0.0.0",
4      "parameters": {
5          "adminUsername": {
6              "type": "string",
7              "metadata": {
8                  "description": "Username for the Virtual Machine."
9              }
10         },
11         "adminPassword": {
12             "type": "securestring",
13             "minLength": 12,
14             "metadata": {
15                 "description": "Password for the Virtual Machine."
16             }
17         },
18         "dnsLabelPrefix": {
19             "type": "string",
20             "defaultValue": "[toLowerCase(concat(parameters('vmName'),'-', uniqueString(resourceGroup().id, parameters('vmName'))))]",
21             "metadata": {
22                 "description": "The DNS label for the VM's public IP address. It must be lowercase and unique within the resource group. It can't contain spaces or special characters, and it must be at least 2 characters long. If you don't specify a value, the VM's name will be used as the default value, which may result in a conflict if the VM name is changed later. You can't change the value after deployment unless you delete the VM and recreate it with a different value."}
23     }
24 }

```

Save **Discard**

- Em seguida faremos o load do parameters

Custom deployment

Deploy from a custom template

Select a template **Basics** Review + create

Template

Customized template 6 resources

Edit template Edit parameters Visualize

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * Visual Studio Enterprise Subscription – MPN

Resource group * Create new

Instance details

Region * East US

Admin Username *

Review + create < Previous Next : Review + create >

Edit parameters ...

[Load file](#) [Download](#)

Recent	Name	Location	Size	Type	Accessed
template_MOD11_02.json	Desktop/az104-monitoring	10,4 kB	Program	16:31	
parameters_MOD11_02.json	Desktop/az104-monitoring	582 bytes	Program	16:31	
template_MOD11_01.json	Desktop/az104-monitoring	10,4 kB	Program	16:28	
parameters_MOD11_01.json	Desktop/az104-monitoring	582 bytes	Program	16:28	

Edit parameters ...

[Load file](#) [Download](#)

```

1  {
2    "$schema": "https://schema.management.azure.com/schemas/2015-01-01/d
3    "contentVersion": "1.0.0.0",
4    "parameters": {
5      "adminUsername": {
6        "value": "admin.rafael"
7      },
8      "adminPassword": {
9        "value": null
10     },
11     "dnsLabelPrefix": {
12       "value": "vm01labb1tftec"
13     },
14     "publicIpAddress": {
15       "value": "VM01-LAB11-IP"
16     },
17     "vmSize": {
18       "value": "Standard_B2s"
19     },
20     "location": {
21       "value": "eastus2"
22     }
}

```

[Save](#) [Discard](#)

- O único item que preencheremos será a senha de admin, e o grupo de recurso
 - Vamos usar a região East Us

Custom deployment

Deploy from a custom template

[Project details](#)

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *	Visual Studio Enterprise Subscription – MPN	▼
Resource group *	(New) rg-az104-monitoring-labs1	▼
	Create new	

Instance details

Region *	East US	▼
Admin Username *	az104-admin	✓
Admin Password *	*****	✓

- Vamos colocar o DNS label prefix como um nome personalizado mesmo e vamos alterar também o public ip name

Dns Label Prefix	vm01labmonitoring-01	✓
	.eastus.cloudapp.azure.com	
Public Ip Name	VM01-IP1	✓

- Vamos em next, e seguimos em create

Custom deployment

Deploy from a custom template

Validation Passed

Select a template Basics Review + create

Summary

Customized template
6 resources

Terms

[Azure Marketplace Terms](#) | [Azure Marketplace](#)

By clicking "Create," I (a) agree to the applicable legal terms associated with the offering; (b) authorize I charge or bill my current payment method for the fees associated the offering(s), including applicable same billing frequency as my Azure subscription, until I discontinue use of the offering(s); and (c) agree deployment involves 3rd party offerings, Microsoft may share my contact information and other details deployment with the publisher of that offering.

Microsoft assumes no responsibility for any actions performed by third-party templates and does not p third-party products or services. See the [Azure Marketplace Terms](#) for additional terms.

Deploying this template will create one or more Azure resources or Marketplace offerings. You acknow

[Create](#)

< Previous

Next >

Microsoft.Template-20230605164202 | Overview

Deployment

Search | Delete | Cancel | Redeploy | Download | Refresh

Overview

Your deployment is complete

Deployment name : Microsoft.Template-20230605164202
Subscription : Visual Studio Enterprise Subscription – MPN
Resource group : rg-az104-monitoring-labs1
Start time : 6/5/2023, 4:42:08 PM
Correlation ID : 476e8dfe-3465-4291-a763-2350ab0e3075

Deployment details
Next steps

Go to resource group

- Por fim vamos efetuar os mesmos passos para o segundo grupo de recursos

<input type="checkbox"/> rg-az104-monitoring-labs1	Visual Studio Enterprise Subscription... East US
<input type="checkbox"/> rg-az104-monitoring-labs2	Visual Studio Enterprise Subscription... East US

- Vamos criar um terceiro grupo de recurso no qual irá ter o nosso analytics

rg-az104-monitoring

Resource group

Search | Create | Manage view | Delete resource group | Refresh | Export to CSV | ...

Overview

Essentials

Resources Recommendations

Filter for any field... Type equals all Add filter More (1)

Showing 0 to 0 of 0 records. Show hidden types No grouping

List view

Name	Type	Location
No resources match your filters		

Give feedback

▼ Lab02 - Criar um log analytics workspace

- Com os 3 RGs criados



- Vamos seguir com a criação do nosso log analytics workspace em nosso RG rg-az104-monitoring

The screenshot shows the Azure portal interface with a search bar at the top containing 'log'. Below the search bar, there are tabs for 'All', 'Services (20)', 'Marketplace (31)', 'Documentation (99+)', and 'Azure Active Di...'. Under the 'Services' heading, 'Logz.io' and 'Logic apps' are listed. 'Log Analytics workspaces' is highlighted with a red box and a red arrow pointing to the 'Create' button below it. Other services listed include 'Log Analytics query packs', 'Logic Apps Custom Connector', 'Azure Native New Relic Ser...', 'Sign-in Logs', and 'Activity log'. In the 'Marketplace' section, 'Logic App' and 'Azure Functions' are listed. At the bottom of the blade, there are buttons for 'Create', 'Open recycle bin', 'Manage view', 'Refresh', 'Export to CSV', and 'Add filter'. The text 'Showing 1 to 1 of 1 records.' is displayed.

Create Log Analytics workspace

you should take when creating a new Log Analytics workspace. [Learn more](#)

With Azure Monitor Logs you can easily store, retain, and query data collected from your monitored resources in Azure and other environments for valuable insights. A Log Analytics workspace is the logical storage unit where your log data is collected and stored.

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *	Visual Studio Enterprise Subscription – MPN
Resource group *	rg-az104-monitoring
	Create new

Instance details

Name *	az104-monitoring-logs-workspace
Region *	East US

[Review + Create](#)

[« Previous](#)

[Next : Tags >](#)

Microsoft.LogAnalyticsOMS | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview Inputs Outputs Template

Your deployment is complete

Deployment name : Microsoft.LogAnalyticsOMS
Subscription : Visual Studio Enterprise Subscription – MPN
Resource group : rg-az104-monitoring
Start time : 6/5/2023, 4:51:45 PM
Correlation ID : 53ca2735-518d-43ce-8663-f09869d8adf0

Deployment details Next steps

[Go to resource](#)

Give feedback

[Tell us about your experience with deployment](#)

- Após criarmos podemos validar varias opções

az104-monitoring-logs-workspace ⚡ ⭐ ...

Log Analytics workspace

Search Delete

Settings

- Tables
- Agents
- Usage and estimated costs
- Data export
- Network isolation
- Linked storage accounts
- Properties
- Locks

Classic

- Legacy agents management
- Legacy activity log connector
- Legacy storage account logs
- Legacy computer groups
- Legacy solutions
- System center

The Log Analytics agents (MMA.OMS) used to collect logs from virtual machines and servers will no longer be supported from August 31, 2024. Plan to migrate to Azure Monitor Agent before this date. [Learn more about migrating to Azure Monitor Agent](#)

Essentials

	JSON V
Resource group (move)	Workspace Name rg-az104-monitoring
Status	Workspace ID 95285d32-00c4-443e-b1db-2a7fd221d437
Location	Pricing tier East US
Subscription (move)	Access control mode Visual Studio Enterprise Subscription – MPN
Subscription ID	Operational issues afe7f77d-a295-4675-9bf9-5b6bf32b89f4
Tags (edit)	OK Click here to add tags

Get started with Log Analytics

Log Analytics collects data from a variety of sources and uses a powerful query language to give you insights into the operation of your applications and resources. Use Azure Monitor to

- No caso precisaremos configurar nossos recursos para que os logs possam ser armazenados neste workspace

▼ Lab03 - Instalar azure monitor client nas VMs

- Vamos seguir com a intalação do client em nossas VMs
 - Vamos em monitor

Azure search results for 'monitor':

- All (16)
- Services (16)
- Resources (1)
- Resource Groups (3)
- Marketplace (31)
- Dc

Azure Active Directory (5)

Services

- Monitor** (highlighted with a red arrow)
- Azure Native New Relic Service
- Azure Monitor workspaces
- Azure Monitor Private Link Scopes

Other results:

- Azure Monitors for SAP solutions
- Azure Monitors for SAP Solutions (1)
- Logz.io
- Datadog - An Azure Native ISV Sen

- No caso não temos nenhuma maquina, e podemos ver os recursos que temos e que não estão habilitados

Monitor | Virtual Machines

Get started Overview Performance Map

Monitor the health and performance of virtual machines

VM insights monitors the performance and health of your virtual machines and virtual machine scale sets, including their running processes and dependencies on other resources. It can help deliver predictable performance and availability of vital applications by identifying performance bottlenecks and network issues. [Learn more](#)

Enable VM Insights
Implement complete monitoring of your Azure and hybrid virtual machine environment. [Learn more](#)

Analyze data
Analyze the health and performance for a single machine or multiple machines and drill into logs for troubleshooting. [Learn more](#)

Configure Insights **Analyze data**

- Vamos dar um enabled e setar o nosso workspace log analytics, para salvar os dados das vms que criamos

Get started Overview Performance Map

Filter by name... Subscription : Visual Studio Enterprise Subscription – MPN

Resource group : All resource groups Type : All types Location : All locations

Group by : Subscription, Resource group

Monitored (0) Not monitored (2) Workspace configuration Other onboarding options

Name	Monitor Coverage	Workspace
Visual Studio Enterprise Subscr	2 of 2	
rg-az104-monitoring-labs1	1 of 1	
VM01-LAB11	Not enabled	Enable
rg-az104-monitoring-labs2	1 of 1	
VM02-LAB11	Not enabled	Enable

Azure Monitor

X

Insights Onboarding

Get more visibility into the health and performance of your virtual machine

With an Azure virtual machine you get host CPU, disk and up/down state of your VMs out of the box. Enabling additional monitoring capabilities provides insights into the performance and dependencies for your virtual machines.

You will be billed based on the amount of data ingested and your data retention settings. It can take between 5-10 minutes to configure the virtual machine and the monitoring data to appear.



i The map data set collected with Azure Monitor for VMs is intended to be infrastructure data about the resources being deployed and monitored. For details on data collected please [click here](#).

Enable

⚠️ Having difficulties enabling Azure Monitors for VM? [Troubleshoot](#)

Monitoring configuration

X

Virtual machine Insights now supports data collection using the Azure Monitor agent. Configuring using the Azure Monitor Agent is currently in preview mode.

Enable insights using

Azure Monitor agent (Recommended)

Log Analytics agent

Subscription *

Visual Studio Enterprise Subscription – MPN

Log Analytics workspaces

az104-monitoring-logs-workspace

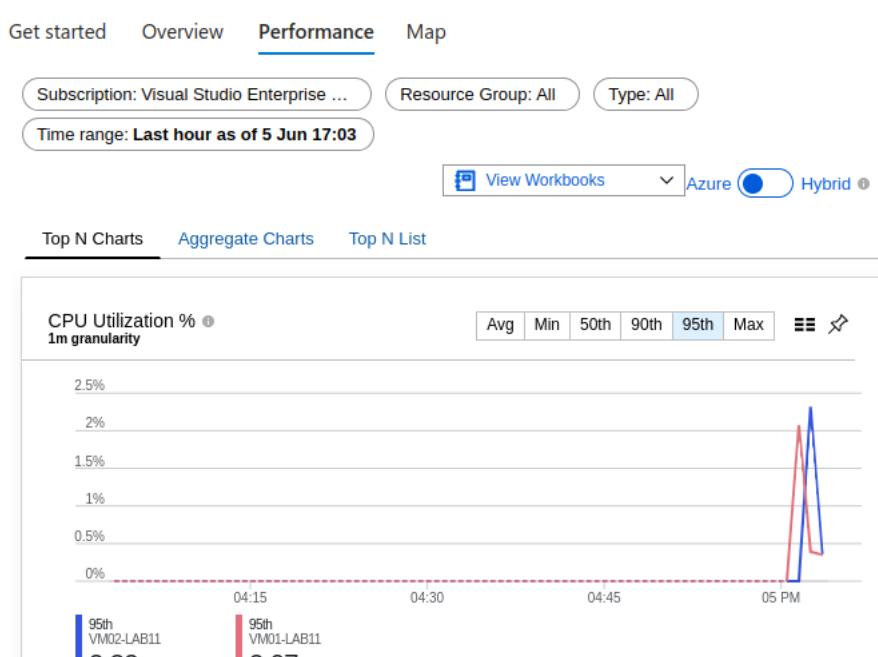
Configure

Cancel

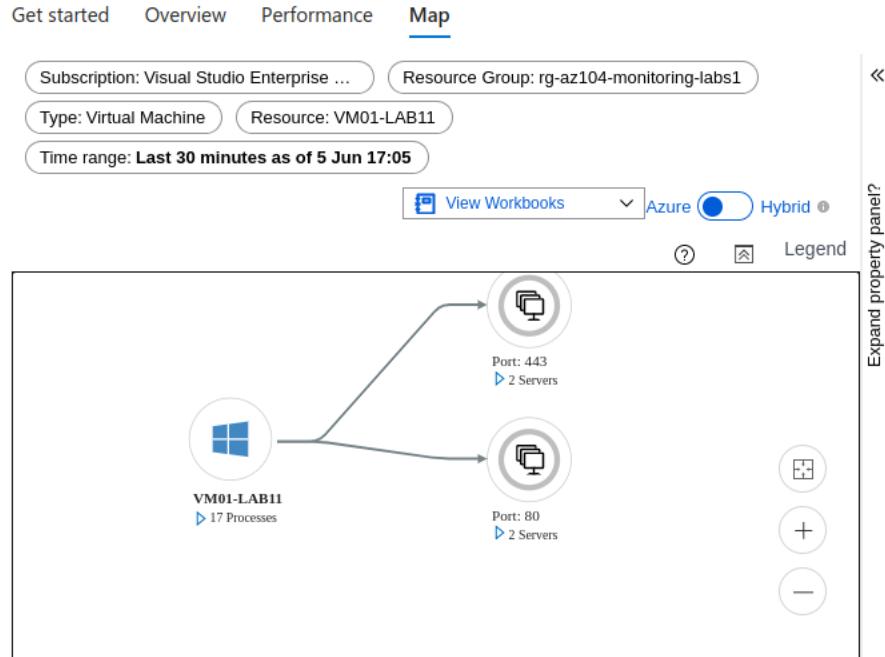
- Podemos ver que as vms já aparecem no monitor

Name	Monitor Coverage	Data cc
Visual Studio Enterprise Subscr	2 of 2	
rg-az104-monitoring-labs1	1 of 1	
VM01-LAB11	Enabled	Config
VM02-LAB11	Enabled	Config

- Podemos ver duas opções Performance e map
 - Em performance, temos grafos de CPU, memoria, latencia, processos etc.



- MAP mostra as informações da vm e desenha um em arquitetura de tudo oq a vm está conectada



- Vamos em nosso workspace log analytics
 - Podemos ver os recursos, no caso as vms que habilitamos

The screenshot shows the Log Analytics workspace titled "az104-monitoring-logs-workspace". The left sidebar includes a search bar, Settings, Tables, Agents (which is selected), Usage and estimated costs, Data export, Network isolation, Linked storage accounts, Properties, and Locks. The main content area is divided into sections for Windows servers and Linux servers. Under Windows servers, it shows "0 Windows computers connected via Azure Monitor Windows agent" and "2 Windows computers connected via Log Analytics Windows agent (legacy)". There is a link to "See them in Logs" and a button to "Data Collection Rules". Under Linux servers, there is a section titled "Want to setup the new Azure Monitor agent? Go to 'Data Collection Rules'" with a "Data Collection Rules" button. At the bottom, there is a section titled "Log Analytics agent instructions".

- Podemos validar custos, podemos reservar espaços, por padrão escolhemos pay as you go

Your Log Analytics cost depends on your choice of pricing tier, data retention and which solutions are used. Here you can see the estimated monthly cost for each of the available pricing tiers, based on your last 31-days of Log Analytics data ingested. These cost estimates can be used to help you select the best pricing tier based on your data ingestion patterns. These estimates include the 500MB/VM/day data allowances if you are using Microsoft Defender. This page does not reflect your actual billed usage. To view that, use Cost Management (learn more). If you have questions about using this page, contact us. Learn more about Log Analytics pricing and the many techniques to optimize your cost.

Pricing Tiers

- Pay-as-you-go** Per GB

The Pay-as-you-go pricing tier offers flexible consumption pricing in which you are charged per GB of data ingested. There are additional charges if you increase the data retention above the 31 day included retention (or 90 day included retention if using Sentinel on this workspace). The estimated cost does not include the 5 GB/month allowance per billing account. Learn more about [Log Analytics pricing](#)

- Em workspace summary podemos ver o que está rodando em nossa vm, podemos rodar uma query que irá nos trazer informações sobre a vm

Home > Log Analytics workspaces > az104-monitoring-logs-workspace | Workspace summary (deprecated) > Overview >

New Query 1 x +

az104-monitoring... Select scope Run Time range : Last 24 hours Save Share ...

Tables Queries Functions ...

Type your query here or click one of the queries to start

Favorites

You can add favorites by clicking on the star icon

Azure Monitor for VMs

- InsightsMetrics
- VMBoundPort
- VMComputer**
 - AgentId (string)
 - AzureCloudServiceDeployment
 - AzureCloudServiceInstanceId :
 - AzureCloudServiceName :

Queries History

No queries history

- Vamos rodar a query VMcomputer

Logs az104-monitoring-logs-workspace

New Query 1*

az104-monitoring... Select scope Run Time range : Last 24 hours

Tables Queries Functions ...

Search Filter Group by: Solution

VMComputer

Collapse all

Favorites

You can add favorites by clicking on the star icon

Azure Monitor for VMs

- InsightsMetrics
- VMBoundPort
- VMComputer
- VMConnection
- VMProcess

AzureResources

Queries History

No queries

- Podemos ver que ele já traz as vms, e também podemos visualizar as vms no editor

Run Time range : Last 24 hours Save Share ...

VMComputer

TimeGenerated [UTC]	Computer	AgentId	Machine
05/06/2023, 20:01:00.647	VM01-LAB11	13ba43d4-9091-416c-aed5-8f0fa9f65efd	m-13ba43d4-9091-416c-aed5-8f0fa9f65efd
05/06/2023, 20:01:30.523	VM02-LAB11	690bc9c9-5e9a-4a68-b8f9-e6e3ba0e1d37	m-690bc9c9-5e9a-4a68-b8f9-e6e3ba0e1d37

- Podemos visualizar todo o inventario das vms

TimeGenerated [UTC]	Computer	Agencia	Machine
05/06/2023, 20:01:00.6...	VM01-LAB11	13ba43d4-9091-416c-aed5-8f0fa9f65efd	m-13ba43d4-9091-416c-aed5-8f0fa9f65efd
TimeGenerated [UTC]		2023-06-05T20:01:00.647Z	
Computer		VM01-LAB11	
AgentId		13ba43d4-9091-416c-aed5-8f0fa9f65efd	
Machine		m-13ba43d4-9091-416c-aed5-8f0fa9f65efd	
DisplayName		VM01-LAB11	
FullDisplayName		VM01-LAB11	

- Podemos rodar outras querys como VMprocess que irá trazer todos os processos das vms

- As queries ficam salvas dentro do proprio painel

- ▶ **Azure Monitor for VMs**
 - ▶ **InsightsMetrics**
 - ▶ **VMBoundPort**
 - ▶ **VMComputer**
 - ▶ **VMConnection**
 - ▶ **VMProcess**
- ▶ **AzureResources**
- ▶ **LogManagement**
- ▶ **Custom Logs**

- Podemos salvar ou exportar as consultas no powerbi

The screenshot shows the Azure Monitor Metrics blade. At the top, there are buttons for 'Run' and 'Save' with a time range of 'Last 24 hours'. Below the results table, there are tabs for 'Results' and 'Chart'. A context menu is open over the table, listing options: 'New alert rule', 'Export', 'Pin to', 'Format query', and 'Search job mode'.

▼ Lab04 - Criar um action Group

- Vamos criar um action group
 - Vamos em monitor, e vamos em alerts

The screenshot shows the Azure Monitor Alerts blade. On the left, there's a navigation menu with 'Overview', 'Activity log', 'Alerts' (selected), 'Metrics', 'Logs', 'Change Analysis', 'Service health', and 'Workbooks'. Below that is an 'Insights' section with 'Applications', 'Virtual Machines', 'Storage accounts', 'Containers', and 'Networks'. The main area displays a summary of alerts: Total alerts (0), Critical (0), Error (0), Warning (0), Informational (0), and Verbose (0). A large green circle with a white checkmark is prominently displayed, followed by the text 'No fired alerts in the past 24 hours'.

- Vamos criar um alert rule

The screenshot shows a 'Create' dropdown menu with three options: 'Alert rule' (highlighted with a red box), 'Action group', and 'Alert processing rules'.

- Vamos selecionar a vm do primeiro RG

Select a resource

X

Browse Recent

Resource types

All resource types

Locations

All locations

Search to filter items...

Resource	Resource type	Location
<input checked="" type="checkbox"/> VM02-LAB11	Virtual machine	East US 2
<input type="checkbox"/> VM02-LAB11_disk2_d7ed79460c0743d3abe51d05...	Disk	East US 2
<input type="checkbox"/> VM02-LAB11_OsDisk_1_29d7df5a0ed34fa9898759...	Disk	East US 2
<input type="checkbox"/> VMNAT102	Natmated interface	East US 2

i Metric and Log signals might not be available if the scope includes multiple resources.

Selected resources 2 virtual machines

<input type="checkbox"/> VM02-LAB11	Virtual machine	East US 2	<input type="button" value="Delete"/>
<input type="checkbox"/> VM01-LAB11	Virtual machine	East US 2	<input type="button" value="Delete"/>

Create an alert rule

Scope Condition Actions Details Tags Review + create

Create an alert rule to identify and address issues when important conditions are found in your monitoring data. [Learn more](#)

+ Select scope

Resource	Hierarchy	<input type="button" value="X"/>
<input type="checkbox"/> VM01-LAB11	Visual Studio E... > [?] rg-az104-m...	<input type="button" value="X"/>
<input type="checkbox"/> VM02-LAB11	Visual Studio E... > [?] rg-az104-m...	<input type="button" value="X"/>

- Vamos criar uma regra para quando uma vm for desalocada

Signal name	Signal source
Resource health	Resource health
Available Memory Bytes (Preview)	Platform metrics
CPU Credits Consumed	Platform metrics
CPU Credits Remaining	Platform metrics
Data Disk Bandwidth Consumed Percentage	Platform metrics
Data Disk IOPS Consumed Percentage	Platform metrics
Data Disk Max Burst Bandwidth	Platform metrics
Data Disk Max Burst IOPS	Platform metrics

Review + create **Apply** **Cancel**

- Vamos selecionar a condição de Deallocate vm

Create an alert rule

- Irá mostrar eventos relativos a condição selecionada
- Vamos configurar o action group

Scope Condition Actions Details Tags Review + create

An action group is a set of actions that can be applied to an alert rule. [Learn more](#)

+ Select action groups + Create action group

Action group name Contains actions

No action group selected yet

- Primeiro vamos criar um action group

Create action group ...

Basics Notifications Actions Tags Review + create

An action group invokes a defined set of notifications and actions when an alert is triggered. [Learn more](#)

Project details

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Resource group * [Create new](#)

Region *

Instance details

Action group name * ✓

Display name * ✓
The display name is limited to 12 characters

- Vamos setar uma notificação no caso e-mail, e vamos colocar nosso email pessoal para este caso
 - Podemos usar SMS também

Basics Notifications Actions Tags Review + create

Choose how to get notified when the action group is triggered. This step is optional.

Notification type	Name	Selected
<input type="text"/>	<input type="text"/>	✓
Email Azure Resource Manager Role		
Email/SMS message/Push/Voice		

Create action group

Basics Notifications Actions Tags Review + create

Choose how to get notified when the action group is triggered.

Notification type ⓘ	Name ⓘ
Email/SMS message/Push/Voice	<input type="text"/>
<input type="text"/>	<input type="text"/>

Email
Email * ⓘ lucasbcontato@outlook.com

SMS (Carrier charges may apply)
Country code 1
Phone number

Azure mobile app notification
Azure account email ⓘ

Voice
Country code 1
Phone number

Enable the common alert schema. [Learn more](#)

Yes No

OK

Review + create Previous Next: Actions >

Basics Notifications Actions Tags Review + create

Choose how to get notified when the action group is triggered. This step is optional.

Notification type ⓘ	Name ⓘ	Selected ⓘ
Email/SMS message/Push/Voice	<input type="text"/> Lucas	<input checked="" type="checkbox"/> Email
<input type="text"/>	<input type="text"/>	

- Podemos setar uma ação, como no caso estamos atrelando a uma regra, não será necessário definir esta opção

Basics Notifications Actions Tags Review + create

Choose which actions are performed when the action group is triggered. This step is optional.

Action type ⓘ	Name ⓘ	Selected ⓘ
<input type="text"/>	<input type="text"/>	
Automation Runbook		
Azure Function		
Event Hub		
ITSM		
Logic App		
Secure Webhook		
Webhook		

- Feito isso podemos seguir com a criação do nosso action group

Create action group ...

Basics

Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-az104-monitoring
Region	global
Action group name	vms-monitor
Display name	vms-monitor

Notifications

Notification type	Name	Selected
Email/SMS message/Push/Voice	Lucas	Email

Actions

None

Tags

None

[Create](#)

[Previous](#)

- Seguindo adiante, vamos seguir com a criação da regra, vamos definir para salvar no nosso RG onde se encontra nosso workspace analytics

Create an alert rule ...

Scope Condition Actions Details Tags Review + create

An action group is a set of actions that can be applied to an alert rule. [Learn more](#)

+ Select action groups + Create action group

Action group name

vms-monitor

Contains actions

1 Email

Custom properties

Add your own properties to the alert rule. These will be sent with the alert payload.

Name	Value
	:

Review + create

Previous

Next: Details >

Create an alert rule ...

Scope Condition Actions Details Tags Review + create

Project details

Select the subscription and resource group in which to save the alert rule.

Subscription ⓘ

Visual Studio Enterprise Subscription – MPN

Resource group * ⓘ

rg-az104-monitoring

[Create new](#)

Alert rule details

Alert rule name * ⓘ

VMs-Deallocated

Alert rule description ⓘ

VM Deallocated|

Advanced options

Review + create

Previous

Next: Tags >

Create an alert rule ... X

Scope Condition Actions Details Tags **Review + create**

Scope

Resources

- 💡 Visual Studio Enterprise Subscription – MPN > [key] rg-az104-monitoring-labs1 > [cloud] VM01-LAB11
- 💡 Visual Studio Enterprise Subscription – MPN > [key] rg-az104-monitoring-labs2 > [cloud] VM02-LAB11

Condition

Condition preview Whenever the Activity Log has an event with Category='Administrative', Signal name='Deallocate Virtual Machine (Virtual Machines)'

Actions

Action group name Contains actions
vms-monitor 1 Email ⓘ

Details

Create **Previous**

✓ Alert rule created Alert rule VMs-Deallocated successfully created. It might take a few minutes for changes to be shown. 3 minutes ago

✓ Create action group Action group created successfully 7 minutes ago

VMs-Deallocated ! Activity log alert rule

Search Overview

- Activity log
- Access control (IAM)
- Tags

Settings

- Locks

Automation

- Tasks (preview)
- Export template

Support + troubleshooting

New Support Request

Scope

Resource	Hierarchy
[key] vm02-lab11	💡 Visual Studio Enterpris... > [key] rg-az104-monitoring-l...
[key] vm01-lab11	💡 Visual Studio Enterpris... > [key] rg-az104-monitoring-l...

Condition

Whenever the Activity Log has an event with Category='Administrative', Operation name='Deallocate Virtual Machine'

[View events in Azure Monitor - Activity Log](#)

Actions

Name	Contains actions
vms-monitor	1 Email

- Feito isso vamos na vm em que se encontra na regra, e vamos pausar

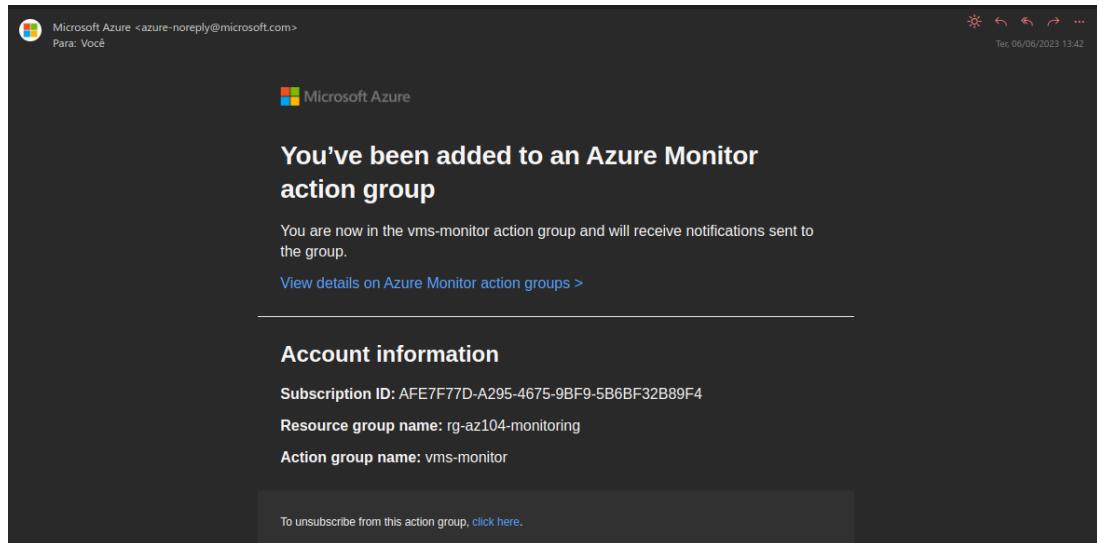
The screenshot shows the Azure portal's 'Virtual machines' blade. It lists two virtual machines: 'VM01-LAB11' and 'VM02-LAB11'. Both are of type 'Virtual machine' and are currently 'Running'. The 'Status' column includes a 'Stop' button, which is highlighted with a red box. Other actions like 'Start', 'Restart', 'Delete', 'Services', and 'Maintenance' are also visible.

- O analytics valida o activity logs da vm

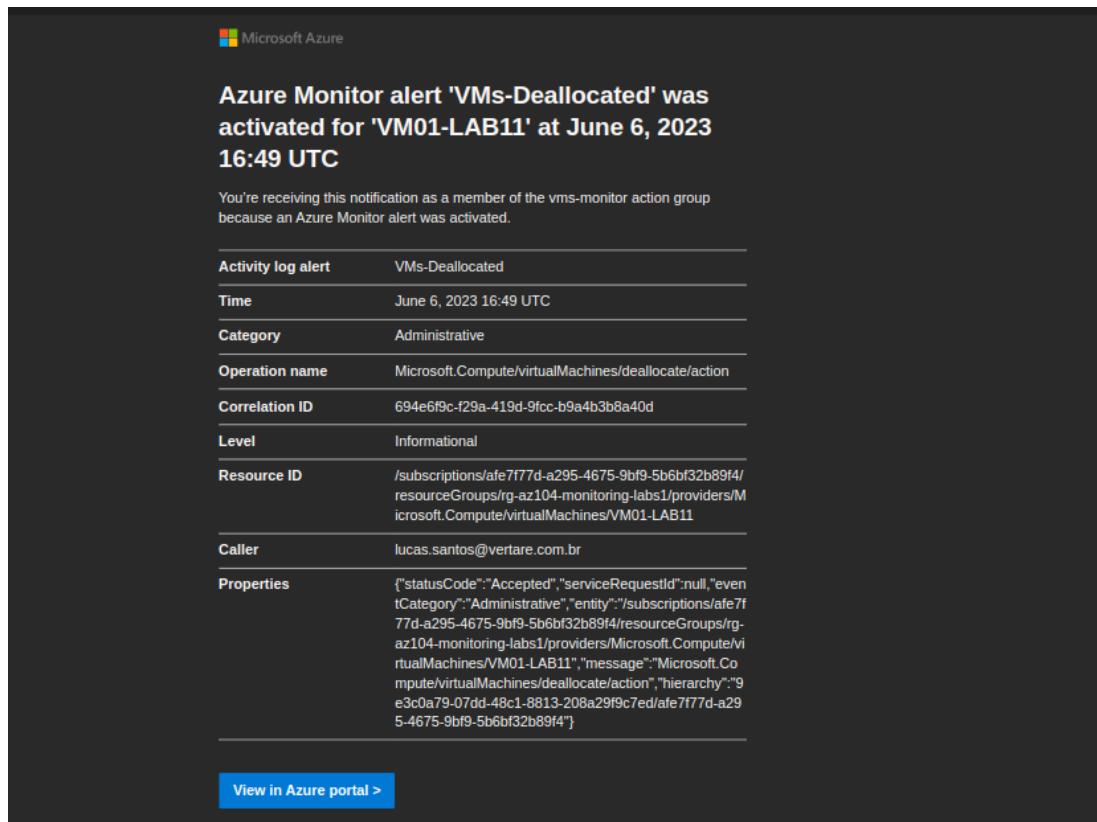
The screenshot shows the 'Activity log' blade for 'VM01-LAB11'. It displays a list of recent events. One event, 'Deallocate Virt.', is highlighted with a red box. The event details show it was accepted a minute ago on Tuesday, June 6, 2023, by 'Visual Studio Enterpr...' and initiated by 'lucas.santos@vertare...'. Other events listed include 'Start Virtual Ma...' and 'Health Event Re...'.

Operation name	Status	Time	Time stamp	Subscription	Event initiated by
> Deallocate Virt.	Accepted	a minute ago	Tue Jun 06 ...	Visual Studio Enterpr...	lucas.santos@vertare...
> Start Virtual Ma...	Succeeded	17 minutes ...	Tue Jun 06 ...	Visual Studio Enterpr...	lucas.santos@vertare...
> Health Event Re...	Resolved	18 minutes ...	Tue Jun 06 ...	Visual Studio Enterpr...	

- Indo no e-mail podemos ver o alerta notificando
 - Primeiro receberá um e-mail informando que a conta foi adicionada em um grupo de ação



- Em seguida receberá o alerta indicando que a vm X foi desalocada



▼ Lab05 - Realizar testes com o network watcher

- Vamos entender o monitoramento como o Network watcher
 - Vamos em network watcher

Azure Active Directory (9)

Services

- Network managers
- Network connections
- Network interfaces
- Network Watcher

- Vamos confirmar se já está habilitado em nosso região

Search

Overview

Get started

Monitoring

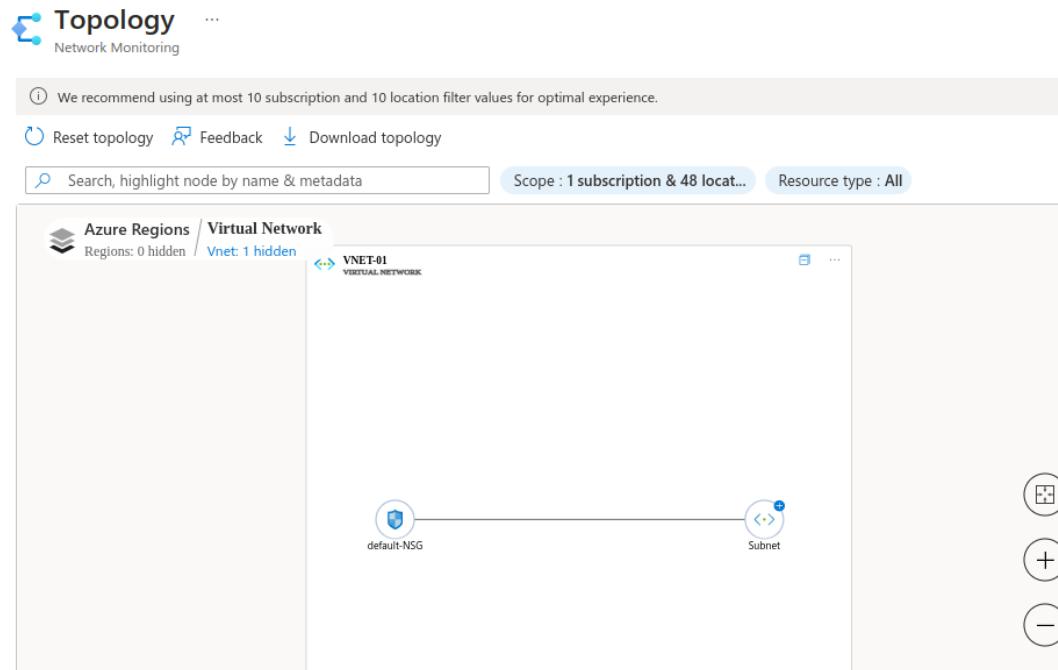
- Topology
- Connection monitor (classic)
- Connection monitor
- Network Performance Monitor

Network diagnostic tools

- IP flow verify
- NSG diagnostics
- Next hop

Name	Subscription	Location
NetworkWatcher_eastus	Visual Studio Enterprise ...	East US
NetworkWatcher_eastus2	Visual Studio Enterprise ...	East US 2

- Opções do monitoring
 - As topologias de rede são criadas pelo network watcher



- Connection monitor permite ativar uma conexão entre duas máquinas, isso permite validar os logs, funciona como TCPDUMP

The screenshot shows the Network Watcher Connection monitor interface. At the top, there's a header with the title 'Network Watcher | Connection monitor' and a sub-header 'Microsoft'. Below the header, there's a search bar, a 'Create' button, a 'Refresh' button, and a 'Feedback' button. A sidebar on the left has links for 'Overview', 'Get started', 'Monitoring', 'Topology', 'Connection monitor (classic)', 'Connection monitor' (which is highlighted with a green box and a green arrow labeled 'Novo'), and 'Network Performance Monitor'. The main area is titled 'Overview' with sub-links 'Get Started', 'Import tests from NPM', and 'Migrate'. It also has 'Filter ...', '4 selected', and 'Scope : 1 Subscriptions &'. A message at the bottom says 'No resources to display'. A red arrow points to 'Connection monitor (classic)' with the label 'Legado', and a green arrow points to 'Connection monitor' with the label 'Novo'.

Create Connection Monitor

Microsoft
Data generated by Connection monitor tests in Log Analytics workspace. Complete the basics and then proceed to Test Groups tab. [Learn more](#)

Connection Monitor Name *	test-monitoring
Subscription *	Visual Studio Enterprise Subscription – MPN
Don't see a subscription? Open Directory + Subscription settings	
Region *	East US
Workspace configuration <input type="checkbox"/> Use workspace created by connection monitor (default) Subscription * Visual Studio Enterprise Subscription – MPN Region * 2 selected Workspace * az104-monitoring-logs-workspace <small>Visual Studio Enterprise Subscription – MPN in eastus</small>	

[Next : Test groups >>](#) [Review + create](#) [Cancel](#)

Add Test configuration

Protocol ⓘ	HTTP
<input type="checkbox"/> Create TCP test configuration ⓘ	
Destination port *	80
Test Frequency ⓘ	Every 30 seconds
HTTP Configuration Method GET Path <small>Eg: /</small> Request headers <small>Eg: 'X-StuffServer-RandomString: 80000', 'Host: remotestuffserver'</small> Valid status code ranges <small>Eg: '102', '200-202', '3xx'</small>	
Success Threshold ⓘ Add Test configuration Cancel	

Add test group details

Test group name * ✓

Sources 1 Items [Edit](#)

Azure endpoints	Extension Status
VNET-01(rg-az104-monitoring-l...	Not Enabled
Subscription: Visual Studio Enter...	
Resource group: rg-az104-mon...	
Edit	

Test configurations 1 Items [Edit](#)

test
Add Test configuration

Destinations 1 Items [Edit](#)

Azure endpoints	Extension Status
VNET-02(rg-az104-monitoring-l...	Enabled
Subscription: Visual Studio Enter...	
Resource group: rg-az104-mon...	
Edit	

[Add sources](#) [Add Test configuration](#) [Add destinations](#)

Disable test group
While creating the Connection Monitor, if you have disabled a test group you will not be charged for it unless you enable it again

[Add Test Group](#) [Cancel](#)

Create Connection Monitor

Microsoft

[Basics](#) [Test groups](#) [Create alert](#) [Review + create](#)

Test groups

test-group [Edit](#)

Sources 1 Items [Edit](#)

VNET-01(rg-az104-mon...	test
Edit	

Destinations 1 Items [Edit](#)

VNET-02(rg-az104-mon...	test
Edit	

Test Configuration 1 Items [Edit](#)

test
Edit

Summary

Each test group in Connection Monitor defines a number of sources, destinations and test configurations. All sources and destinations added to a test group with test configuration specified get broken down to individual tests. Tests are automatically generated by Connection Monitor. Individual tests will produce their own results, including checks failure rate and round-trip time.

[Add Test Group](#)

Name	Sources ↑↓	Destinations ↑↓	Test Configuration ↑↓	Current... ↑↓	Estima... ↑↓	Status ↑↓	Extens... ↑↓
test-group	VNET-01(rg-az104-mon...	VNET-02(rg-az104-mon...	test	0	\$0.3	Enabled	1 Auto Enableme... ***

[<< Previous](#) [Next : Create alert >>](#) [Review + create](#) [Cancel](#)

Notifications

[More events in the activity log →](#)

[Dismiss all](#) ▾

✓ Connection Monitor

Connection Monitor test-net created successfully

Click Refresh to see created connection monitor.

a few seconds ago

✓ Deployment succeeded

Deployment 'NetworkWatcher_VM01-LAB11-20230606142418' to resource group 'rg-az104-monitoring-labs1' was successful.

[Pin to dashboard](#)

[Go to resource group](#)

Network Watcher - Connection Monitor

Microsoft

[+ Create](#) [⟳ Refresh](#) [🔗 Feedback](#)

[Overview](#) [Get Started](#) [Import tests from NPM](#) [Migrate Connection Monitors](#)

ℹ️ Newly created Connection Monitors may take 3-5 mins to get monitoring data and show up in the dashboard.

[🔍 Filter by name](#)

4 selected ▾

Scope : 1 Subscriptions & 1 Locations

Time : Current Time (6/6/2023, 2:26:07 PM)

Fail ⓘ

0 ✖️
out of 1

Warning ⓘ

0 ⚠️
out of 1

Indeterminate ⓘ

1 ?
out of 1

Not running ⓘ

0 🕒
out of 1

Pass ⓘ

0 ✓
out of 1

Alerts fired

0 ❗
out of 0 created

Connection Monitor

↑↓ Test configu...

AI..↑↓ Protocol

↑↓ Status

↑↓ Reason

↑↓ Last polled ↑↓

> [🔍 test-net](#)

[Create ↗](#) -

?

- Network Performance Monitor é o medidor de performance em nossa rede, podemos add a rede que estamos trabalhando e atribuir os logs para um determinado workspace

Starting 1 July 2021, you will not be able to add new tests in existing or new workspaces in Network Performance Monitor but you can continue to use the tests created prior to 1 July 2021. We're retiring Network Performance Monitor on 29 February 2024. [Migrate](#) to the new Connection Monitor before 29 February 2024.

Subscription

Visual Studio Enterprise Subscription – M...

Workspace name	Location
az104-monitoring-logs-workspace	eastus

Alerts fired

Reason	Last polled
ChecksFailedPercer	6/6/2023 2:26:07... ***
ChecksFailedPercer	6/6/2023 2:26:07... ***

- Indo em try connection ele irá efetuar um teste com o connection monitor que fizemos, os logs serão encaminhados para o log workspace
 - Como as vms estão em redes diferentes não pareadas irá ocorrer este erro
- Opções de ferramentas de diagnóstico
 - IP flow verify funciona como um ping avançado, setamos a vm, e setamos o ping e porta para testar se está chegando, caso chegue ele vai dar uma mensagem que está ok, caso o contrário ele apontará que foi denied e apontará o nome da regra que bloqueou

Network Watcher | IP flow verify

Microsoft

Search

Monitoring

- Topology
- Connection monitor (classic)
- Connection monitor
- Network Performance Monitor

Network diagnostic tools

- IP flow verify**
- NSG diagnostics
- Next hop
- Effective security rules
- VPN troubleshoot
- Packet capture
- Connection troubleshoot

Metrics

- Usage + quotas

Logs

- Cloud logs

information. The security group decision and the name of the rule that denied the packet will be returned. [Learn more.](#)

Specify a target virtual machine with associated network security groups, then run an inbound or outbound packet to see if access is allowed or denied.

Target resource

Virtual machine * Select virtual machine

Network interface *

Packet details

Protocol TCP UDP

Direction Inbound Outbound

Local IP address *

Local port *

Remote IP address *

Remote port *

Verify IP flow

Results

Access allowed

Security Rule	Network Security Group
default-allow-3389	default-NSG

- Next Hop valida se uma determinada conexão passa por algum ip no meio do caminho

Network Watcher | Next hop

Microsoft

Search

Learn more.

Subscription * Visual Studio Enterprise Subscription – MPN

Resource group * rg-az104-monitoring-labs1

Virtual machine * VM01-LAB11

Network interface * VMNic01

Source IP address * 10.1.0.4

Destination IP address * 20.122.180.25

Next hop

Result

Next hop type **Internet**

IP address

Route table ID System Route

- Effective security rules, serve quando tivermos uma rede grande, setamos o RG e a vm, e podemos ver todas as regras na vm, ele permite fazermos um download do CSV com todas as regras

Network Watcher | Effective security rules

Microsoft

Search

Download Refresh

Showing only top 50 security rules in each grid, click Download above to see all.

Subscription * Visual Studio Enterprise Subscription – MPN

Resource group * rg-az104-monitoring-labs1

Virtual machine * VM01-LAB11

Select a network interface below to see the effective security rules and network security groups associated with it.

Scope Virtual machine (VM01-LAB11)

Network interface VMNic01

Associated NSGs: default-NSG (Subnet)

Click on a rule row to see the expanded list of prefixes.

default-NSG

- VPN troubleshoot conseguimos colocar o gateway e lado que o mesmo está conectado, ele permite validar como a conexão está ocorrendo, se a conexão está ocorrendo, ou oq pode estar impedindo da conexão ocorrer

Network Watcher | VPN troubleshoot

Microsoft

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Metrics

Subscription: Visual Studio Enterprise Subscript... Resource group: Select resource group to filter Location: No available items.

Select storage account: No available items.

Checkbox	Name	Troubleshooting sta...	Resource status	Resource Group	Lo
No results.					

- Packet capture valida o que está trafegando na vm, funciona como um wireshark

Network Watcher | Packet capture

Microsoft

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Metrics

Logs

- Flow logs
- Diagnostic logs
- Traffic Analytics

Add packet capture

Resource group: rg-az104-monitoring-labs

Target type: Virtual machine

Target instance: VM01-LAB11

Packet capture name: VM01-LAB11_1

Packet capture configuration

Capture location: Storage account (selected)

Storage accounts: cs2100320020771a3f2

Maximum bytes per packet: default: 0 (entire packet)

Maximum bytes per session: default: 1073741824

Time limit (seconds): default: 18000

Filtering (optional)

Protocol	Local IP address	Local port	Remote IP address	Remote port
TCP	20.122.40.124	3389	20.122.180.25	3389

Add filter criteria

Start packet capture Cancel

Name	Target	Status	Start time	Storage	Bytes per packet	Bytes per session
VM01-LAB11_1	VM01-LAB11	Running	6/6/2023, 2:44:18 PM	cs2100320020771a3f2	Entire packet (default)	1073741824

Details

Status Details

Session status
Running

Storage location
[packetcapture_17_44_17_038.cap](#)



- Connection troubleshoot, valida o tráfego, o caminho que está usando, o que está dando latência etc. Setamos a VM da origem e a de destino (demora um pouco para rodar).

Network Watcher | Connection troubleshoot

Source

Subscription * Visual Studio Enterprise Subscription – MPN

Resource group * rg-az104-monitoring-labs1

Source type * Virtual machine

Virtual machine * VM01-LAB11

Destination

Destination type Select a virtual machine

Specify manually

Resource group * rg-az104-monitoring-labs2

Virtual machine * VM02-LAB11

Probe settings

Preferred IP version IPv4

Protocol TCP

ICMP

Destination port * 3389

Source port (optional) 3389

Connection diagnostic

Diagnostic tests * 4 selected

Destination port * ⓘ

Source port (optional) ⓘ

Connection diagnostic

Diagnostic tests * ⓘ

Select all
 Connectivity
 NSG diagnostic
 Next hop
 Port scanner

4 selected

Run diagnostic tests

Test	Status	Details	Suggestions
Connectivity Test	Success	Probes Sent: 13 ,Probes Failed: 12 Avg Latency: 1 ms Min Latency: 1 ms Max Latency: 1 ms	None
NSG Outbound (from source)	Fail	There are failed tests in the following NSGs: • default-NSG	Go to VM > Update the networking rule Read docs
NSG Inbound (to destination)	Fail	There are failed tests in the following NSGs:	Go to VM > Update the networking rule Read docs
Next Hop (from source)	Success	Next Hop Type: None Route Table Id: System Route	None
Destination port accessible	Success	Port on destination is reachable	
Destination port accessible	Fail	Port on source is not reachable	None

Hop by hop details

Name	Status	IP address	Next hop	RTT	Errors
VM01-LAB11	Success	10.1.0.4	20.122.180.25	2	-
VM02-LAB11	Info	20.122.180.25	-	-	{"origin": "Outbound", "severity": "Error", "type": "VMNotAllocated", "context": []}

- Após concluir ele mostra o caminho, o destino, por onde passou, o numero de pacotes que enviou, e também ele mostra uma topologia
- Vamos criar um peering entre as duas VNets que criamos para testar novamente, para confirmar se mostra que a conexão ocorre através da rede interna
- Concluido, podemos ver que dessa vez ele foi pelo IP interno
- Ou seja ele vai sempre pela localidade mais proxima
- Trocando o protocolo TCP para ICMP, ele realizará um ping avançado, porém como o NSG não tem a regra ele apresentará erro

Topology view

