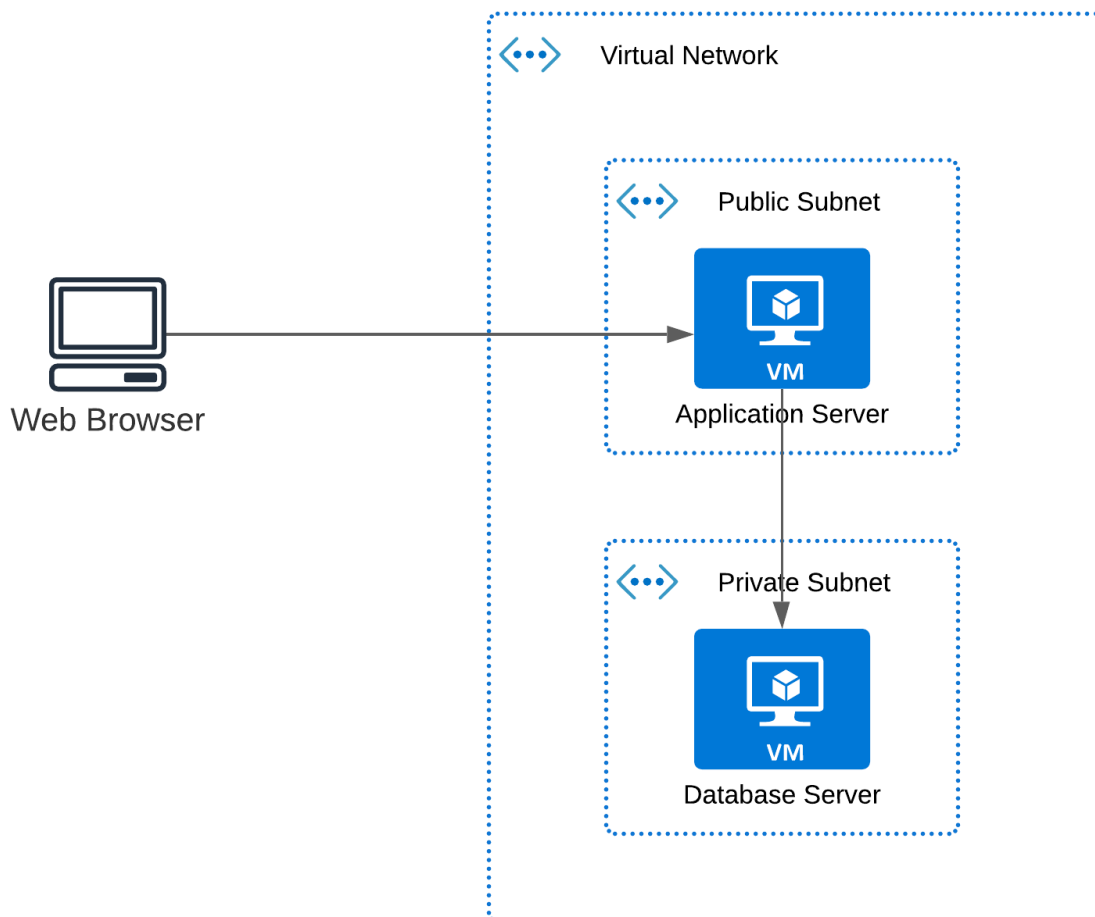


## Scenario

According to recent research, 40-75% of employees are using Dropbox to share files inside and outside of their businesses. Half of those Dropbox users do this even though they know it's against the rules. More than 40% of businesses have experienced the exposure of confidential information and the estimated average cost of a data breach equaled \$5.5 Million in 2011.

These files, containing sensitive company and customer data, are stored in a public cloud outside of the businesses' control - possibly even outside of the country. The potential for data leakage and security breaches is enormous and companies need to stay compliant with their own policies and procedures for security and governance.

## Architecture diagram:



ArchitectureImplementation	
1	Implement2differentsubnets(onepublicandtheotherprivate)inavirtualnetwork
2	InstallandconfigureMySQLonanUbuntu18.04virtualmachineontheprivatesubnetusingtheinstructions provided. (Hint: Use a bastion host and a NAT gateway)
3	InstallandconfigureOwnCloudonanUbuntu18.04virtualmachineonthepublicsubnetusingtheprovided instructions.
4	Configurethenetworksecuritygroupstoallowtherequiredports
5	TesttheinstallationbyaccessingtheIPoftheapplicationserverinabrowser

### Step1:VPCandSubnetCreation

Stepnumber	a
Stepname	CreationofVirtualNetwork
Expected screenshots	1) Createdvirtualnetworkwithpropertiesvisible 2) Propertiesofpublicsubnet 3) Propertiesofprivatesubnet

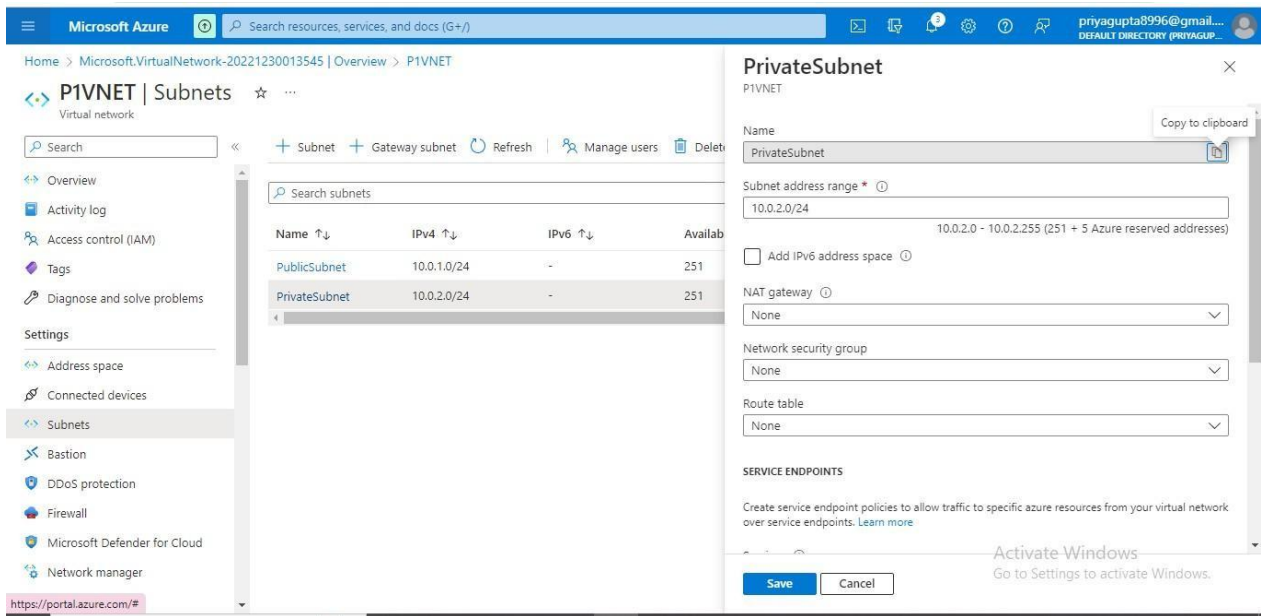
## VirtualNetworksCreated:

The screenshot shows the Azure portal interface for a Virtual Network (P1VNET). The left sidebar contains navigation options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Address space, Connected devices, Subnets, Bastion, DDoS protection, Firewall, and Microsoft Defender for Cloud. The main content area displays the 'Overview' tab with essential information: Resource group (res-1), Location (East US), Subscription (Free Trial), and Subscription ID (2b8088d0-d862-47b4-bd5f-bd40a169e4e0). It also shows the Address space (10.0.0.0/16), DNS servers (Azure provided DNS service), Flow timeout (Configure), BGP community string (Configure), and Virtual network ID (fba16f44-d65e-4b45-ad33-bf7af98972e9). Below this, there are three cards for DDoS protection, Azure Firewall, and Peerings, all marked as 'Not configured'.

## PublicSubnet:

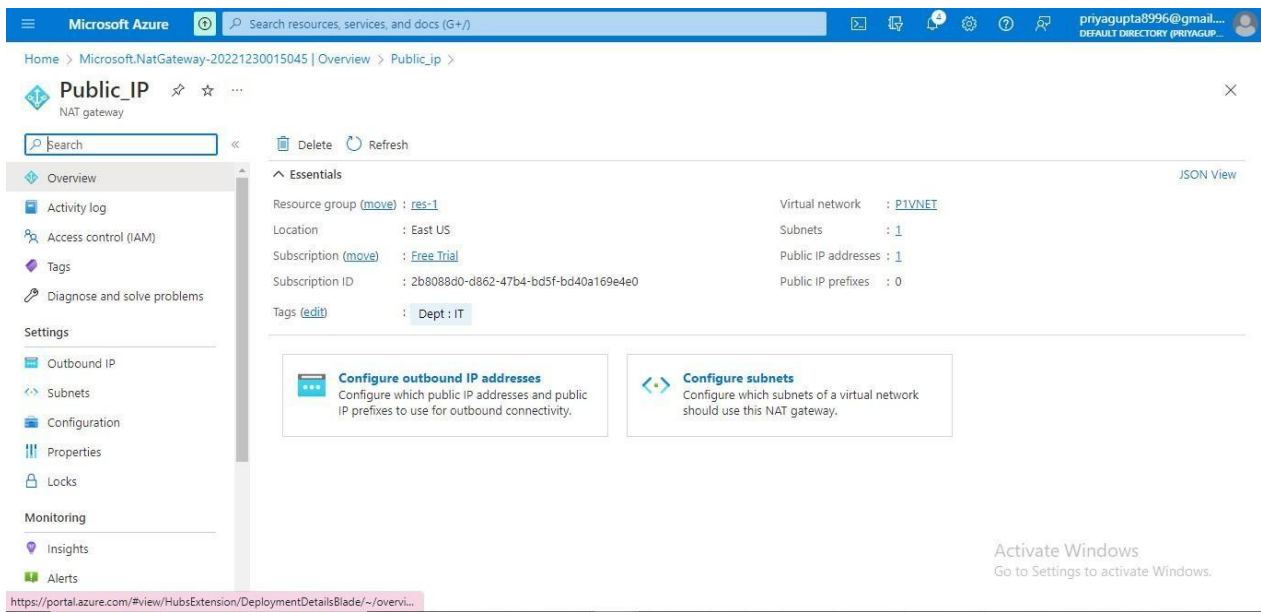
The screenshot shows the Azure portal interface for the Subnets page of the P1VNET. The left sidebar is the same as the previous screenshot. The main content area displays a table of subnets with columns for Name, IPv4, IPv6, and Availability. Two subnets are listed: PublicSubnet and PrivateSubnet, both with IPv4 address ranges of 10.0.1.0/24 and 10.0.2.0/24 respectively, and an availability of 251. The PublicSubnet configuration form is open on the right, showing fields for Name (PublicSubnet), Subnet address range (10.0.1.0/24), Add IPv6 address space (unchecked), NAT gateway (None), Network security group (None), and Route table (None). The SERVICE ENDPOINTS section is also visible, with a note to create service endpoint policies. The form has 'Save' and 'Cancel' buttons at the bottom.

PrivateSubnet



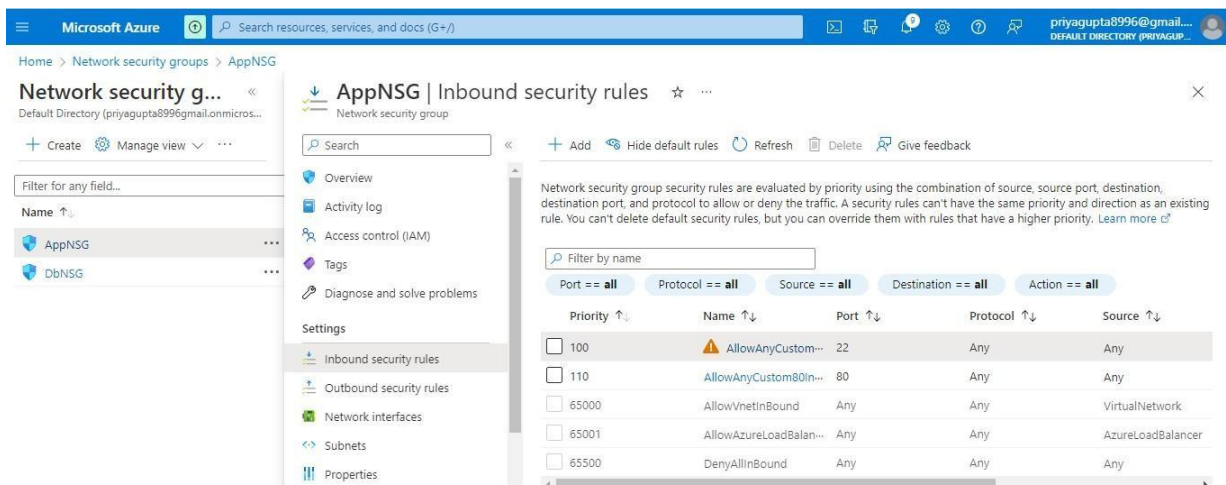
Stepnumber	b
Stepname	CreationofNATGateway
Expected screenshots	1)CreatedNATgateway

NATGateway:



Stepnumber	C
Stepname	CreationandconfigurationofNetworksecuritygroups
Expectedscreenshots	hots
	1)AppNSGsecurityrules
	2)DbNSGsecurityrules

AppNSG securityrules:



# DbNSG securityrules

Microsoft Azure

Search resources, services, and docs (G+/I)

priyagupta8996@gmail...

DEFAULT DIRECTORY (PRIYAGUP...

Home > Network security groups > DbNSG

Network security g...

Default Directory (priyagupta8996gmailonmicros...

+ Create

Manage view

Filter for any field...

Name ↑

AppNSG

DbNSG

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Inbound security rules

Outbound security rules

Network interfaces

Subnets

Properties

Locks

DbNSG | Inbound security rules

Network security group

+ Add

Hide default rules

Refresh

Delete

Give feedback

Search

Filter by name

Port == all

Protocol == all

Source == all

Destination == all

Action == all

Priority ↑↓	Name ↑↓	Port ↑↓	Protocol ↑↓	Source ↑↓
<input type="checkbox"/> 100	Port_3306inbound	3306	Any	Any
<input type="checkbox"/> 110	Port_22inbound	22	Any	Any
<input type="checkbox"/> 65000	AllowVnetInBound	Any	Any	VirtualNetwork
<input type="checkbox"/> 65001	AllowAzureLoadBalan...	Any	Any	AzureLoadBalancer
<input type="checkbox"/> 65500	DenyAllInBound	Any	Any	Any

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 rules 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](#)

## Step2:InstanceCreation

Stepnumber	a
Stepname	CreationofApplicationserver
Expected screenshots	1)CreatedApplicationserverOverviewpage

## ApplicationserverOverviewpage

The screenshot displays the Microsoft Azure portal interface for a virtual machine named 'VM-Test1'. The top navigation bar includes the 'Microsoft Azure' logo, a search bar, and a user profile. The left sidebar contains navigation links for 'Home', 'Virtual machines', 'Activity log', 'Diagnose and solve problems', 'Settings', 'Automation', and 'Help'. The main content area is titled 'VM-Test1' and includes a search bar and a toolbar with actions like 'Connect', 'Start', 'Restart', 'Stop', 'Capture', 'Delete', 'Refresh', 'Open in mobile', 'CLI / PS', and 'Feedback'. The 'Essentials' section provides a summary of the VM's properties, including its resource group, status, location, subscription, and operating system. The 'Properties' section is expanded, showing details for the 'Virtual machine' and 'Networking' categories. The 'Virtual machine' section lists the computer name, health state, operating system, and publisher. The 'Networking' section lists the public and private IP addresses. The bottom right corner of the screen shows an 'Activate Windows' watermark.

Essentials	
Resource group	(move) : <a href="#">res-1</a>
Status	: Running
Location	: East US
Subscription	(move) : <a href="#">Free Trial</a>
Subscription ID	: 2b8088d0-d862-47b4-bd5f-bd40a169e4e0
Tags	(edit) : <a href="#">Click here to add tags</a>
Operating system	: Linux (ubuntu 18.04)
Size	: Standard B1s (1 vcpu, 1 GiB memory)
Public IP address	: <a href="#">20.228.238.141</a>
Virtual network/subnet	: <a href="#">P1VNET/PrivateSubnet</a>
DNS name	: <a href="#">Not configured</a>

Properties	
<strong>Virtual machine</strong>	
Computer name	VM-Test1
Health state	-
Operating system	Linux (ubuntu 18.04)
Publisher	Canonical

Networking	
Public IP address	20.228.238.141
Public IP address (IPv6)	-
Private IP address	10.0.2.5
Private IP address (IPv6)	-

Stepnumber	b
Stepname	CreationofDatabaseserver
Expected screenshots	1)CreatedDatabaseserveroverviewpage

## Databaseserveroverviewpage

The screenshot displays the Microsoft Azure portal interface. At the top, the navigation bar shows 'Microsoft Azure' and a search bar. The user's profile 'priyagupta8996@gmail...' is visible on the right. The breadcrumb trail indicates the location: 'Home > Virtual machines > VM-Test2'. Below the breadcrumb, the VM name 'VM-Test2' is shown with a 'Virtual machine' label. A toolbar contains actions like 'Connect', 'Start', 'Restart', 'Stop', 'Capture', 'Delete', 'Refresh', 'Open in mobile', 'CLI / PS', and 'Feedback'. The main content area is divided into two sections: 'Essentials' and 'Properties'. The 'Essentials' section provides a summary of the VM's configuration, including its resource group, status, location, subscription, and operating system. The 'Properties' section is further divided into 'Virtual machine' and 'Networking' tabs, showing detailed specifications for the VM and its network configuration. A 'JSON View' link is available in the top right of the Essentials section.

**Essentials**

Resource group (move)	: res-1	Operating system	: Linux (ubuntu 18.04)
Status	: Running	Size	: Standard B1s (1 vcpu, 1 GiB memory)
Location	: East US	Public IP address	: -
Subscription (move)	: Free Trial	Virtual network/subnet	: P1VNET/PrivateSubnet
Subscription ID	: 2b8088d0-d862-47b4-bd5f-bd40a169e4e0	DNS name	: -
Tags (edit)	: <a href="#">Click here to add tags</a>		

**Properties** | Monitoring | Capabilities (7) | Recommendations | Tutorials

**Virtual machine**

Computer name	VM-Test2
Health state	-
Operating system	Linux (ubuntu 18.04)
Publisher	Canonical
Offer	UbuntuServer
Plan	18_04-lts-gen2

**Networking**

Public IP address	-
Public IP address (IPv6)	-
Private IP address	10.0.2.6
Private IP address (IPv6)	-
Virtual network/subnet	P1VNET/PrivateSubnet
DNS name	-

Activate Windows  
Go to Settings to activate Windows.



## Step4:ApplicationandDatabaseInstallationandTesting

Step number	a
Stepname	InstallationandconfigurationofMySQL
Expected screenshots	1) Downloadingoftheprovidedscrip 2) Executingthescript

```
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.  
  
azureuser@VM-Test1:~$ ssh -i VM-Test1_key_1231.ppk ubuntu@10.0.2.6  
Warning: Identity file VM-Test1_key_1231.ppk not accessible: No such file or directory.  
The authenticity of host '10.0.2.6 (10.0.2.6)' can't be established.  
ECDSA key fingerprint is SHA256:ZKy7xmzfeF8zDgfcWYCySywEgmfjsdapsolZhmhg80w.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added '10.0.2.6' (ECDSA) to the list of known hosts.  
ubuntu@10.0.2.6: Permission denied (publickey).  
azureuser@VM-Test1:~$
```

Activate Windows

