

Create a VNet

Creating a virtual network and resource group...

The screenshot shows the 'Create virtual network' wizard in the Microsoft Azure portal. The current step is 'Basics'. The 'Project details' section shows a selected subscription 'Azure for Students' and a new resource group '(New) GuoDevVNET'. The 'Instance details' section shows a virtual network name 'GuoDevVNET' and a region '(US) East US 2'. At the bottom, there are 'Previous', 'Next', and 'Review + create' buttons.

Adding subnets...

The screenshot shows the 'Create virtual network' wizard in the Microsoft Azure portal, focusing on the 'IP addresses' step. A 'Add a subnet' modal is open on the right. It shows a configuration for a new subnet named 'default2' with a checked 'Include an IPv4 address space' option. The 'IPv4' section includes fields for 'Starting address' and 'Size'. The 'IPv6' section has an unchecked 'Include an IPv6 address space' checkbox. The 'Private subnet' section contains a note about enabling outbound connectivity via a NAT gateway. At the bottom of the modal are 'Add' and 'Cancel' buttons. The main wizard interface shows a table for subnets with one entry for 'default' and a 'Add IP address space' button.

Subnets added...

The screenshot shows the 'Create virtual network' wizard in Microsoft Azure, specifically the 'IP addresses' step. The top navigation bar includes 'Microsoft Azure', a search bar, and user information 'SHG182@pitt.edu UNIVERSITY OF PITTSBURGH (P...)'.

The main content area is titled 'Create virtual network' with a back button. Below it, tabs for 'Basics', 'Security', 'IP addresses' (which is selected), 'Tags', and 'Review + create' are visible.

A large central panel displays a table for managing subnets:

Subnets	IP address range	Size	NAT gateway
DMZ	[REDACTED]	[REDACTED]	[REDACTED]
Intranet	[REDACTED]	[REDACTED]	[REDACTED]
AppServices	[REDACTED]	[REDACTED]	[REDACTED]

Below the table are buttons for 'Add subnet' and 'Delete address space'. At the bottom of the panel are buttons for 'Add IP address space' and 'Next'.

At the very bottom of the screen are 'Previous', 'Next', and 'Review + create' buttons.

Creating a virtual network...

The screenshot shows the 'Create virtual network' wizard in Microsoft Azure, specifically the 'Basics' step. The top navigation bar includes 'Microsoft Azure', a search bar, and user information 'SHG182@pitt.edu UNIVERSITY OF PITTSBURGH (P...)'.

The main content area is titled 'Create virtual network' with a back button. Below it, tabs for 'Basics' (selected), 'Security', 'IP addresses', 'Tags', and 'Review + create' are visible.

The 'Basics' section contains the following configuration:

Subscription	Azure for Students
Resource Group	GuoDevVNET
Name	GuoDevVNET
Region	East US 2

The 'Security' section contains the following settings:

Azure Bastion	Disabled
Azure Firewall	Disabled
Azure DDoS Network Protection	Disabled

The 'IP addresses' section contains the following subnet configuration:

Address space	[REDACTED]
Subnet	DMZ [REDACTED]
Subnet	Intranet [REDACTED]
Subnet	AppServices [REDACTED]

At the bottom of the screen are 'Previous', 'Next', and 'Create' buttons.

Virtual network created...

GuoDevVNET Overview

Resource group (move) : GuoDevVNET

Location (move) : East US 2

Subscription (move) : Azure for Students

Subscription ID : [REDACTED]

Address space : [REDACTED]

DNS servers : Azure provided DNS service

Flow timeout : Configure

BGP community string : Configure

Virtual network ID : [REDACTED]

Tags (edit) : Add tags

Capabilities (5)

- DDoS protection
- Azure Firewall
- Peering
- Microsoft Defender for Cloud
- Private endpoints

Topology Properties Capabilities (5) Recommendations Tutorials

Create a VM

Creating a virtual machine...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Create a virtual machine

This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

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 for Students

Resource group * : (New) GuoDevVMs

Virtual machine name * : GuoBastionHost

Region * : (US) East US 2

< Previous Next : Disks > Review + create Give feedback

Selecting network...

The screenshot shows the Microsoft Azure 'Create a virtual machine' interface. The 'Networking' tab is selected. The 'Network interface' section is configured as follows:

- Virtual network: GuoDevVNET
- Subnet: DMZ [REDACTED]
- Public IP: (new) GuoBastionHost-ip
- NIC network security group: Basic (selected)
- Public inbound ports: Allow selected ports (selected)

At the bottom, there are navigation buttons: < Previous, Next : Management >, and Review + create.

Creating VM...

The screenshot shows the Microsoft Azure 'Create a virtual machine' interface on the 'Review + create' tab. A green bar at the top indicates 'Validation passed'. The 'Price' section shows:

- 1 X Standard B2s by Microsoft
- Subscription credits apply: 0.0496 USD/hr
- [Pricing for other VM sizes](#)

The 'TERMS' section contains a detailed legal agreement. A warning message at the bottom left states: "⚠ 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." At the bottom, there are navigation buttons: < Previous, Next >, Create, Download a template for automation, and Give feedback.

VM created...

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes 'Microsoft Azure', a search bar, and user information 'SHG182@pitt.edu UNIVERSITY OF PITTSBURGH (PA)'. The main title is 'GuoBastionHost' under 'Virtual machine'. The left sidebar has sections like 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Connect', 'Networking', 'Settings', 'Availability + scale', 'Security', 'Backup + disaster recovery', 'Operations', 'Monitoring', 'Automation', and 'Help'. The 'Overview' tab is selected. The main content area shows 'Properties' for the virtual machine, including 'Computer name: GuoBastionHost', 'Operating system: Windows (Windows Server 2019 Datacenter)', 'VM generation: V2', 'VM architecture: x64', 'Agent status: Ready', 'Agent version: 2.7.41491.1095', 'Hibernation: Disabled', 'Host group: -', 'Host: -', 'Proximity placement group: -', 'Colocation status: N/A', 'Capacity reservation group: -', 'Disk controller type: SCSI', and 'Azure Spot: -'. It also displays 'Networking' details: 'Public IP address: [REDACTED]', 'Public IP address (IPv6): -', 'Private IP address: [REDACTED]', 'Private IP address (IPv6): -', 'Virtual network/subnet: GuoDevVNET/DMZ', and 'DNS name: Configure'. Below these are 'Size' (Standard B2s), 'vCPUs: 2', 'RAM: 4 GiB', and 'Source image details' (Source image publisher: MicrosoftWindowsServer, Source image offer: WindowsServer, Source image plan: 2019-datacenter-gensecond).

Connecting to VM

Is the public IP static or dynamic? What is the difference? **This public IP is static as shown in the image below.** The difference between static and dynamic is that static IP remains constant over time, while dynamic will change periodically, such as a router restart or ISP refresh. In conclusion, if the public IP changes, it is dynamic; If it doesn't change, in most cases, it is static.

The screenshot shows the 'GuoBastionHost-ip | Configuration' page. The left sidebar includes 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Settings', 'Configuration' (selected), 'Properties', and 'Locks'. The main content area shows 'IP address assignment: Static', 'IP address: [REDACTED]', 'Idle timeout (minutes): 4', and 'DNS name label (optional): .eastus2.cloudapp.azure.com'. A note says '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](#)'. Below this, 'Alias record sets' are listed with 'Create an alias record in Azure DNS. [Learn more](#)' and '+ Create alias record'. A table at the bottom lists 'Subscription', 'DNS zone', 'Name', 'Type', and 'TTL' with 'No results.' and 'Need help?' buttons.

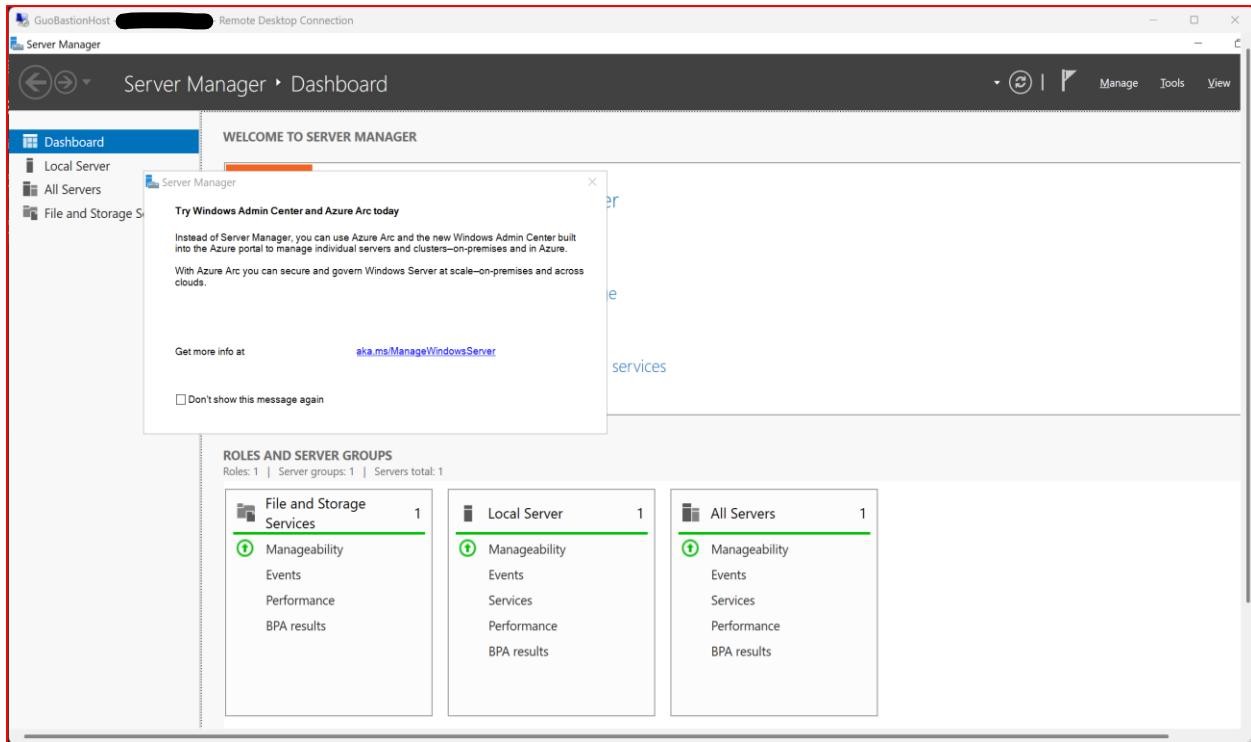
Connecting to VM using RDP...

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes 'Microsoft Azure', a search bar, 'Copilot', and user information 'SHG182@pitt.edu UNIVERSITY OF PITTSBURGH (PL)'. The main content area is titled 'GuoBastionHost | Connect' under 'Virtual machine'. A message says 'Your virtual machine is stopped' with a note to start it before connecting. Below are buttons for 'Start VM', 'View instructions', and 'Cancel'. On the left, a sidebar menu is open, showing 'Connect' selected under 'GuoBastionHost'. Other options include 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Networking', 'Settings', 'Availability + scale', 'Security', 'Backup + disaster recovery', 'Operations', 'Monitoring', 'Automation', and 'Help'. Under 'Connect', there are links for 'Bastion' and 'Windows Admin Center'. The central pane displays 'Most common' connection methods, with 'Native RDP' highlighted. It shows a preview of the connection, stating 'Local machine' and 'Native RDP'. Below this, it says 'Connect via native RDP without any additional software needed. Recommended for testing only.' and lists a 'Public IP address' (redacted). Buttons for 'Select' and 'Download RDP file' are present. At the bottom, there's a link 'More ways to connect (4)'.

VM connected using the public IP (████████) ...

The screenshot shows a 'Remote Desktop Connection security warning' dialog box. The title bar says 'Remote Desktop Connection security warning'. The main content area has a yellow header with an exclamation mark icon and the text 'The publisher of this remote connection can't be identified. Do you want to connect anyway?'. Below this, a message states 'This remote connection could harm your local or remote computer. Do not connect unless you know where this connection came from or have used it before.' On the left, there's a small icon of a computer monitor with a green checkmark. To its right, the 'Publisher:' is listed as 'Unknown publisher', 'Type:' as 'Remote Desktop Connection', and 'Remote computer:' followed by a redacted IP address. At the bottom left is a checkbox for 'Don't ask me again for connections to this computer'. At the bottom right are 'Connect' and 'Cancel' buttons.

Successfully connected...

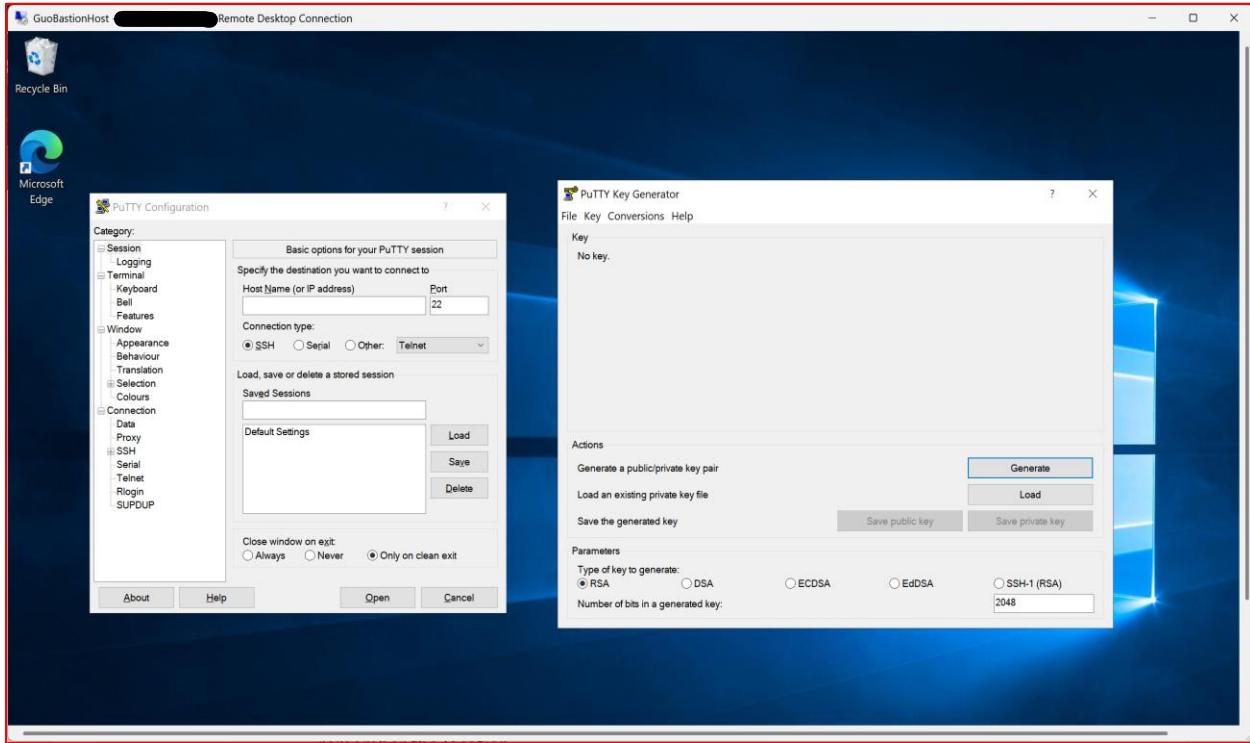


Installing PuTTY on VM

Installing PuTTY...

The screenshot shows a browser window displaying the Putty download page at <https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>. The page indicates the latest release is 0.83, released on 2025-02-08. It provides links for MSI installers and Unix source archives. Overlaid on the browser is a 'PuTTY release 0.83 (64-bit) Setup' window. The window shows a progress bar with the message 'Completed the PuTTY release 0.83 (64-bit) Setup Wizard'. It includes a note to click 'Finish' and a checkbox for 'View README file'. The background browser page also shows a note about development snapshots.

PuTTY installed...



Create an Ubuntu VM

Creating a VM...

A screenshot of the Microsoft Azure portal showing the "Create a virtual machine" wizard. The top navigation bar includes "Microsoft Azure", "Search resources, services, and docs (G+)", "Copilot", and user information "SHG182@pitt.edu UNIVERSITY OF PITTSBURGH". The main page shows "Home > Virtual machines >" and the title "Create a virtual machine". Below this, there are three buttons: "Help me create a low cost VM", "Help me create a VM optimized for high availability", and "Help me choose the right VM size for my workload". The "Basics" tab is selected, followed by "Disks", "Networking", "Management", "Monitoring", "Advanced", "Tags", and "Review + create". A note states: "Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)". A warning message says: "This subscription may not be eligible to deploy VMs of certain sizes in certain regions." Under "Project details", it asks to select a subscription ("Azure for Students") and a resource group ("GuoDevVMs"). Under "Instance details", it asks for a virtual machine name ("GuoLinux") and a region ("(US) East US 2"). At the bottom are buttons for "< Previous", "Next : Disks >", and "Review + create".

Review... (I used size B2s, because it's a bit faster and price is not a big different hourly, than the B1s)

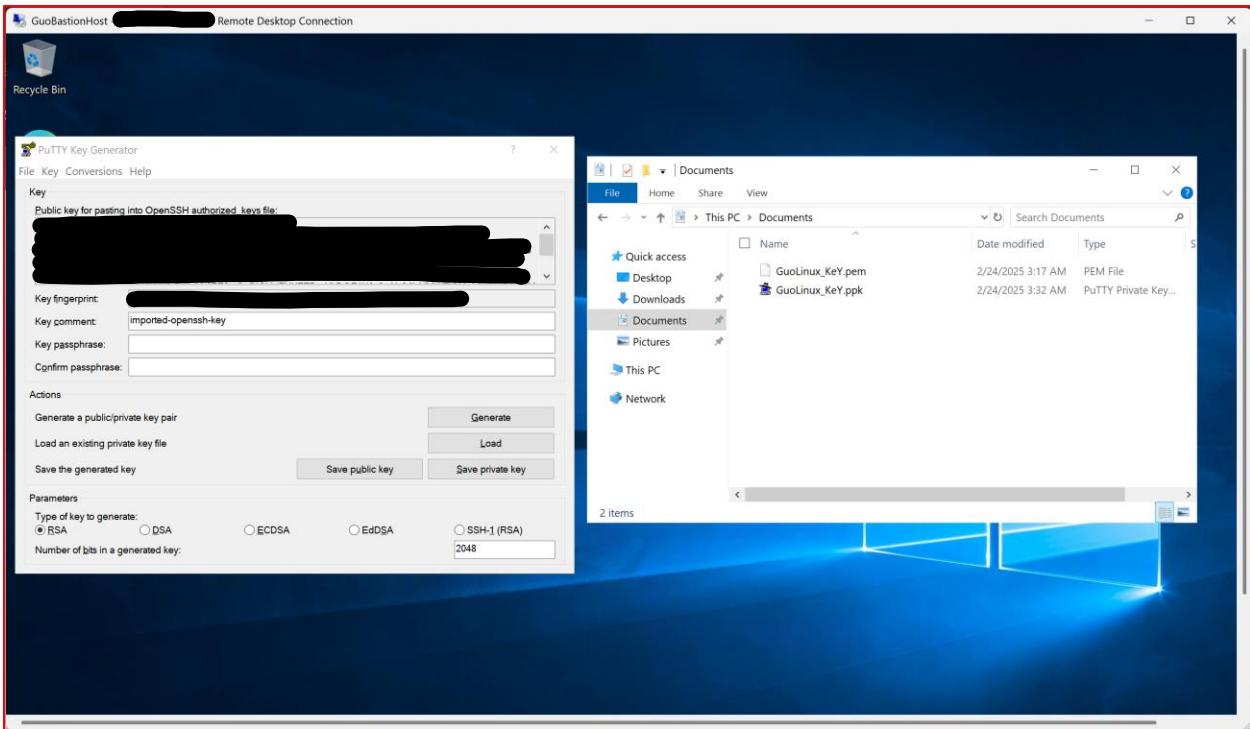
The screenshot shows the Microsoft Azure 'Create a virtual machine' wizard. At the top, a green bar indicates 'Validation passed'. Below it, there are three tabs: 'Help me create a low cost VM', 'Help me create a VM optimized for high availability', and 'Help me choose the right VM size for my workload'. The 'Review + create' tab is selected. The 'Price' section shows '1 X Standard B2s by Microsoft' at '0.0416 USD/hr'. The 'TERMS' section contains legal text about agreeing to terms and privacy statements. Below that, fields for 'Name' (Shi Hao Guo), 'Preferred e-mail address' (SHG182@pitt.edu), and 'Preferred phone number' are filled. At the bottom are 'Previous', 'Next >', and 'Create' buttons, along with links for 'Download a template for automation' and 'Give feedback'.

Ubuntu VM created...

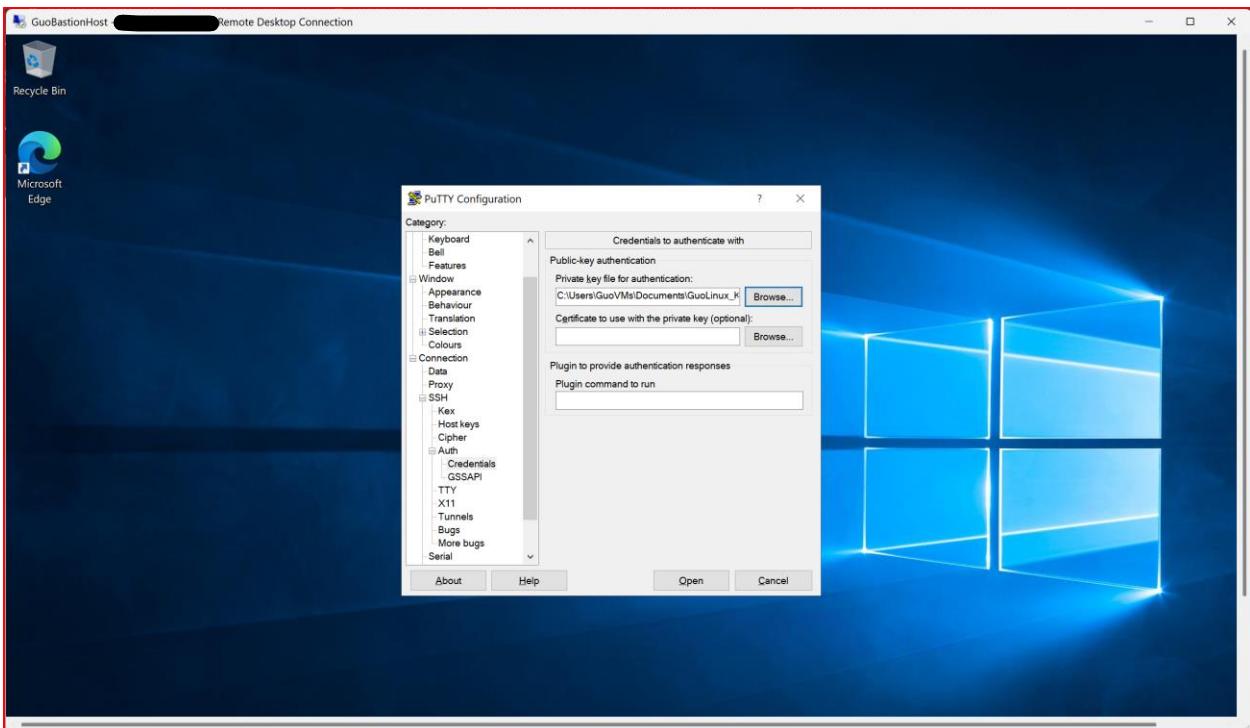
The screenshot shows the Microsoft Azure VM Overview page for a virtual machine named 'GuoLinux'. The left sidebar has a tree view with nodes like 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Connect', 'Networking', 'Settings', 'Availability + scale', 'Security', 'Backup + disaster recovery', 'Operations', 'Monitoring', 'Automation', and 'Help'. The main area has tabs for 'Overview', 'Properties', 'Monitoring', 'Capabilities (7)', 'Recommendations', and 'Tutorials'. The 'Properties' tab is selected. It displays details for the 'Virtual machine' and 'Networking' sections. Under 'Virtual machine', fields include Computer name (GuoLinux), Operating system (Linux (ubuntu 24.04)), VM generation (V2), VM architecture (x64), Agent status (Ready), Agent version (2.12.0.2), Hibernation (Disabled), Host group (-), Host (-), Proximity placement group (-), Colocation status (N/A), Capacity reservation group (-), and Disk controller type (SCSI). Under 'Networking', fields include Public IP address (-), Public IP address (IPv6) (-), Private IP address (-), Private IP address (IPv6) (-), Virtual network/subnet (GuoDevVNET/Intranet), and DNS name (-). The 'Size' section shows Size (Standard B2s), vCPUs (2), and RAM (4 GiB). The 'Source image details' section shows Source image publisher (canonical), Source image offer (ubuntu-24_04-lts), and Source image plan (server).

Using PuTTY

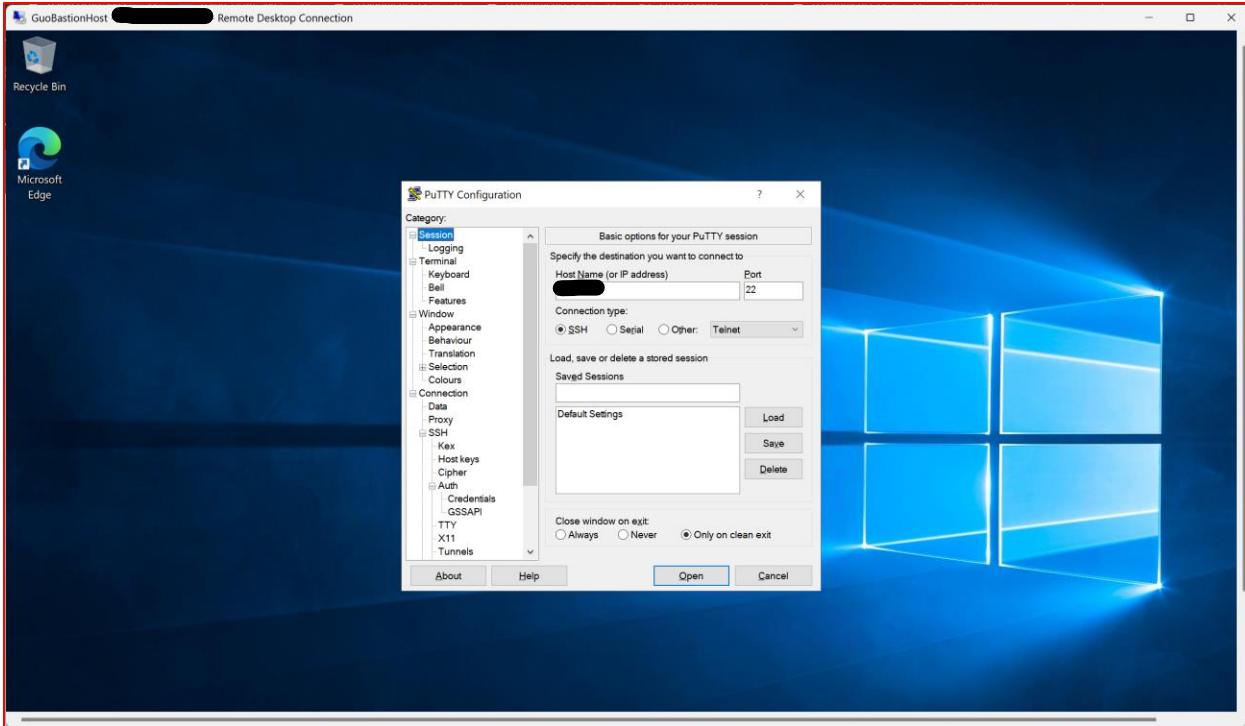
Converted .pem to .ppk in Windows 2019 VM using PuTTY...



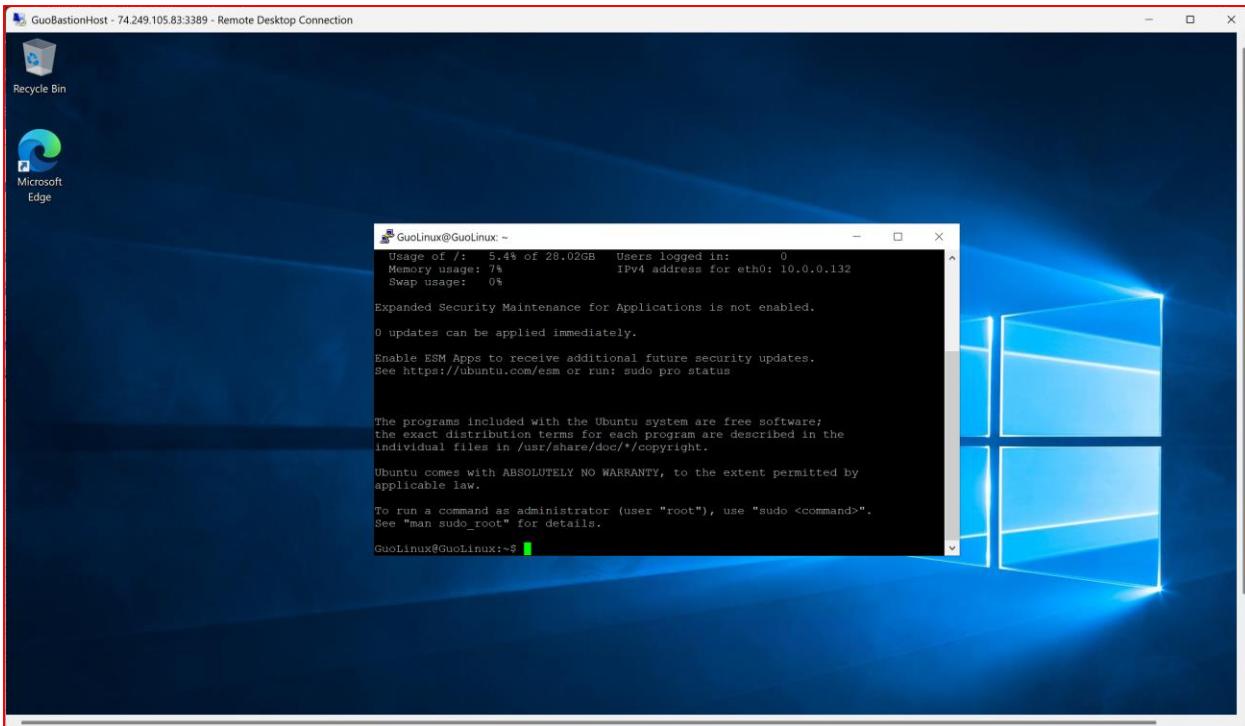
Connecting to Linux VM...



Connecting to Linux VM...



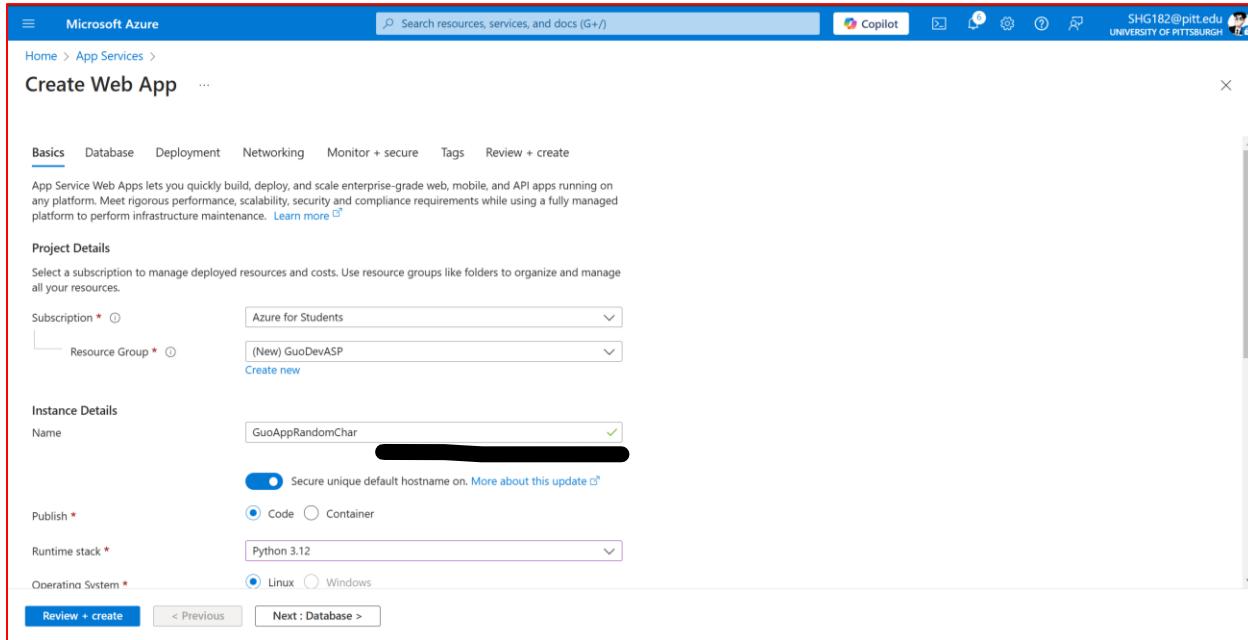
Linux VM successfully connected...



Can you connect to your Linux VM via SSH from the internet? Explain why or why not? **No, I cannot connect to my Linux VM via SSH. This is because I will need a public IP address in order to connect to the VM.**

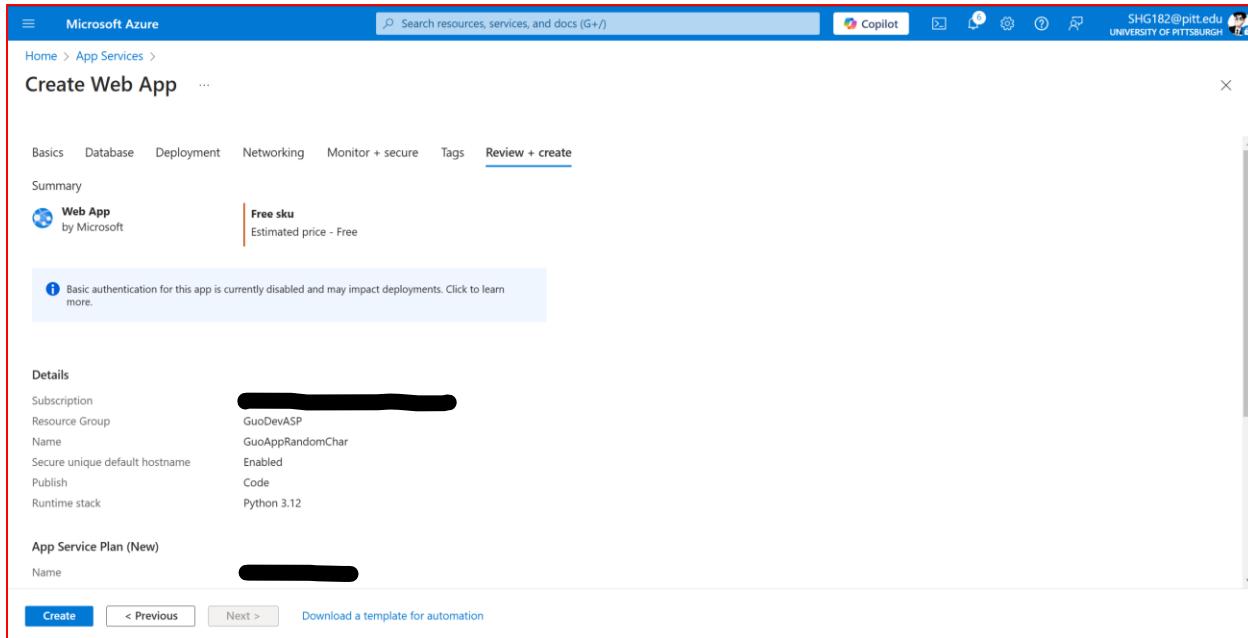
Create a Web App

Creating a web application...



The screenshot shows the 'Create Web App' wizard in Microsoft Azure. The 'Basics' tab is selected. In the 'Project Details' section, the subscription is set to 'Azure for Students' and the resource group is '(New) GuoDevASP'. In the 'Instance Details' section, the name is 'GuoAppRandomChar', the runtime stack is 'Python 3.12', and the operating system is 'Linux'. A note indicates that basic authentication is disabled. At the bottom, there are 'Review + create', '< Previous', and 'Next : Database >' buttons.

Review...



The screenshot shows the 'Review + create' step of the 'Create Web App' wizard. It displays the summary of the configuration: a 'Web App' by Microsoft using a 'Free sku' estimated price - Free. It also lists the details: Subscription (redacted), Resource Group 'GuoDevASP', Name 'GuoAppRandomChar', Secure unique default hostname 'Enabled', Publish 'Code', Runtime stack 'Python 3.12'. The 'App Service Plan (New)' section shows a redacted name. At the bottom, there are 'Create', '< Previous', 'Next >', and 'Download a template for automation' buttons.

Web App created...

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

SHG1B2@pitt.edu UNIVERSITY OF PITTSBURGH

Home > Microsoft.Web-WebApp-Portal [REDACTED] | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview

Your deployment is complete

Deployment name: Microsoft.Web-WebApp-Portal [REDACTED]
Subscription: Azure for Students
Resource group: GuoDevASP

Start time: [REDACTED]
Correlation ID: [REDACTED]

Deployment details

Resource	Type	Status	Operation details
GuoAppRandomChar/scm	Microsoft.Web/sites/basicPubli...	OK	Operation details
GuoAppRandomChar/ftp	Microsoft.Web/sites/basicPubli...	OK	Operation details
GuoAppRandomChar	Microsoft.Web/sites	OK	Operation details
ASP-GuoDevASP-87f1	Microsoft.Web/serverfarms	OK	Operation details

Next steps

Manage deployments for your app. Recommended
Protect your app with authentication. Recommended

Go to resource

Give feedback
Tell us about your experience with deployment

Cost Management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >

Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >

Free Microsoft tutorials
Start learning today

Work with an expert
Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
Find an Azure expert >

Questions

What is the URL to access your app service and what is shown when accessing this URL via a web-browser? [REDACTED]

It is showing “Your web app is running and waiting for your content”.

Microsoft Azure

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.



Built with Python

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.

Deployment center

Quickstart

Overview...

The screenshot shows the Microsoft Azure portal interface. On the left, there's a sidebar titled 'App Services' under 'University of Pittsburgh'. The main area is titled 'GuoAppRandomChar' and 'Web App'. The 'Overview' tab is selected. The 'Essentials' section displays basic information: Resource group (redacted), Status (Running), Location (East US 2), Subscription (Azure for Students), and Operating System (Linux). The 'Properties' section shows the Web app details: Name (GuoAppRandomChar), Publishing model (Code), and Runtime Stack (Python - 3.12). On the far right, there's a 'JSON View' button.

Is App Services IaaS or PaaS? Why or why not? In regard to responsibility, which additional layers (i.e. networking, hypervisor, etc...) is Microsoft Azure responsible for vs a VM?

Microsoft Azure App Services is a PaaS, because it handles the operating system, server maintenance, patching, and other infrastructure tasks. On the other hand, Microsoft Azure VM is an IaaS, because it has more control over the infrastructure, but it also requires more responsibility from the user. In addition, Azure App Services is responsible for OS & runtime layers compared to Azure VM. In conclusion, Azure App Service is PaaS where I deploy my code, and Microsoft manages the underlying infrastructure (OS, servers, etc.), and Azure VMs are IaaS where I manage the OS, runtime, and everything above the hypervisor.

Screenshot of Resource Group... (What is NetworkWatcherRG? I don't remember creating it.)

The screenshot shows the Microsoft Azure Resource Groups dashboard. At the top, there's a search bar and various navigation icons. Below the header, it says "Resource groups" and "University of Pittsburgh". There are buttons for "Create", "Manage view", "Refresh", "Export to CSV", "Open query", and "Assign tags". A filter bar at the top allows filtering by "Subscription equals all" and "Location equals all". The main area shows a table with 4 records:

Name	Subscription	Location
GuoDevASP	Azure for Students	East US 2
GuoDevVMs	Azure for Students	East US 2
GuoDevVNET	Azure for Students	East US 2
NetworkWatcherRG	Azure for Students	East US 2

At the bottom, there are navigation links for "Page 1 of 1" and "Next >".

What is the purpose of Azure Resource Groups? “Resource groups are logical containers where you can deploy and manage Azure resources like virtual machines, web apps, databases, and storage accounts.” -Microsoft Teams

The screenshot shows a page from the Cloud Adoption Framework for Azure. On the left, there's a sidebar with a "Filter by title" input and a list of topics under "Cloud Adoption Framework for Azure". The "Organize resources" topic is currently selected. The main content area has a diagram illustrating the hierarchy: Management groups contain Subscriptions, which contain Resource groups, which contain Resources. Below the diagram, a bulleted list explains the concepts:

- Management groups help you manage access, policy, and compliance for multiple subscriptions. All subscriptions in a management group automatically inherit the conditions applied to the management group.
- Subscriptions logically associate user accounts with the resources they create. Each subscription has limits or quotas on the amount of resources it can create and use. Organizations can use subscriptions to manage costs and the resources created by users, teams, and projects.
- Resource groups are logical containers where you can deploy and manage Azure resources like virtual machines, web apps, databases, and storage accounts.
- Resources are instances of services you can create in a resource group, such as virtual machines, storage, and SQL databases.

A "Note" section at the bottom right says: "To understand and minimize the effect of regional outages, see [Select Azure regions](#)".

Deleting all Resource Groups except for GuoDevVNET and NetworkWatcherRG... (Should I delete NetworkWatcherRG as well?)

Microsoft Azure

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

Copilot

SHG1B2@pitt.edu UNIVERSITY OF PITTSBURGH

Home > Resource groups

University of Pittsburgh

Create Manage view Refresh Export to CSV Open query Assign tags

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

No grouping List view

Showing 1 to 2 of 2 records.

Name	Subscription	Location
[Icon] GuoDevVNET	Azure for Students	East US 2
[Icon] NetworkWatcherRG	Azure for Students	East US 2

< Previous Page 1 of 1 Next >

Give feedback

The screenshot shows the Microsoft Azure Resource Groups page. At the top, there's a search bar and a Copilot button. On the right, the user's email (SHG1B2@pitt.edu) and the University of Pittsburgh logo are displayed. Below the header, the page title is "Resource groups" with a back arrow and three dots. A breadcrumb trail shows "Home >". The main content area has a table with two rows of data. The columns are "Name", "Subscription", and "Location". The first row contains "[Icon] GuoDevVNET", "Azure for Students", and "East US 2". The second row contains "[Icon] NetworkWatcherRG", "Azure for Students", and "East US 2". There are also "Name", "Subscription", and "Location" headers with arrows indicating sorting. At the bottom, there are navigation links for "Page 1 of 1" and a "Give feedback" button.