YouTestMe

Installation and Support Manual for Windows Server





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1 Introduction

YouTestMe GetCertified is a Java-based web application. The Standard Edition requires the following software components to be installed on the Windows Server 2022 host: Java Runtime Environment (JRE), Tomcat application server, and PostgreSQL database.

2 System (Host) Hardware Requirements

Typical	Enhanced
4 vCPU cores	8 vCPU cores
16 GB	32 GB
128 GB	256 GB (2x128)
Yes	Yes
	Typical 4 vCPU cores 16 GB 128 GB Yes

2.1 Network Bandwidth Requirements

Ensuring optimal network performance is crucial for a seamless and efficient experience on the GetCertified application. This chapter outlines the network requirements for users engaging in basic/lightweight tests.

We recommend a minimum network bandwidth of 1 Mbit/s per user for users participating in lightweight tests. This estimate is based on typical usage scenarios involving text-based questions and minimal multimedia content.

Several factors can influence the network bandwidth required, including the complexity of test content, the frequency of interactions, and the presence of multimedia elements. It's advisable to monitor network usage during peak periods and adjust bandwidth accordingly.

Recommendations for Users:

To ensure an optimal testing experience, we recommend the following:

- Stable Internet Connection: Users should connect to a stable and reliable internet connection to minimize disruptions during the testing session.
- Pre-Test Network Check: Before starting a test, users can perform a pre-test network check to ensure their internet connection meets the recommended bandwidth requirements.
- Test Environment Considerations: Consider the test environment, especially for proctoring-enabled tests, and ensure the necessary bandwidth is available for a smooth proctoring experience.



3 Azure Virtual Machine Installation

1. Search for "Virtual machine" in Azure Portal to create a new one:

		𝒫 virtual)	× 🧔 🗸	opilot
Azure services Create a resource	Virtual Storag machines accoun	All Service Services Image: Service ser	es (36) Marketplac	e (31)	✓ More (4) See more	ations	O Load balancers
Home > Com	pute infrastruct pute inf	rastruct	t ure Virt	tual ma	chines		
₽ Search)	Virtual machi	nes Get s	tarted		
OverviewAll resource	25		+ Create ∨	\rightleftharpoons Switch to	o classic (у Reser	rvations 🗸



Select "Project details" and "Instance details" parameters according to your deployment plan. It is
essential to select "Windows Server 2022 Datacenter Azure Edition - x64 Gen2" for the Image type. The
recommended hardware configuration is 8 vcpus and 32 GiB RAM, and the most suitable type is "D" General Purpose. D8as_v6 or similar will work for you.



Microsoft Azure Search reso Home > Compute infrastructure | Virtual machines > Create a virtual machine Ð Help me create a VM optimized for high availability Help me choose the right VM Help me create a low cost VM Basics Disks Networking Management Monitoring Advanced Tags Review + create 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 🖻 Project details Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources. Subscription * (i) youtestme Resource group * (i) (New) YTM-VM_group Create new Instance details Virtual machine name * (i) YTM-VM \checkmark Region * 🛈 (US) East US \sim Availability options (i) No infrastructure redundancy required \sim Trusted launch virtual machines Security type (i) \sim Configure security features Image * (i) Windows Server 2022 Datacenter: Azure Edition - x64 Gen2 See all images | Configure VM generation Arm64 VM architecture (i) 🔵 x64 Arm64 is not supported with the selected image. Run with Azure Spot discount ()



Home > Compute infrastructure Virtu	al machines >	
Create a virtual mach	ine	
D Help me create a low cost VM	Help me create a VM optimized for high availability	Help me choose the right VM
~	x64	
	 Arm64 is not supported with the selected image. 	
Run with Azure Spot discount ①		
Size * 🔅	Standard_D8as_v6 - 8 vcpus, 32 GiB memory (\$533.63/ See all sizes	month) 🗸
	The size you've selected is supported by higher storage anabled. Learn more [™]	ge performance with NVMe
Enable Hibernation ()	 Hibernate is not supported by the size that you have sele compatible with Hibernate to enable this feature. Learn 	ected. Choose a size that is more 🗗
Administrator account		
Username * 🕕	ytmlogin	\checkmark
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 * ①	None Allow selected ports	
Select inbound ports *	RDP (3389)	

3. Under the "Disks" section, you can create and attach a new data disk. It is not mandatory, but it is a good practice to separate user data from system data in a different storage. The premium SSD disk type is recommended, but a standard SSD will also work.

To calculate data disk size, you can use the following relation: 1000 test attempts generate approximately 1 GB of data on the storage (disk). It does not include multimedia that can be attached to the test.



ⅲ		℅ Search resources,
Home > Compute infrastructure Virtua	I machines >	
Create a virtual maching	ne ····	
D Help me create a low cost VM	Help me create a VM optimized for high availability Help me cho	ose the right VM size fo
Basics Disks Networking Ma	nagement Monitoring Advanced Tags Review + create	
Azure VMs have one operating system dis The size of the VM determines the type of	k and a temporary disk for short-term storage. You can attach additional da storage you can use and the number of data disks allowed. Learn more 🖻	ata disks.
VM disk encryption		
Azure disk storage encryption automatica default when persisting it to the cloud.	ly encrypts your data stored on Azure managed disks (OS and data disks) a	at rest by
Encryption at host		
	1 Encryption at host is not registered for the selected subscription. <u>Learn</u>	more ©
OS disk		
OS disk size (i)	Image default (127 GiB)	\checkmark
OS disk type * 🔅	Premium SSD (locally-redundant storage)	\sim
Delete with VM ①		
Key management 🛈	Platform-managed key	\sim
Enable Ultra Disk compatibility 🛈	Ultra disk is supported in Availability Zone(s) 1,2,3 for the selected VM siz Standard_D8as_v6.	ze
Data disks for YTM-VM		
You can add and configure additional dat temporary disk.	disks for your virtual machine or attach existing disks. This VM also comes	s with a
LUN Name S	ze (GiB) Disk type Host caching Delete with VM 🔅)
Create and attach a new disk Attach a	n existing disk	
< Previous Next : Networking :	Review + create	



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Home > Compute infrastructure | Virtual machines > Create a virtual machine >

Create a new disk

Create a new disk to store applications and data on your VM. Disk pricing varies based on factors including disk size, storage type, and number of transactions. Learn more 🖻

Name *	YTM-VM_DataDisk_0	
Source type * (i)	None (empty disk)	
Size * (i)	128 GiB (P10 performance tier) Premium SSD LRS Change size	
Key management ①	Platform-managed key	
Enable shared disk	🔿 Yes 💿 No	
Delete disk with VM		

- 4. Create a new Virtual Network and Subnet if necessary, or place the server in the existing ones. Avoid using public IP addresses attached to the VM in the production environment; instead, use Azure VPN or Azure Bastion to connect to the VM using its private IP address.
- 5. Under the "Management" section, select the "Enable backup" option if you are not sure about the correct backup strategy that can be applied to the VM.



Backup		
Enable backup ①	\checkmark	
Recovery Services vault * ①	(new) defaultVault	\ \
	Create new	
Policy subtype *	Standard	Enhanced
	🧹 Once a day backup	Multiple backups per day
	1-5 days operational tier	1-30 days operational tier
	Vault tier	✓ Vault tier
	ZRS resilient snapshot tier	ZRS resilient snapshot tier
	Support for Trusted launch and Confidential Azure VMs	Support for Trusted launch and Confidential Azure VMs
Backup policy *	(new) EnhancedPolicy-mcxqcswl	N
	Create new	
Site Recovery		
Enable Disaster Recovery ①		
Guest OS updates		
Enable periodic assessment ①		
Enable hotpatch ①		
	 Hotpatch is not available for this image. 	Learn more
Patch orchestration options ①	Automatic by OS (Windows Automatic U	Jpdates)
-	i Some patch orchestration options are	not available for this image. Learn more
< Previous Next : Monitorin	g > Review + create	

6. Regarding the **Monitoring** section, you can activate all options. The Health Monitor configuration should include the default Tomcat HTTP port 8080.



Home > Compute infrastructure | Virtual machines > Create a virtual machine Ð Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM Basics Disks Networking Management Monitoring Advanced Review + create Tags Configure monitoring options for your VM. Alerts Enable recommended alert rules (i) Alert rules Alert rules not configured Configure Diagnostics Enable with managed storage account (recommended) Boot diagnostics (i) Enable with custom storage account Disable Enable OS guest diagnostics (i) Diagnostics storage account * (i) (new) ytmvmgroupdiag \sim Create new Health Enable application health monitoring (i) Type: Application health extension Health monitor configuration Protocol: HTTP Port number: 8080 Path: / Configure



7. You can skip the remaining sections and proceed to the "Review+create" step. After the final examination of the specified configuration, confirm that you are ready to start Azure VM creation.



4 Azure VM Remote Desktop Connection

4.1 **SPrerequisites**

To connect via private IP (strongly recommended), ensure the following:

- 1. The Azure VM is running and has a private IP address.
- 2. PYou have network-level access to the VM (via the same virtual network, vNet peering, VPN, or ExpressRoute).
- 3. RDP (TCP port 3389) is allowed in the Network Security Group (NSG) for the VM.
- 4. ¹ You have the VM's username and password.

4.2 Common Scenarios That Allow Private Access

You can connect via private IP if:

- You're on another Azure VM in the same vNet or peered vNet
- You're on-premises and connected to Azure via VPN Gateway or ExpressRoute
- You're using an Azure Bastion host
- You're connecting via a jump host (bastion/jump VM) that has public access

4.3 Step-by-Step Instructions

4.3.1 Find the VM's Private IP

- Go to the Azure Portal
- Navigate to Virtual Machines → Select your VM
- Under the Networking section of the **Overview** tab, find the Private IP address

4.3.2 Check NSG Inbound Rule for RDP

Ensure the VM's Network Security Group allows RDP:

- Go to Networking \rightarrow Inbound Port Rules
- Confirm a rule exists:
 Port: 3389
 Protocol: TCP
 Source: Your private network range
 Action: Allow

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• If not, click the + Add inbound port rule and allow TCP 3389 from your subnet or specific IP.

4.3.3 **Sensure Network Access**

You must be connected to the same private network as the VM.

Choose the method that fits your setup:

- If you're on another Azure VM, verify it's in the same vNet or peered vNet.
- If on-prem: ensure VPN or ExpressRoute is active.
- If using a jump host: connect to it first, then RDP into the target VM from there.

4.3.4 **© Connect via RDP**

On the machine with network access (local PC or jump host):

- Open Remote Desktop Connection (mstsc on Windows)
- In the Computer field, enter the private IP (e.g., 10.0.1.5)
- Enter the Username and Password for the VM
- Click **Connect** and accept any certificate warning



5 GetCertified Deployment on Windows Server

5.1 Mount a New Disk on Azure Windows VM (optional)

5.1.1 Attach the Disk in Azure (if not done yet)

If you haven't attached the disk yet:

- Go to Azure Portal \rightarrow Virtual Machines
- Select your VM
- Navigate to Disks \rightarrow + Add data disk
- Choose an existing disk or create a new one
- Click Save

The disk is now attached at the Hyper-V (virtual controller) level, but it has not been mounted inside Windows yet.

5.1.2 **Example 1** Log into the Windows VM

- Use RDP to connect to your Azure Windows VM.
- Open Server Manager or Run > diskmgmt.msc to launch Disk Management.

5.1.3 Initialize the Disk

In Disk Management:

- You will see a new disk marked as "Offline" or "Not Initialized" (typically something like Disk 1).
- Right-click the new disk and choose:
 - "Online" (if it's offline)
 - Then "Initialize Disk"
- Choose GPT (recommended for Azure/modern OS) or MBR (legacy).

5.1.4 Create New Volume

- After initialization, right-click on the unallocated space \rightarrow New Simple Volume
- Use the wizard to:
 - Assign a drive letter
 - Format with NTFS
 - Set volume label (e.g., Data, Backup, etc.)
 - Perform a quick format

5.1.5 Verify Mount

- The new disk will appear in File Explorer with the assigned drive letter.
- You can now use it like any other drive.

5.2 Software Download

Use the URL below to download the resource files required for the software installation:

YouTestMe Software Download

Copy the URL above in the Azure VM browser and download the ZIP archive that contains the following components:

- JRE 21 installation file (.exe)
- PostgreSQL Server 16 installation file (.exe)
- Apache Tomcat v10 (portable version)
- Initial Postgres data (.dmp) the minimal set of data required for the GetCertified to work
- PostgreSQL configuration files

Decompress the downloaded archive and move (copy) the "apache-tomcat-10.1.39" directory to the "C:" partition.

	×
Extract Compressed (Zipped) Folders	
Select a Destination and Extract Files	
Files will be extracted to this folder:	
C:\Users\ytmlogin\Downloads\ Browse	
Extract	incel

5.3 JRE and PostgreSQL Server Installation

Install Java Runtime Environment (JRE) and PostgreSQL 16 Database Server using the executable files downloaded from the YouTestMe Nextcloud server.

During the installation process, keep the default settings. Specify and keep the database administrative password for user **postgres** in a secure place. You can also skip the installation of some database components (pgAdmin 4 and Stack Builder).

5.4 Edit System Environment Variables

It is mandatory to define %CATALINA_BASE% and %JAVA_HOME% user variables and to modify the system %PATH% variable by adding the paths to the following "bin" directories ("bin" directories contain executable files of the primary system components):

- %CATALINA_BASE%\bin
- %JAVA_HOME%\bin
- C:\Program Files\PostgreSQL\16\bin
- 1. Search for "Edit the system environment variables" dialog:

6)			
Best match			
Edit the system environment variables Control panel			
Settings			
Edit environment variables for your account			
∽ env	ei 占 💽		



- 2. Click on the "Environment Variables..." button
- 3. Create the new system variables by clicking on the "New..." button. To edit the system variable **Path**, highlight it and click on "Edit..."

Variable	Value	
CATALINA_BASE	C:\apache-tomcat-10.1.39	
JAVA_HOME	C:\Program Files\Eclipse Adoptium\jre-21.0.7.6-hotspot	
Path	C:\Users\ytmlogin\AppData\Local\Microsoft\WindowsApps;	
TEMP	C:\Users\ytmlogin\AppData\Local\Temp	
TMP	C:\Users\ytmlogin\AppData\Local\Temp	
	New Edit Delete	
	New Edit Delete	
/stem variables	New Edit Delete	
/stem variables Variable	New Edit Delete	^
/stem variables Variable ComSpec	New Edit Delete Value C:\Windows\system32\cmd.exe	^
/stem variables Variable ComSpec DriverData	New Edit Delete Value C:\Windows\system32\cmd.exe C:\Windows\System32\Drivers\DriverData	^
/stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS	New Edit Delete Value C:\Windows\system32\cmd.exe C:\Windows\System32\Drivers\DriverData 8	^
/stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS	New Edit Delete Value C:\Windows\system32\cmd.exe C:\Windows\System32\Drivers\DriverData 8 Windows_NT	^
/stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS Path	New Edit Delete Value C:\Windows\system32\cmd.exe C:\Windows\System32\Drivers\DriverData 8 Windows_NT C:\Program Files\Eclipse Adoptium\jre-21.0.7.6-hotspot\bin;C:\Win	
/stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS Path PATHEXT	New Edit Delete Value C:\Windows\system32\cmd.exe C:\Windows\System32\Drivers\DriverData 8 Windows_NT C:\Program Files\Eclipse Adoptium\jre-21.0.7.6-hotspot\bin;C:\Win .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC	
/stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS Path PATHEXT PROCESSOR ARCHITECTURE	New Edit Delete Value C:\Windows\system32\cmd.exe C:\Windows\System32\Drivers\DriverData 8 Windows_NT C:\Program Files\Eclipse Adoptium\jre-21.0.7.6-hotspot\bin;C:\Win .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC AMD64	~
/stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS Path PATHEXT PROCESSOR ARCHITECTURE	New Edit Delete Value C:\Windows\system32\cmd.exe C:\Windows\System32\Drivers\DriverData 8 Windows_NT C:\Program Files\Eclipse Adoptium\jre-21.0.7.6-hotspot\bin;C:\Win .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC AMD64	



4. Edit the system variable %PATH% and add the specific system paths:

Edit environment variable	×
C:\Program Files\Eclipse Adoptium\jre-21.0.7.6-hotspot\bin	New
%SystemRoot%\system32	
%SystemRoot%	Edit
%SystemRoot%\System32\Wbem	
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\	Browse
%SYSTEMROOT%\System32\OpenSSH\	
C:\Program Files\dotnet\	Delete
C:\Program Files\TortoiseSVN\bin	
%JAVA_HOME%\bin	
%CATALINA_BASE%\bin	Move Up
C:\Program Files\PostgreSQL\16\bin	
	Move Down
	Edit text
	_
ОК	Cancel

5.5 PostgreSQL Configuration

5.5.1 Replace Default Configuration Files

- <u>Stop PostgreSQL Service</u>
- Replace default PostgreSQL configuration files "pg_hba.conf" and "postgresql.conf" from the PostgreSQL data directory:

C:\Program Files\PostgreSQL\16\data

with the preconfigured database configuration files located in the "Downloads" folder.

• <u>Start PostgreSQL Service</u>

5.5.2 Move PostgreSQL Data to Partition 2 (optional)

- 1. Stop PostgreSQL Service
- 2. Copy the Existing PostgreSQL Data Directory to partition number 2 (Data disk), e.g.:

C:\Program Files\PostgreSQL\16\data ->(copy)-> E:\PostgreSQLData

- 3. *D* Update Windows Service Parameters:
 - a) Open Registry Editor (regedit)
 - b) Navigate to: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\postgresql-x64-16
 - c) Edit the ImagePath value by changing the **-D** parameter to point to the new data path:

"C:\Program Files\PostgreSQL\16\bin\pg_ctl.exe" runservice -N "postgresql-x64-16" -D "E:\PostgreSQLData"

4. Set Folder Permissions:

Ensure the postgres service user (usually **NETWORK SERVICE**) has Full Control on E:\PostgreSQLData.

- a) Right-click the new folder \rightarrow Properties
- b) Go to Security \rightarrow Edit \rightarrow Add the service user
- c) Grant Full Control





5. <u>Start PostgreSQL Service</u>

- 6. Verify the New Location
 - a) Run **psql** from the command line and confirm it works: **psql** -**U postgres**
 - b) From within **psql**, run: **SHOW data_directory**;
 - c) You should see: E:/PostgreSQLData
- 7. 🞻 (Optional) Delete Old Data Folder

Once everything is working correctly and you've backed up your data:

• You can delete the old C:\Program Files\PostgreSQL\16\data folder to free space.



5.5.3 Data Import

Open the Windows terminal (Command Prompt) and navigate to the "Downloads" directory where the downloaded file "ytm1-initial-data.dmp" is located.

🖊 🕑 📙 🗢 Downloads						
File Home	Share	View				
← → • ↑ ↓	cmd		~	→		
📌 Quick access	*	Name ~ Today (4)	Date modified	Туре		
Lownloads	*	ytm1-initial-data.dmp	7/11/2025 6:47 PM 7/11/2025 6:46 PM	DMP File Application		
📰 Pictures	*	UpenJUK21U-jre_x64_windows_hotspot apache-tomcat-10.1.39	7/11/2025 6:46 PM 7/11/2025 8:18 PM	Windows Installer File folder		
 3D Objects Desktop						

Execute the following commands (marked as bold text):

- psql -U postgres postgres (connecting to the local database; entering psql shell)
- postgres=# create database ytmdb1;
- postgres=# create role ytm1 with password `2ytm1';
- postgres=# alter role ytm1 with login;
- postgres=# alter database ytmdb1 owner to ytm1;
- postgres=# \q (exit psql shell)
- pg_restore -v -U postgres -d ytmdb1 ytm1-initial-data.dmp

5.5.4 Restart (Start/Stop) PostgreSQL Service

Method 1:

Open the command prompt as an administrator and type one of the following commands:

- net stop postgresql-x64-16
- net start postgresql-x64-16
- net restart postgresql-x64-16

Method 2:

Search for the keyword **Services**, locate PostgreSQL service, highlight it, right-click and select "Restart/Stop/Start" operation:



🔍 Services					- 0	×
File Action View	Help					
	à 🗟 🛛 📰 🕨 🔲 II 🕪					
🤹 Services (Local)	Services (Local)					
	postgresql-x64-16	Name	Description	Status	Startup Type	Log ^
	Stop the service Pause the service Restart the service	Optimize drives Payments and NFC/SE M Performance Counter DL Performance Logs & Ale Optimum and Play Plug and Play	Helps the c Ian Manages pa L Enables rem rts Performanc Enables a c	Running Running	Manual Disabled Manual Manual Manual	Loc: Loc: Loc: Loc: Loc:
	Provides relational database storage.		Provides rel	Running	Automatic	Loc: Net
		Power St Power Print Spooler Print Spooler Print Problem Report Program Compa Red Quality Window Al Radio Managem RedAgent Remote Access Remote Access Remote Desktop Remote Desktop Services Remote Desktop Services Remote Desktop Services	ause ause asume astart and ause asume astart and asse astart as a service astart astart as a service astart a	Running Running Running Running Running Running	Automatic Automatic Manual Manual (Trig Manual Automatic (Manual Disabled Automatic Manual Manual Manual Manual	Loc: Loc: Loc: Loc: Loc: Loc: Loc: Loc:
	Extended / Standard /					
Start service nostgresg	-x64-16 on Local Computer					

6 Windows Firewall

If it is necessary to allow database connection on port 5432 within the private network, you need to modify Windows Firewall rules:

1. Search for the "Windows Defender Firewall with Advanced Security" prompt and select "Inbound Rules" from the left menu. Proceed by clicking the "New Rule..." option from the right menu:

Pindows Defender Firewall with	h Advanced Security								×
File Action View Help									
🗢 🏟 🖄 📰 🗟 🖬									
Pindows Defender Firewall witl	Inbound Rules						Actions		
Inbound Rules	Name	Group	^	Profile	Enabled	Acti ^	Inbound Rules		•
Connection Security Rules	🖉 anydesk.exe		Private	Yes	Allo	🐹 New Rule			
> 🛄 Monitoring	🥝 anydesk.exe	sk.exe		Private	Yes	Allo	Filter by Profile		•
-	🔮 atmgr.exe	.exe		Private	Yes	Allo			1980
	atmgr.exe	Private	Yes	Allo	Y Filter by State				
	BlackBerry Handheld Simulator			Private	Yes	Allo	Filter by Group		•
	SlackBerry Handheld Simulator			Public	Yes	Bloc	View		•
	S BlackBerry Handheld Simulator	kBerry Handheld Simulator		Public	Yes	Bloc	Back		
	BlackBerry Handheld Simulator		Private	Yes	Allo	Refresh			
	Sirefox (C:\Program Files\Mozilla Firefox)	V Firefox (C:\Program Files\Mozilla Firefox)			Yes	Allo	📑 Export List		
	Sirefox (C:\Program Files\Mozilla Firefox)			Private	Yes	Allo	Help		
	🔮 Google Chrome			Public	Yes	Allo			
	🔮 Google Chrome			Private	Yes	Allo			

2. Select the following options for the steps listed on the left:



- a) Rule Type -> select "port"
- b) Protocols and Ports -> select "TCP" and type "5432" in the "Specific local ports:" field
- c) Action -> select "Allow the connection"
- d) Profile -> check "Private" ("Domain" is optional)
- e) Name -> specify custom rule name ("PGRULE", for example)

Image: Does this rule apply to TCP or UDP? Protocol and Ports Image: CCP Action UDP Profile Does this rule apply to all local ports or specific local ports? Image:	Rule Type Protocol and Ports Action Profile	Does this rule apply to TCP or U	DP?		
Action O UDP Profile Name Does this rule apply to al local ports or specific local ports? O All local ports O Specific local ports Example: 80, 443, 5000-5010	Action Profile				
Name Does this rule apply to al local ports or specific local ports? All local ports Specific local ports: Example: 80, 443, 5000-5010		O UDP			
All local ports Specific local ports: Example: 80, 443, 5000-5010	Name	Does this rule apply to all local p	orts or specific local ports?		
Specific local ports: 5432 Example: 80, 443, 5000-5010		All local ports			
Example: 80, 443, 5000-5010		Specific local ports:	5432		

- 3. Click "Finish" and test the database connection from the different nodes located in the same private network.
- 4. The same procedure can be applied to open the Tomcat HTTP port (8080) for access within the private network.



7 Starting YouTestMe Server Application

Open the Command Line (CMD), navigate to the Tomcat binary folder, and execute Tomcat **startup.bat** script:

- C:\Users\ytmlogin> cd C:\apache-tomcat-10.1.39\apache-tomcat-10.1.39\bin
- C:\apache-tomcat-10.1.39\apache-tomcat-10.1.39\bin> startup.bat

When executed, the **startup.bat** script starts the Tomcat application server and launches a new console window that displays the live output of the server. Wait up to 5 minutes for the application deployment after you start the Tomcat server.

To access the application, type (copy) the following string in the VM browser's address bar:

http://localhost:8080/ytm1/login.xhtml

Login information and the instructions for configuring recommended initial settings can be found in the document **Instructions for First Time Use.pdf**.

0	Login	× +			-	D	×
С	Iocalhost:8080)/ytm1/login.xhtml		A* 1	£_≡	•••	-
			Username *				
			Paseword *				
			©				
			Forgot username or password?				
			Log in				
			Not registered yet? Greate an account				
			Application language Contact support				
	0	 Login Collocalhost8080 	Cogin x +	<image/>			<pre> com x +</pre>



8 Changing Application Default Port (optional)

1. Check ports that are currently in use by executing the following command:

C:\Users\ytmlogin> netstat -an | findstr LISTEN

- 2. Choose the port that is not currently used:
 - a) Edit file: C:\apache-tomcat-10.1.39\conf\server.xml
 - b) Change the port in the line below:



- c) Save file
- d) <u>Restart Tomcat Server</u>



9 Tomcat Manager

Tomcat Manager App is a web application packaged with the Tomcat server and provides us with the basic functionality we need to manage our deployed web applications.

To access the Tomcat Manager application, do the following steps:

1. Open a browser on the Azure Virtual Machine and type the following URL:

http://localhost:8080





2. Access to Tomcat Manager is allowed only from localhost by default for security reasons. To change it, do the following:

Edit the following configuration file (**Valve** component) and specify the IP address of your workstation.

C:\apache-tomcat-10.1.39\webapps\manager\META-INF\context.xml

Example: Allow Tomcat manager access from the private IP address 192.168.1.80.

<Valve className="org.apache.catalina.valves.RemoteAddrValve" allow="127\.\d+\.\d+\.\d+\::1|0:0:0:0:0:0:0:1|192\.168\.1\.80" />

- 3. Click on the "Manager App" button and enter the default login credentials:
 - Username: ytmadmin
 - Password: 2youtestme1
- 4. Now, you can easily manage the YouTestMe application using the GUI:



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← C 🕕	🗧 🕜 🚺 localhost:8080/manager/html									
Message: OK										
Manager										
List Applicatio	ons		HTML Manager He	elp		<u>Manager Help</u>		<u>Serve</u>	<u>r Statu</u>	
Applications										
Path	Version		Display Name	Running	Sessions	Commands				
			- .			Start Stop Reload	Undeploy			
Ľ	None specified	vveicome to	Welcome to Tomcat		⊻	Expire sessions with idle	e ≥ 30	minutes		
		T				Start Stop Reload	Undeploy			
/host-manager	None specified	Tomcat Host Manager Application		true	<u> </u>	Expire sessions with idle	e ≥ 30	minutes		
Imonogor	None energified	Tomest Manager Application		true	1	Start Stop Reload Undeploy				
	none apecimen	Tomear Manager Application		lide		Expire sessions with idle	e ≥ 30	minutes		
/service1	14.2.21s			true	0	Start Stop Reload	Undeploy			
	14.2.210		l		<u> </u>	Expire sessions with idle	e ≥ 30	minutes		
Artm1	14.3.316	VouTactMa	tMe GetCertified			Start Stop Reload	Undeploy			
291111			Jurestime GetCentiled		_ <u>⊥</u>	Expire sessions with idle	e ≥ 180	minutes		
Danlau										
Deploy Deploy director	rv or WAR file locat	ed on serve	r							-
			Context Path:							
	Versio	n (for parallel	deployment):		_					
	>	· (ML Configur	ation file path:		=					

Check the <u>official documentation</u> for more details about Tomcat Manager functionality.



9.1 Change Login Credentials

To change Tomcat Manager login credentials, perform the following operation:

1. Edit the following configuration file and set up your username and password values.

```
C:\apache-tomcat-10.1.39\conf\tomcat-users.xml
```

```
<role rolename="manager-status"/>
<role rolename="manager-gui"/>
<role rolename="manager-jmx"/>
<role rolename="manager-script"/>
<user username="ytmadmin" password="2youtestme1" roles="manager-gui"/>
<user username="ytmscript" password="2youtestme1" roles="manager-script"/>
<user username="ytmscript" password="2youtestme1" roles="manager-script"/>
</toncat-users>
```

2. <u>Restart Tomcat Server</u>

10 Securing Network Access to the YouTestMe System

This section describes ensuring that only specific computers on your network can access the YouTestMe system.

10.1 YouTestMe Virtual Machine Active Ports

Port	Protocol	Purpose
3389	RDP	System support
5432	ТСР	Access to the PostgreSQL database
8080	HTTP	Access to the YouTestMe Web Application using a web browser

10.2 Assumptions

All computers are on the local network.

10.3 Step #1 - Determine a set of IP addresses with Access to the YouTestMe System

Determine the range of IP addresses permanently assigned to computers (devices) that will have access to the YouTestMe System. For example, suppose you have 30 computers (workstations) used for doing tests and for the application's administration. In that case, you could specify a range of related IP addresses from 192.168.1.100 to 192.168.1.129.



10.4 Step #1 - Collect MAC addresses

Collect MAC addresses from all computers (devices) that need access to the YouTestMe system. Type "ipconfig /all" inside the DOS Window and search for Physical Address (picture below).

```
Wireless LAN adapter Local Area Connection* 4:
   Media State . .
                                       : Media disconnected
   Connection-specific DNS Suffix
  : Microsoft Hosted Network Virtual Adapter
                                         26-77-03-8A-1B-74
                                         Yes
                                      : Yes
Wireless LAN adapter Wi-Fi:
                                        Intel(R) Centrino(R) Ultimate-N 6300 AGN
24-77-03-8A-1B-74 _____
Yes
   Connection-specific DNS Suffix
  : Yes

: Yes

: fe80::3d7c:b3a9:c9c6:6651%12(Preferred)

: 192.168.1.20(Preferred)

: 255.255.255.0

: March 9, 2018 10:15:01 AM

: March 10, 2018 10:15:00 AM

: 192.168.1.2

: 192.168.1.2

: 103053059

: 00-01-00-01-20-30-30-E1-00-21-CC-CE-02-
  thernet adapter Bluetooth Network Connection:
  : Media disconnected
  Bluetooth Device (Personal Area Network)
40-2C-F4-E2-BA-44
                                         Yes
                                       : Yes
Tunnel adapter Local Area Connection* 15:
```

10.5 Step #3 - Set up your network (DHCP server)

Set up your DHCP server to reserve specific IP addresses to specific MAC addresses. An example of one particular router (Asus RT-AC66U) is shown below:

Manual Assignment					
Enable Manual Assignment • Yes • No					
Manually Assigned IP around the DHCP list (Max Limit : 64)					
Client Name (MAC Add	IP Address	Add / Delete			
00:0C:29:37:6E:2C	•	192.168.1.101	Ð		

10.6 Step 4 - Verify your devices

Reboot your devices and make sure they are assigned IP addresses as set up in Step #3

10.7 Set up networking in the YouTestMe application

Set up access to the YouTestMe application to be allowed for IP ranges from 192.168.1.100 to 192.168.1.129.

Navigate to "System -> Settings and customization -> System preferences" tab, and locate the "Internal network" settings, where you can set a range of your local IP addresses.

	Settings and customization						
Home	System preferences Theme and	language Notifications Job scheduler Support					
	Date and time	Internal network					
Assignments	Web session parameters	Define IP addresses you want in the internal network. Set the masks for IP addresses (example: 192.168.*, 257.142.1*) that					
Users 👻	Internal network	IP mask					
Workspaces	Password configuration	192.168.1.					
Tests 👻	Test booking settings	Client's IP					
Testing sessions	Test cancellation settings	You are inside the internal network					
E Surveys	Answer ordinal markup						
Training courses	Score report setup						
Reporting	Knowledge deficiency report setup						
	Additional modules setup						
tot System	Email server						
Settings and customization	Upcoming tests reminder						
Integrations	Expiring tests reminder						
Maintenance	Finish test URL						



11 Configure HTTPS Using Apache Web Server

Requirements:

- 1. Apache HTTPD
- 2. Apache module **mod_ssl**
- 3. SSL certificate for your domain/subdomain
- 1. Copy your certificate file, the certificate key, and the certificate of the CA that signed the SSL certificate to the following directory: C:\SSLCerts
- 2. Navigate to Apache's **conf\extra** directory (commonly located at):

cd C:\Apache24\conf\extra\

Adjust the path if your Apache installation directory is different.

 Create a "*httpd-vhosts.conf*" file with a Virtual Hosts (your domain/subdomain should replace getcertified.example.com). The "secret" value should be the same as it is specified in the Tomcat file: C:\apache-tomcat-10.1.39\conf\server.xml (AJP connector)

<virtual< th=""><th>Host *:80></th><th></th><th></th><th></th></virtual<>	Host *:80>			
	ServerName		getcertified.example.com	
	Redirect	/	https://getcertified.example.com/	
<td>lHost></td> <td></td> <td></td> <td></td>	lHost>			
<virtual< td=""><td>Host *:443></td><td></td><td></td><td></td></virtual<>	Host *:443>			
	ServerName		getcertified.example.com	
	SSLEngine on			
	SSLCertificateFile	e "C:/SSLCe	erts/YOUR_CERTIFICATE.crt"	
	SSLCertificateKey	File "C:/S	SLCerts/YOUR_key.key"	
	SSLCACertificate	File "C:/SS	LCerts/YOUR_CA.ca-bundle"	
	ProxyPreserveHc	ost on		
	RewriteEngine o	n		
	RewriteCond %{	REQUEST_	URI} ^/\$	
	RewriteRule (.*)	/ytm1/ [R:	=301]	
	RewriteCond %{	HTTP:Upgr	ade} websocket [NC]	
	RewriteCond %{H	HTTP:CONI	NECTION} Upgrade\$ [NC]	
	RewriteRule /(.*)) ws:// Azu	،re_VM_IP :8080/\$1 [P,L]	
	ProxyPass		/ytm1/ ajp://Azure_VM_IP:9101/yt	tm1/ secret= <mark>your_secret</mark>
	ProxyPassRevers	e /ytm1/	ajp:// Azure_VM_IP :9101/ytm1/	



</VirtualHost>



- 4. Enable the Virtual Hosts file in httpd.conf:
 - a. Open: C:\Apache24\conf\httpd.conf
 - Ensure the following line is uncommented (remove # if present):
 Include conf/extra/httpd-vhosts.conf
 - c. Also make sure the following modules are enabled in httpd.conf:

LoadModule ssl_module modules/mod_ssl.so LoadModule proxy_module modules/mod_proxy.so LoadModule proxy_ajp_module modules/mod_proxy_ajp.so LoadModule rewrite_module modules/mod_rewrite.so

- 5. Open Command Prompt as Administrator, then run: httpd.exe -t
- Reload HTTPD: httpd.exe -k restart
- 7. Edit the Tomcat configuration file **server.xml** and uncomment AJP connector configuration. Change the default value for the "secret" parameter within the AJP connector settings. The new secret value should match the value specified in the Apache virtual host. Restart the Tomcat server to apply the changes.

C:\apache-tomcat-10.1.39\conf\server.xml

<Connector protocol="AJP/1.3" address="0.0.0.0" port="9101" secretRequired="true" secret="your_secret" redirectPort="8443" maxParameterCount="1000"/>

12 System Troubleshooting and Maintenance

12.1 Enable Tomcat to Start on Boot

- 1. Run Command Prompt as Administrator:
 - a) Click Start, search for "cmd".
 - b) Right-click Command Prompt \rightarrow Run as Administrator
- Navigate to Tomcat's bin directory: cd C:\apache-tomcat-10.1.39\bin
- Install Tomcat as a Windows service: service.bat install Tomcat10
- 4. Open Windows Services:
 - a) Press Win + R, type services.msc, press Enter
 - b) Look for a service named Tomcat10
- 5. Set the Service to Start Automatically:
 - a) Right-click the Tomcat service -> Properties
 - b) Set Startup type to Automatic (Delayed Start) wait for PostgreSQL to start
 - c) Click Apply and OK.
- Start the Service (Optional): If Tomcat is not running yet: net start Tomcat10
- 7. How to Check if Tomcat Starts After Reboot:
 - a) Reboot the server
 - b) Open a browser on VM and navigate to: <u>http://localhost:8080</u>
 - c) Or open Services again and confirm the Tomcat service is running

12.2 Tomcat Server Restart

- Stop YouTestMe applications (ytm1 and service1) from the Tomcat Manager
- Stop Tomcat Server by executing shutdown.bat script:
 C:\apache-tomcat-10.1.39\bin\shutdown.bat
- Wait for 10-15 seconds for the server shutdown to complete
- Start Tomcat Server by executing startup.bat script:
 C:\apache-tomcat-10.1.39\bin\startup.bat

12.3 Export Database Data to a File

It is good practice to back up your data regularly by exporting it to a file, which can then be stored in a secure location. This backup can be invaluable in the event of data loss, as the saved data can be re-imported into the database.

It is sufficient to backup only the database schema containing your data by executing the following command from the Command Line:

C:\Users\ytmlogin> pg_dump -v -Fc -U ytm1 -n ytm1 -b -d ytmdb1 > ytm1-backup.dmp

12.4 Import Database Data from a File

The PostgreSQL data file can be restored from the backup via CLI (command-line interface) by performing the following procedure:

- 1. Copy your previously exported data file (*ytm1-backup.dmp*, for example) from the backup location and place it in the "Downloads" directory:
- 2. Navigate to the "Downloads" directory where you transferred the database backup file : cd C:\Users\ytmlogin\Downloads>
- 3. Backup your current database data (schema):

pg dump -v -U ytml -n ytml -b -Fc ytmdbl > ytml-backup2.dmp

4. Drop database schema "*ytm1*":

psql -U postgres -d ytmdbl -c `drop schema ytml cascade';

5. Restore user data from the backup file "*ytm1-backup.dmp*":

pg restore -v -U postgres -d ytmdb1 < ytm1-backup.dmp



12.5 Database Parameters

Table showing default database parameters:

Setting	Value
Statistics gathering	automatic
Database Name	ytmdb1
Database administrative user	postgres
YouTestMe database schema (user data)	ytm1
Character Set	UTF8
Time Zone	UTC
Database Port	5432
Log Rotation	automatic

12.6 Virtual Machine Freezes

When a virtual machine freezes, the reason is usually that the host server is running out of memory or disk space. The solution is to shut down some processes on your host server or add more memory. If the cause runs out of disk space on the host server, adding disk space or cleaning unnecessary files will solve it.

12.7 Checking Tomcat Log

Tomcat's standard output and error are displayed in a separate window during startup. Application and API logs (e.g., ytm1.log, service1.log) can be found in the following directory:

C:\apache-tomcat-10.1.39\logs



12.8 Tomcat could not be stopped

Tomcat runs as a Java process, so you need to look for java.exe or javaw.exe. Use Command to execute the commands:

- Open Command Prompt as Administrator.
- Run the following command to list Java processes:

tasklist /FI "IMAGENAME eq java.exe"

Example output:

Image Name	PID	Session Name	Mem Usage
java.exe	12345	Services	150,000 K

 If multiple Java processes are running, identify the one related to Tomcat using this: wmic process where "name='java.exe'" get ProcessId,CommandLine

Look for lines that include something like: ..org.apache.catalina.startup.Bootstrap... That process is Tomcat. Note the PID (Process ID).

• Kill the Tomcat Process:

Once you have the PID, terminate the process:

taskkill /PID <PID> /F

Example: taskkill /PID 12345 /F /F forces the process to terminate. If successful, you'll see:

SUCCESS: The process with PID 12345 has been terminated.

12.9 Running VACUUM ANALYZE on PostgreSQL

To ensure optimal performance and reliability of the PostgreSQL database installed on the Windows server, Windows administrators should periodically execute the VACUUM ANALYZE command. The task is especially important on systems with frequent data updates, inserts, or deletes.

To ensure regular execution, administrators can schedule the VACUUM ANALYZE command using a batch script and the Windows Task Scheduler.

Example batch script (vacuum.bat):

@echo off

psql -U postgres -d your_database_name -c "VACUUM ANALYZE;"

Use **Task Scheduler** to run this batch file weekly or nightly as part of your database maintenance plan.

12.10 Monitoring System Resources

To check resource utilization on a Windows Server, there are several built-in tools you can use depending on how detailed or real-time your monitoring needs to be:

12.10.1 Task Manager (Basic Monitoring)

- Press Ctrl + Shift + Esc or right-click the taskbar and select Task Manager.
- Click the **Performance** tab to view:
 - CPU usage per core
 - Memory (RAM) usage
 - Disk activity
 - Network traffic

Use the **Details** tab to see per-process usage.

12.10.2 Resource Monitor (Advanced GUI)

- Press Win + R, type resmon, and press Enter.
- Go to:
 - CPU tab: see services, threads, per-process usage
 - Memory: usage, hard faults, committed memory
 - Disk: I/O per file and process
 - Network: per-process network usage, ports

Very helpful for diagnosing which app is slowing down the system.



12.10.3 Performance Monitor (In-Depth & Historical Tracking)

- Press Win + R, type perfmon, and press Enter.
- Use:
 - Performance Monitor (real-time graphs)
 - Data Collector Sets (create logs over time)
 - Add counters for:
 - Processor(_Total)\% Processor Time
 - Memory\Available MBytes
 - ◆ PhysicalDisk\% Disk Time
 - Network Interface\Bytes Total/sec

Best for long-term monitoring and reporting.

13 Contact Information

If you encounter any difficulties during the process or have any questions, please do not hesitate to contact our support team at support@youtestme.com. Our dedicated team of experts is available to assist you with any issue that you may have.

https://www.youtestme.com/support-services/