

Project 1 - Install Virtualization Solution (for Windows)

Objective:

The student will install and configure the virtualization environment required to complete course related projects and activities. At the end of this activity, the correct virtualization solution will be installed, and appropriate networking options will be enabled to allow 'guest isolation ' when necessary.

Before you begin:

- Ensure that your student laptop or personal computer meets the minimum requirements for your program, as described in the University Program Handbook.
- Ensure that your student laptop or personal computer has sufficient available disk space to support the storage of the software itself AND the storage requirements for each OS guest. See the table in Appendix A for typical requirements based on the course.
- Ensure that your system BIOS options have Hyper-V/Virtualization <u>enabled</u>. The exact option, title, and configuration method varies among systems. Changing the option usually involves entering the system setup during the boot process, and, usually involves restarting the computer.
- Ensure that you have been approved to access GCU Virtualization Solutions, identified on the Canyon Connect website. Follow links in the Student Success Center > CSET > Course Material Support > Setting up GCU VMWare.
- Download the appropriate virtualization solution for your workstation type.
 - If your system is Windows-based, download 'VMWare Workstation'.
 - If your system is Apple-based, download 'VMWare Fusion'.
 - Be sure to record the Serial number for your product. You will need this to activate your product during the installation.
- Ensure that you have been approved for access to the Azure teaching solutions software required for your course, identified on the Canyon Connect website.
- Download the appropriate Operating System and/or application image file(s) as directed by your instructor. There may be more than one image required.
- Record the Product Key for each OS/Application. You will need these to activate your product following installation.

<u>Overview</u>

Use this instructional guide to assist with installing and configuring your Virtualization Solution. This document includes instructions for:

- Installing VMWare Workstation Pro
- Configuring the Virtual Network Switch



Install VMWare Workstation Pro - 20 points

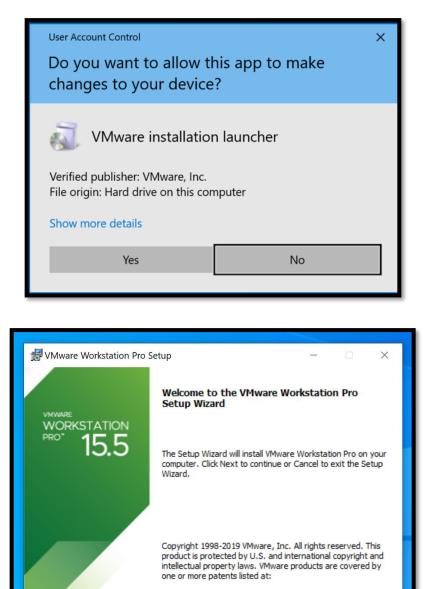
Locate the installation	
package.	

Click on the executable.

File Home	Share	View					
← → ヾ ↑ 🖡 ›	This P	C > Downloads > vmWare			~	U	, Search vmWare
📌 Quick access	^	□ Name	Date modified	Туре	Size		
Desktop	*	🦝 VMware-workstation-full-15.5.0-146	65 6/2/2020 2:13 PM	Application	554,0	038 KB	
🕹 Downloads	*						
Documents	*						
Pictures	*						

User Account Control

Click 'Yes'.



http://www.vmware.com/go/patents

Next

VMware Workstation Pro

Click 'Next'.

Setup Wizard

Cancel

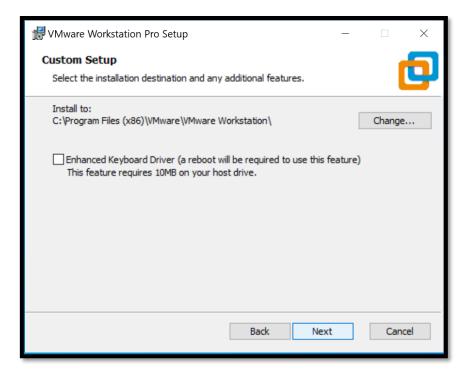


End-User License Agreement					
End ober Electise Agreement	🛃 VMware Workstation Pro Setup - 🗆 🗙				
Check 'Accept'.	End-User License Agreement				
	Please read the following license agreement carefully.				
Click 'Next'.					
	VMWARE END USER LICENSE AGREEMENT				
	PLEASE NOTE THAT THE TERMS OF THIS END USER				
	LICENSE AGREEMENT SHALL GOVERN YOUR USE OF THE SOFTWARE, REGARDLESS OF ANY TERMS				
	THAT MAY APPEAR DURING THE INSTALLATION OF				
	THE SOFTWARE.				
	×				
	☑ I accept the terms in the License Agreement				
	Print Back Next Cancel				



Custom Setup

Click 'Next'.



User Experience

Uncheck 'Join VMware CEIP'.

Click 'Next'.

WWware Workstation Pro Setup -	×
User Experience Settings	
Edit default settings that can improve your user experience.	4
 Check for product updates on startup When VMware Workstation Pro starts, check for new versions of the applicat and installed software components. Join the VMware Customer Experience Improvement Program VMware's Customer Experience Improvement Program ("CEIP") provides VMware with information that enables VMware to improve its products and services, to fix problems, and to advise you on how best to deploy and use our products. As part of the CEIP, VMware collects technical 	< .
Learn More	
Back Next	Cancel



Click 'Next'.

憬 VMware Workstation Pro Setup	_		×
Shortcuts			F
Select the shortcuts you wish to place on your system.			٣
Create shortcuts for VMware Workstation Pro in the following places:			
🗹 Desktop			
Start Menu Programs Folder			
Back Next		Car	ncel

Ready to Install

Click 'Install'.

🛃 VMware Workstation Pro Setup	_		×
Ready to install VMware Workstation Pro			9
Click Install to begin the installation. Click Back to review or chainstallation settings. Click Cancel to exit the wizard.	nge any of yo	bur	
Back	ínstall	Cano	el



Installation

Install Progress

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Installing VMware Workstation Pro				ð
Please wait while the Setup Wizard installs VMware Worksta	tion Pro.			
Status:				
Back	Next		Са	ncel

Installation

Install Progress

扰 VMware Workstation Pro Setup	_		×
Installing VMware Workstation Pro			Ð
Please wait while the Setup Wizard installs VMware Workstation Pro.			
Status: Installing virtual network drivers.			_
Deale	-	6	
Back Next		Car	icei



Installation complete.

IF You have a license key recorded,

Click 'License'.

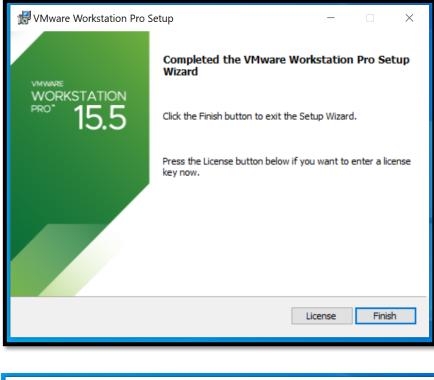
IF you do not have a license, click 'Finish'.

Note: You will need to obtain a valid license key within 180 days of installation. See your instructor for details.

Enter	License	Key.
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Enter your key.

Click 'Enter'.

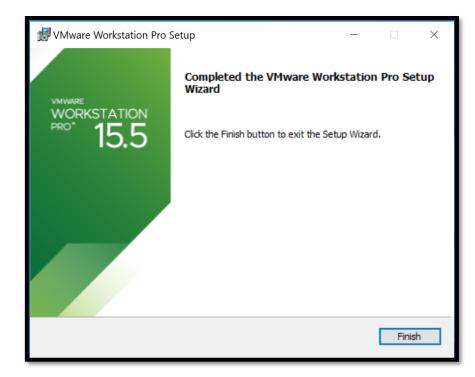


😾 VMware Workstation Pro Setup	-		\times
Enter License Key			6
This dialog allows you to save your product license key.			۳
License Key Format: XXXXX-XXXXX-XXXXX-XXXXX-XXXXX			
12345-12345-12345-12345-12345			
Enter your license key, or Skip to leave this field blank and	enter it later.		
[Skip	En	iter



Wizard Complete

Click 'Finish'.



Submit a screenshot of your Workstation Pro library as evidence of completion.

🔁 VMware Workstation File Edit View VM Tabs Help 🕨		- 🗆 X
Library ×		
United Wite Shared VMs	(1) Your evaluation period ends in 388 days. 1. Get a license key 2. Enter a license key	
	WORKSTATION 15.5 PRO"	
	(+) [7] ≓	
	Create a New Virtual Open a Virtual Connect to a Machine Machine Remote Server	
< , wmware		
n		1

Installation Complete.

Reboot your computer if prompted.



Configure the Workstation Environment

Explanation

Virtual Machines are a series of files in a folder on your local hard disk. The default location may be in a path that copies to a cloud drive, or, may be on a local disk that does not have sufficient space to store the virtual machine files. This section details how to make preference changes to ensure the default folder location for a new virtual machine is placed on a drive with sufficient space. It's up to the user to ensure this path is not also included in a cloud enabled folder path (i.e., 'OneDrive').

File Explorer

Open File Explorer.

Navigate the 'Drive C' or other suitable local drive.

🛀 🛛 🔁 📜 🕶 🗍	Share View	Manage Local Disk (C:) w Drive Tools					-	□ × × 0
← → • ↑ 🗫	> This PC > L	.ocal Disk (C:) >			s ∼	Search Local Disk (C:)		
← → ← ← ← ← ← → ← ← ← ← ← ← ← ←	*	All Disk (C) > Name Pertogs Program Files (466) Users Virtual Machines	Date modified 3/14/2019 952 PM 6/12/2020 727 AM 6/15/2020 7:59 AM 6/12/2020 9:646 AM 6/15/2020 8:04 AM	Type File folder File folder File folder File folder File folder File folder	v D Size			
Pictures Videos Local Disk (C:								

Virtual Machine Folder

Create a new folder,

'Virtual Machines'.

	-	Name	Date modified	Туре	Siz
ick access		_			
esktop	*	PerfLogs	3/18/2019 9:52 PM	File folder	
	*	📜 Program Files	6/12/2020 7:27 AM	File folder	
ownloads		Program Files (x86)	6/15/2020 7:59 AM	File folder	
ocuments	*	Users	6/3/2020 10:16 AM	File folder	
ictures	*	📙 Virtual Machines	6/15/2020 8:04 AM	File folder	
lusic		Windows	6/3/2020 9:46 AM	File folder	
stem32					



Desktop Shortcut

Click the shortcut.



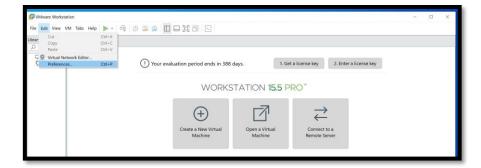
Start VMware Workstation Pro



VMware Workstation Menu

Navigate to 'Edit'.

Select 'Preferences'.





Preferences

Workspace

Default Location

Click 'Browse'.

Then navigate to the drive and folder created earlier.

Select the folder.

Click 'Okay'.

Preferences

Workspace

Click 'Ok'.

Default Location

Preferences	Default location fo C:\Users\Paul\[Browse For Folder Choose the default location for storing virtual machine	× e files.	e
Display Display Unity USB Updates Feedback Feedback Memory Memory Memory Ovices	Virtual machines Virtual machines Remember o Keep VMs ru Enable all shi Show Aero P Show tray icon: Default hardwar C Seconds betwee Save screenshot	 Pictures Videos Local Disk (C:) PerfLogs Program Files Program Files (x86) Users Virtual Machines Windows 	^ ~	C ₹€
	Privacy Offer to save to Show Saved Log	Make New Folder OK Can ogin information for remote hosts gin Information	.t	
		OK Cancel Help		

Imput C:\Virtual Machines Browse Display Virtual machines Browse Unity Virtual machines Virtual machines UsB Remember opened tabs between sessions Virtual machines Updates Reep VMs running after Workstation closes Enable all shared folders by default Shared VMs Implement of the make all for each tabs Default	e
□ Display Virtual machines □ Unity □ Remember opened tabs between sessions □ USB □ Keep VMs running after Workstation closes □ Feedback □ Enable all shared folders by default	
USB Remember opened tabs between sessions Updates Keep VMs running after Workstation closes Feedback Enable all shared folders by default	
CUpdates Keep VMs running after Workstation closes Feedback Enable all shared folders by default	
Shared VMs	
I Show Aero Peek thumbnails for open tabs	
Were Priority Show tray icon: Always	\sim
Operation Default hardware compatibility: Workstation 15.x	~
Compatible with: 🗹 ESX Server	
Seconds between powering on multiple VMs: 10	
Save screenshots to: 🗹 Clipboard	
✓ File: Save to Desktop	~
Privacy	
✓ Offer to save login information for remote hosts	

Preference change complete



Configure the Virtual Network Switch – 10 points

Explanation	The virtualization solution allows the user to configure virtual network switching interfaces to provide various options for connecting and interconnecting the virtual guests created in the environment on your computer.
	You will configure at least two virtual interfaces for use in various courses.
	One interface allows the Guest OS to share the network interface of the host system. This feature provides internet access (assuming your host system has it as well), and is useful for downloading updates to the Guest OS, connecting for activation purposes (windows), and installation of additional packages (Linux/Unix).
	The second interface allows VMWare Fusion to interconnect one guest OS with other guest OSs when they are also configured to use the virtual interface.
	For the purposes of GCU courses, and to provide an additional layer of isolation from the campus network, this 'AirGap' interface is kept disconnected from the host network interface.
	Your instructor will provide specific direction for when to use each interface in your virtual machine guests.
	Note: All Virtual Machine guests should be powered off during this configuration step.
VMware Workstation Main Menu	Ibrar Cut Cut+C Paste Cut+V

Ctrl+P

() Your evaluation period ends in 388 days.

(+)

Create a New Virtual Machine

WORKSTATION 15.5 PRO

7

Open a Virtual Machine

👳 Virtual Network Editor

Navigate to 'Edit'.

The select 'Virtual Network Editor'.

1. Get a license key 2. Enter a license key

 $\stackrel{>}{\leftarrow}$

Connect to a Remote Server



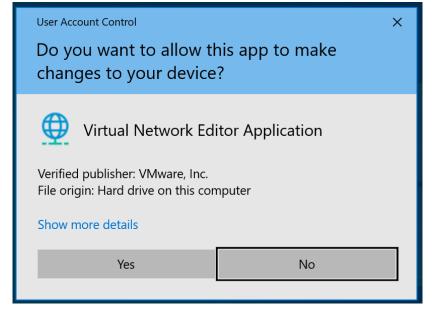
Virtual Network Editor

Click 'Change Settings'.

User Account Control

Click 'Yes'.

lame	Туре	External Connection	Host Connection	DHCP	Subnet Ad	dress
/Mnet1	Host-only		Connected	Enabled	192.168.21	
/Mnet8	NAT	NAT	Connected	Enabled	192.168.5.	0
			Add Network	Remove	e Network	Rename Network.
/Mnet In	formation					
		t VMs directly to the external ne	twork)			
	ged to:				× A.	the second s
БПа	gea to:				AU	utomatic Settings
$\bigcirc NAT$	(shared hos	t's IP address with VMs)				NAT Settings
Host-	only (conne	ect VMs internally in a private ne	twork)			
		the set of the second set of the second second				
		irtual adapter to this network pter name: VMware Network Ac	lanter VMnet1			
⊻ Use I	ocal DHCP s	ervice to distribute IP address to	o VMs			DHCP Settings
Subnet	IP: 192 . 1	168 . 219 . 0 Subnet ma	ask: 255 . 255 . 255 . 0	0		
			re required to medify the	nonuori, co	oficiantion	Change Cetting
		Administrator privileges a	re required to modify the	e network co	nfiguration.	Change Setting





Virtual Network Editor

Click 'Add Network'.

Select 'VMnet10' from the list.

Virtual Network Editor

Un-Check 'Connect a host virtual adapter to this network'.

Change the Subnet IP to '192.168.10.0', or to a range assigned by your instructor.

Name	Туре	External	Connection	Ho	t Connection	DHCP	Subnet Address	
VMnet0	Bridged	Auto-brid	lging	-		-	-	
VMnet1 VMnet8	Host-only NAT	- NAT	iging		nnected	Enabled Enabled	192.168.219.0 192.168.5.0	
VMnet Inf			Add a Virtual Net		VMnet10	×	Network Rena	me Network.
-	ed (connect \ ged to: Autor		ОК	Ca	VMnet2 VMnet3 VMnet4		~ Automatic	c Settings
	(shared host's only (connect		s with VMs) nally in a private netw	vork)	VMnet5 VMnet6 VMnet7 VMnet9 VMnet10		NAT S	ettings
	: virtual adapt	er name: V	r to this network /Mware Network Adap ribute IP address to \		VMnet11 VMnet12		DHCPS	Settings

🕀 Virtual N	Network Edi	itor					×
Name VMnet0 VMnet1 VMnet8 VMnet10	Type Bridged Host-only NAT Custom	External Connection Auto-bridging - NAT -	Host Connection - Connected Connected -	DHCP - Enabled Enabled Enabled	Subnet - 192.168 192.168 192.168	.219.0 .5.0	
VMnet Info		/Ms directly to the external netwo	Add Network	Remove	Network	Renam	e Network
Bridge	ed to: Autor	natic			~	Automatic S	Settings
O NAT (s	hared host's	IP address with VMs)			Í	NAT Set	tings
• Host-o	nly (connect	VMs internally in a private netwo	rk)				
Host	virtual adapte	ual adapter to this network er name: VMware Network Adapt vice to distribute IP address to VN 3 . 119 . 0 Subnet mask:	ſs	0		DHCP Set	ttings
Restore De	faults	Import Export	ОК	Cancel	Арр	bly	Help



Virtual Network Editor

The network configuration is applied, and the network service is restarted.

Name VMnet0	Type Bridged	External Auto-brid	Connection	Host Connection	DHCP	Subnet Ad	ldress
VMnet1	Host-only	-	EE.	Connected	Enabled	192.168.2	
VMnet8 VMnet10	NAT	NAT		Connected	Enabled	192.168.5	
VI MELLO	Custom	-		-	Enabled	192.168.1	0.0
			Initializing virtua	al networks	D	Network	Rename Network
VMnet Inf			5				
	ed (connect)	/Ms directly	Load	ing network configuration	on.		
Bridg	ged to: Autor	matic				~ A	utomatic Settings
	shared host's	IP addres	s with VMs)				NAT Settings
• Host-	only (connect	: VMs inter	nally in a private ne	twork)			
			r to this network /Mware Network Ad	dapter VMnet10			
	ocal DHCP ser	vice to dist	ribute IP address t	o VMs			DHCP Settings
<mark>∕ U</mark> se lo					•		
Use k	P: 192 . 16	8.10.0) Subnet m	ask: 255 . 255 . 255 .	0		

Virtual Network Editor

Click 'Rename Network'.

🕀 Virtual I	Network Edi	tor					×
Name VMnet0 VMnet1 VMnet8 VMnet10	Type Bridged Host-only NAT Custom	External Connection Auto-bridging - NAT -	Host Connection - Connected Connected	DHCP - Enabled Enabled Enabled	Subnet - 192.168 192.168 192.168	3.5.0	1
VMnet Info	rmation		Add Network	Remove	Network	Renam	e Network
		'Ms directly to the external netwo	rk)				
Bridge	ed to: Autor	natic			\sim	Automatic S	Settings
◯ NAT (s	hared host's	IP address with VMs)				NAT Set	tings
Host-o	nly (connect	VMs internally in a private netwo	ork)				
		ual adapter to this network er name: VMware Network Adapt	ter VMnet10				
✓ Use loo	al DHCP ser	vice to distribute IP address to VM	Чs			DHCP Set	ttings
Subnet If	P: 192 . 168	3 , 10 , 0 Subnet mask:	255 . 255 . 255 .	0			
Restore De	faults	mport Export	OK	Cancel	Ap	ply	Help



Rename	а	virtual	network
Nename	а	viituai	network

Rename the network 'GCU-AirGap'.

Click 'Ok'.

1	Rename a Virtua	al Network		×
-1.	GCU-AirGap			
τιγ	ОК	Cancel	Default	

Virtual Network Editor

Custom changes complete.

Click 'Ok'.

	work Editor				×
Name VMnet0 VMnet1 VMnet8 GCU-AirGap	Type Bridged Host-only NAT Custom	External Connection Auto-bridging - NAT -	Host Connection - Connected Connected -	DHCP - Enabled Enabled Enabled	Subnet Address - 192.168.219.0 192.168.5.0 192.168.10.0
			Add Network F	Remove Netw	ork Rename Network
VMnet Informa	ation				
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		rectly to the external networl	<)		
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Example:

You will use the GCU-AirGap in later projects to configure a second network interface in your Guest OS machines.

This is an example of how the network appears in the Add Network Adapter settings in a Virtual Machine Hardware list.

Device ■Memory ■Processors Network Adapter 2 ■USE Controller 4 Sound Card ⊕ Sound Card ⊕ Printer ■ Display	Summary 1 GB 2 Auto detect NAT NAT Present Auto detect Present Auto detect Versent Auto detect	Device status Connacted Connect at power on Network connection Bridged: Connected directly to the physical network Replicate physical network connection state NAT: Used to share the host's IP address Host-only: A private network shared with the host © Custom: Specific virtual network VMmet0 VMmet1 (Host-only) VMmet3 VMmet6 VMmet7 VMmet8 VMmet8 VMmet8 VMmet8 VMmet8 VMmet11 VMmet12 VMmet13 VMmet14 VMmet15 VMmet19	d
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○ E ○ N ○ H ● C	VMnet6 VMnet7 VMnet8 (NAT) VMnet9 GCU-AirGap VMnet11 VMnet12 VMnet13 VMnet14 VMnet15	d
	VMnet14	
	VMnet19	

Add Adapter.



Include a screenshot of your completed Virtual Network Editor with the AirGap configuration as proof of completion.

Virtual Network configuration complete.

Scoring (30 points total):

- Install virtualization solution: 20 points
- Configure Virtual Network Switch: 10 Points