



Final Project Report:

IT Solutions for Book Icons

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Submitted to:

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Introduction

Our company provides network-related IT (Information Technology) technical support services which are necessary for customer organizations to achieve their business goals. Our aim is to provide a high-level network up-grade solution using the knowledge, tools and techniques garnered from our CNET courses. The solution is geared to enhance the IT infrastructure, services and network backbone which are essential for our customer's organizations to achieve their business goals. We will focus on implementing VoIP services, enterprise WAN network, a server farm and a robust security infrastructure and a hybrid cloud hot backup.

Technical Section

List of Hardware and Software:

Hardware:

Equipment Name	Type
Cisco 8600 Router	Network Router
Cisco 9300/9200-48 E Switch	Network Switch
Firewall-Firepower 2130	Security Console
Cisco Meraki MX80 Wireless Controller	Wireless Controller
Cisco Meraki MR42 Wireless Access Point	Access Point
Dell PowerEdge R620	Server
Cisco UCS C240 M5 Rack Server	Server

Software:

Applications	Category

Windows Active Directory	Security and Control
Windows 10 PRO	Operating System
Windows Server 2016 Enterprise	Server
Website	Web application
Cisco IP Phone Server	Collaboration

End-Devices:

Equipment Name	Type
Cisco 7841 IP Phone	IP Phone
Dell Inspiron 15 Laptop	Laptop
Dell Inspiron Desktop	PC

Hardware/Device Specification

- Dell PowerEdge R620



Product Specification

Form Factor	1U rack
Processors	Intel Xeon processor E5-2600 and 2600 v2 product families
Processor sockets	2 sockets
Internal interconnect	2 Intel Quick Path Interconnect (QPI) Links: 6.4GT/s, 7.2GT/s, 8.0GT/s
Cache	2.5 MB per core; core options: 4,6,8,10,12
Chipset	Intel C602
Memory	Up to 768GB (24DIMM slots)

- Cisco UCS C240 M5 Rack Server



Product Specification

Form Factor	2RU rack server
Processors	Intel® Xeon® Scalable processors (1 or 2) or second-generation Intel Xeon Scalable processors
Processor sockets	2 sockets
Power Supplies	Hot-pluggable, redundant 770W AC, 1050W AC, 1050W DC and 16000W AC
PCIe expansion	6 PCIe 3.0 slots plus 1 dedicated 12-Gbps RAID controller slot and 1 dedicated mLOM slot
Memory	24 DDR4 DIMM slots: 8, 16, 32, 64, and 128 GB and up to 2666 MHz Support for the Intel Optane DC Persistent Memory (128G, 256G, 512G)

- Firewall-Firepower 2130



Performance Specification

Throughput: FW + AVC (1024B)	5.4Gbs
Maximum concurrent sessions, with AVC	2 million
TLS	760 Mbps
Throughput: IPS (1024B)	1.9Gbps
Maximum VPN Peers	7500
Cisco Firepower Device Manager (local management)	Yes

We use Firepower 2130 for improved security and maintain high-level network performance.

The Firepower 2100 series features an innovative dual-core CPU architecture that simultaneously optimizes security system, encryption, and threat investigation capabilities, which can enhance security without compromising network performance.

- Cisco Catalyst 9300



Product Specification

Design to replace	Cisco Catalyst 3850
ACL scale entries	5,120
Total number of IPv4 routes (ARP plus learned routes)	32,000 (24,000 direct routes and 8000 indirect routes)
IPv6 routing entries	16,000
Switching capacity	208 Gbps - 640 Gbps
Packet buffer per SKU	16 MB buffer for 24- or 48-port Gigabit Ethernet models
VLAN IDs	4094
ACL scale entries	1,600

- Cisco Catalyst 9200-48 port



Product Specification

Default primary AC power supply	PWR-C6-1KWAC
ACL scale entries	1,600
Total number of IPv4 routes (ARP plus learned routes)	14,000 (10,000 direct routes and 4,000 indirect routes)
IPv6 routing entries	2,000
Switching capacity	176 Gbps
Packet buffer per SKU	6 MB buffers for 24- or 48-port Gigabit Ethernet models
VLAN IDs	4096
ACL scale entries	1,600

- Cisco Meraki MX80 Wireless Controller



Product Specification

Recommended use cases	Medium sized branch
Recommended max user	100
Stateful Firewall Throughput	250 Mbps
Advanced Security Throughput	80 Mbps
Maximum VPN sessions	50
Interfaces	5 x GbE

We use the Cisco Meraki MX80 Wireless Controller to check the status of access points and manage or control them.

- Cisco Meraki MR42 Wireless Access Point



Product Specification

Usage	General purpose 802.11ac wave 2 for campus and enterprise, with external antenna option.
Radio specification	One 802.11b/g/n One 802.11a/n/ac One WIDS/WIPS One Bluetooth® radio 1.9 Gbit/sec max rate Three 3:3 MU-MIMO with beamforming
Interface	One Gigabit Ethernet port
Power	802.3af/at PoE or DC power adapter
Performance features	Three 3:3 MU-MIMO Priority voice, power save (802.11e/WMM) Hardware-accelerated encryption Band steering Removable antennas (MR42E)
Weight	25 oz (0.7 kg)

Software Specification

- Windows Servers 2016 Standard
- Windows 10 Professional
- Active directory

We have adopted Windows server 2016 as Book icon's Windows server, and user workstations on 7 sites are based on Windows 10 Professional. We configured an active directory on the Windows server, which made it easy for bookicons domain network administrators to manage or deploy dns-based naming, network changes, security policy changes, and remediation for all user workstations and VMs connected to the domain

Topology

Ajax HQ Office

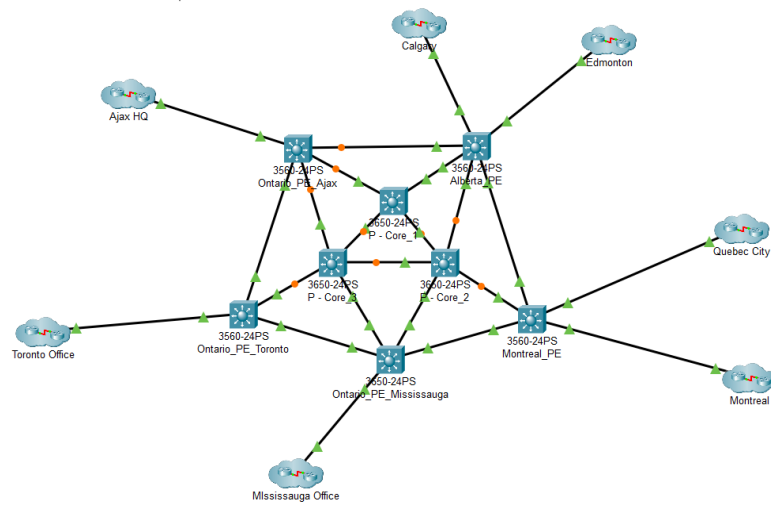
- 2-tier Hierarchical network design topology
- Core/Distribution Layer
 - Core switch
 - Distribution layer-WLAN controller
- Access Layer
 - Connected to core switch
 - Access points in WLAN Network
 - End-point device: PCs and IP Phone for each department

Remote site Offices

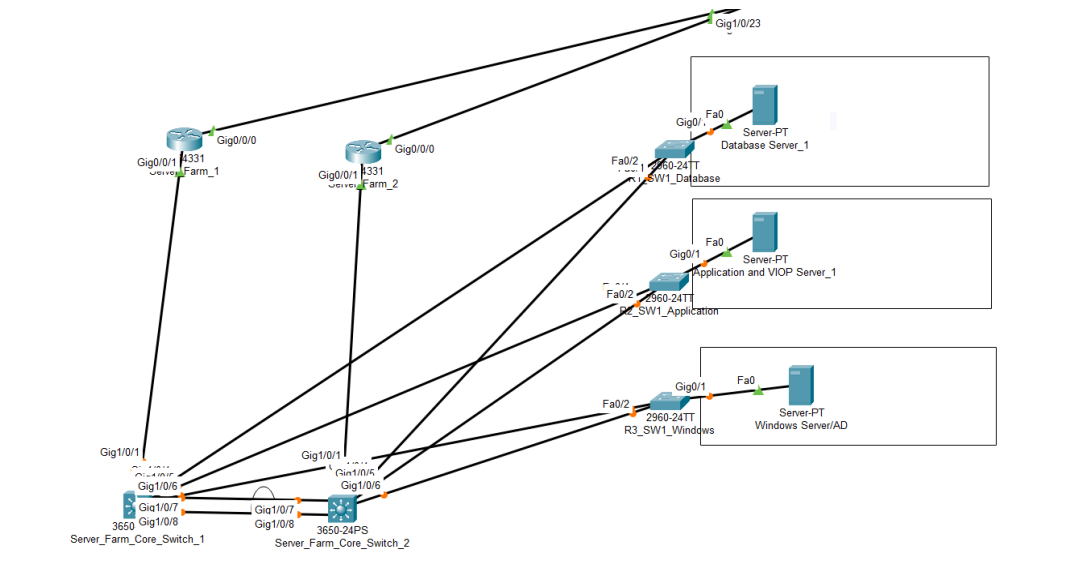
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 - Connected to core switch
 - Access points
 - End-point device: PCs and IP Phone for each department

Physical Topology

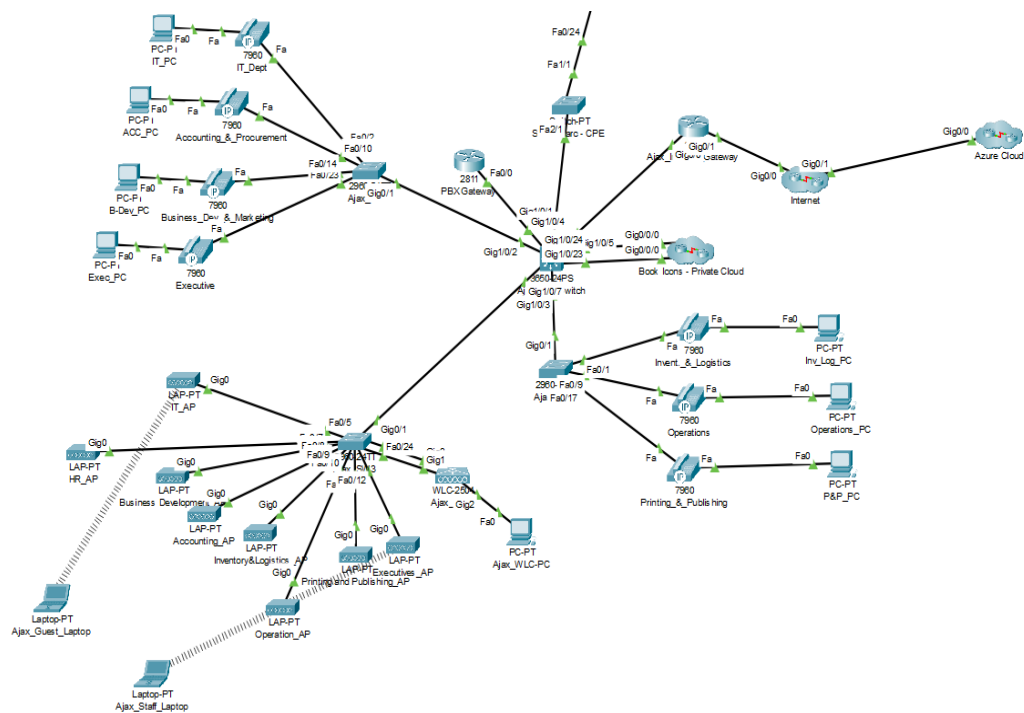
Bookicons MPLS Network



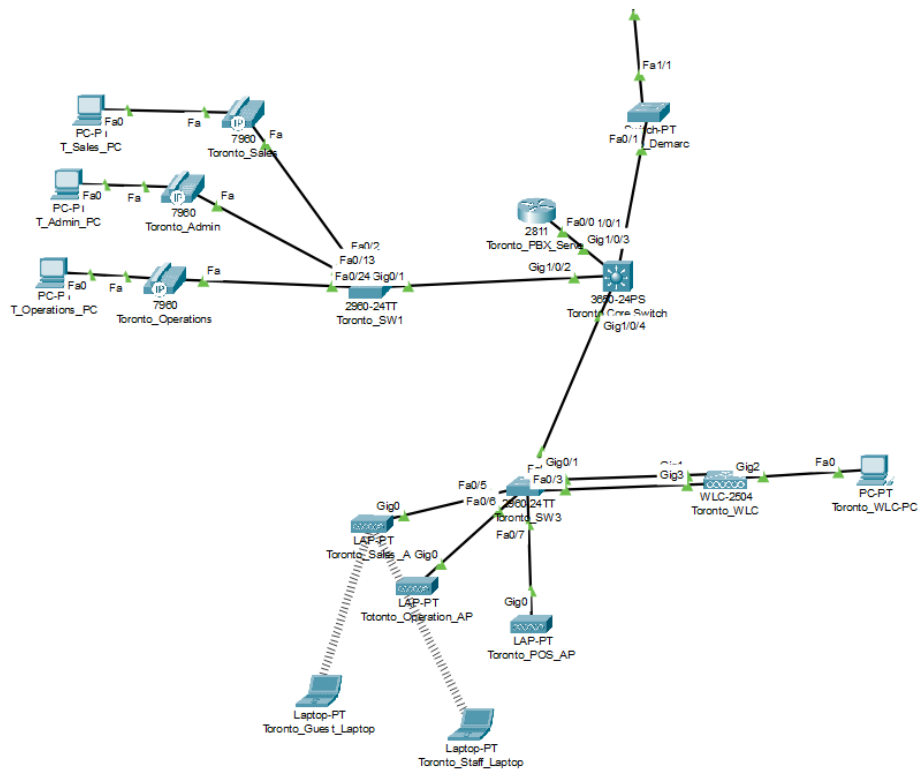
Book Icons Private Cloud



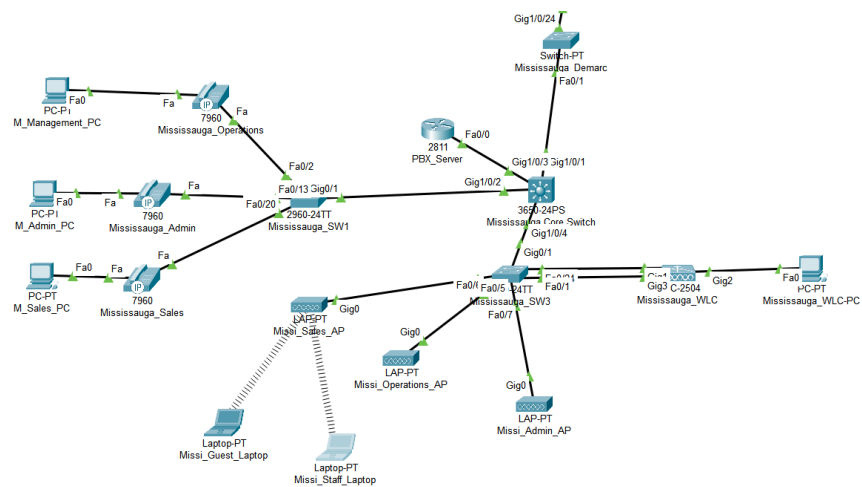
Ajax LAN/WLAN Network



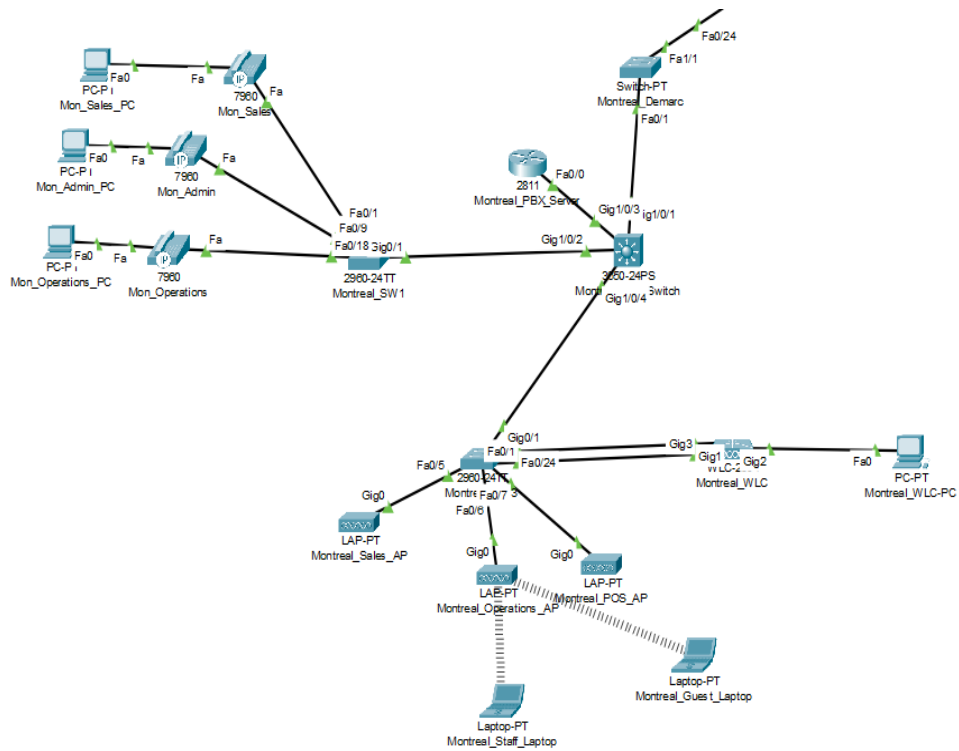
Toronto LAN/WLAN Network



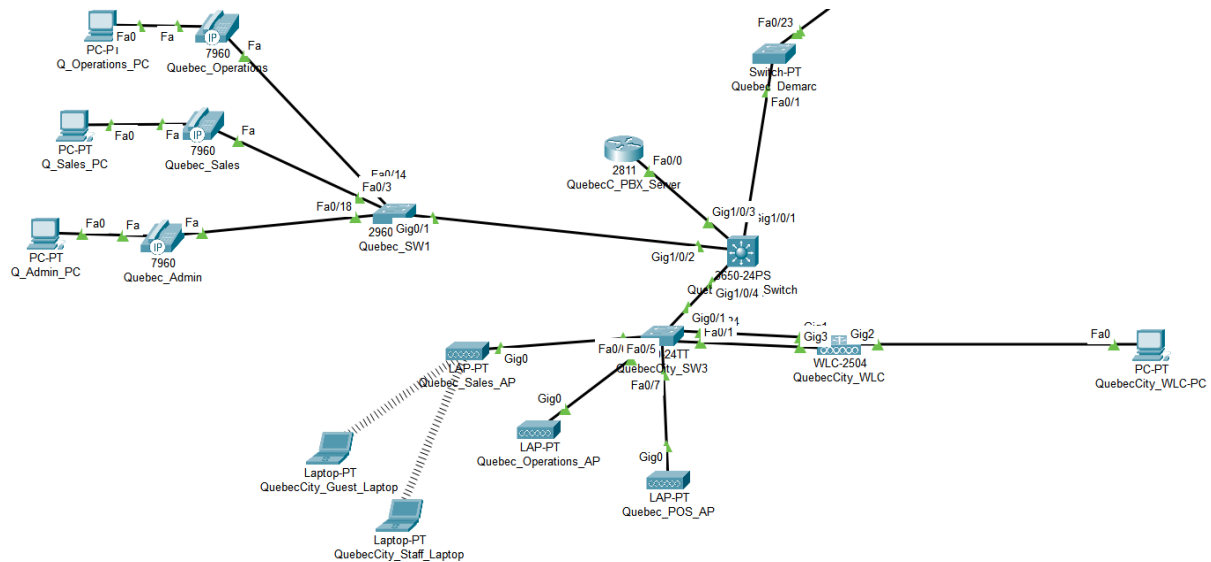
Mississauga LAN/WLAN Network



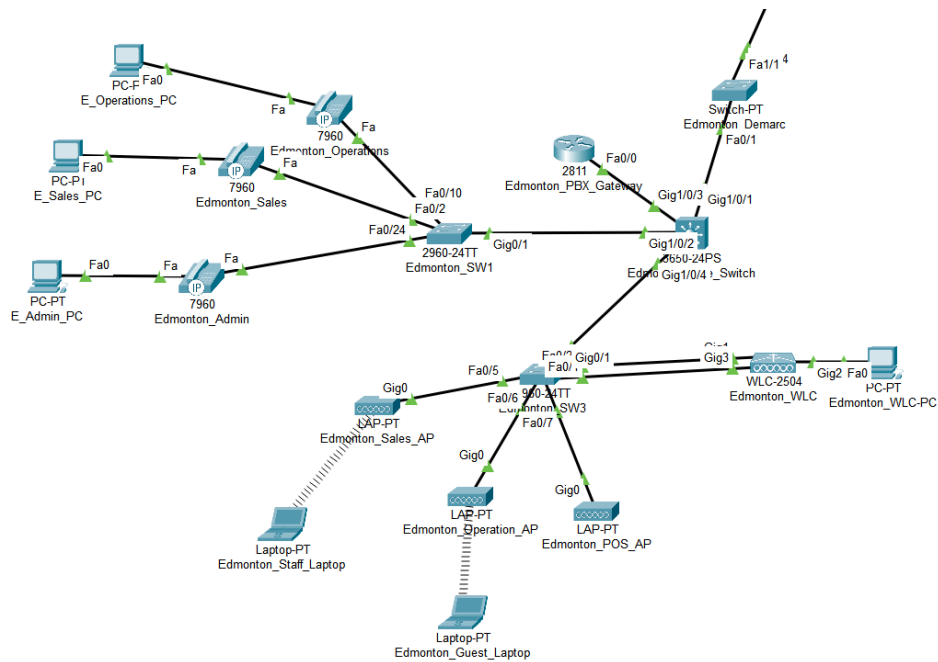
Montreal LAN/WLAN Network



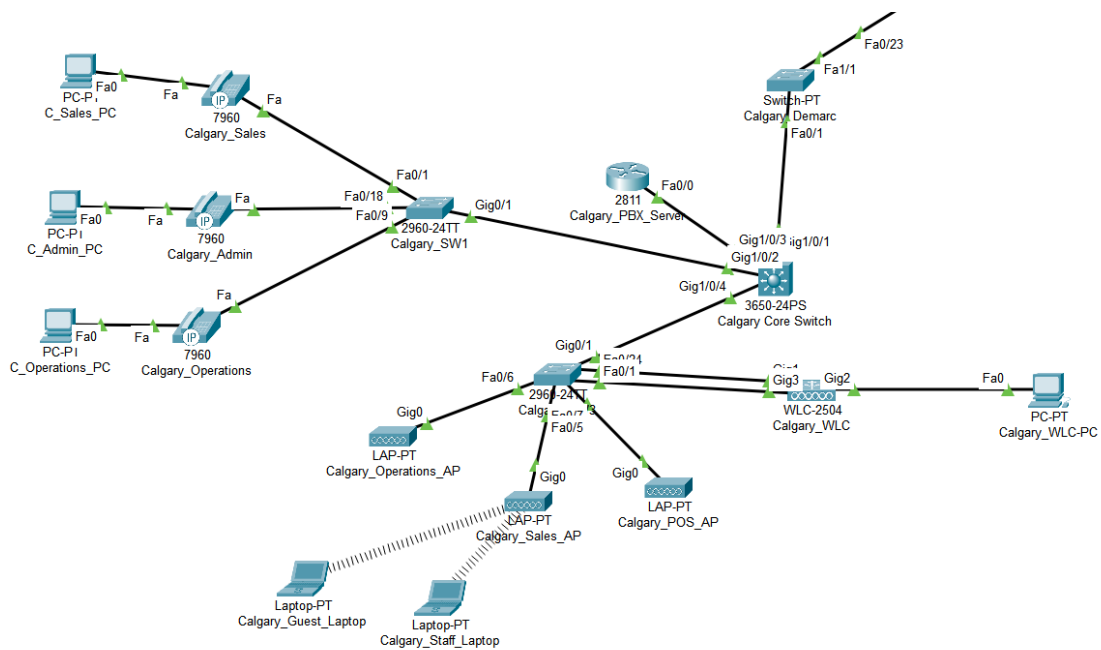
Quebec City LAN/WLAN Network



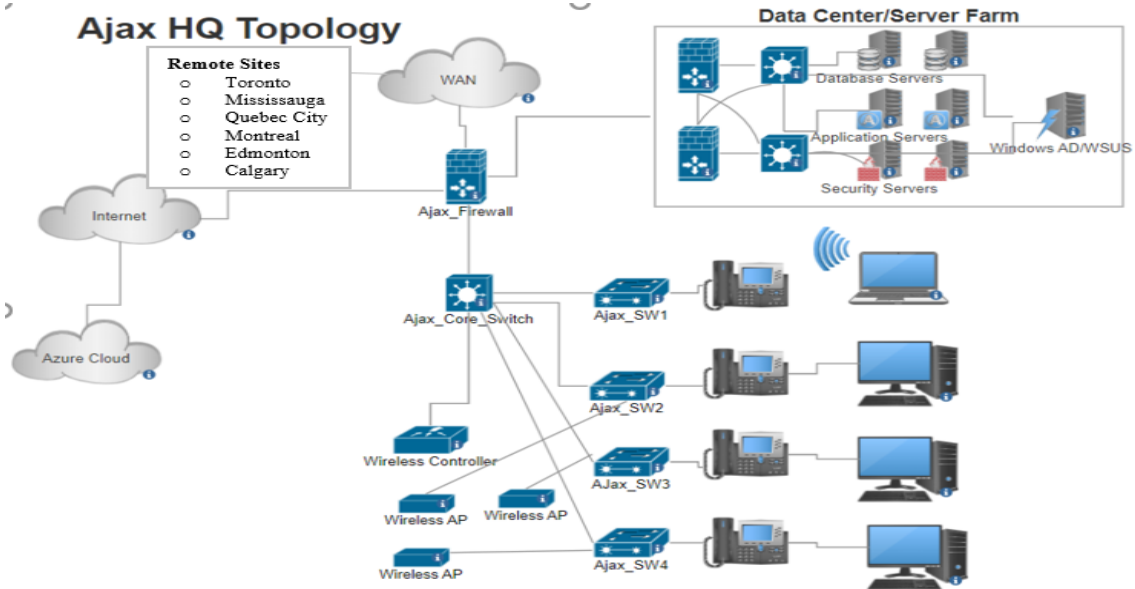
Edmonton LAN/WLAN Network



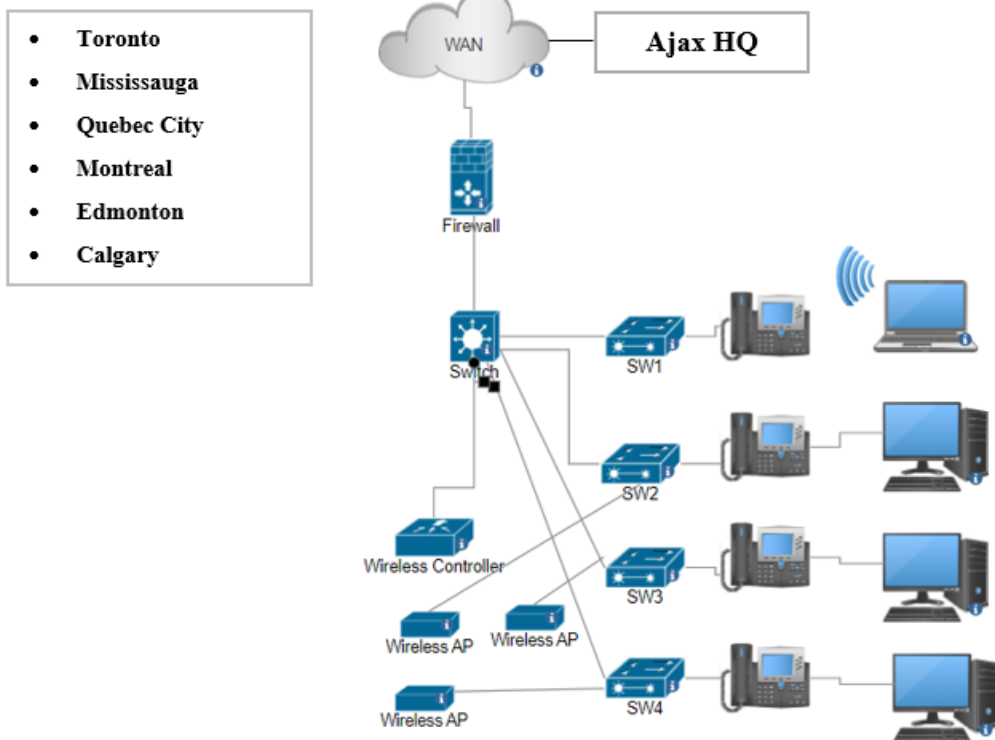
Calgary LAN/WLAN Network



Logical Topology



Remote Sites Topology



Network Virtualization and Cloud

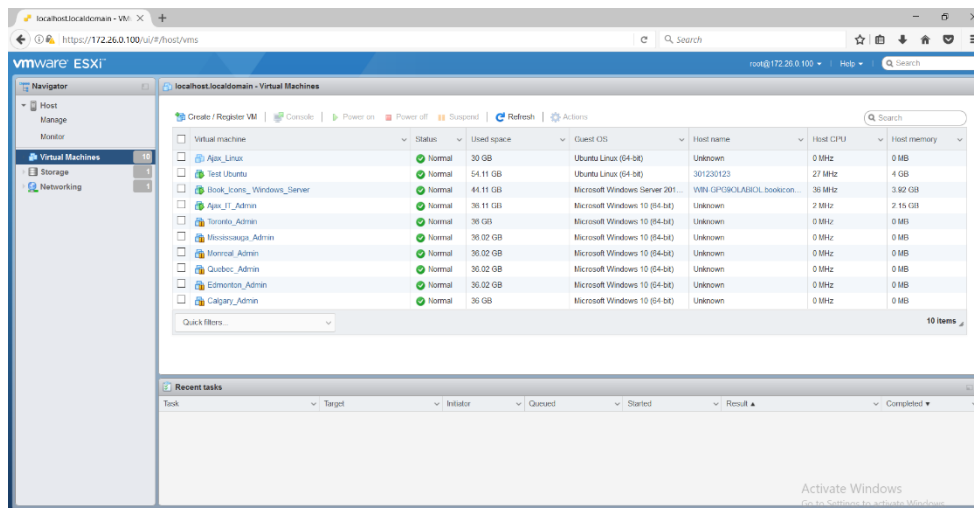
The Cloud infrastructure was implemented using ESXi for the private cloud that virtualizes all the servers into one bare-metal machine.

Resource	Server	Environment	Services
Dell PowerEdge R620	Database & File Server	VMWare ESXi 6.5	SQL, FTP, TFTP, SFTP
Dell PowerEdge R620	Application and VOIP (Voice Over Internet Protocol) Servers	VMWare ESXi 6.5	Web applications, DNS (Domain Name System), HTTP, HTTPS, Azure Gateway Services
Dell PowerEdge R620	Windows 2016 Server/WSUS	VMWare ESXi 6.5	Windows Update Services, Active Directory Services, RDP

Installation of Windows Server on ESXi:

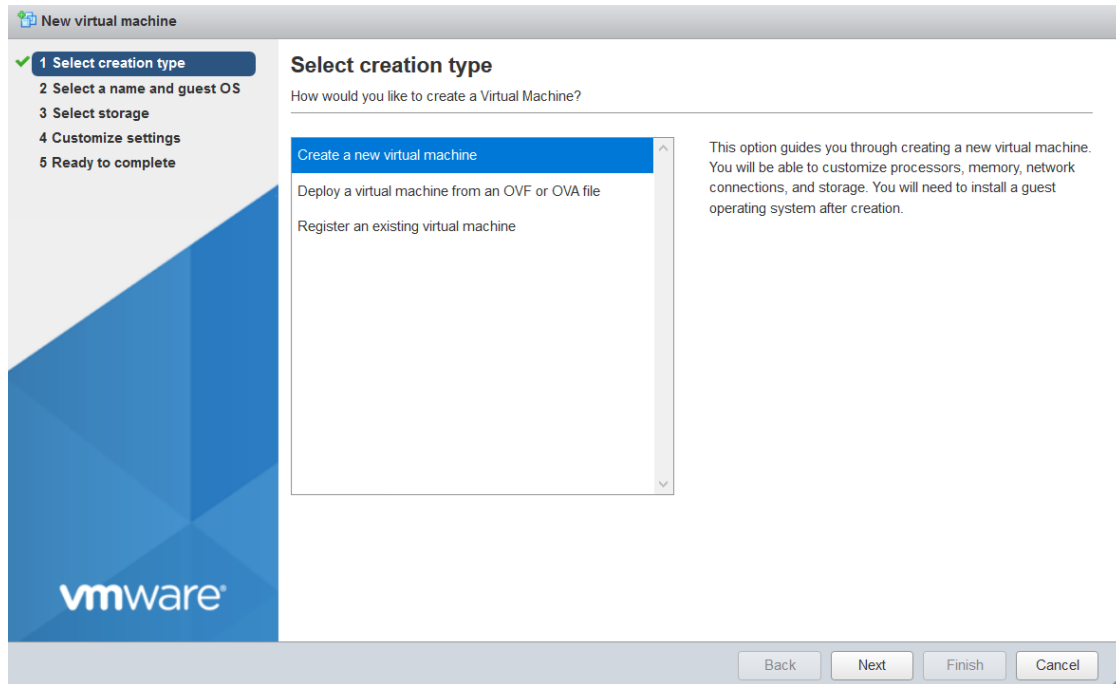
Step 1:

Launch ESXi application and select Virtual Machines. In the List of machines pane, select Create/ Register VM (Virtual Machine)



Step 2:

Select Create a new Virtual Machine and click next



Step 3:

Enter the name of your machine and select the following:

Compatibility - ESXi 6.5 Virtual Machine

Guest OS (Operating System) family – Windows

Guest OS Version – Windows 10 Professional

Then click next

New virtual machine - Ajax_Private_Cloud_Windows_Server (ESXi 6.5 virtual machine)

1 Select creation type

2 Select a name and guest OS

3 Select storage

4 Customize settings

5 Ready to complete

Select a name and guest OS

Specify a unique name and OS

Name

Ajax_Private_Cloud_Windows_Server

Virtual machine names can contain up to 80 characters and they must be unique within each ESXi instance.

Identifying the guest operating system here allows the wizard to provide the appropriate defaults for the operating system installation.

Compatibility

ESXi 6.5 virtual machine

Guest OS family

Select Guest OS Family

Guest OS version

Select Guest OS Version

Back Next Finish Cancel

Step 4:

Select the datastore for the VM and select next

New virtual machine - Book_Icons_Windows_AD_Server (ESXi 6.5 virtual machine)

1 Select creation type

2 Select a name and guest OS

3 Select storage

4 Customize settings

5 Ready to complete

Select storage

Select the storage type and datastore

Standard Persistent Memory

Select a datastore for the virtual machine's configuration files and all of its' virtual disks.

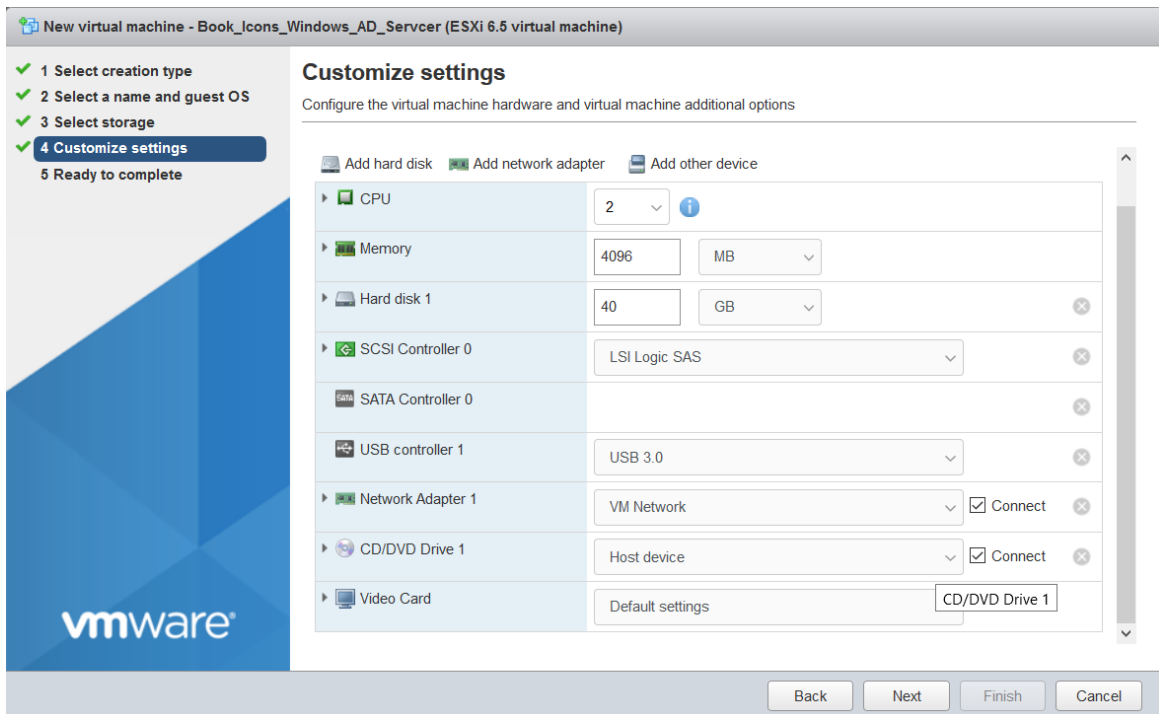
Name	Capacity	Free	Type	Thin pro...	Access
datastore1	923 GB	512.68 GB	VMFS5	Supported	Single

1 items

Back Next Finish Cancel

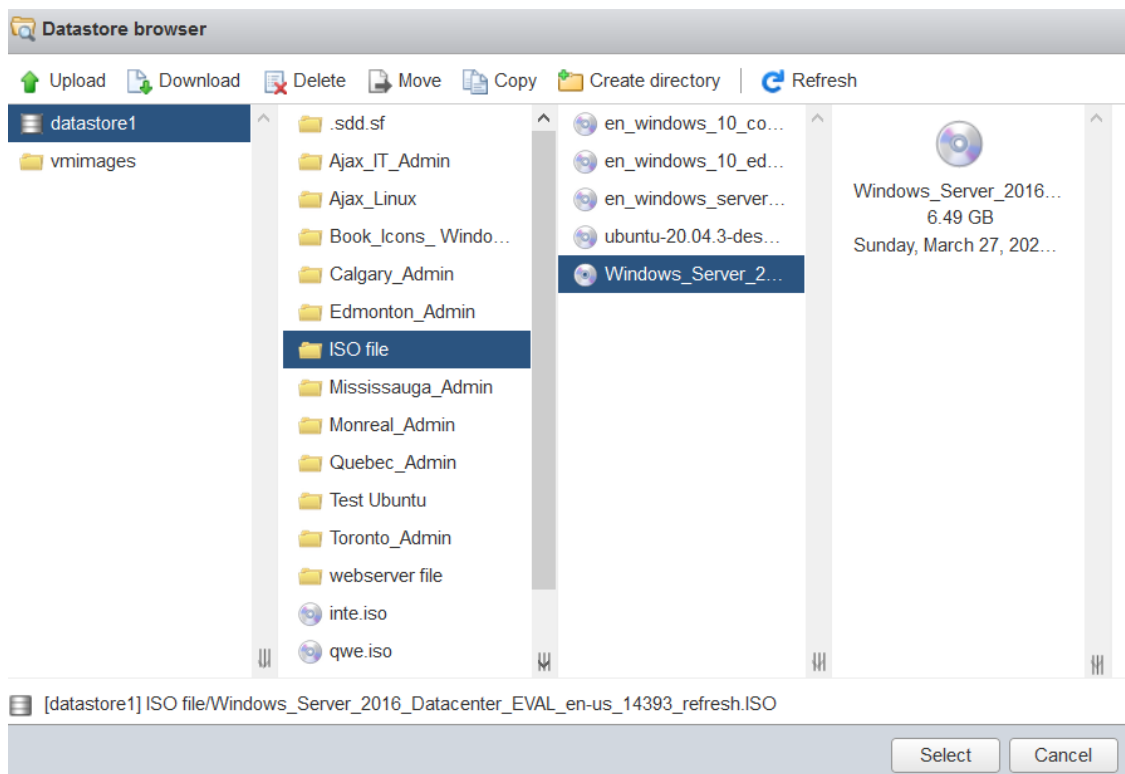
Step 5:

Customize the machine by providing the resources that the machine will use. Then select CD/DVD Drive 1 to select the OS for the system to run on.



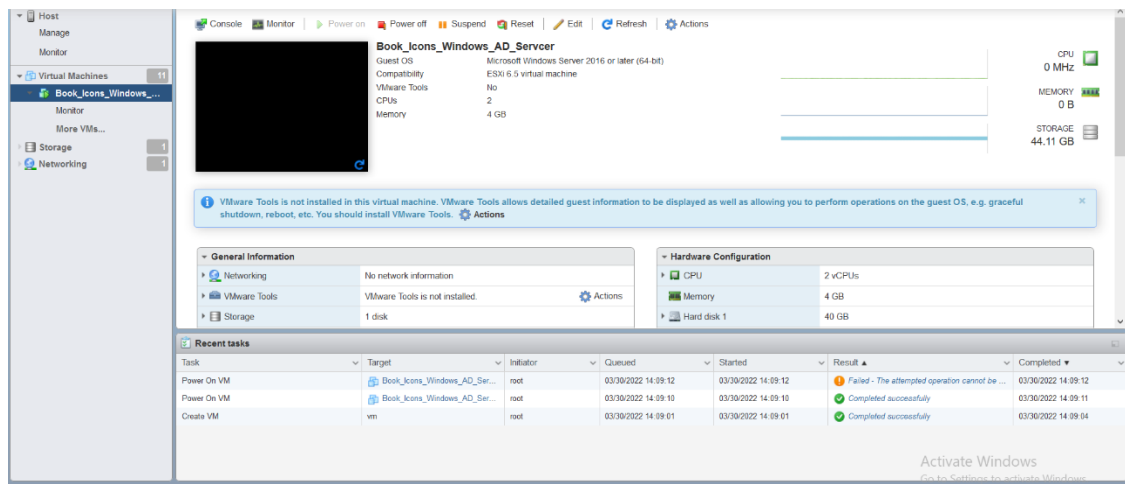
Step 6:

Search for the location of your ISO file, if not already uploaded to your datastore, select the upload button, and upload the file from an external source, and then select finish in the customization window.



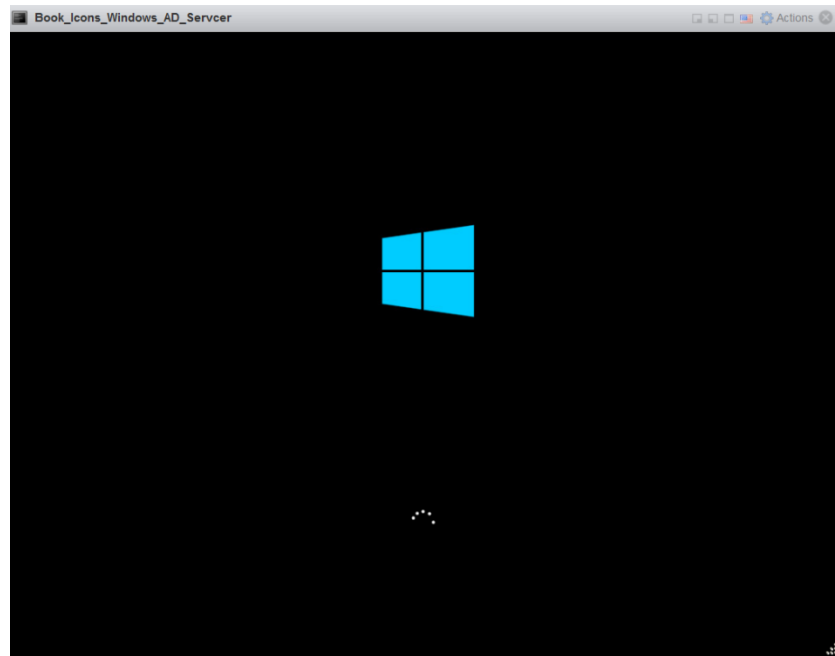
Step 7:

Power on the machine from the ESXi interface

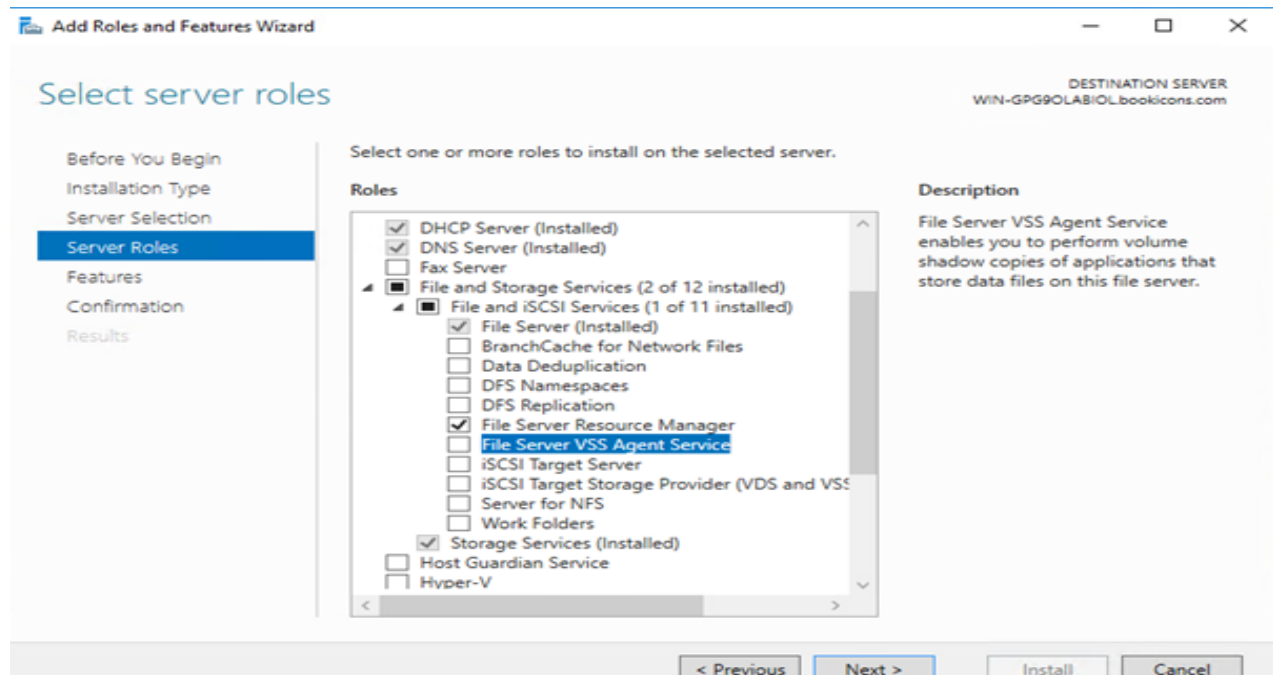


Step 8:

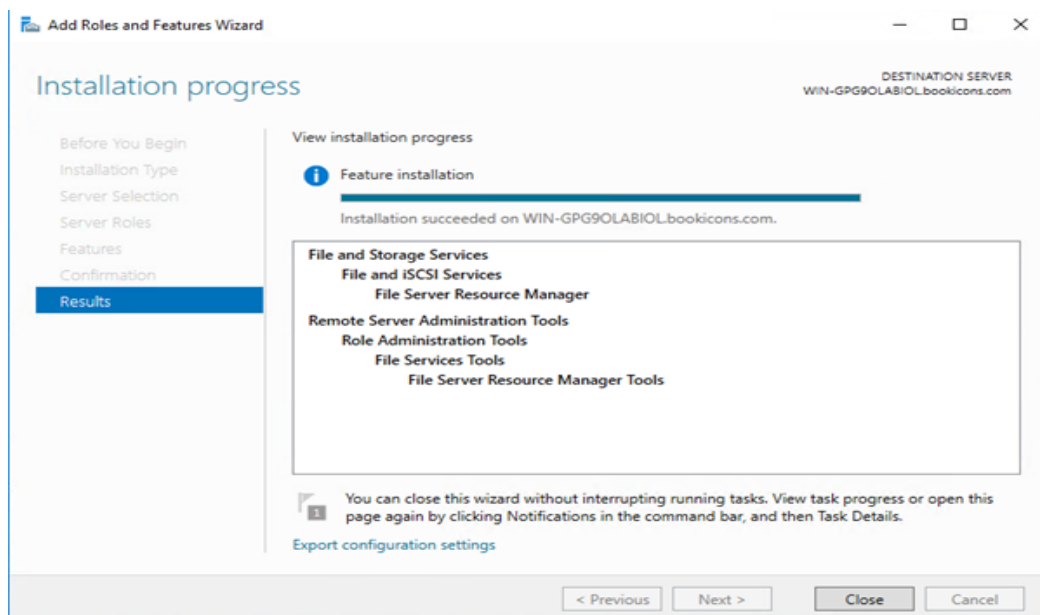
Complete the installation of the Windows Server



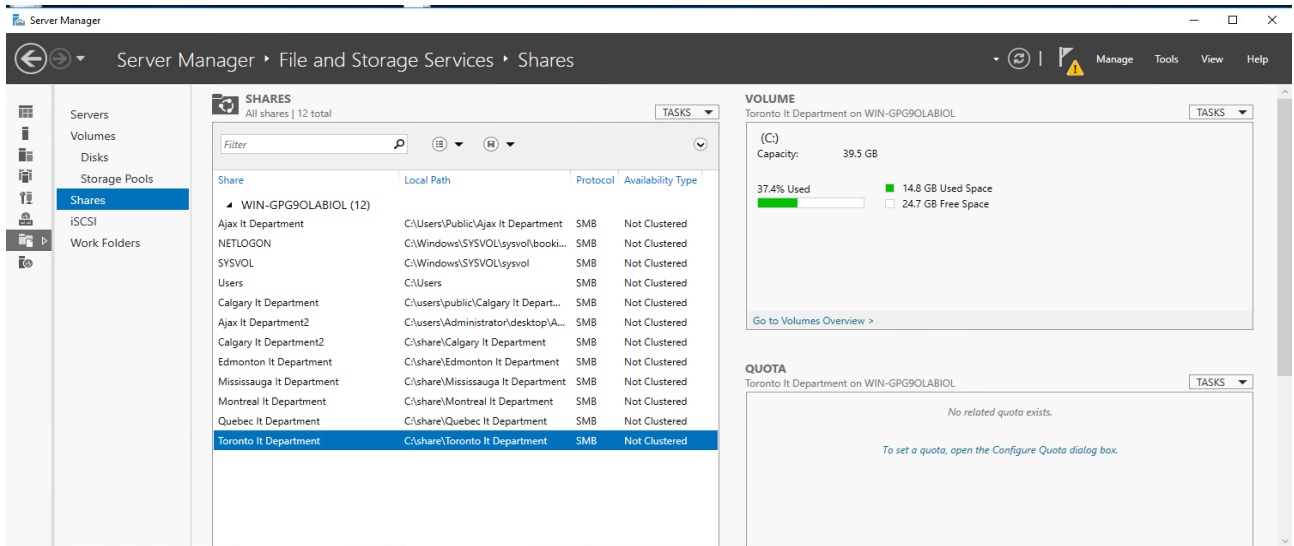
Shared Storage



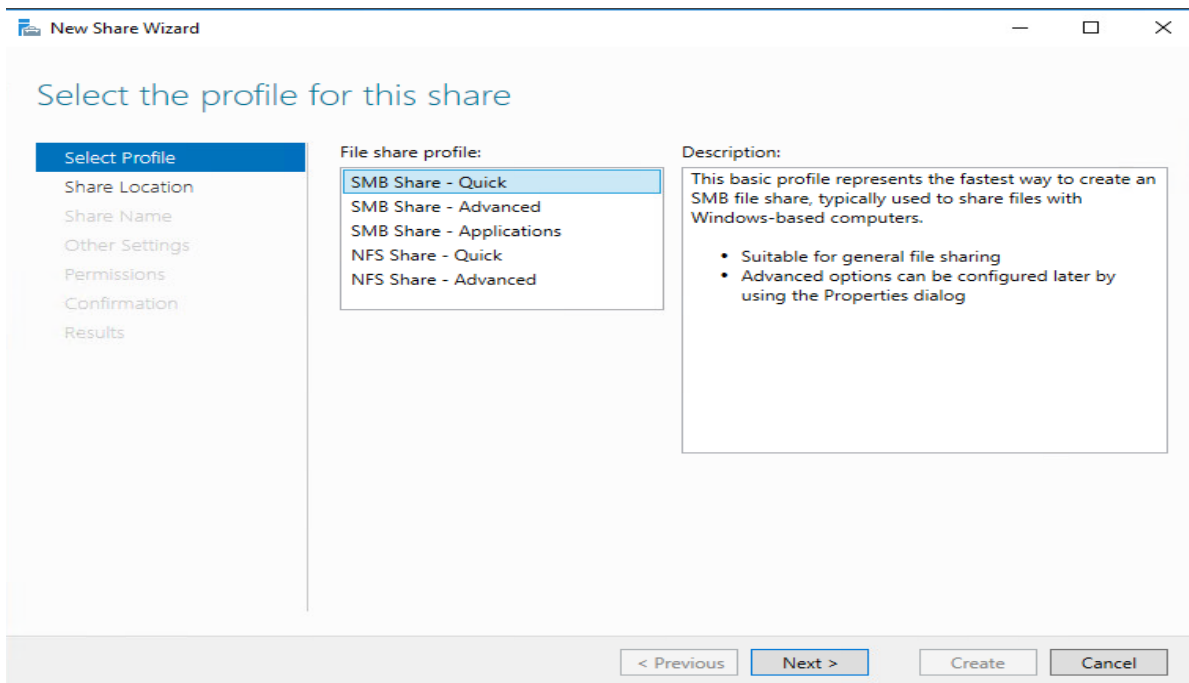
Step1: Add Roles and Features Wizard, check the File and Storage Services and file and iscsi inside check the file server Resource Manager



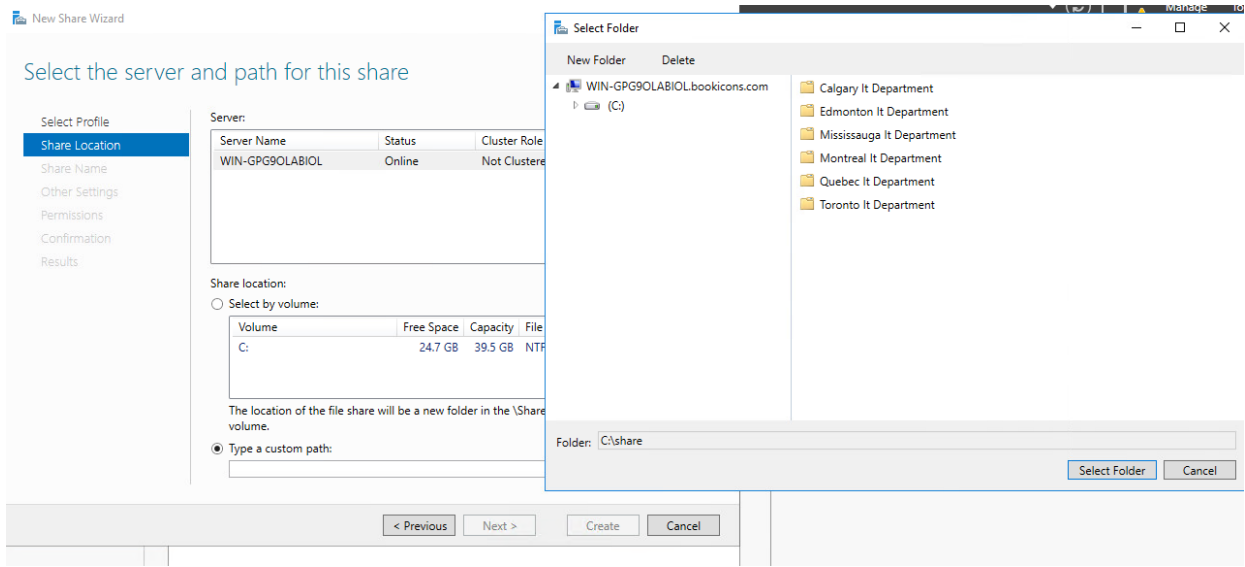
Step2: Next and install.



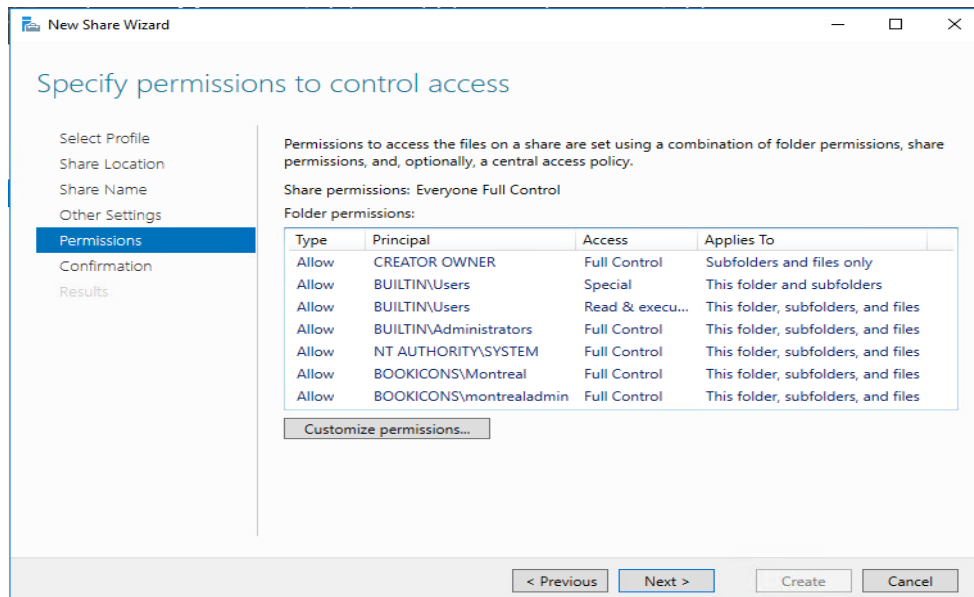
Step3: On Server Manager, go file and Storage Services, and click the Share.



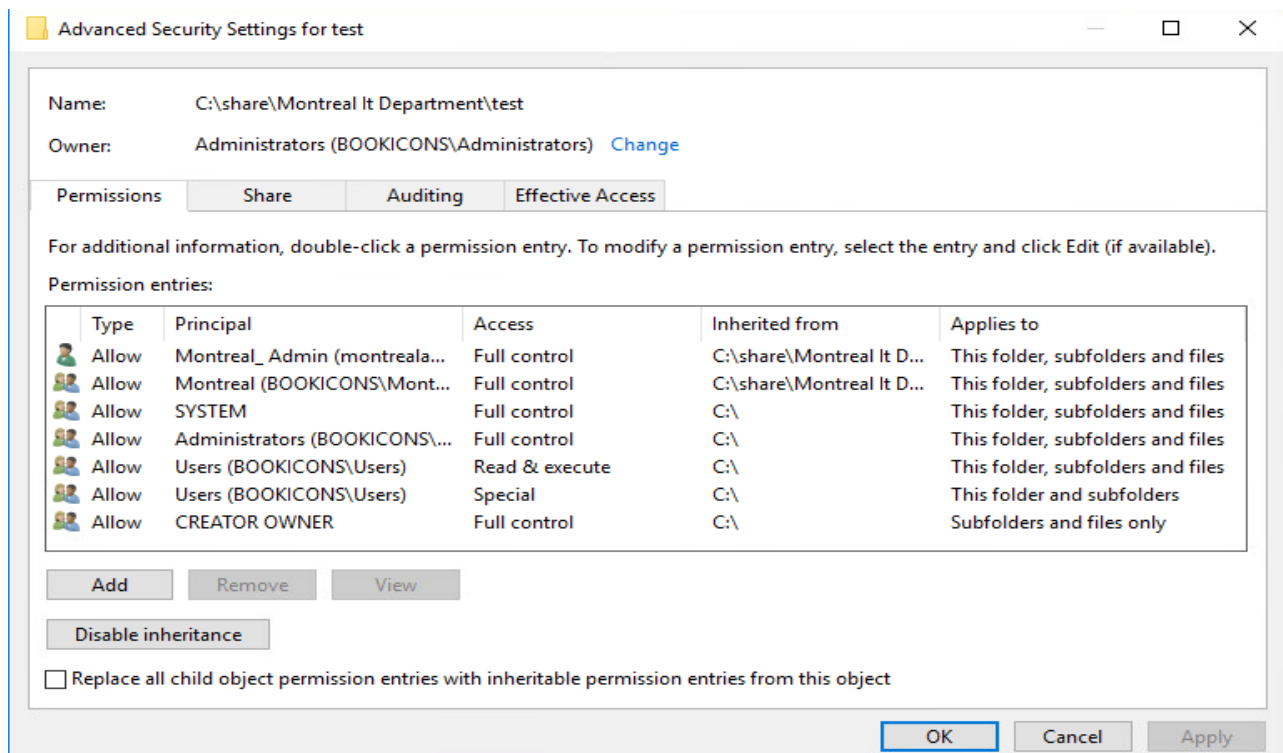
Step4: Right Click and press new share and click the next.



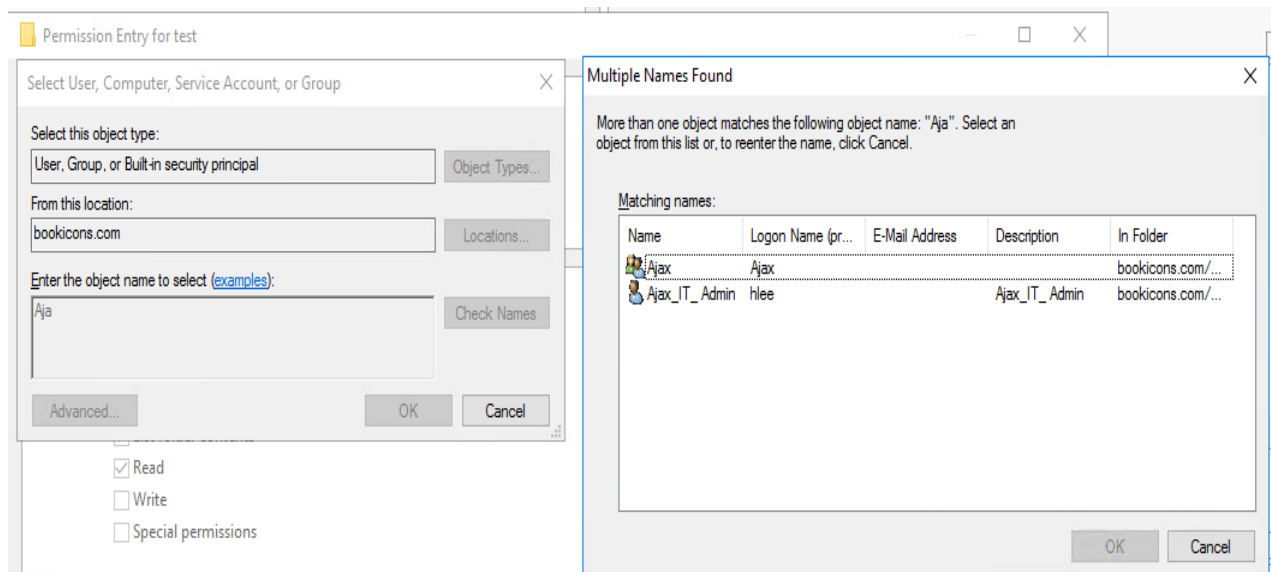
Step5: Click the Type a custom path and navigate the create folder



Step6: press next and next, on the permissions, press customize permissions button.

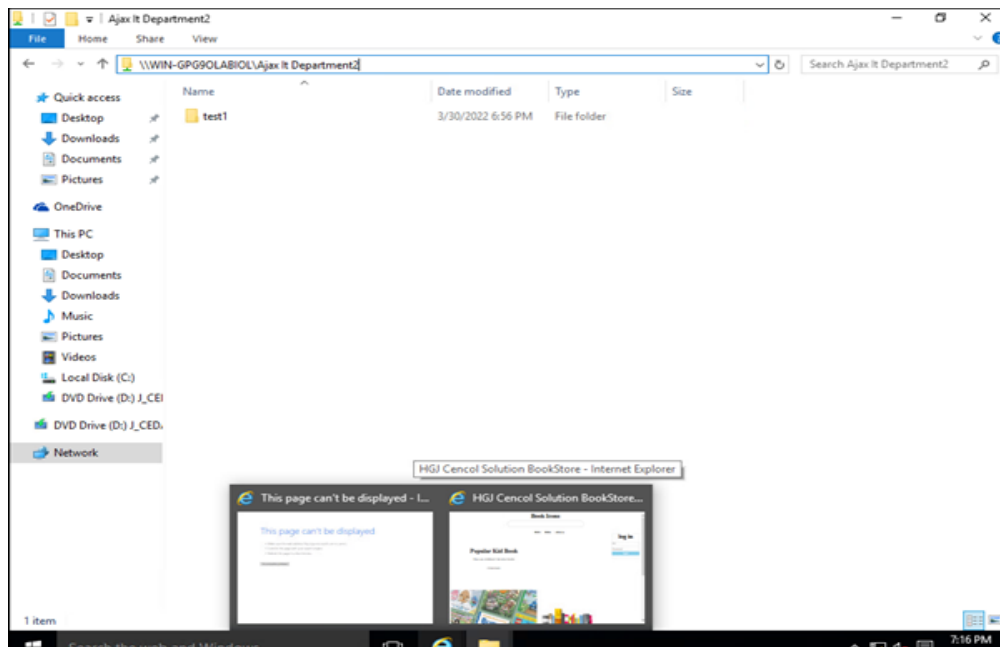


Step7: press Add and press select a principal.

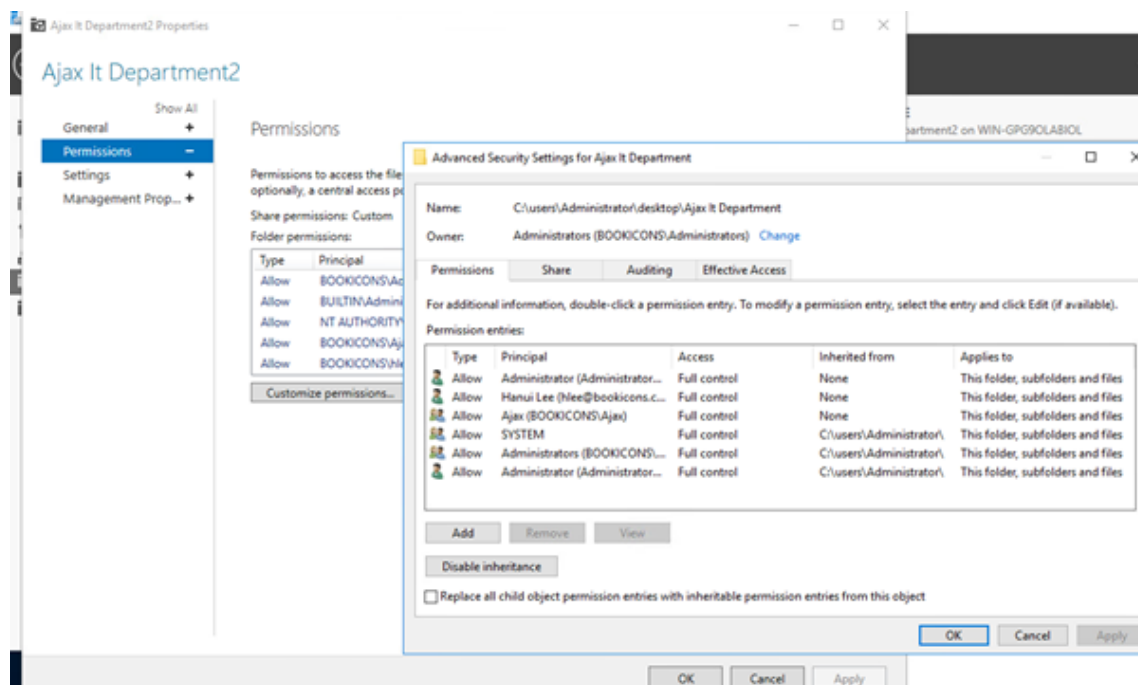


Step7: In the Enter the object name to select box, type the User or Group name

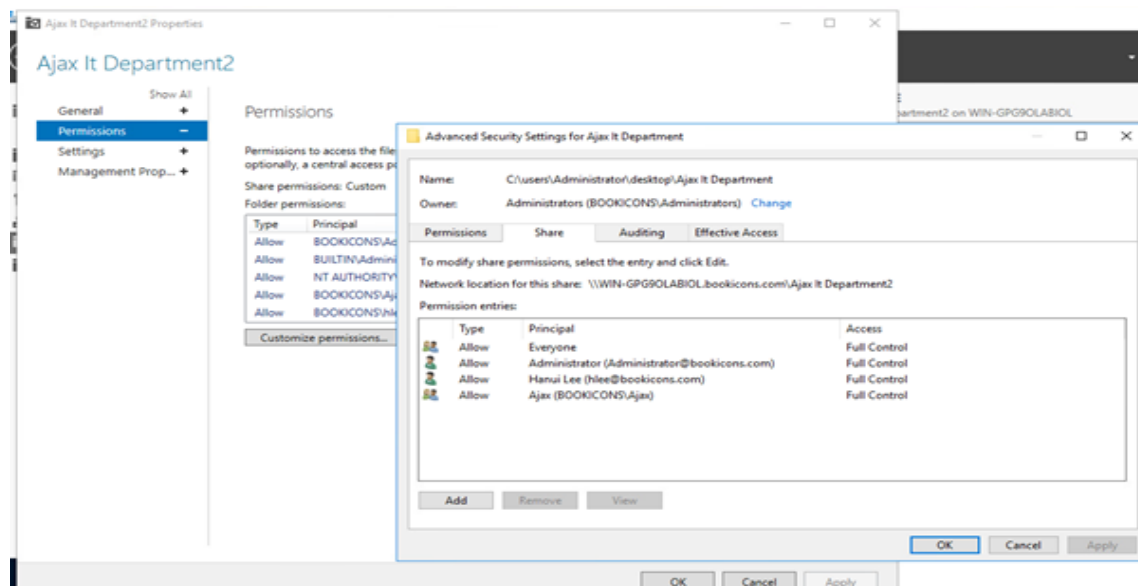
And give permission, and as same way, give share permission on share tab. After do



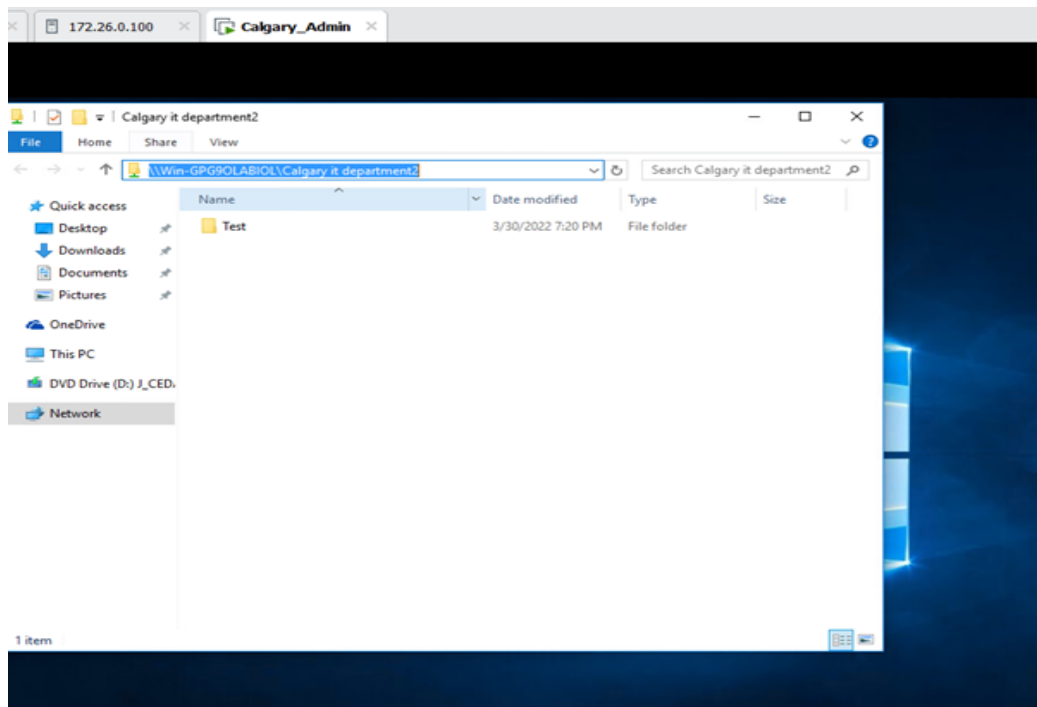
Result: Toronto_Admin Desktop access the share folder



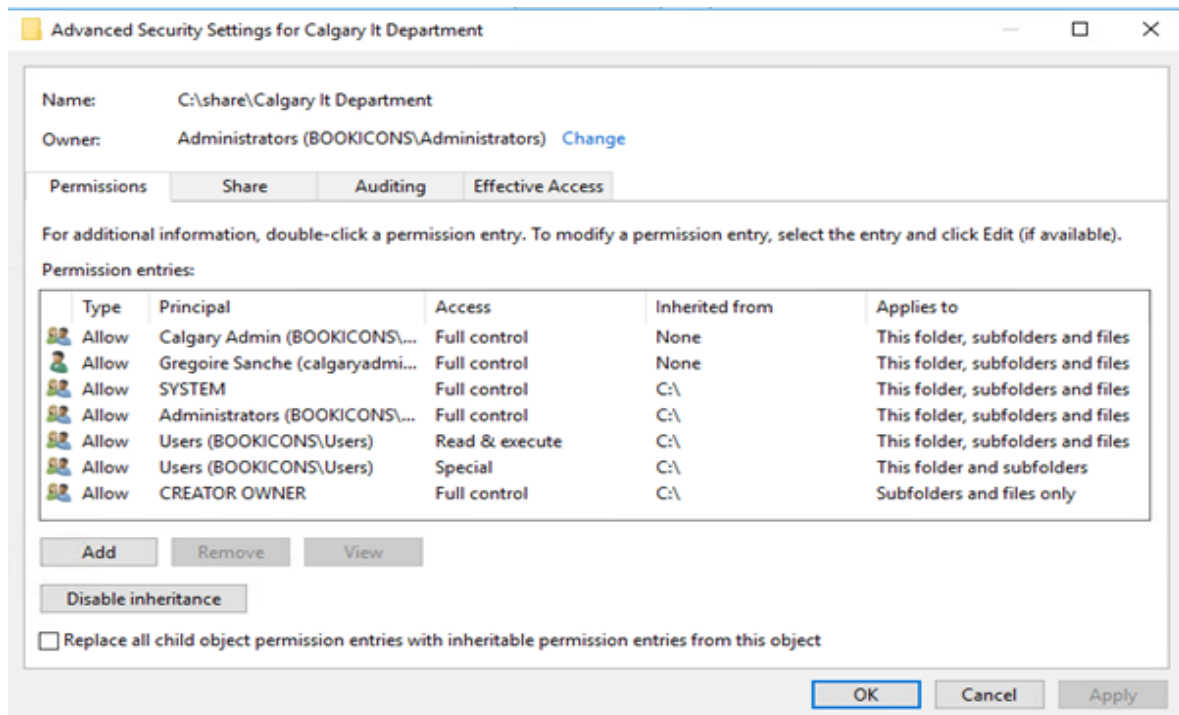
Result: Aax it department 2 setting of permission



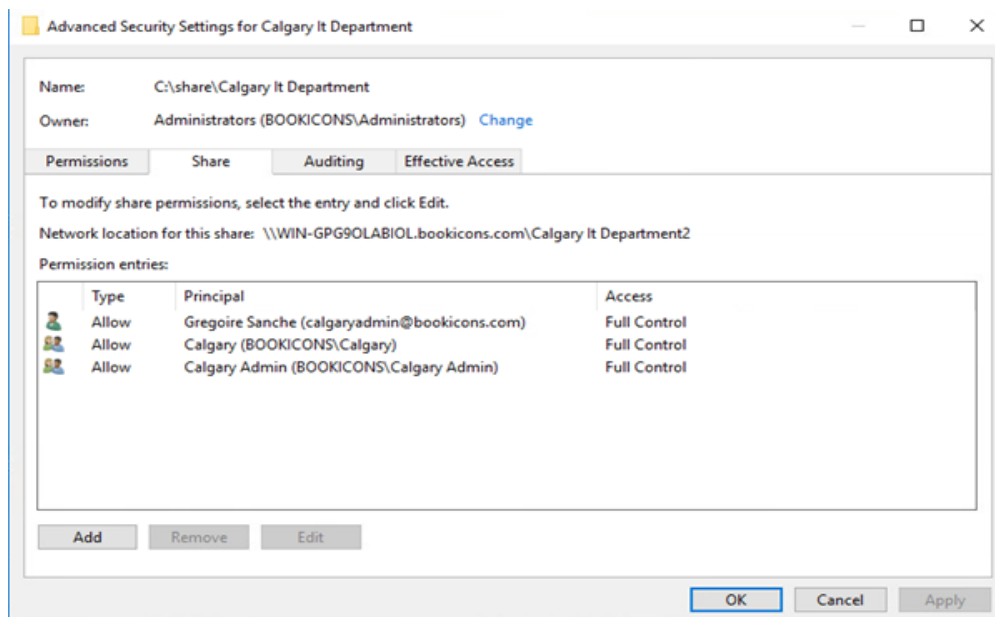
Result: Aax it department 2 setting of Share



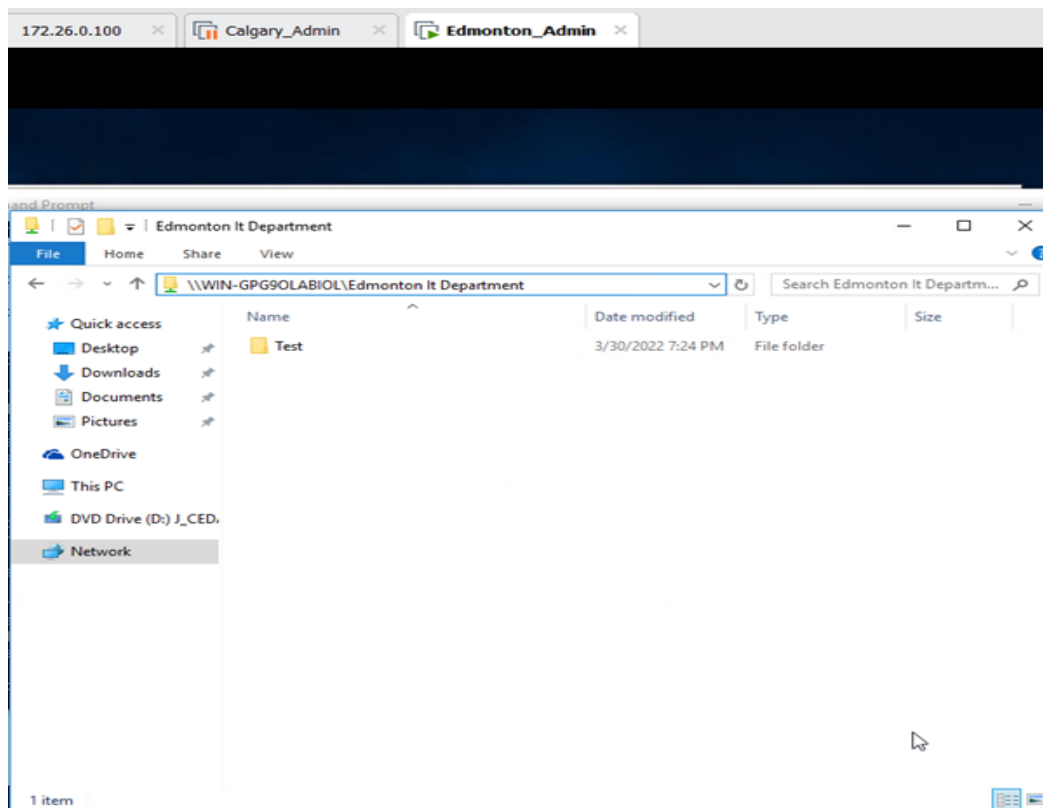
Result: Calgary_Admin Desktop access the share folder



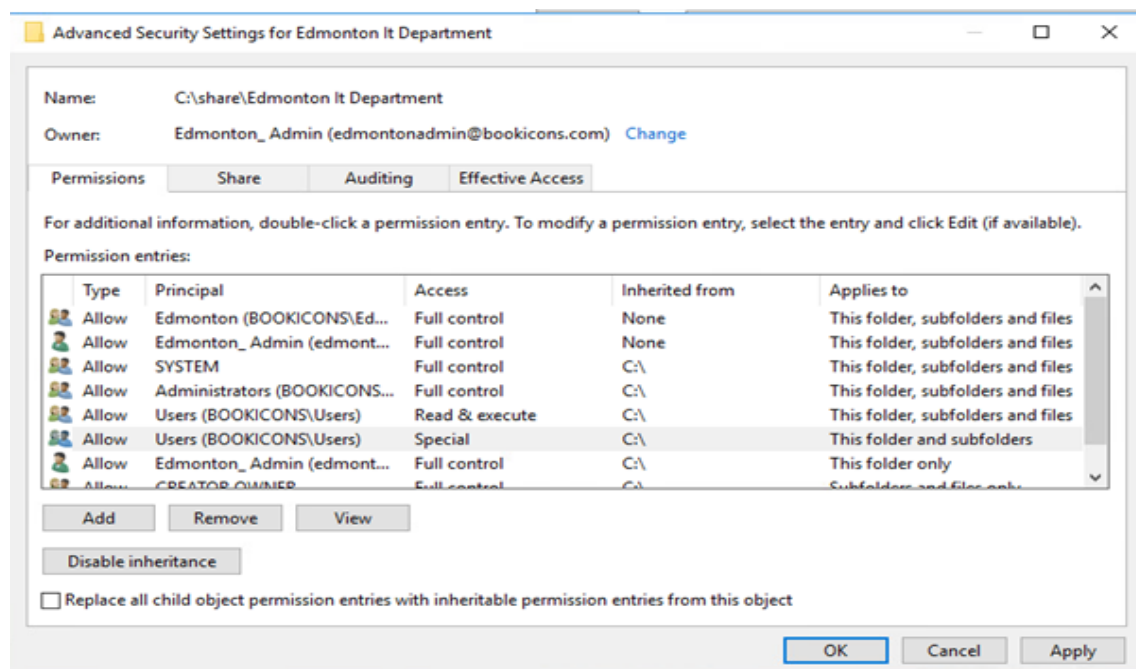
Result: Calgary it department 2 setting of permission



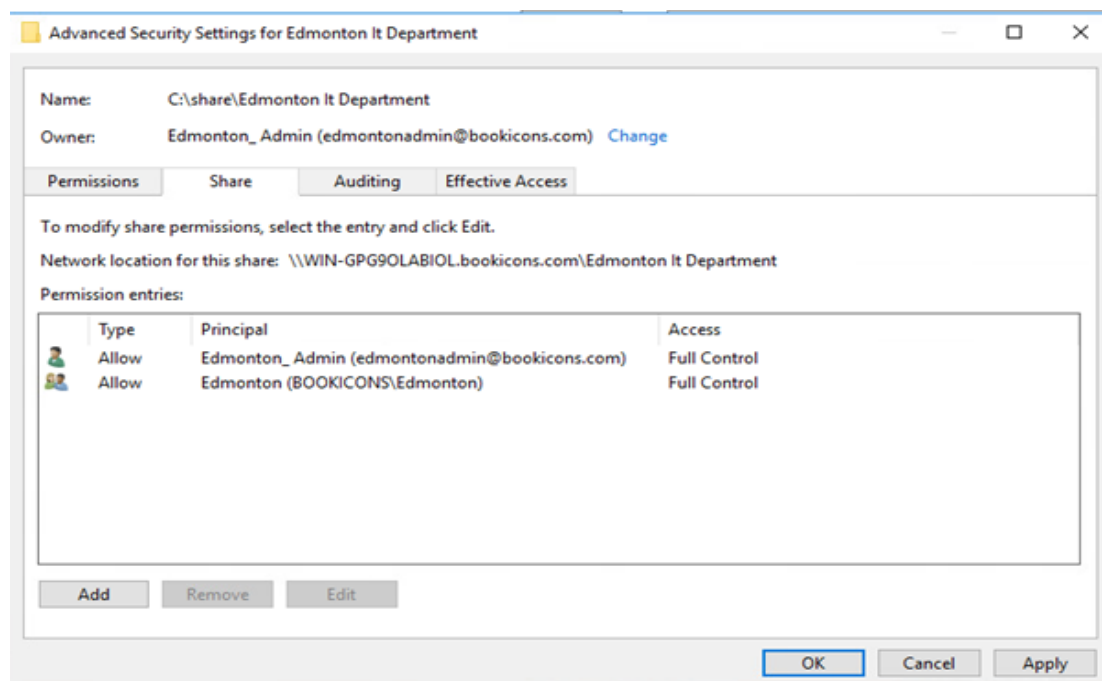
Result: Calgary it department 2 setting of Share



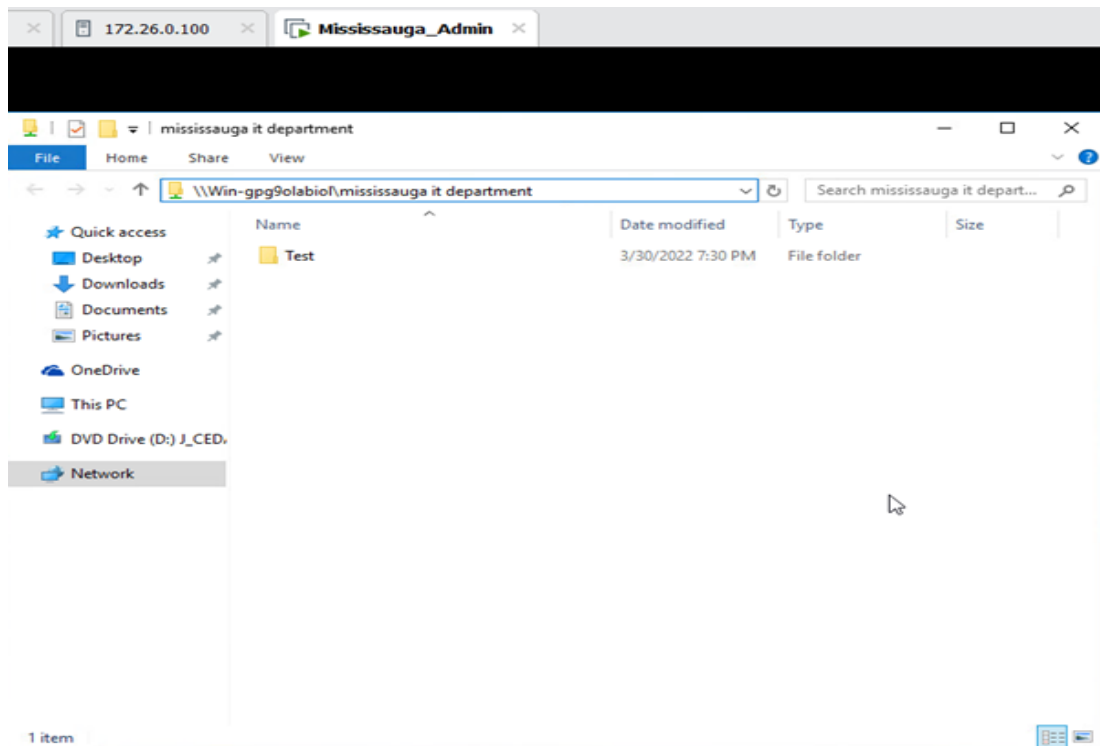
Result: Edmonton_Admin Desktop access the share folder



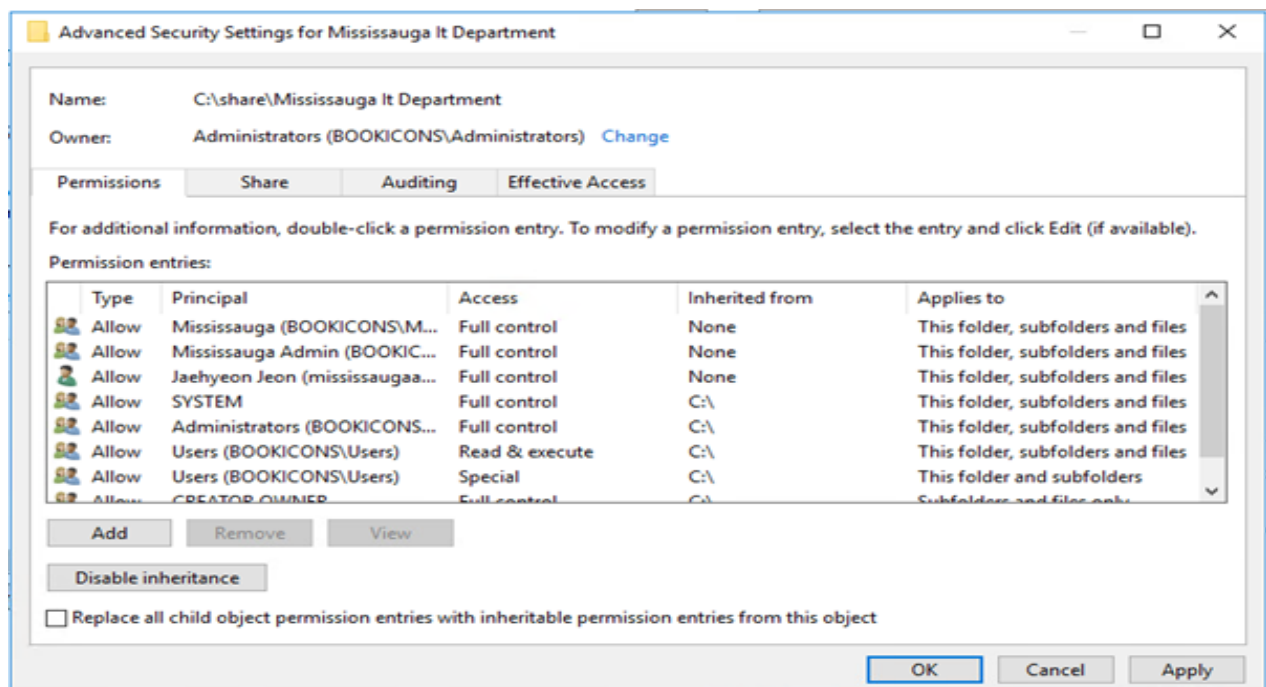
Result: Edmonton IT department 2 setting of permission.



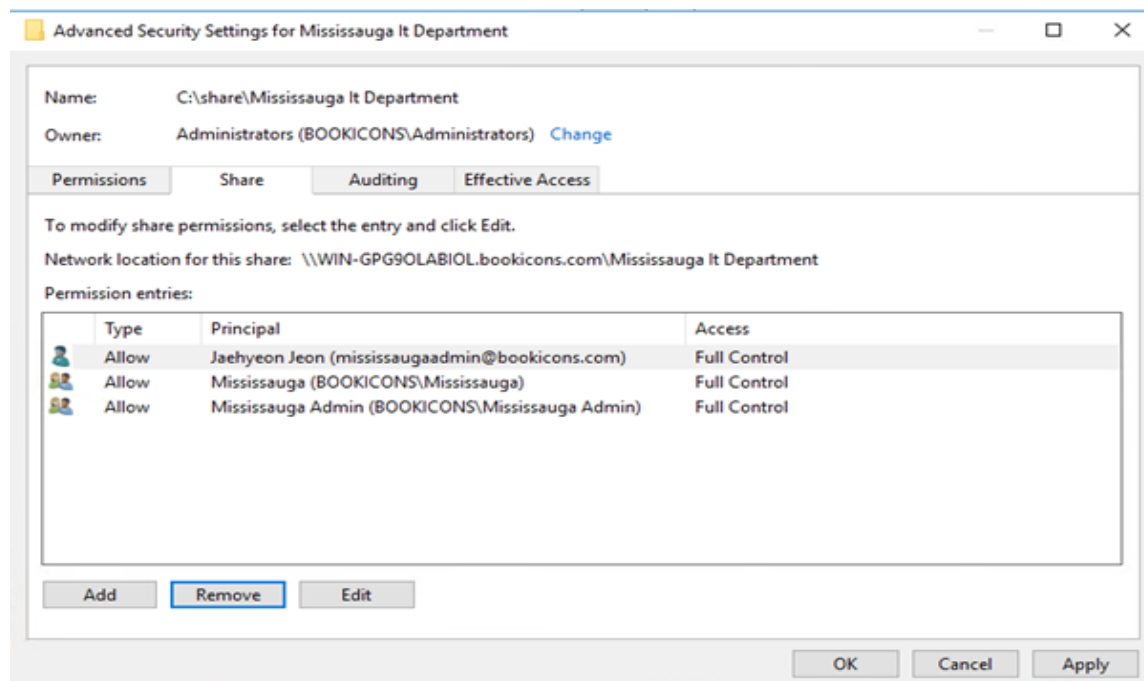
Result: Edmonton it department 2 setting of Share



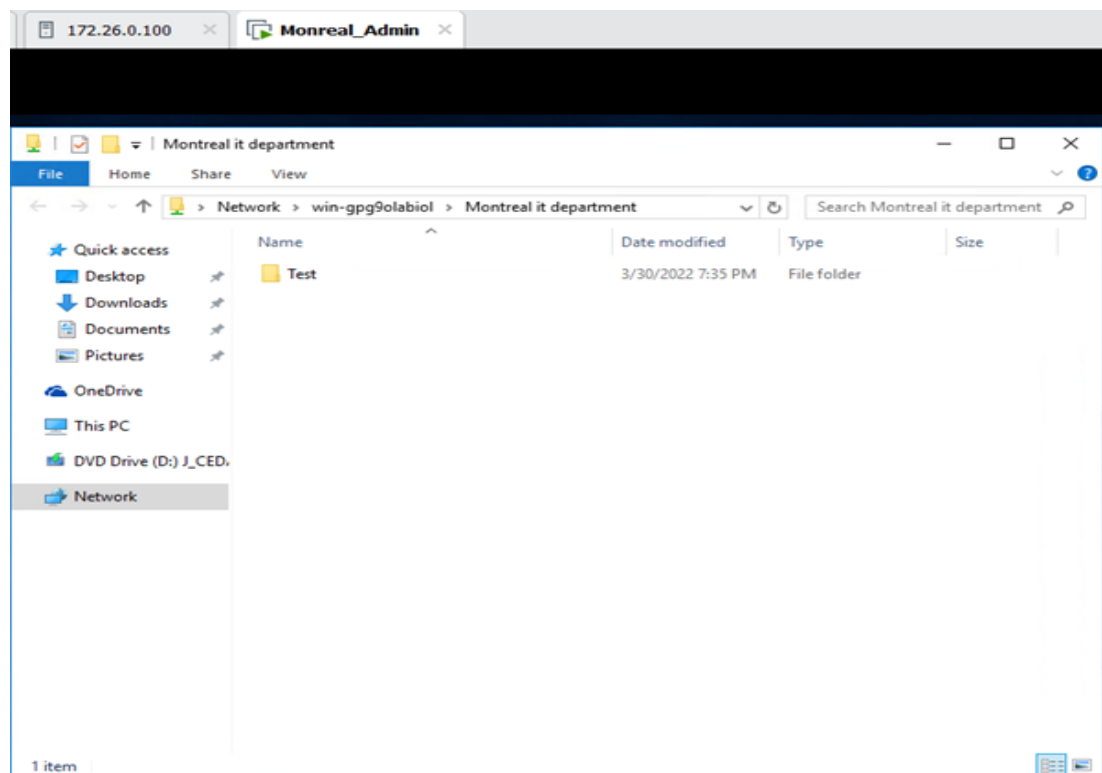
Result: Mississauga_Admin Desktop access the share folder



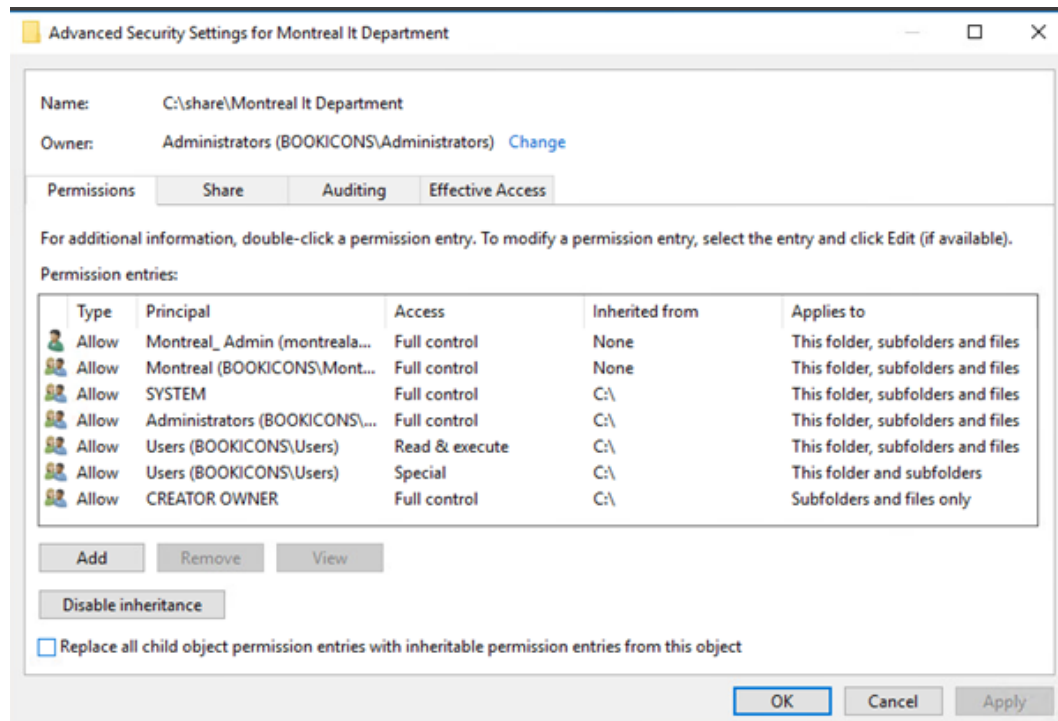
Result: Mississauga it department 2 setting of Permission



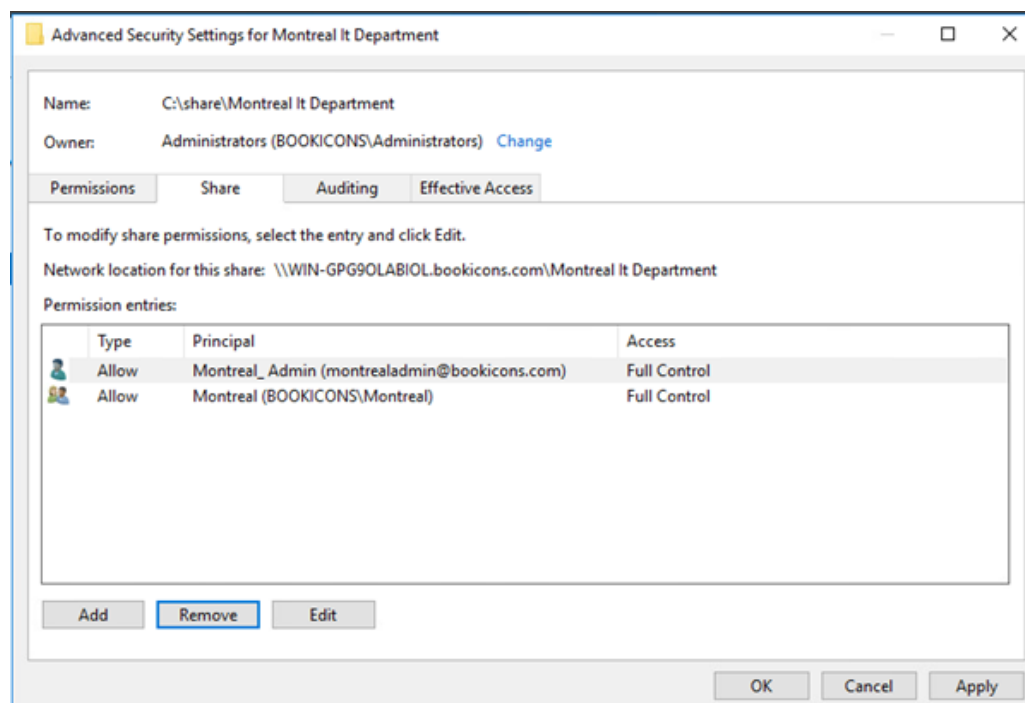
Result: Mississauga it department 2 setting of Share



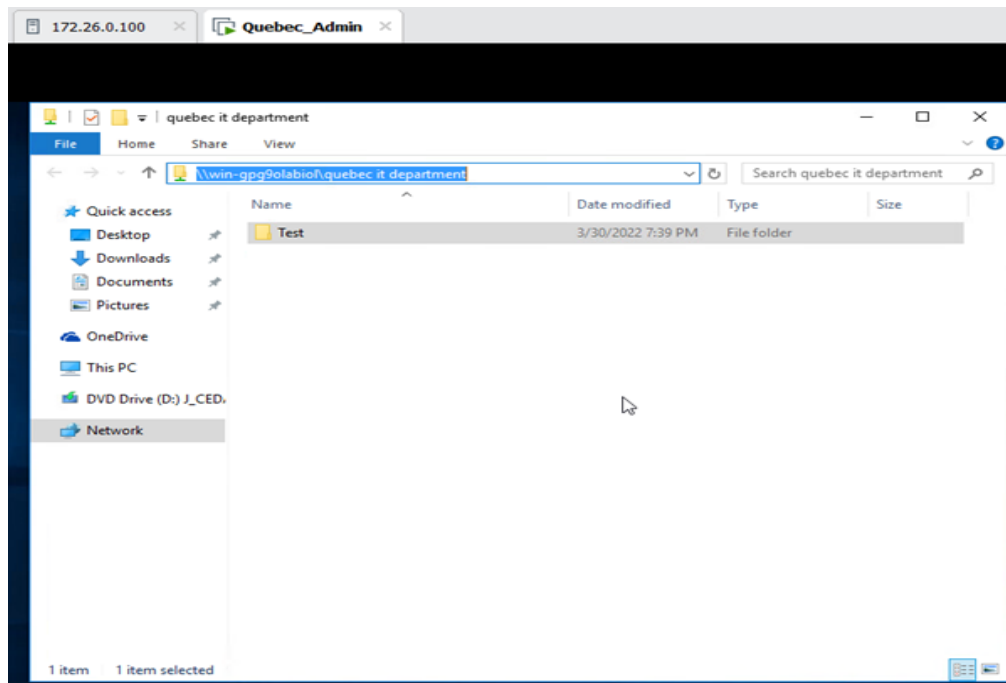
Result: Montreal_Admin Desktop access the share folder



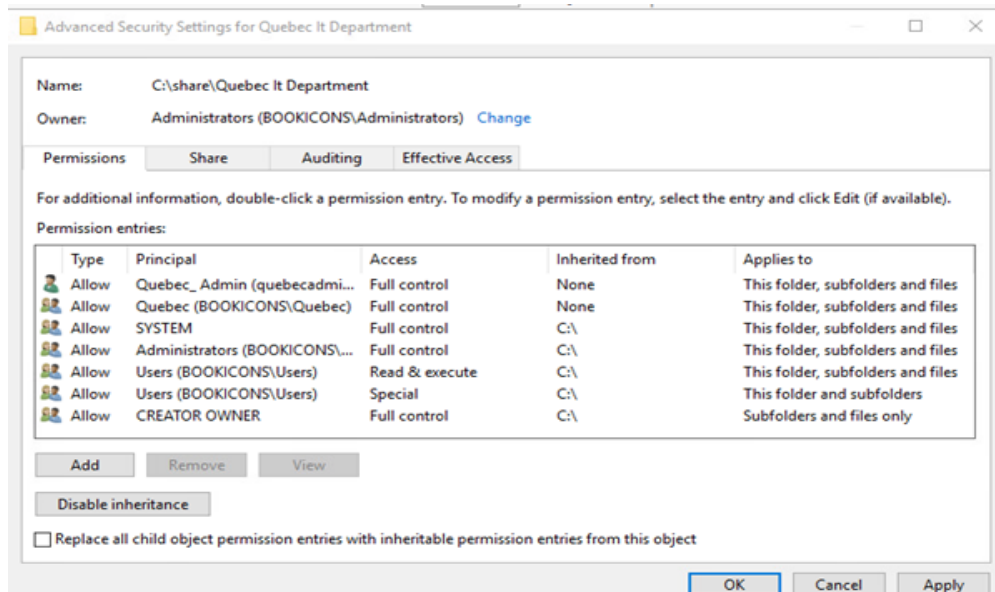
Result: Montreal it department 2 setting of Permission



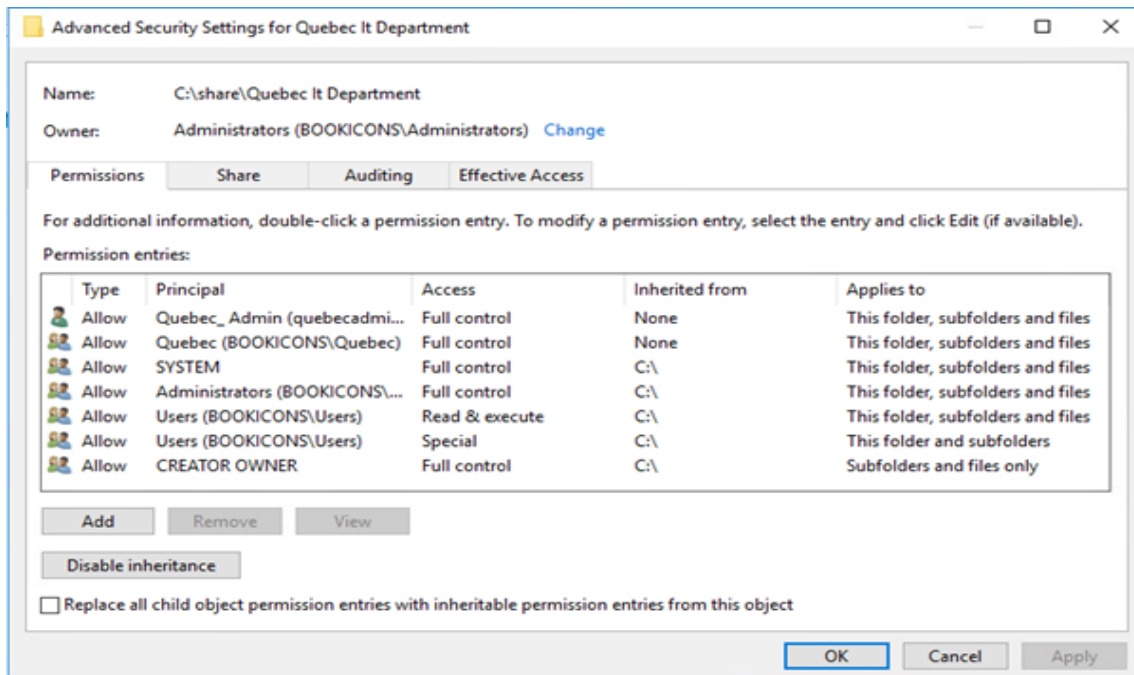
Result: Montreal it department 2 setting of Share



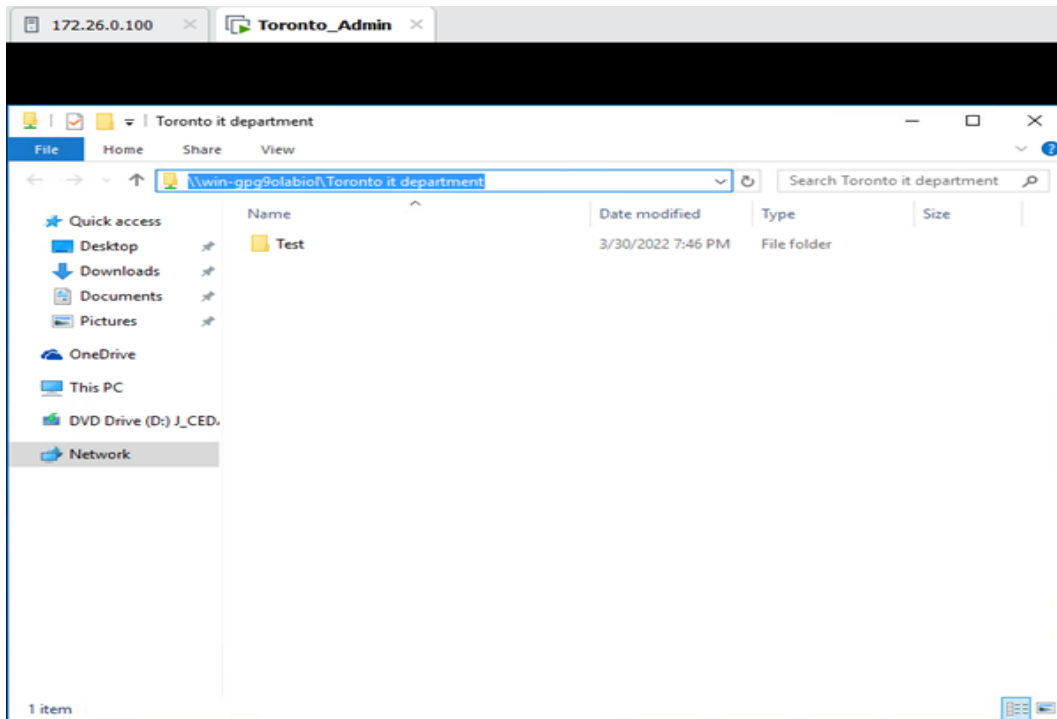
Result: Quebec_Admin Desktop access the share folder



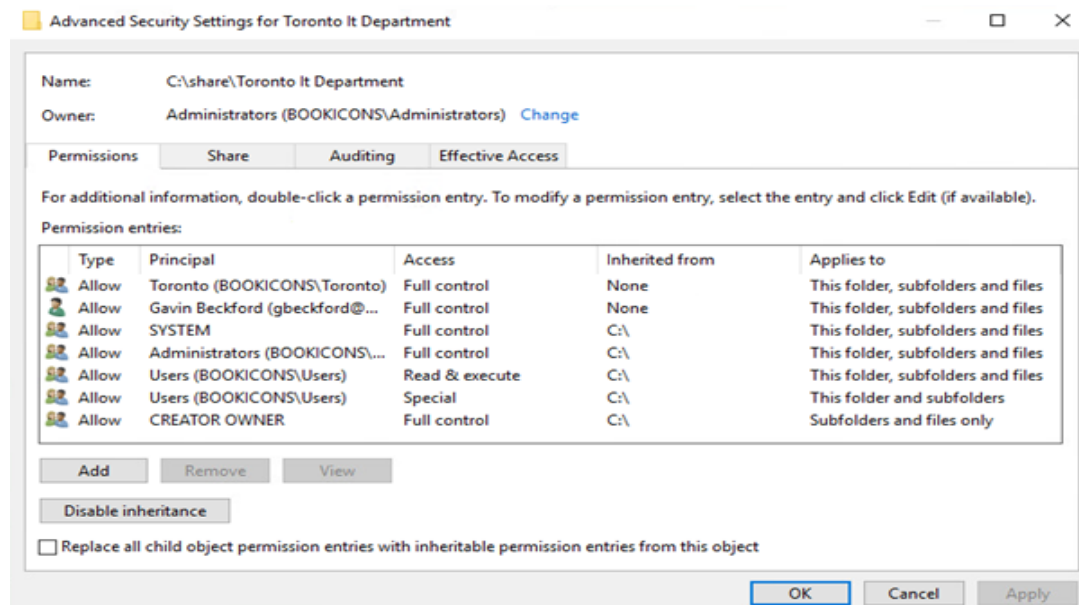
Result: Quebec it department 2 setting of Permission



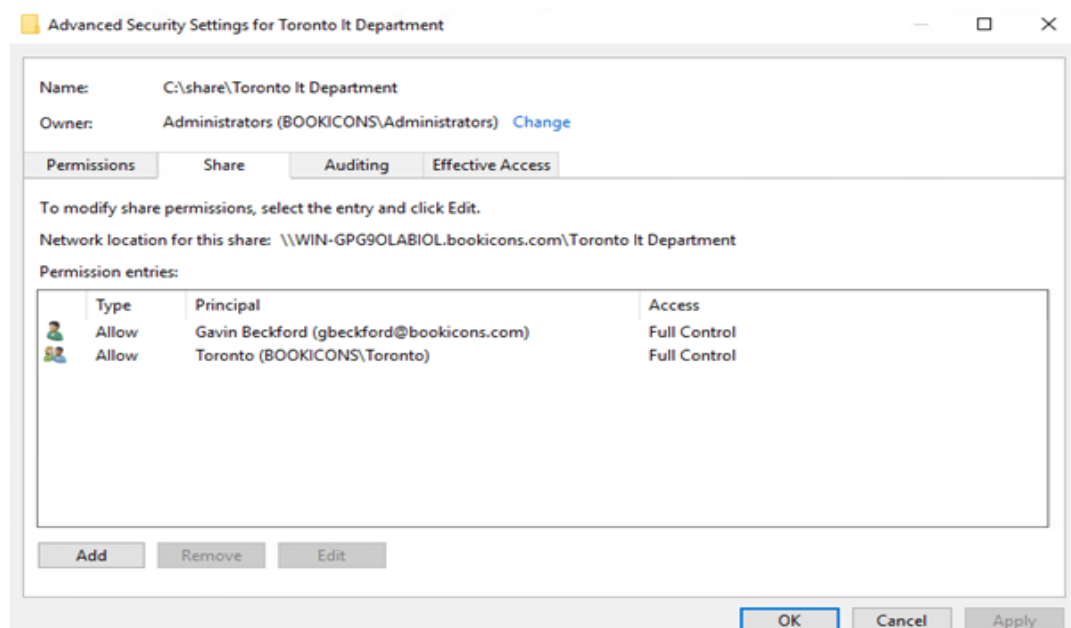
Result: Quebec it department 2 setting of Share



Result: Toronto_Admin Desktop access the share folder



Result: Toronto it department 2 setting of Permission



Result: Toronto it department 2 setting of Share

VoIP

A PBX IP phone system was configured and implemented using the Cisco VOIP services (Configured on the Cisco 2811 series router – Demonstration Purposes). This was done to satisfy the requirement for telephony services between sites. The system was configured to scale to a quantity of 50 devices at the remote sites based on operations and staffing and 1000 at the HQ.

The configuration for the VOIP service is shown below:

```
hostname PBX_Server

int f0/0
ip address 10.42.0.6 255.255.255.252
ip helper-address 10.42.0.6
no shut
exit

ip dhcp excluded-address 10.42.13.1 10.42.13.10

ip dhcp pool Voice
network 10.42.13.0 255.255.255.0
default-router 10.42.0.6
option 150 ip 10.42.0.6
exit

telephony-service
max-dn 50
max-ephones 40
ip source-address 10.42.0.6 port 2000
create cnf-files
auto assign 1 to 10
auto-reg-ephone

ephone-dn 1
number 3001
exit

ephone-dn 2
number 3002
exit

ephone-dn 3
number 3003
exit

ephone-dn 4
number 3004
exit

ephone-dn 5
number 3005
exit

ephone-dn 6
number 3006
exit

ephone 7
type 7960
button 1:7
exit

ephone 8
type 7960
button 1:8
exit

ephone 9
type 7960
button 1:9
exit

ephone 10
type 7960
button 1:10
exit

router ospf 2
router-id 1.1.1.2
network 10.42.13.0 0.0.0.255 area 2
exit

dial-peer voice 100 voip
session target ipv4:10.42.0.6
destination-pattern 31..

dial-peer voice 200 voip
session target ipv4:10.42.0.9
destination-pattern 32..

dial-peer voice 300 voip
session target ipv4:10.42.0.18
destination-pattern 33..

dial-peer voice 400 voip
session target ipv4:10.42.0.22
destination-pattern 34..

dial-peer voice 500 voip
session target ipv4:10.42.0.26
destination-pattern 35..

dial-peer voice 600 voip
session target ipv4:10.42.0.30
destination-pattern 36..
```

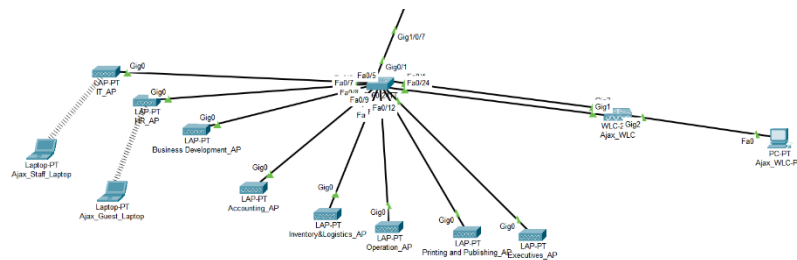


WLAN

*All attached screenshots for WLAN configuration steps are Ajax Site's WLAN configurations.

Step 1: Connect SW3(in WLAN cluster) to CoreSwitch

SW3(g0/1) -Ajax Core Switch (g1/0/7) /Other sites Core Switch(g1/0/4)



Step 2: Configure DHCP pool on Core Switch and VLAN on Core Switch and VLAN

```
ip dhcp excluded-address 10.42.1.1 10.42.1.10
ip dhcp excluded-address 10.42.2.1 10.42.2.10
ip dhcp excluded-address 10.42.3.1 10.42.3.10
ip dhcp excluded-address 10.42.4.1 10.42.4.10
ip dhcp excluded-address 10.42.5.1 10.42.5.10
ip dhcp excluded-address 10.42.6.1 10.42.6.10
ip dhcp excluded-address 10.42.7.1 10.42.7.10
ip dhcp excluded-address 10.42.8.1 10.42.8.10
ip dhcp excluded-address 10.42.10.1 10.42.10.10
ip dhcp excluded-address 10.42.12.1 10.42.12.10
!
ip dhcp pool Ajax_IT
network 10.42.1.0 255.255.255.0
default-router 192.168.42.5
dns-server 172.18.42.65
ip dhcp pool Ajax_HR
network 10.42.2.0 255.255.255.0
default-router 192.168.42.5
dns-server 172.18.42.65
ip dhcp pool Ajax_Accounting
network 10.42.3.0 255.255.255.0
default-router 192.168.42.5
dns-server 172.18.42.65
ip dhcp pool Ajax_Inventory_Logistics
network 10.42.4.0 255.255.255.0
default-router 192.168.42.5
dns-server 172.18.42.65
ip dhcp pool Ajax_Operations
network 10.42.5.0 255.255.255.0
default-router 192.168.42.5
dns-server 172.18.42.65
ip dhcp pool Ajax_Printing_Publishing
network 10.42.6.0 255.255.255.0
default-router 192.168.42.5
dns-server 172.18.42.65
ip dhcp pool Ajax_Executive
network 10.42.7.0 255.255.255.0
default-router 192.168.42.5
dns-server 172.18.42.65
ip dhcp pool Ajax_WLAN_Staff
network 10.42.10.0 255.255.254.0
default-router 192.168.42.5
dns-server 172.18.42.65
ip dhcp pool Ajax_WLAN_Guest
network 10.42.12.0 255.255.255.0
default-router 192.168.42.5
dns-server 172.18.42.65

interface Vlan101
description IT_Dept
mac-address 00e0.a3de.b901
ip address 10.42.1.1 255.255.255.0
!
interface Vlan102
description Voice
mac-address 00e0.a3de.b902
ip address 10.42.13.2 255.255.255.0
!
interface Vlan201
description HR_Dept
mac-address 00e0.a3de.b903
ip address 10.42.2.1 255.255.255.0
!
interface Vlan301
description Busi_Dept
mac-address 00e0.a3de.b904
ip address 10.42.3.1 255.255.255.0
!
interface Vlan302
description Accounting_Dept
mac-address 00e0.a3de.b905
ip address 10.42.4.1 255.255.255.0
!
interface Vlan303
description Inv_Log_Dept
mac-address 00e0.a3de.b906
ip address 10.42.5.1 255.255.255.0
!
interface Vlan304
description Operations_Dept
mac-address 00e0.a3de.b908
ip address 10.42.6.1 255.255.255.0
!
interface Vlan305
description Printing_Dept
mac-address 00e0.a3de.b909
ip address 10.42.7.1 255.255.255.0
!
interface Vlan306
description Executive_Dept
mac-address 00e0.a3de.b90a
ip address 10.42.8.1 255.255.255.0
!
interface Vlan500
description Staff_WLAN
mac-address 00e0.a3de.b90b
ip address 10.42.10.1 255.255.254.0
!
interface Vlan501
description Guest_WLAN
mac-address 00e0.a3de.b90c
ip address 10.42.12.1 255.255.255.0
!
interface Vlan502
description Executive_WLAN
mac-address 00e0.a3de.b90d
ip address 10.42.9.1 255.255.255.0
!
interface Vlan900
description Management_Vlan
mac-address 00e0.a3de.b90e
ip address 10.42.254.1 255.255.255.0
```

```
Ajax_SW3(config)#vlan 500
Ajax_SW3(config-vlan)#name Staff
Ajax_SW3(config-vlan)#vlan 501
Ajax_SW3(config-vlan)#name Guest
Ajax_SW3(config-vlan)#vlan 502
Ajax_SW3(config-vlan)#name Executives
```

Step 3: Change the mode of the CoreSwitch switchport connected to SW3 to trunk

```
interface GigabitEthernet1/0/7
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
```

Step 4: Change the mode of SW3 switchports connected to APs to trunk

```
interface FastEthernet0/5
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
!
interface FastEthernet0/6
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
!
interface FastEthernet0/7
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
!
interface FastEthernet0/8
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
!
interface FastEthernet0/9
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
!
interface FastEthernet0/10
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
!
interface FastEthernet0/11
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
!
interface FastEthernet0/12
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
```

Step 5: Change the SW3 f0/24 and g0/1 switchport mode to trunk

SW3 f0/24 (connected to WLC)

```
interface FastEthernet0/24
  switchport trunk native vlan 500
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
.
```

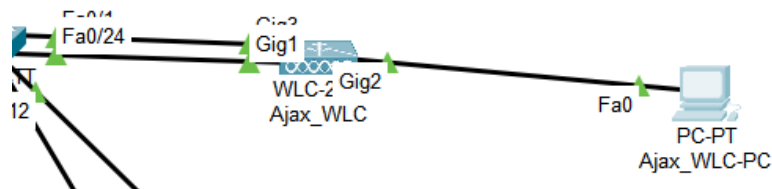
SW3 g0/1 (connected to Core Switch)

```
interface GigabitEthernet0/1
  switchport trunk allowed vlan 500-502,900
  switchport mode trunk
```

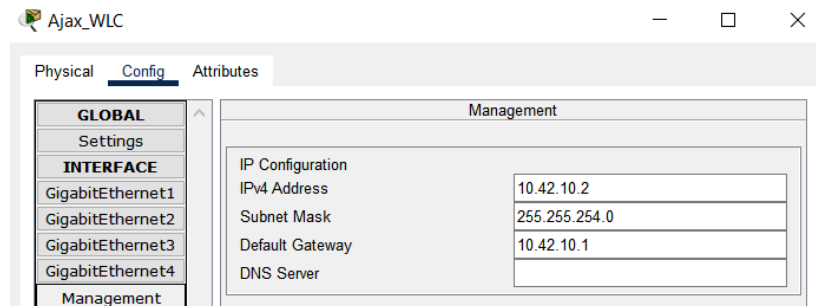
Step 6: Connect WLC to SW3 and WLC-PC

SW3(Fa0/24)-WLC(Gig1) -> VLAN500(Staff)

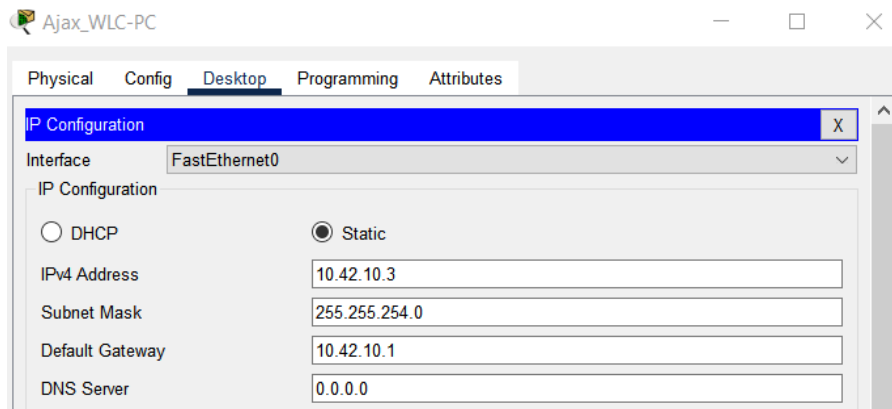
SW3(Fa0/1)-WLC(Gig3) -> VLAN501(Guest)



Step 7: Configure the IP address of WLC



Step 8: Configure the IP address of WLC-PC



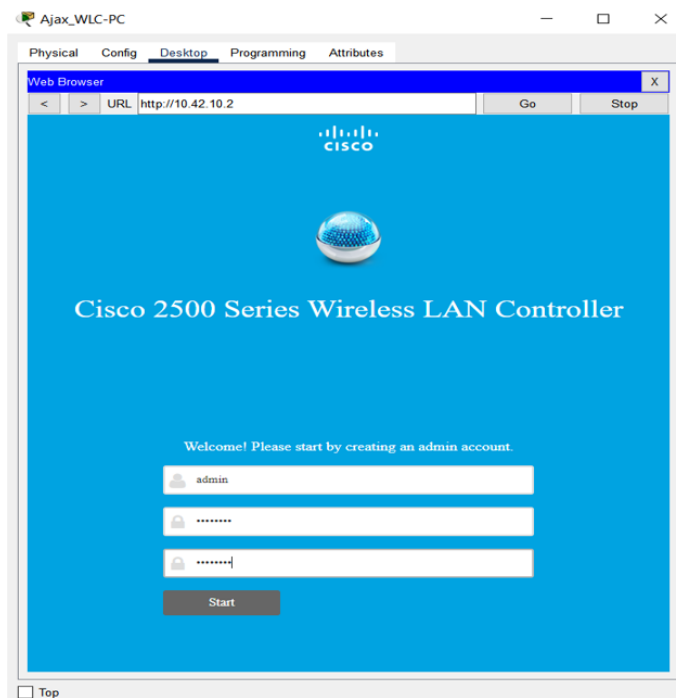
Step 9: Create an admin account

WLC-PC>Desktop>Web Browser >type WLC IP add

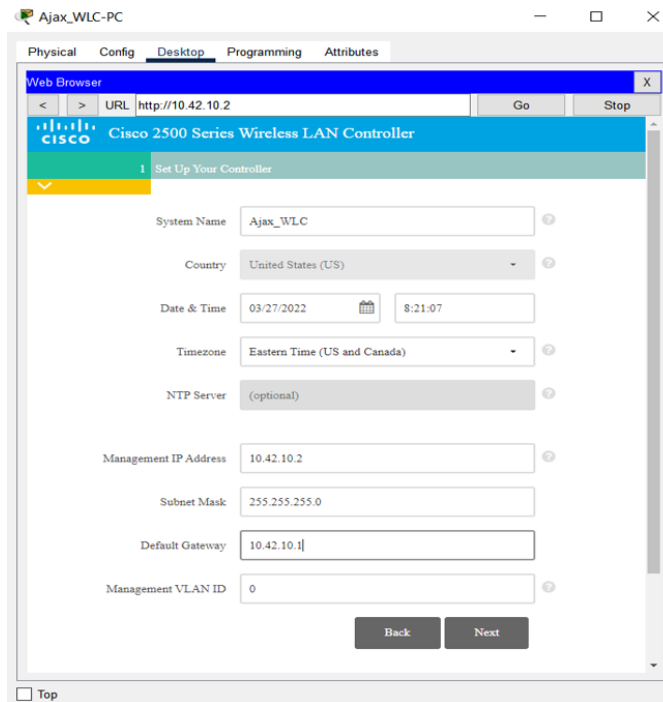
Set the Admin username: admin

Password: Pa\$\$w0rd

and then click "Start"



Step 10: Set up the Ajax Wireless Controller



The screenshot shows a web browser window titled "Ajax_WLC-PC" displaying the Cisco 2500 Series Wireless LAN Controller configuration page. The browser's address bar shows the URL "http://10.42.10.2". The page has a blue header with the Cisco logo and the title "Cisco 2500 Series Wireless LAN Controller". Below the header, there is a navigation bar with tabs: "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is selected, and a sub-tab "1 Set Up Your Controller" is active. The main content area contains several configuration fields:

- System Name:
- Country:
- Date & Time:
- Timezone:
- NTP Server:
- Management IP Address:
- Subnet Mask:
- Default Gateway:
- Management VLAN ID:

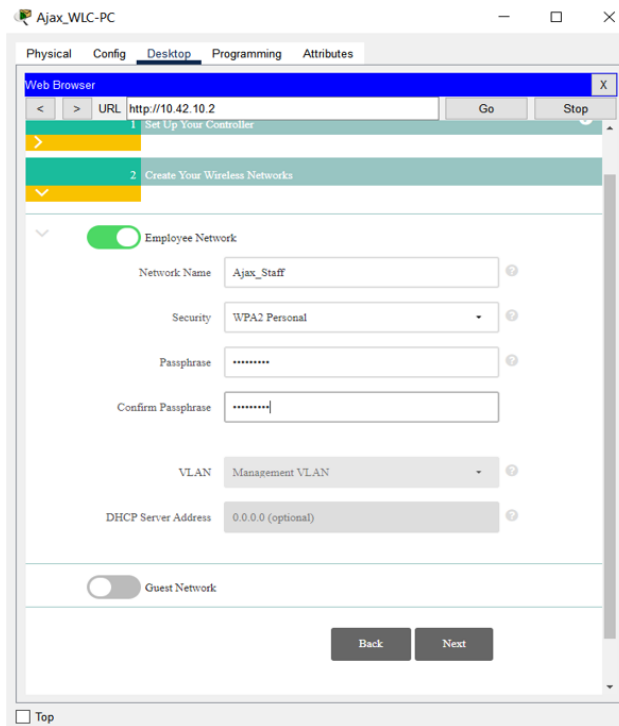
At the bottom of the form, there are "Back" and "Next" buttons. A "Top" link is located at the bottom left of the browser window.

Step 11: Create the WLAN for Staff

Network name: [Site name] _Staff

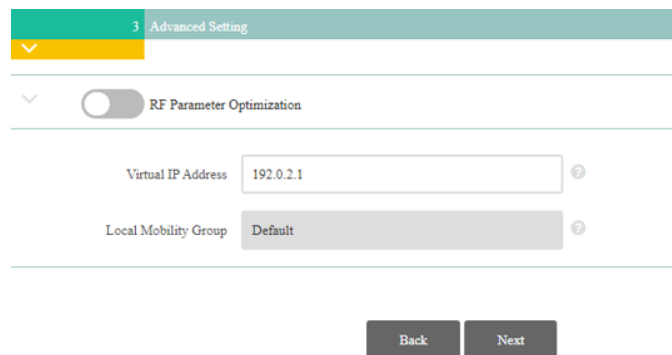
Passphrase: 123456789

and click next

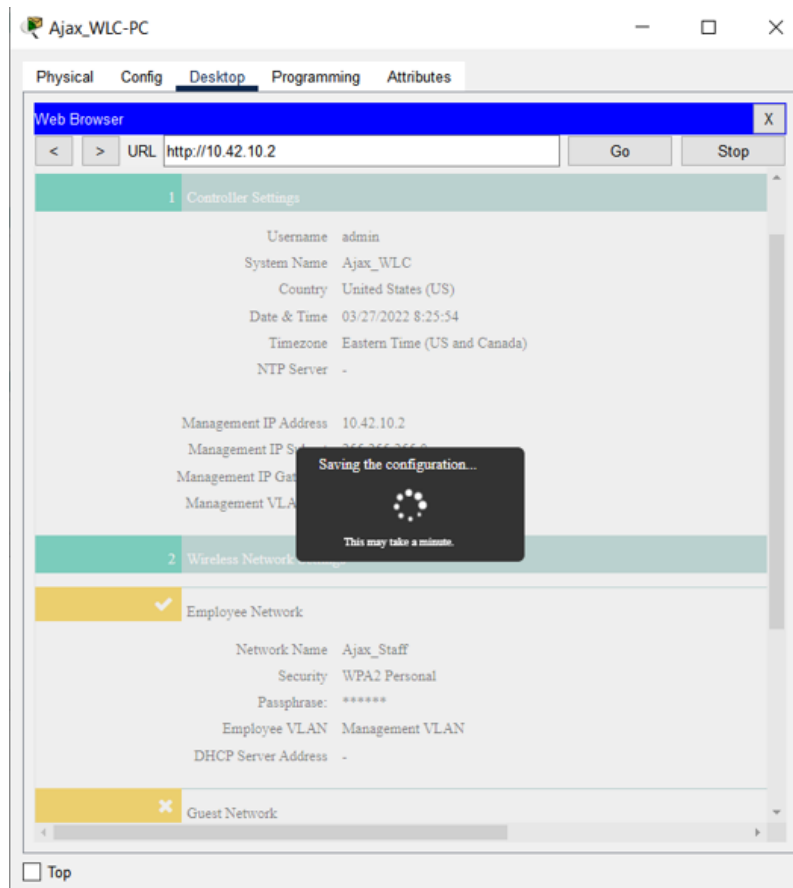


Through this setting, we created the 'Ajax_Staff' network with the authentication method WPA2-PSK and password is 123456789. PSK is an authentication method that allows AP access based on a pre-shared key between a client device and an AP without an authentication server and WPA2 is a security authentication protocol performed by Wi-Fi and follows the AES standard.

Step 12: Leave this field as default and click “Next”



Step 13: Apply the setting



Step 14: Ping to WLC from PC to activate WLC interface

```
C:\>ping 10.42.10.2

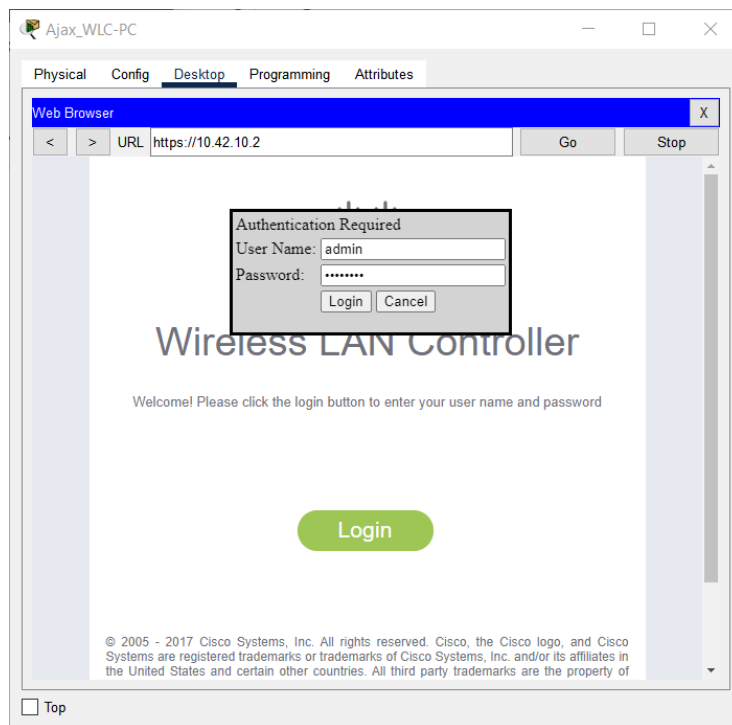
Pinging 10.42.10.2 with 32 bytes of data:

Reply from 10.42.10.2: bytes=32 time<1ms TTL=255
Reply from 10.42.10.2: bytes=32 time=8ms TTL=255
Reply from 10.42.10.2: bytes=32 time<1ms TTL=255
Reply from 10.42.10.2: bytes=32 time<1ms TTL=255

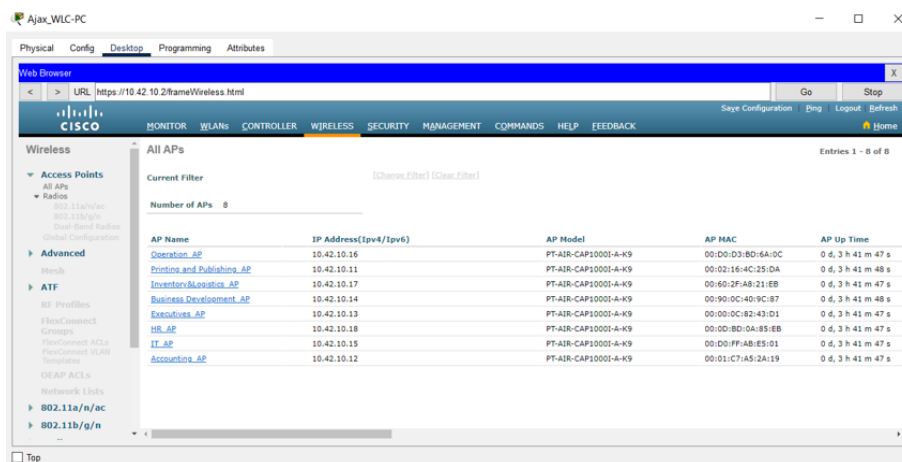
Ping statistics for 10.42.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms
```

Step 15: Log in to WLC interface

WLC-PC>Web Browser>type [https://\[WLC IP add\]](https://10.42.10.2)



Step 16: Make sure that all APs in WLAN network is connected to WLC



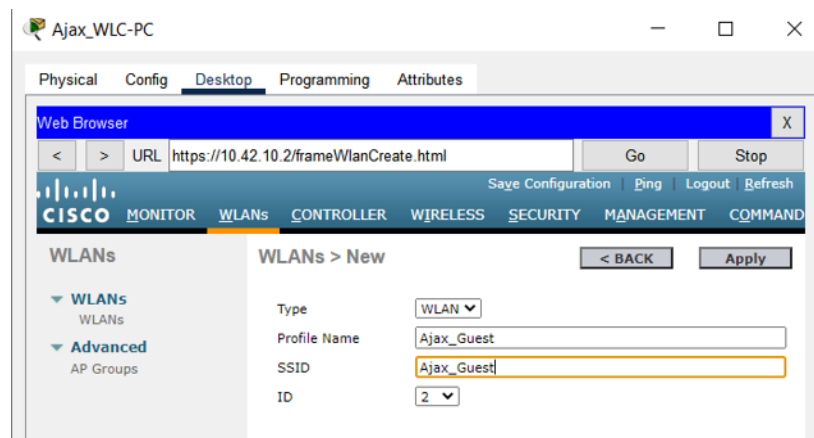
The Ajax site, where the headquarters of Book Icons are located, has eight departments, and all the other sites except Ajax have three departments: IT, Operation, and POS. Since one AP is

placed for each department, we must verify that eight APs are connected to the WLC on the WLC interface.

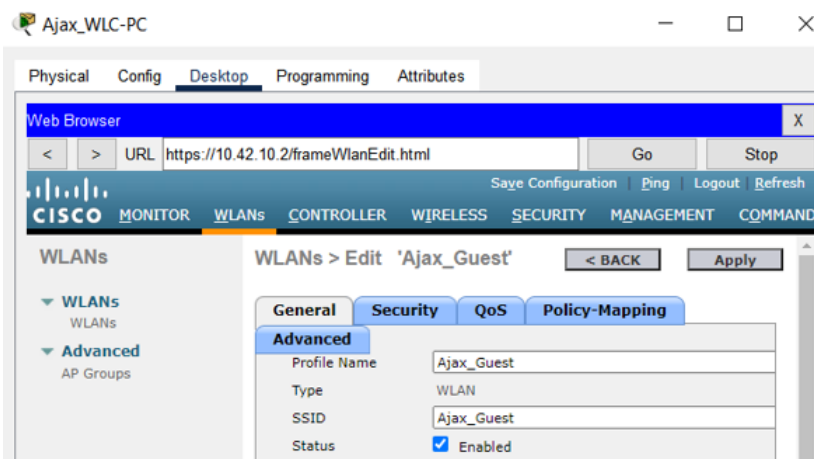
Step 17: Create new WLAN for Guest

‘WLANs’ tab>Click “Go” button next to the ‘Create new’

SSID: [Site name]_Guest

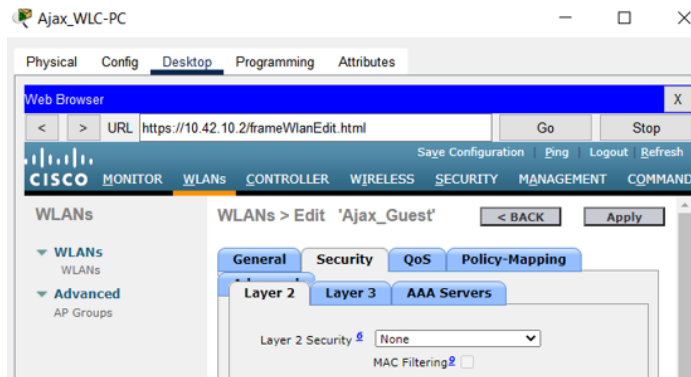


Step 18: Enable new SSID



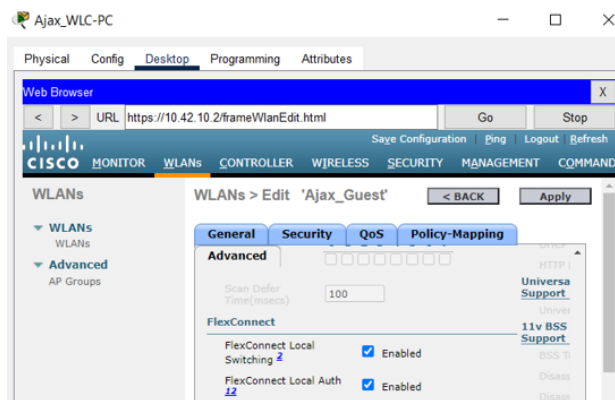
Step 19: Do not set any Layer 2 security to Guest WLAN

Security>Layer2>Layer2 Security: None



We have only encrypted the wireless network for the staff of the Book Icons and set the layer 2 security for guests to none. Guests can access the network without any authentication. However, they will never have access to wireless networks for staff.

Advanced>Check FlexConnect Local Switching, FlexConnect Local Auth



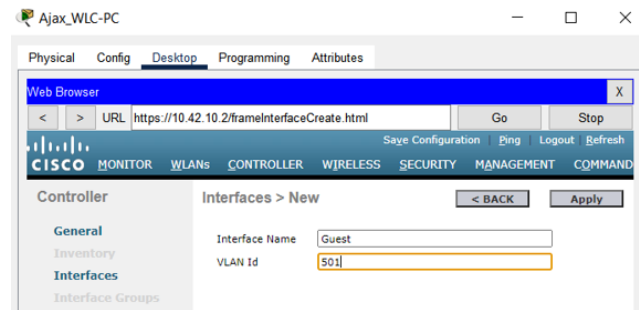
Step 20: Create Guest interfaces on WLC

'Controller' tab>Interfaces>Click "New"

Interface Name: Guest

Vlan ID: 501

Change the *'Port Number'* to 3



Physical Information

Port Number	3
Backup Port	0
Active Port	3
Enable Dynamic AP Management	☐

Interface Address

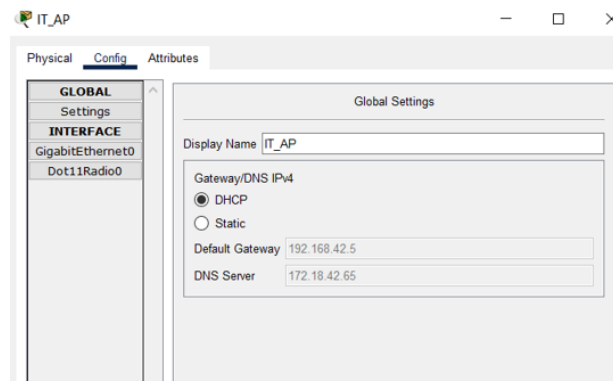
VLAN Identifier	501
IP Address	10.42.12.2
Netmask	255.255.254.0
Gateway	10.42.12.1

DHCP Information

Primary DHCP Server	10.42.12.1
---------------------	------------

Step 21: Verify that all APs obtain IP addresses from the DHCP pool on the core switch.

Click AP>Config>Settings>Click ***"DHCP"***



Step 22: Add two wireless client devices to test Staff and Guest WLAN

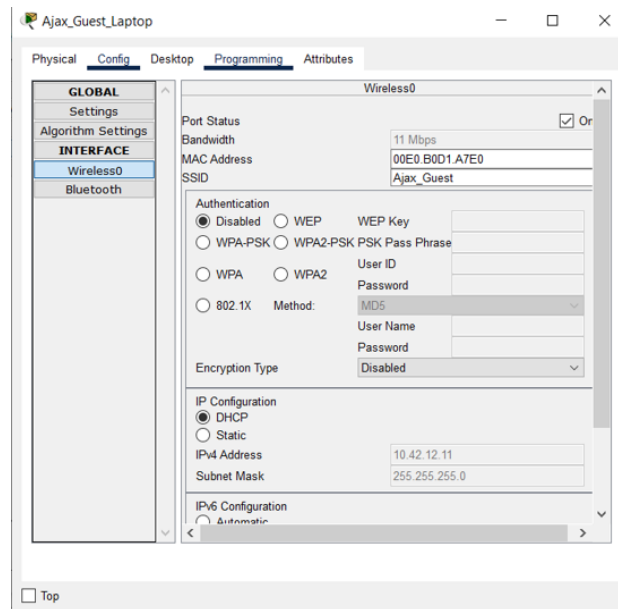
Wireless client device>Config>Wireless0

For the Guest device,

SSID: [Site name] _Guest

*Authentication: **Disabled** (There is no layer 2 security for guest WLAN)*

*Click “**DHCP**” on IP Configuration box*



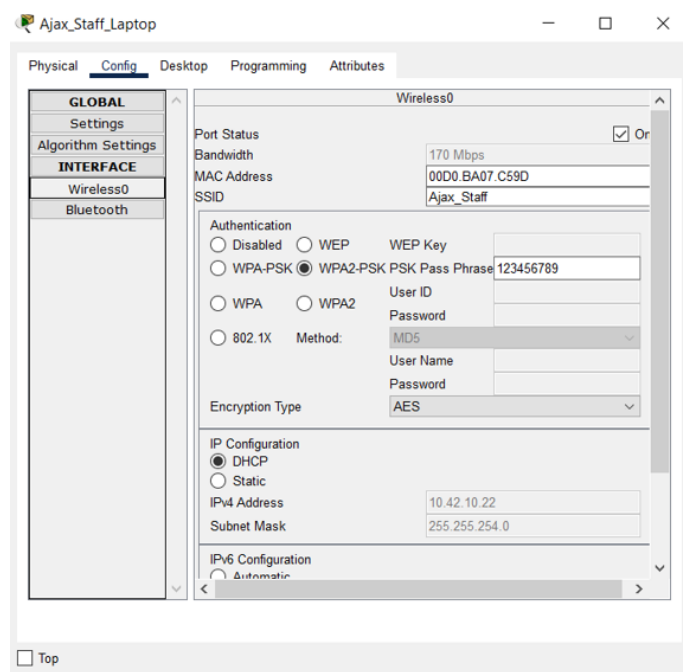
Guests can connect to the wireless network by entering the correct network SSID for the guest without any authentication.

For the Staff device.

SSID: [Site name] _Staff

*Authentication: **123456789***

Click “**DHCP**” on IP Configuration box



However, all staffs in Book Icons can access to the wireless staff network through entering the encryption key configured in the WLC interface. After setting the authentication method to WPA2-PSK, enter the previously set password 123456789 in the PSK Pass Phase box.

Step 23: Try to ping *VLAN 101* gateway and IT_PC from Ajax to check the connection

Staff laptop connects to Ajax_Staff can ping gw and IT_PC

```
Ajax_Staff_Laptop
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 10.42.1.1

Pinging 10.42.1.1 with 32 bytes of data:

Reply from 10.42.1.1: bytes=32 time=38ms TTL=255
Reply from 10.42.1.1: bytes=32 time=5ms TTL=255
Reply from 10.42.1.1: bytes=32 time=5ms TTL=255
Reply from 10.42.1.1: bytes=32 time=5ms TTL=255

Ping statistics for 10.42.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 5ms, Maximum = 38ms, Average = 13ms

C:\>ping 10.42.1.11

Pinging 10.42.1.11 with 32 bytes of data:

Reply from 10.42.1.11: bytes=32 time=5ms TTL=127
Reply from 10.42.1.11: bytes=32 time=5ms TTL=127
Reply from 10.42.1.11: bytes=32 time=12ms TTL=127
Reply from 10.42.1.11: bytes=32 time=8ms TTL=127

Ping statistics for 10.42.1.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 5ms, Maximum = 12ms, Average = 7ms
```

*Guest laptop connects to **Ajax_Guest** can ping gw but cannot access IT_PC*

```
Ajax_Guest_Laptop
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 10.42.1.1

Pinging 10.42.1.1 with 32 bytes of data:

Reply from 10.42.1.1: bytes=32 time=3ms TTL=255
Reply from 10.42.1.1: bytes=32 time=9ms TTL=255
Reply from 10.42.1.1: bytes=32 time=5ms TTL=255
Reply from 10.42.1.1: bytes=32 time=7ms TTL=255

Ping statistics for 10.42.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 9ms, Average = 6ms

C:\>ping 10.42.1.11

Pinging 10.42.1.11 with 32 bytes of data:

Reply from 10.42.12.1: Destination host unreachable.
Reply from 10.42.12.1: Destination host unreachable.
Reply from 10.42.12.1: Destination host unreachable.
Reply from 10.42.12.1: Destination host unreachable.

Ping statistics for 10.42.1.11:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Both wireless client devices must try to ping the gateway of VLAN (VLAN 101) and PC for the Ajax IT department to check the connection status. Laptops connected to staff networks must successfully ping to both Ajax IT department's gateways and PC, and guest laptop must never be

connected to IT_PC. You can configure ACLs to prevent clients connected to the guest network from accessing the staff network. Please refer to the description for the ACL configuration.

Security and Authentication

Several security features were configured and implemented as a part of the solution to ensure an optimized, secure, and resilient network infrastructure some. These are:

- **Active Directory** – Provide Role-based access and authentication to devices and service.
- **VLANs** – To segment user traffic and improve network performance
- **NAT** – To secure private addressing space from the public Internet
- **IPSEC VPN Tunnel** – Provide a secure, encrypted channel to our backup and disaster recovery service
- **Access Control Lists** – Configured to deny or permit authorized addresses to access other internal resources or services
- **Authentication and Authorization** – To ensure only authorized users are granted access to resources
- **Encryption** – To protect the integrity and confidentiality of internal and external traffic in/out of the network

NAT:

Configuration and Test Results:

```
ip nat pool public 198.42.0.129 198.42.0.254 netmask 255.255.255.128
ip nat inside source list 100 pool public overload
ip nat inside source list 101 pool public overload|
```

```
access-list 100 permit ip 172.18.42.0 0.0.0.255 10.10.10.0 0.0.0.255
access-list 100 permit ip 192.168.42.0 0.0.0.255 10.10.10.0 0.0.0.255
access-list 100 permit ip 10.42.0.0 0.0.255.255 10.10.10.0 0.0.0.255
access-list 100 permit ip 198.42.0.0 0.0.0.255 10.10.10.0 0.0.0.255
```

```
int g0/1
ip address 201.201.201.1 255.255.255.0
crypto map VPN_Azure
ip nat outside
no shut
exit

int g0/0
ip address 10.42.0.2 255.255.255.252
ip nat inside
no shut
exit

int lo1
ip address 198.42.0.1 255.255.255.0
no shut
exit
```

```
Ajax_Internet_Gateway>
Ajax_Internet_Gateway>en
Ajax_Internet_Gateway#show ip nat translation
Pro Inside global      Inside local      Outside local      Outside global
tcp 198.42.0.129:1025  10.42.1.11:1025   10.10.10.10:80     10.10.10.10:80
Ajax_Internet_Gateway#
```

Ctrl+F6 to exit CLI focus

Copy

Paste

☐ Top

IPSEC VPN TUNNEL:

Configuration and Test Results:

```
crypto isakmp policy 10
encryption aes 256
authentication pre-share
group 2
hash sha
lifetime 86400
exit

crypto isakmp key it07 address 203.203.203.2

crypto ipsec transform-set Ajax->Azure esp-aes esp-sha-hmac

crypto map VPN_Azure 20 ipsec-isakmp
set peer 203.203.203.2
set pfs group2
set security-association lifetime seconds 86400
set transform-set Ajax->Azure
match address 100

int g0/1
ip address 201.201.201.1 255.255.255.0
crypto map VPN_Azure
ip nat outside
no shut
exit
```

```
Ajax_Internet_Gateway#show crypto map
Crypto Map VPN_Azure 20 ipsec-isakmp
  Peer = 203.203.203.2
  Extended IP access list 100
    access-list 100 permit ip 172.18.42.0 0.0.0.255 10.10.10.0
0.0.0.255
    access-list 100 permit ip 192.168.42.0 0.0.0.255 10.10.10.0
0.0.0.255
    access-list 100 permit ip 10.42.0.0 0.0.255.255 10.10.10.0
0.0.0.255
    access-list 100 permit ip 198.42.0.0 0.0.0.255 10.10.10.0
0.0.0.255
  Current peer: 203.203.203.2
  Security association lifetime: 4608000 kilobytes/86400 seconds
  PFS (Y/N): Y
  Transform sets={
    Ajax->Azure,
  }
  Interfaces using crypto map VPN_Azure:
    GigabitEthernet0/1

Ajax_Internet_Gateway#
```

Physical Config Desktop Programming Attributes

Command Prompt

X

```
Ping statistics for 10.10.10.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 26ms, Average = 8ms
```

```
C:\>tracert 10.10.10.10
Invalid Command.
```

```
C:\>tracert 10.10.10.10
```

```
Tracing route to 10.10.10.10 over a maximum of 30 hops:
```

1	0 ms	0 ms	0 ms	10.42.1.1
2	0 ms	0 ms	0 ms	10.42.0.2
3	0 ms	0 ms	0 ms	203.203.203.2
4	0 ms	0 ms	0 ms	10.10.10.10

```
Trace complete.
```

```
C:\>tracert 203.203.203.2
```

```
Tracing route to 203.203.203.2 over a maximum of 30 hops:
```

1	0 ms	0 ms	6 ms	10.42.1.1
2	0 ms	0 ms	0 ms	10.42.0.2
3	0 ms	0 ms	10 ms	201.201.201.2
4	0 ms	0 ms	0 ms	202.202.202.2
5	0 ms	0 ms	0 ms	203.203.203.2

```
Trace complete.
```

```
C:\>
```

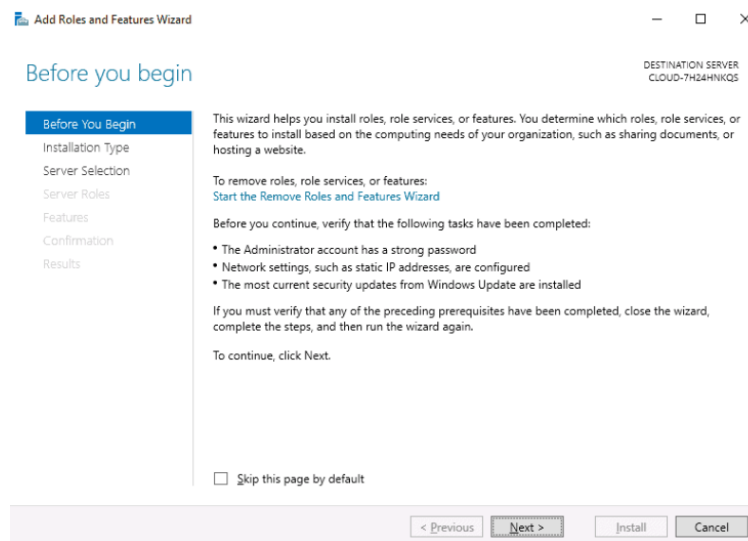
☐ Top

Active Directory

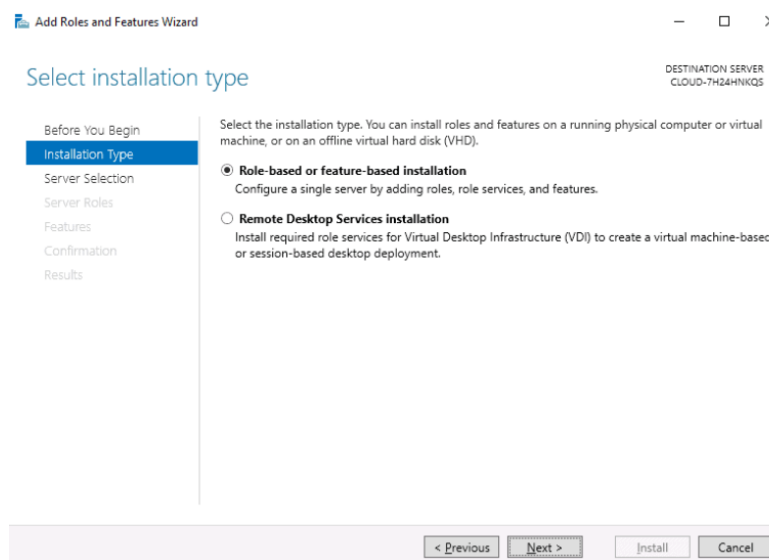
Configuration and Test Results:

Step 1: Login to the server

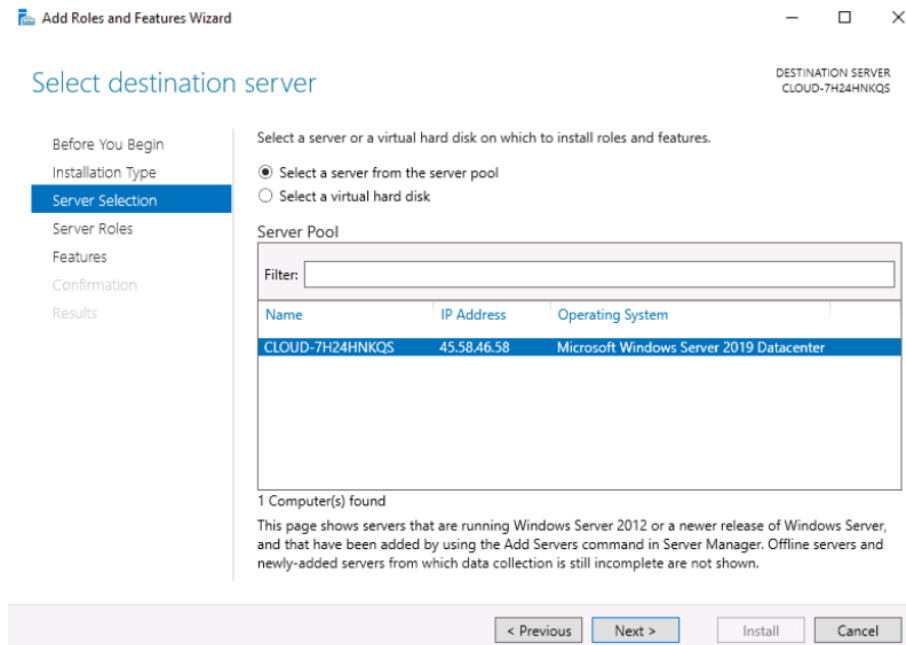
Step 2: Launch the Server Manager Dashboard>Manage>Add Roles and Features



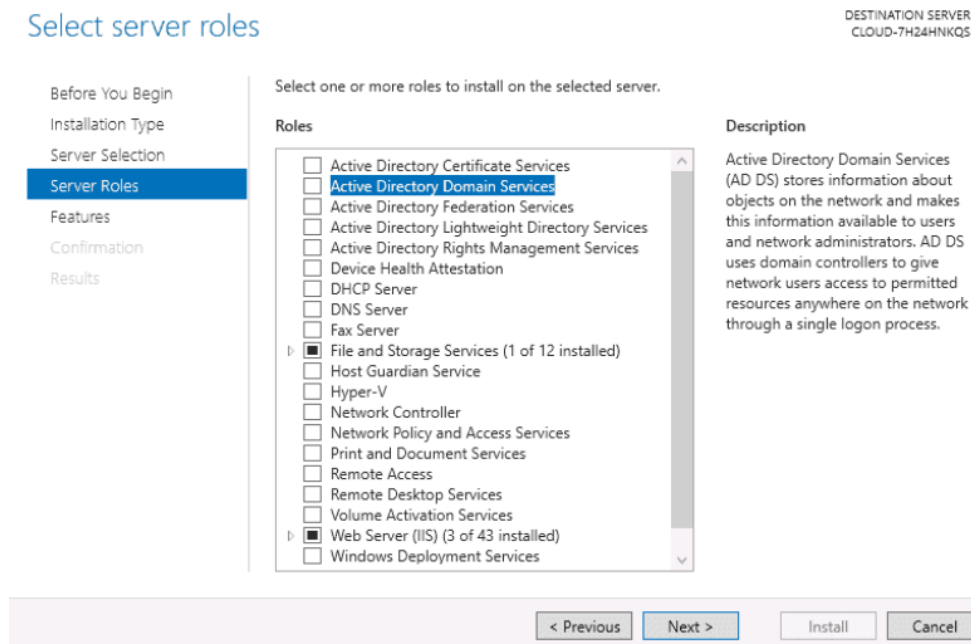
Step 3: Select 'Role-based or feature-based installation' option



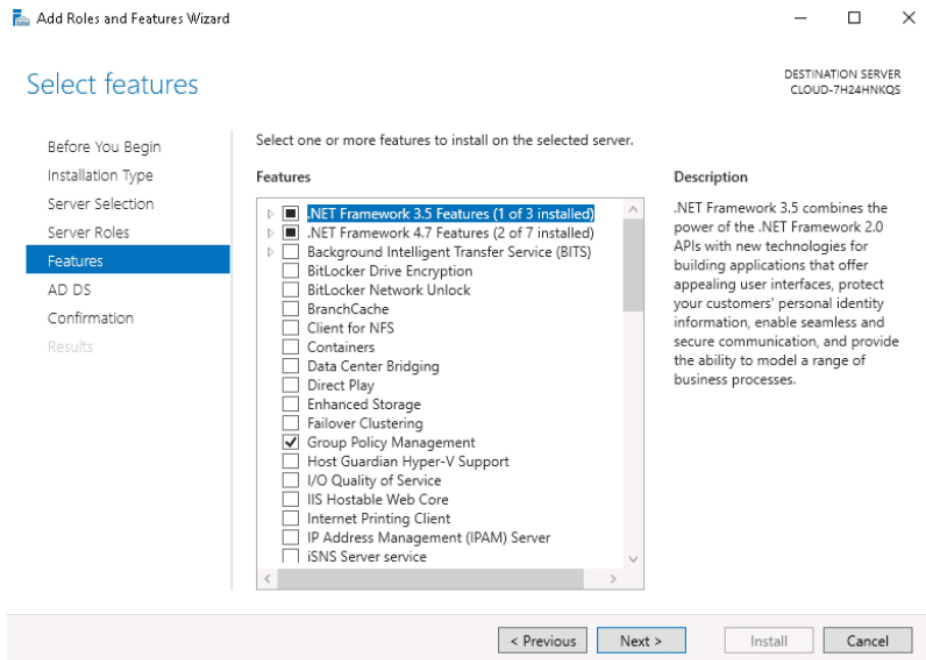
Step 4: Select the local server



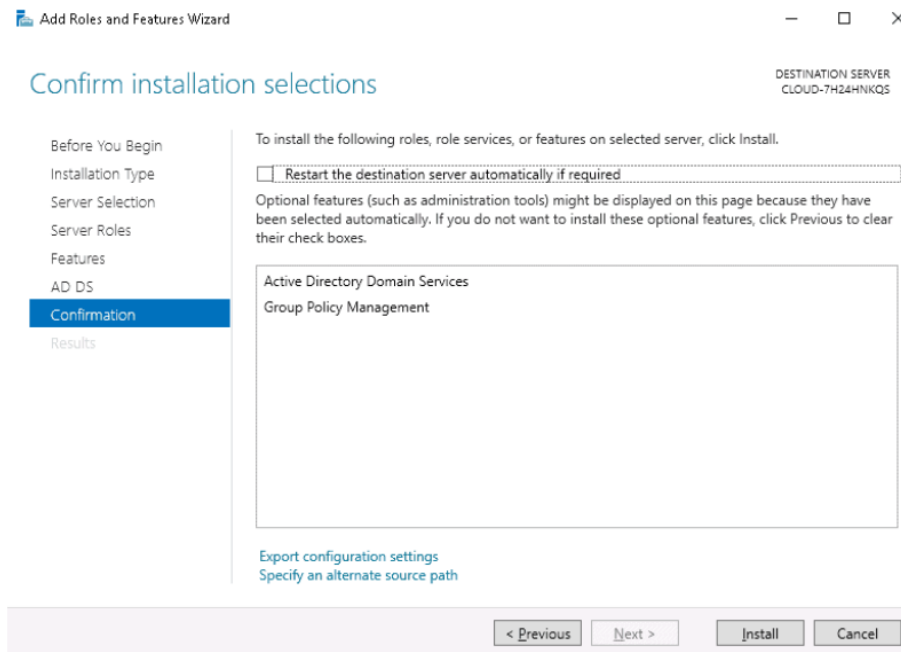
Step 5: Check 'Active Directory Domain Services' to add server roles



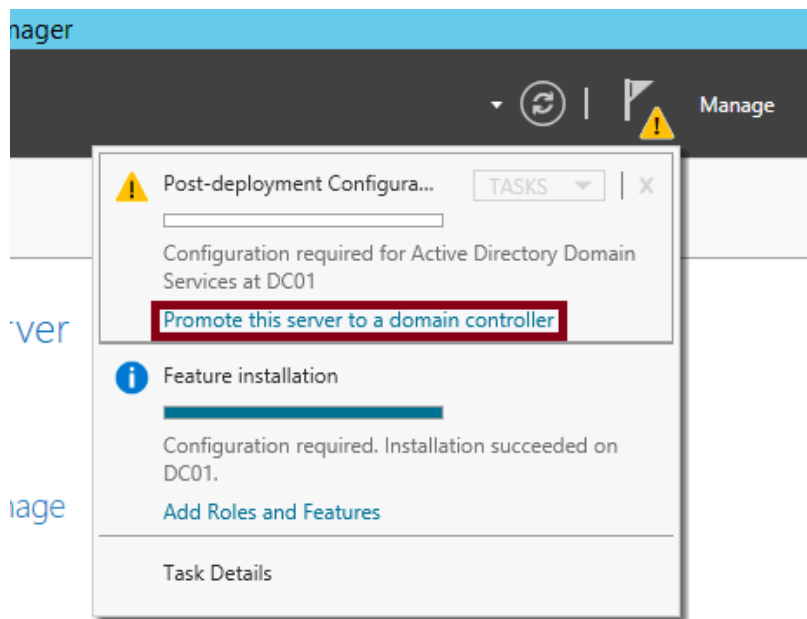
Step 6: Leave it as default, and click 'Next'



Step 7: Click 'Install'

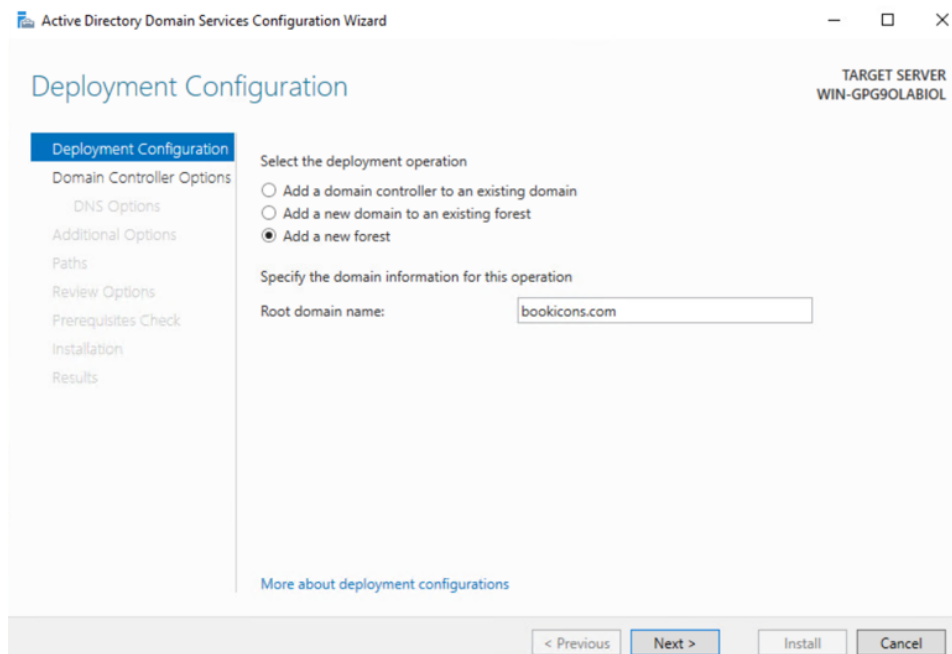


Step 8: Click 'Promote this server to domain controller'



Step 9: Select ‘Add a new forest’

Root domain name: *bookicons.com*



Step 10: Leave everything as default and set the DSRM password

Password: *Pa\$\$w0rd*

The screenshot shows the 'Domain Controller Options' page of the Active Directory Domain Services Configuration Wizard. The left sidebar contains a list of steps: Deployment Configuration, Domain Controller Options (highlighted), DNS Options, Additional Options, Paths, Review Options, Prerequisites Check, Installation, and Results. The main content area is titled 'Domain Controller Options' and includes the following sections:

- Select functional level of the new forest and root domain:** Forest functional level is set to 'Windows Server 2016' and Domain functional level is set to 'Windows Server 2016'.
- Specify domain controller capabilities:** Checkboxes for 'Domain Name System (DNS) server' and 'Global Catalog (GC)' are checked. The checkbox for 'Read only domain controller (RODC)' is unchecked.
- Type the Directory Services Restore Mode (DSRM) password:** Two password fields are shown, both containing masked characters (dots).

At the bottom, there are navigation buttons: '< Previous', 'Next >', 'Install', and 'Cancel'. A link 'More about domain controller options' is also present.

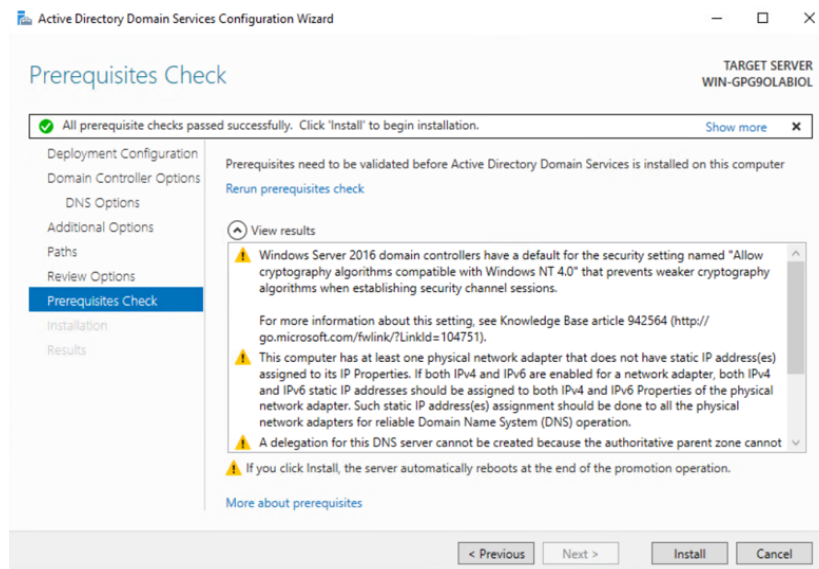
Step 11: Wait until NetBIOS domain name is automatically created

The screenshot shows the 'Additional Options' page of the Active Directory Domain Services Configuration Wizard. The left sidebar is the same as the previous page, with 'Additional Options' highlighted. The main content area is titled 'Additional Options' and includes the following sections:

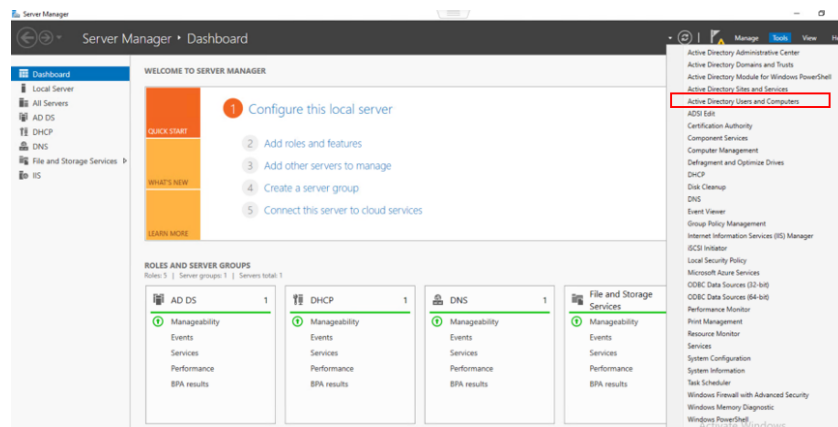
- Verify the NetBIOS name assigned to the domain and change it if necessary:** A text box labeled 'The NetBIOS domain name:' contains the value 'BOOKICONS'.

At the bottom, there are navigation buttons: '< Previous', 'Next >', 'Install', and 'Cancel'. A link 'More about additional options' is also present.

Step 12: Wait until prerequisites check is completed and click ‘Install’

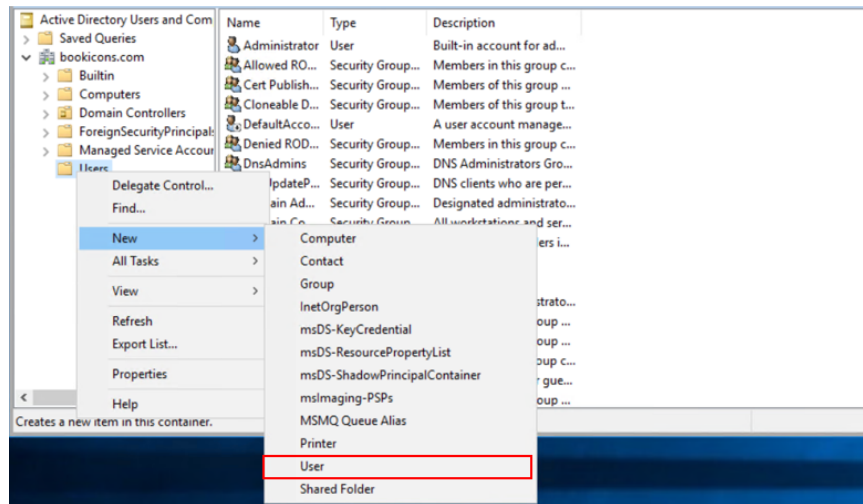


Step 13: Tools>Active Directory Users and Computers



Step 14: Add domain users

Expand bookicons.com>Right Click 'Users'>'New' > 'User'



Step 15: Put the user name and user logon name

- **Hanui Lee:** *hlee@bookicons.com*
- **Gavin Beckford:** *gbeckford @bookicons.com*
- **Jaehyeon Jeon:** *jjeon@bookicons.com*
- **Gregorie Sanche:** *gsanche @bookicons.com*

The screenshot shows the 'New Object - User' dialog box. The 'Create in:' field is set to 'bookicons.com/Users'. The 'First name:' field contains 'Hanui', and the 'Last name:' field contains 'Lee'. The 'Full name:' field displays 'Hanui Lee'. The 'User logon name:' field contains 'ajaxiadmin', and the domain dropdown is set to '@bookicons.com'. The 'User logon name (pre-Windows 2000):' field contains 'BOOKICONS\ajaxiadmin'. The 'Next >' button is highlighted.

Create in: bookicons.com/Users

First name: Hanui Initials:

Last name: Lee

Full name: Hanui Lee

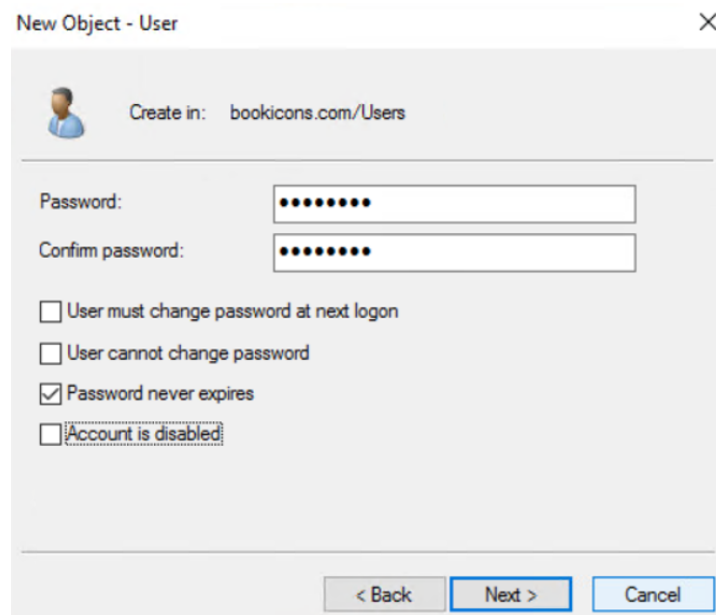
User logon name: ajaxiadmin @bookicons.com

User logon name (pre-Windows 2000): BOOKICONS\ ajaxiadmin

< Back Next > Cancel

Step 16: Set the password for domain user

Password: *Pa\$\$w0rd*



New Object - User

Create in: bookicons.com/Users

Password: [dots]

Confirm password: [dots]

☐ User must change password at next logon

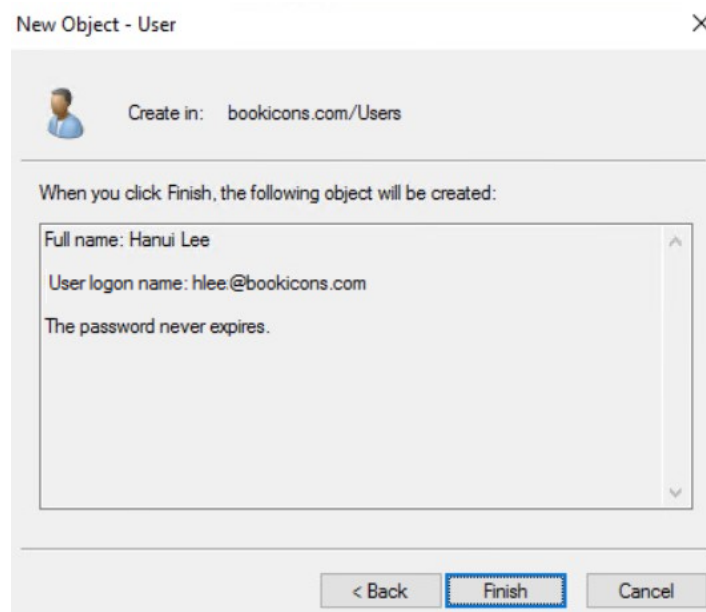
☐ User cannot change password

☒ Password never expires

☐ Account is disabled

< Back Next > Cancel

Step 17: Review the setting you had made and click **‘Finish’**



New Object - User

Create in: bookicons.com/Users

When you click Finish, the following object will be created:

Full name: Hanui Lee

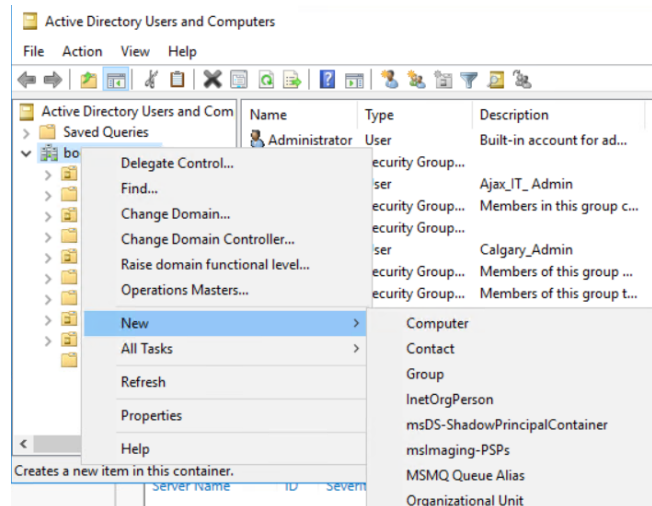
User logon name: hlee@bookicons.com

The password never expires.

< Back Finish Cancel

Step 18: Add organization unit

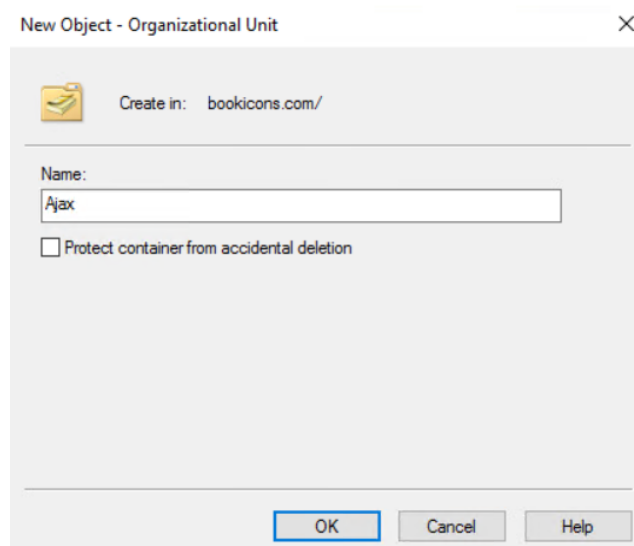
Right click bookicons.com > 'New' > 'Organizational Unit'



Step 19: Change the name of organization unit

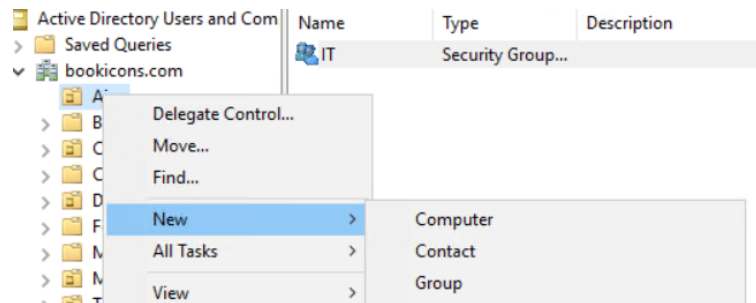
Name it to [Site name] ex) Ajax, Toronto

Uncheck 'Protect container from accidental deletion' and click 'OK'

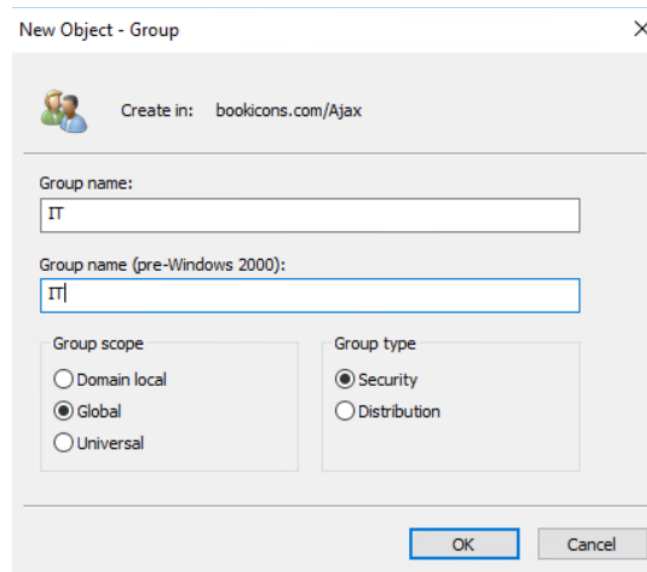


Step 20: Add a group on organizational group

Right click Organizational group 'Ajax' > 'New' > 'Group'



Step 21: Put the name of group and leave other settings as default



Step 22: Add user into group

Group properties>Members>Add

Enter '**Site name**' on 'Enter the object name to select' box

Click '**Check Names**' next to the box

Select Users, Contacts, Computers, Service Accounts, or Groups

Select this object type:

From this location:

Enter the object names to select [\(examples\)](#):

Step 23: Click the user you created previously and click ‘OK’

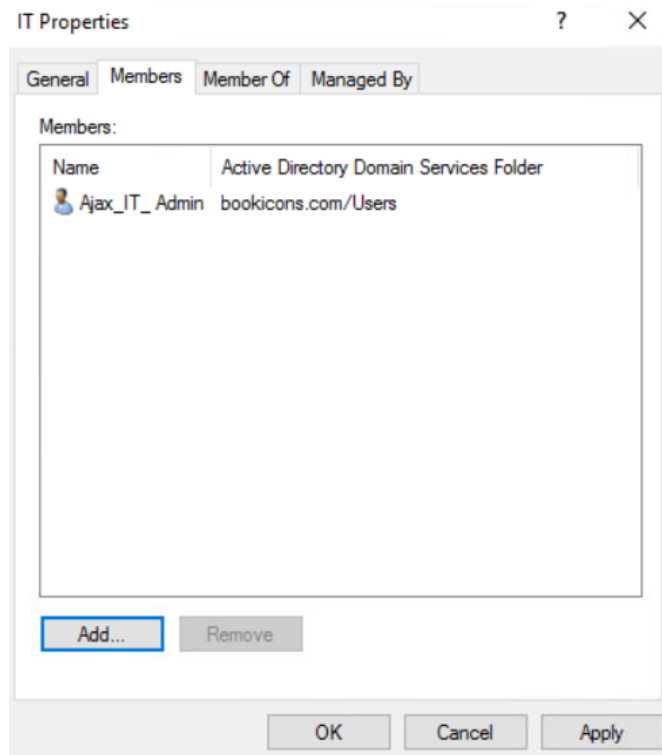
Multiple Names Found

More than one object matched the name "ajax". Select one or more names from this list, or, reenter the name.

Matching names:

Name	Logon Name (pr...	E-Mail Address	Description	In Folder
Ajax	Ajax			bookicons.com/...
Ajax_IT_Admin	hlee		Ajax_IT_Admin	bookicons.com/...

Step 24: Make sure that user added to group and click ‘Apply’

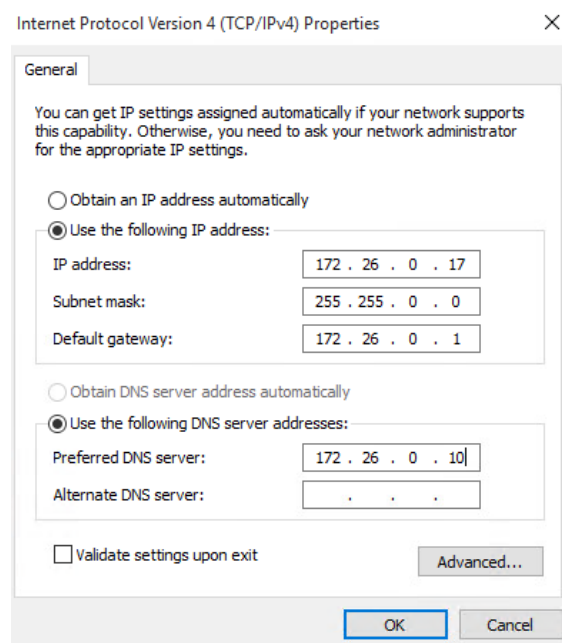


- ***Ajax:*** Hanui Lee
- ***Toronto:*** Gavin Beckford
- ***Mississauga:*** Jaehyeon Jeon
- ***Calgary:*** Gregorie Sanche

Step 25: Turn on the Windows 10 Desktop and change adapter setting

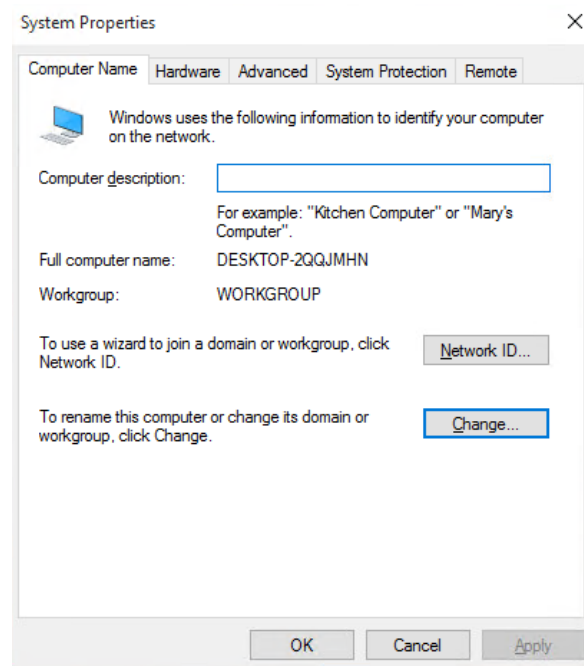
Select '***Use the following DNS server address***'

Add the IP address of server (172.26.0.10) to 'Preferred DNS server' box



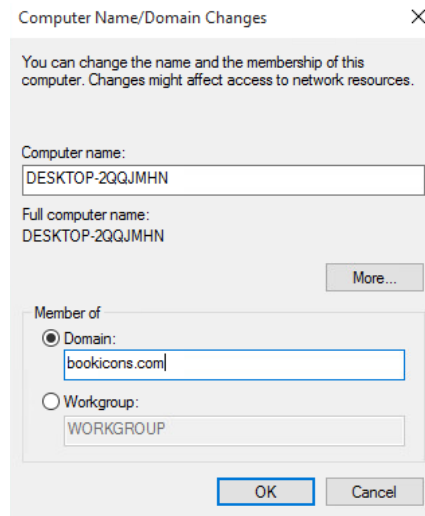
Step 26: Click 'Search' on start menu and type '**Join a domain**'

Click '**Change**'



Step 27: For the 'Member of' box, select '**Domain**'

Type **'bookicons.com'** in the box



Computer Name/Domain Changes

You can change the name and the membership of this computer. Changes might affect access to network resources.

Computer name:
DESKTOP-2QQJMHN

Full computer name:
DESKTOP-2QQJMHN

More...

Member of

☒ Domain:
bookicons.com

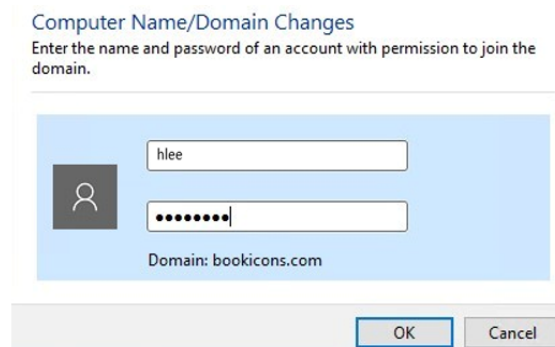
☐ Workgroup:
WORKGROUP

OK Cancel

Step 28: Put user logon name and password you previously configured

ex) user logon name: hlee

password: Pa\$\$w0rd



Computer Name/Domain Changes

Enter the name and password of an account with permission to join the domain.

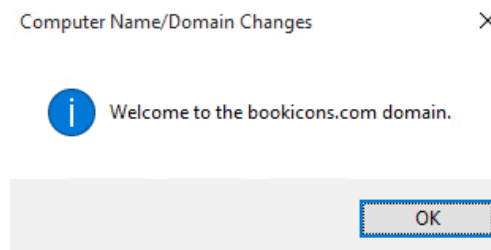
hlee

.....

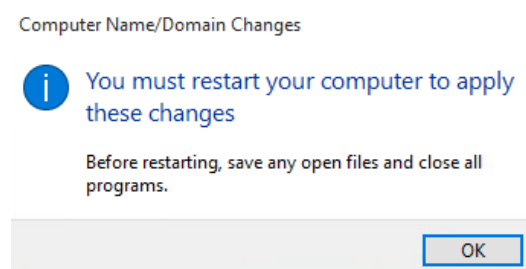
Domain: bookicons.com

OK Cancel

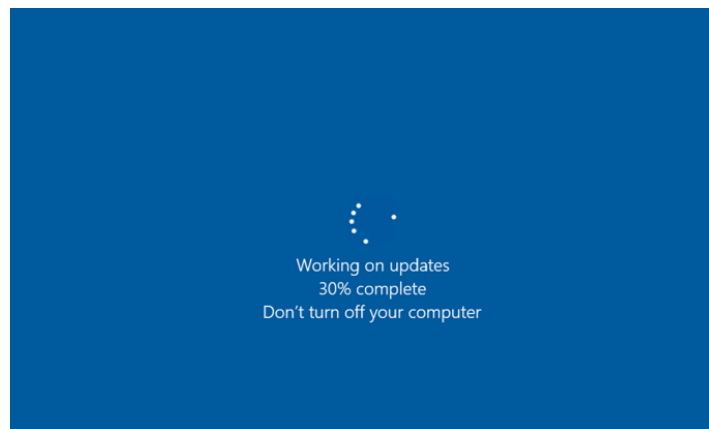
Step 29: Your desktop is connected bookicons.com domain



Step 30: Click 'OK' when this message appears



Step 31: Restart the desktop VM

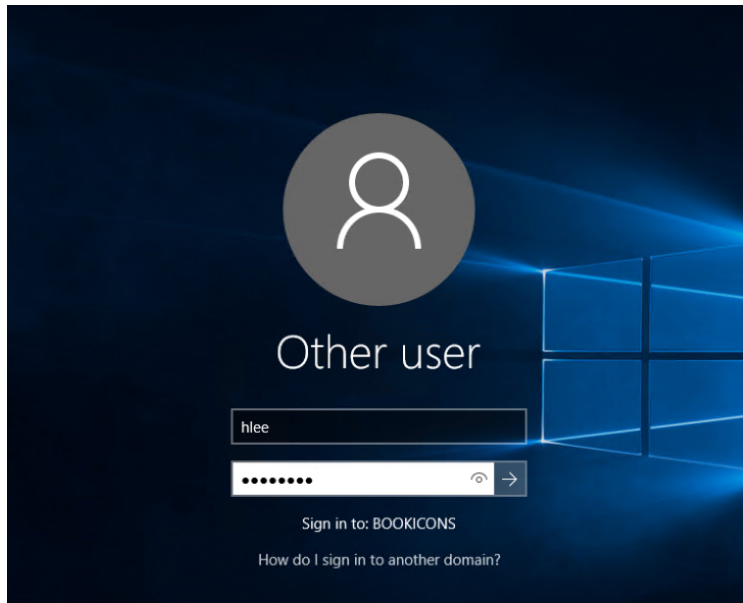


Step 32: Logon with domain user credentials

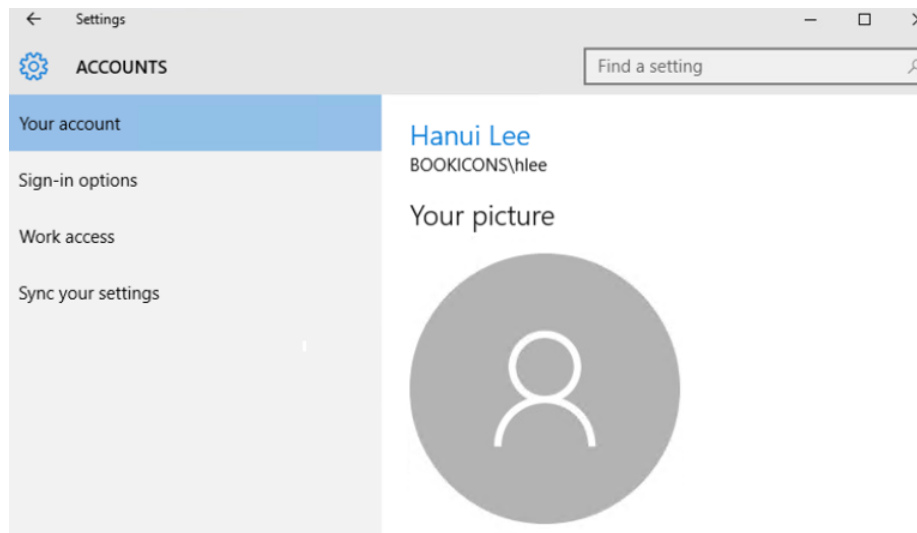
Click 'Other user'

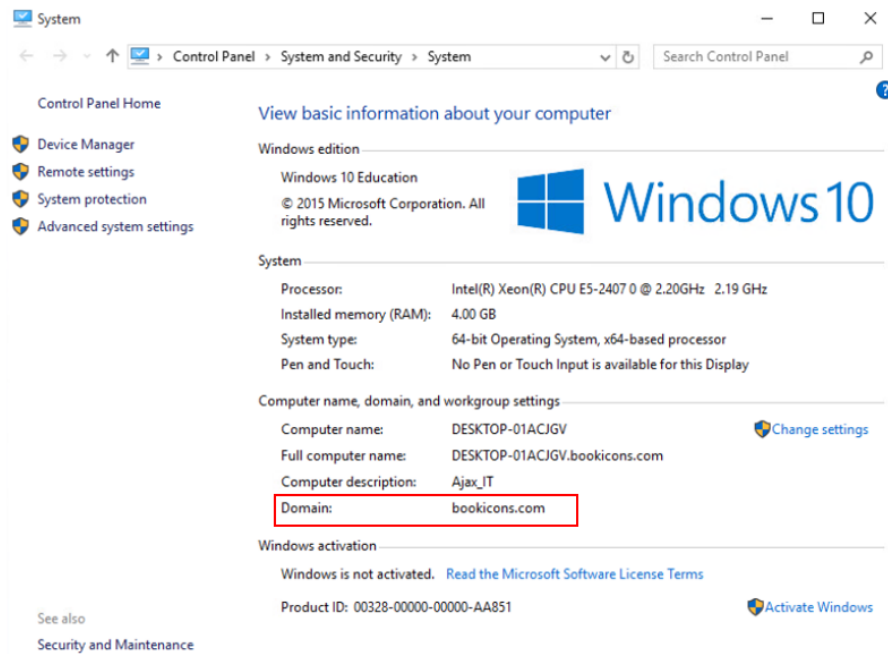
user logon name: hlee

password: Pa\$\$w0rd



Step 33: Make sure that Windows 10 desktop VM joins a bookicons.com domain with proper domain user account

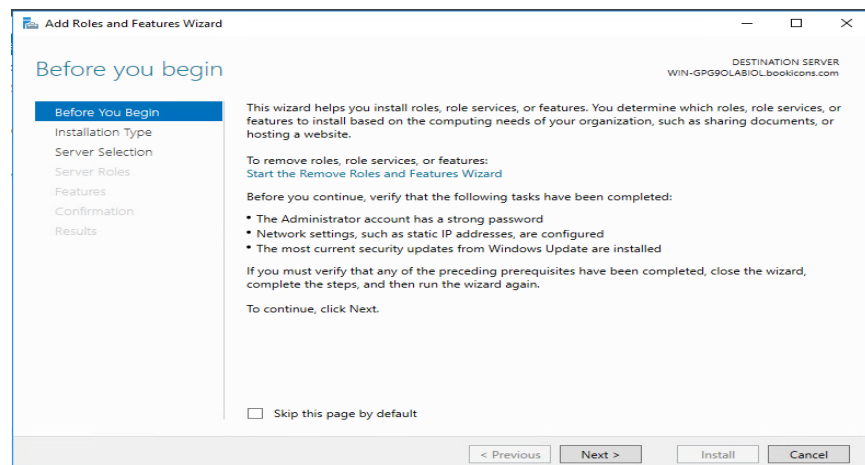




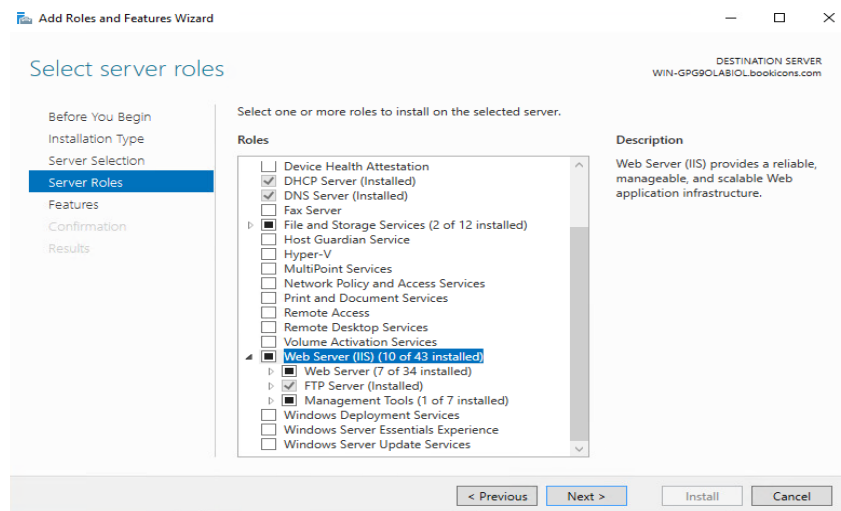
Web Service

Configuration and Test Results:

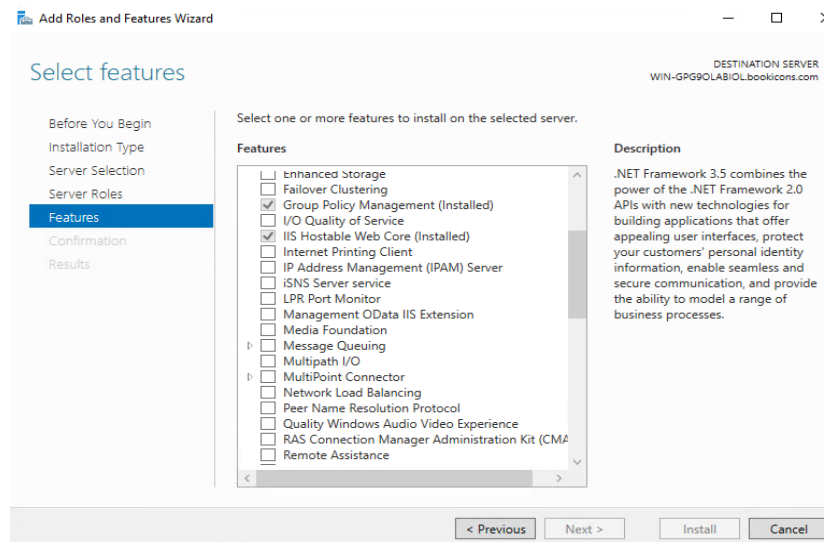
Web Server (IIS)



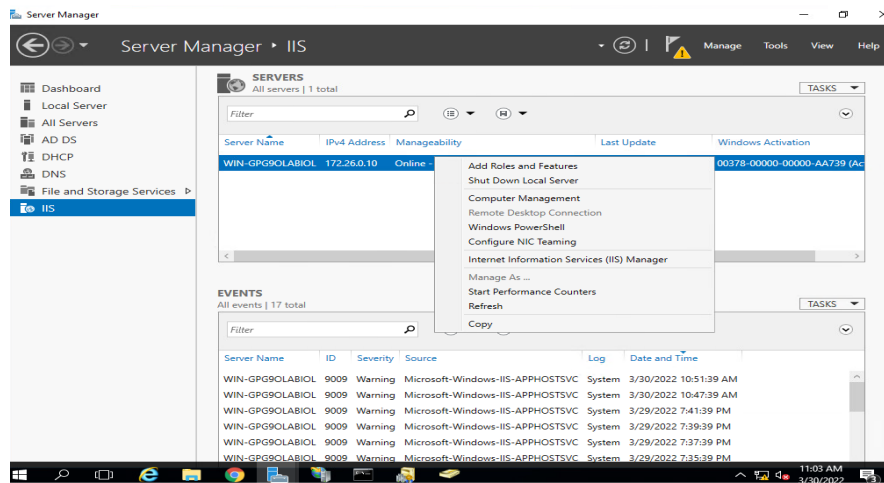
Step1: Click the Add roles and Features Wizard.



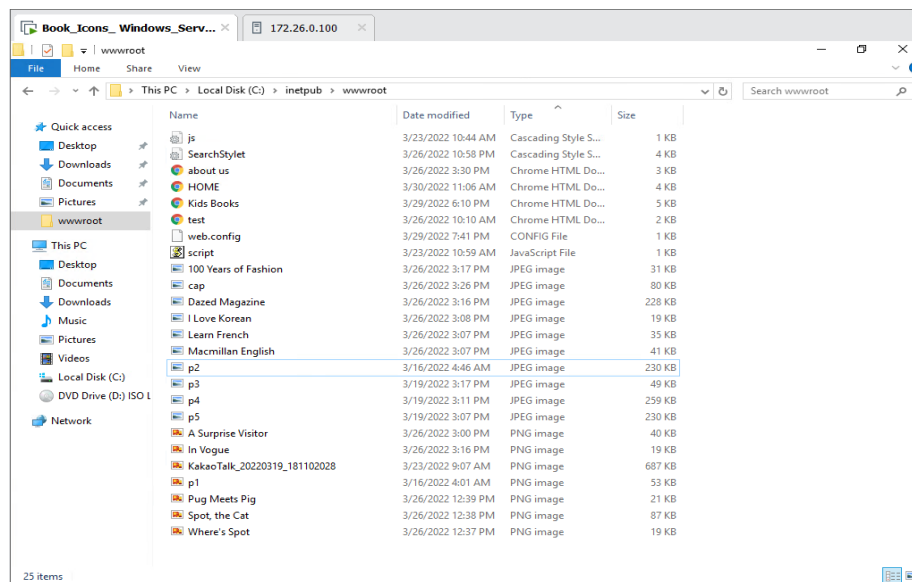
Step2: In Select server role, check the Web Server (IIS)



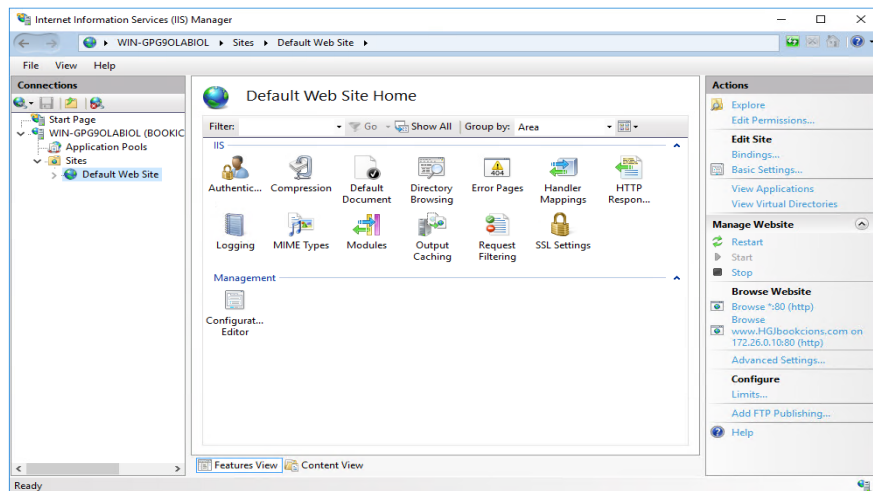
Step3: In Select features, check the IIS Hostable Web Core and click Next, Install



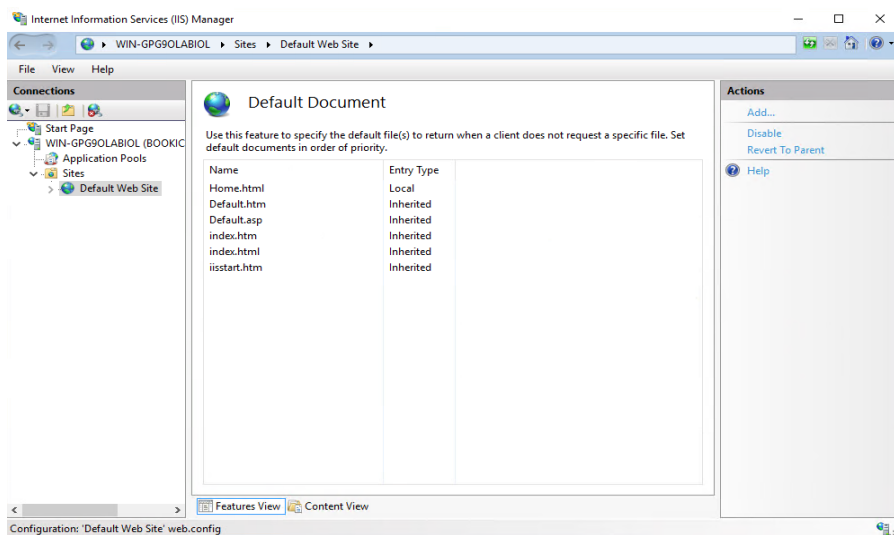
Step4: In IIS tab, right click at Server Name, and click on Internet Information Services(iis) Manager



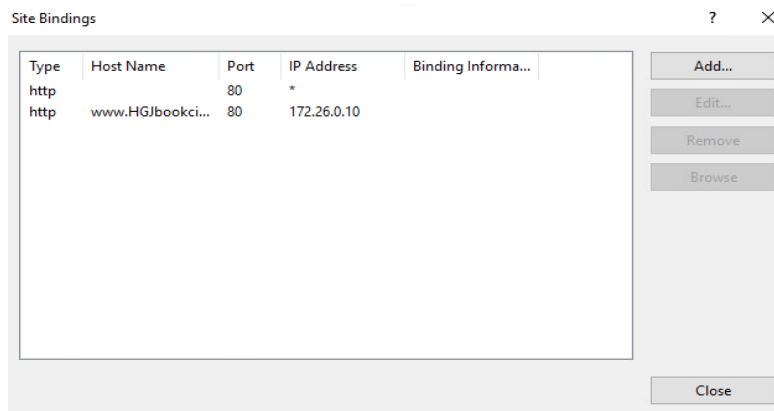
Step5: Copy web coding file to C:\inetpub\wwwroot



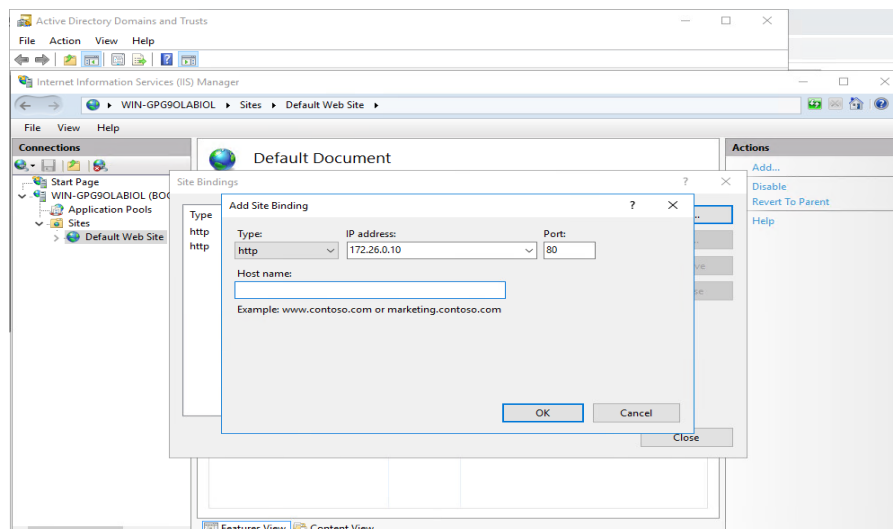
Step6: Go site and Default website page, and click the Default Document



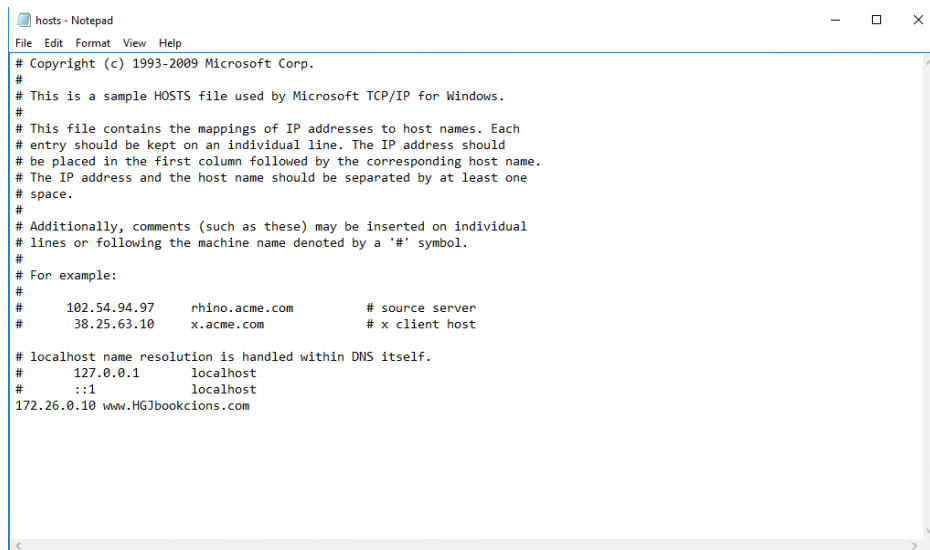
Step7: Right Click and press Add button, and type Home (Home page name).html



Step8: Right click the Default Web Site

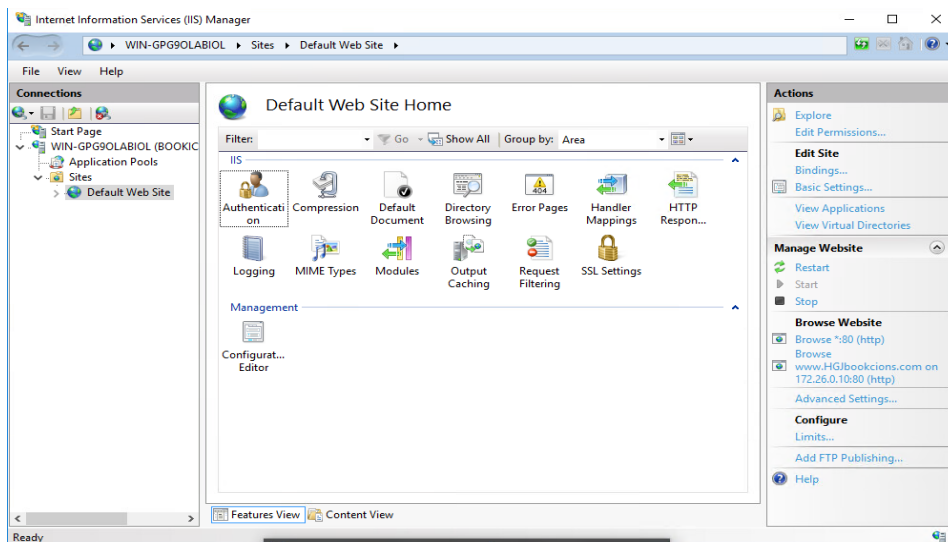


Step9: In ip address change to All Unassigned to Server ip address and type the URL address.

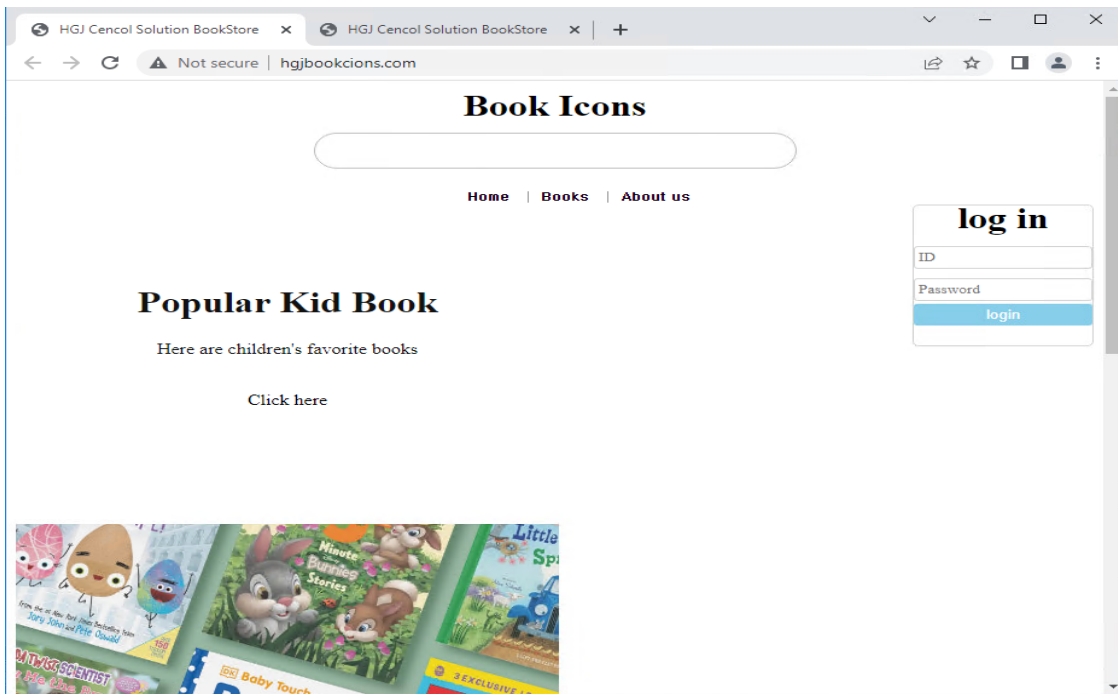


```
hosts - Notepad
File Edit Format View Help
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com       # source server
#       38.25.63.10       x.acme.com          # x client host
#
# localhost name resolution is handled within DNS itself.
#       127.0.0.1         localhost
#       ::1              localhost
172.26.0.10 www.HGJbookcions.com
```

Step10: Go Windows -> System32 -> drivers -> etc and open the host file, in the bottom add the Server ip address with URL address.

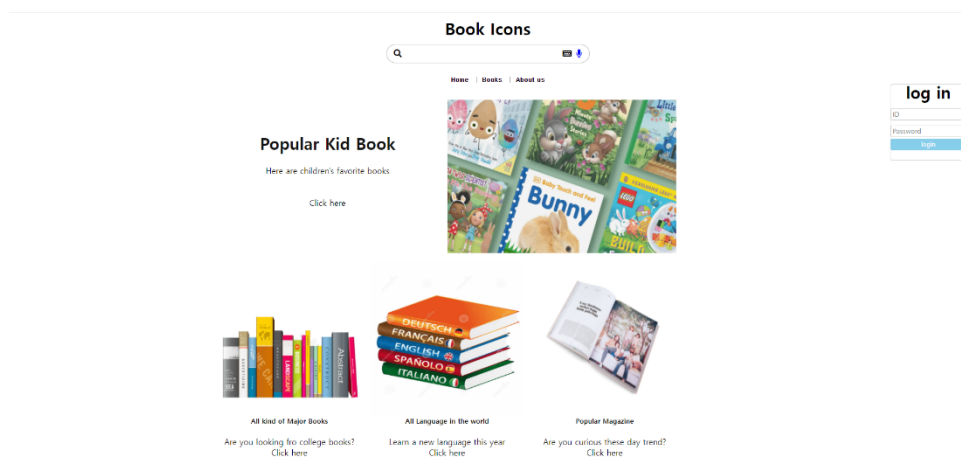


Step11: In the internet Information Serveries (iis) Manager, press start or Restart button



Step12: On the right side in the Actions, Press (URL) on (Server Ip address) http. In this case, www.HGJbookcions.com on 172.26.0.10:80 (http). As a result, we can see home page in browser

HTML5 CSS, JavaScript

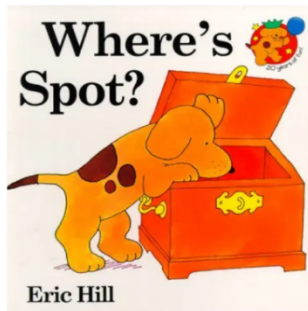


Book Icons



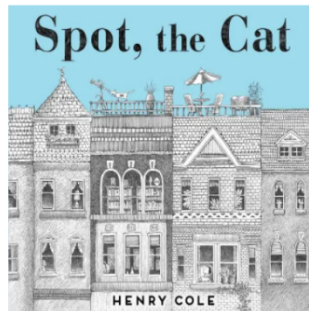
[Home](#) | [Books](#) | [About us](#)

Popular Kid Book



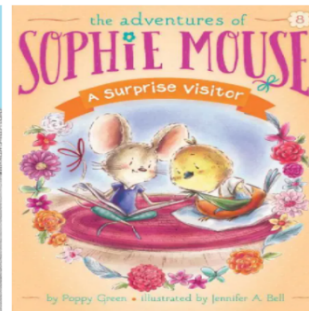
Where's Spot?

by Hill, Eric
[Click here](#)



Spot, the Cat

by Cole, Henry
[Click here](#)



A Surprise Visitor

The Adventures of Sophie Mouse
[Click here](#)

Language Book



I Love Korean

The series of short-term
[Click here](#)



Macmillan English 1

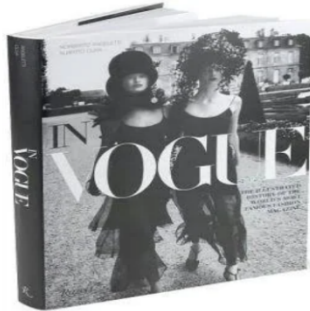
Language Book Paperback
[Click here](#)



Learn French

6 Books in 1
[Click here](#)

Popular Magazine



In Vogue

most Famous Fashion Magazine
[Click here](#)



Dazed Magazine

most influential independent fashion
[Click here](#)



100 Years of Fashion

100 Years of Fashion documents
[Click here](#)

Book Icons



[Home](#) | [Books](#) | [About us](#)

22W --Technologist Project (SEC. 004)



The HGJ Cencol Solution project team for Book Icon will consist of three members: Hanui Lee, Gavin Beckford, JaeHyeon Jeon. The HGJ Cencol project team was organized to achieve the customer needs and business goals of Book Icon and was formed by recruiting suitable personnel to carry out the project. This team can be disbanded if the customer's requirements are met. Each member has strengths in proposing and providing various IT solutions and strives to achieve the goals of the project. Efficient communication and cooperation among members will continue to take place for successful project

HTML5 Coding

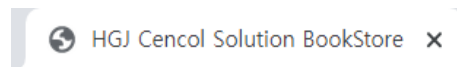
Home.html

Home page part

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8"/>
  <meta name="viewport" content="width=device-width">
  <title>HGJ Cencol Solution BookStore</title>
  <link href="SearchStylet.css" rel="stylesheet" type="text/css" />
  <style type="text/css">

    a{text-decoration:none; color:#000000;}
    a:hover{color:#ff0000;}

    /* nav tag */
    nav ul{padding-top:10px;}
    nav ul li {
      display:inline;
      border-left:1px solid #999;
      font:bold 12px Dotum;
      padding:0 10px;
    }
    nav ul li:first-child{border-left:none;}
  </style>
</head>
```



For title page, we put in HGJ Cencol Solution Bookstore, so we can check the name on the Internet tab.

In the link part, it brings up a CSS file named SearchStyle, so the settings named in all classes are migrated to the coding in this file. in the navigation area, Change the top margin to 10px, vertical column to horizontal column, display | on the left side of each menu (category display), font setting - 12px in bold, menu spacing, menu sorting, delete the leftmost |. as a result, head part is done.

```

<body>

<h1 class="Title">Book Icons</h1>
<div class="search">
  <i class="fas fa-search"></i>
  <input type="text">
  <i class="fas fa-keyboard"></i>
  <i class="fas fa-microphone"></i>
</div>

<nav>
  <ul class="MenuBar">
    <li><a href="home.html">Home </a></li>
    <li><a href="Kids Books.html">Books </a></li>
    <li><a href="about us.html">About us </a></li>
  </ul>
</nav>
<div class="main">
  <h1 class="logo">log in</h1>
  <div class="container">
    <input type="text" placeholder="ID" id="id" class="account">
    <input type="password" placeholder="Password" id="password" class="account">
    <button id="login" class="account">login</button>
    <p id="alert" class="account"> </p>
  </div>
</div>
<script src="script.js"></script>
<br>

```

Book Icons

[Home](#) | [Books](#) | [About us](#)

log in

In the first line from page, output the Book Icon according to the setting Class="title".

Use div to define the first area and follow the search settings and create a search window using i tag. Follow the fas fa-search, fas fa-keyboard, and fas fa-microphone settings, respectively.

Use div to define the first area and follow the Menmubar settings, and create a navigation tag, follow the Manubar settings, and press three buttons to create a home page and a books page and about us.html to move to home.html.

Use div to create an area, follow the main setting, output log in, follow the logo setting, and then use div to create a sub-area and follow the container setting with have an id tag, create a window that can be input, and the class follows the account, and it has a pass setting tag and the class follows the account.

Create a button below it, and the id follows login. At this time, class has an account, and the text statement shown is login. Use p to define a paragraph and follow the alert with id with class = account. This is a message according to the result after entering it. To activate the login window feature, load a JavaScript file with the script.js source.

```
<br>
<div class="test1">
  <div class="test2-1">
    <div class="test3-1">
      <div class="box1-1">
        <br><br>
        <h1 class="Title2">Popular Kid Book</h1>
        <h1-1 class="Title3">Here are children's favorite books</h1-1>
        <br><br><br>
        <ul class="Cleck">
          <li><a href="Kids Books.html">Click here </a></li>
        </ul>

      </div>
      <div class="box1-1">
        
      </div>
      <br>
    <div class="box1-2">
      
      <h5>All kind of Major Books</h5>
      <h5-1>Are you looking fro college books?</h5-1>
      <ul class="Cleck">
        <li><a href="Kids Books.html">Click here </a></li>
      </ul>
    </div>
    <div class="box2-2">
      
      <h5>All Language in the world </h5>
      <h5-1> Learn a new language this year </h5-1>
      <ul class="Cleck">
        <li><a href="Kids Books.html">Click here </a></li>
      </ul>
    </div>
    <div class="box3-2">
      
      <h5> Popular Magazine</h5>
      <h5-1> Are you curious these day trend?</h5-1>
      <ul class="Cleck">
        <li><a href="Kids Books.html">Click here </a></li>
      </ul>
    </div>

  </div>
</div>
</div>
```

The div with the outermost region is defined, and the class follows test1.

Declare an area with detailed settings of the outermost area, and class follows test2-1.

For the newly created area within the created area, the div is redefined, and the class follows test3-1.

Use div to create a region, and class defines the setting values according to box1-1.

Print out the text "Popular Kid Book" as the title. Below that, print out Here are children's favorite books as the body content. Create the button that follows the class "cleck" through "ui".

Show the Click here text, if users have the text to display and press it, it will go to a file named Kinds books.html, which is a book page. Set the div area to the right. Class follows box1-2. It brings up the image. The source is a file named p4.jpg with the class setting follows box2-2.

Popular Kid Book

Here are children's favorite books

[Click here](#)



After spacing, follow box1-2 setting through class through div commend, and p3.jpg. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading All Major Books under the image and print “Are you looking from college books?” with the small font size function of h5-1. Show the Click here text, if users have the text to display and press it, it will go to a file named Kinds books.html

Create the box2-2 setting through class through div commend, and p4.jpg. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading All Language in the world under the image and print “Learn a new language this year” with the small font size function of h5-1. Show the Click here text, if users have the text to display and press it, it will go to a file named Kinds books.html

Create the box2-2 setting through class through div commend, and p5.jpg. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading Popular Magazine under the image and print “Are you curious these day trend?” with the small font size function of h5-1. Show the Click here text, if users have the text to display and press it, it will go to a file named Kinds books.html

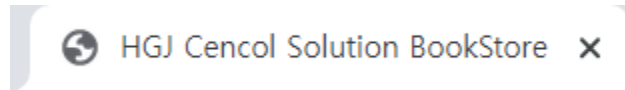


This concludes home.html coding.

Books Page part

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8"/>
  <meta name="viewport" content="width=device-width">
  <title>HGJ Cencol Solution BookStore</title>
  <link href="SearchStylet.css" rel="stylesheet" type="text/css" />
  <style type="text/css">
    a{text-decoration:none; color:#000000;}
    a:hover{color:#ff0000;}

    /* nav tag */
    nav ul{padding-top:10px;}
    nav ul li {
      display:inline;
      border-left:1px solid #999;
      font:bold 12px Dotum;
      padding:0 10px;
    }
    nav ul li:first-child{border-left:none;}
  </style>
</head>
```



The head part is the same as before. we put in HGJ Cencol Solution Bookstore, so we can check the name on the Internet tab.

In the link part, it brings up a CSS file named SearchStyle, so the settings named in all classes are migrated to the coding in this file. in the navigation area, Change the top margin to 10px, vertical column to horizontal column, display | on the left side of each menu (category display), font setting - 12px in bold, menu spacing, menu sorting, delete the leftmost |. as a result, head part is done.

```

<body>

  <h1 class="Title">Book Icons</h1>
  <div class="search">
    <i class="fas fa-search"></i>
    <input type="text">
    <i class="fas fa-keyboard"></i>
    <i class="fas fa-microphone"></i>
  </div>
  <nav>
    <ul class="MenuBar">
      <li><a href="HOME.html">Home </a></li>
      <li><a href="Kids Books.html">Books </a></li>
      <li><a href="about us.html">About us </a></li>
    </ul>
  </nav>
  <br>

</div>

```

Book Icons

[Home](#) | [Books](#) | [About us](#)

In the first line from page, output the Book Icon according to the setting Class="title".

Use div to define the first area and follow the search settings and create a search window using i tag. Follow the fas fa-search, fas fa-keyboard, and fas fa-microphone settings, respectively.

Use div to define the first area and follow the Menmubar settings, and create a navigation tag, follow the Manubar settings, and press three buttons to create a home page and a books page and about us.html to move to home.html.

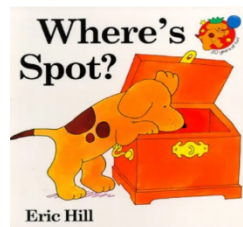
```

<div class="test1">
  <div class="test2-1">
    <div class="test3-1">
      <h1 class="Title2">Popular Kid Book</h1>
      <div class="box1-2">

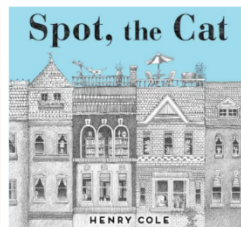
        
        <h5>Where's Spot?</h5>
        <h5-l>by Hill, Eric</h5-l>
        <ul class="Cleck">
          <li><a href="#">Click here </a></li>
        </ul>
      </div>
      <div class="box2-2">
        
        <h5>Spot, the Cat </h5>
        <h5-l> by Cole, Henry </h5-l>
        <ul class="Cleck">
          <li><a href="#">Click here </a></li>
        </ul>
      </div>
      <div class="box3-2">
        
        <h5> A Surprise Visitor</h5>
        <h5-l> The Adventures of Sophie Mouse</h5-l>
        <ul class="Cleck">
          <li><a href="#">Click here </a></li>
        </ul>
      </div>
    </div>
  </div>
</div>

```

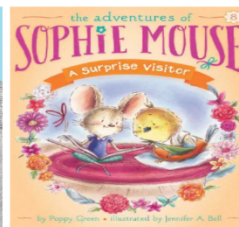
Popular Kid Book



Where's Spot?
by Hill, Eric
Click here



Spot, the Cat
by Cole, Henry
Click here



A Surprise Visitor
The Adventures of Sophie Mouse
Click here

The div with the outermost region is defined, and the class follows test1.

Declare an area with detailed settings of the outermost area, and class follows test2-1.

For the newly created area within the created area, the div is redefined, and the class follows test3-1. Print Popular Kid Book as the subject of this area.

Create the box1-2 setting through class through div commend, and Where's Spot.png. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading Where's Spot? under the image and print “by Hill, Eric” with the small font size function of h5-1. Show the Click here as text.

Create the box2-2 setting through class through div commend, and Spot, the Cat.png. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading Spot, the Cat under the image and print “by Cole, Henry” with the small font size function of h5-1. Show the Click here as text.

Create the box3-2 setting through class through div commend, and A Surprise Visitor.png.

Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading A Surprise Visitor under the image and print “by Cole, Henry” with the small font size function of h5-1. Show the Click here as text.

```
<div class="test1">
  <div class="test2-1">
    <div class="test3-1">
      <h1 class="Title2">Language Book</h1>
      <div class="box1-2">
        
          <h5>I Love Korean</h5>
          <h5-l>The series of short-term</h5-l>
          <ul class="Cleck">
            <li><a href="#">Click here </a></li>
          </ul>
        </div>
        <div class="box2-2">
          
          <h5>Macmillan English 1 </h5>
          <h5-l> Language Book Paperback </h5-l>
          <ul class="Cleck">
            <li><a href="#">Click here </a></li>
          </ul>
        </div>
        <div class="box3-2">
          
          <h5> Learn French</h5>
          <h5-l> 6 Books in 1</h5-l>
          <ul class="Cleck">
            <li><a href="#">Click here </a></li>
          </ul>
        </div>
      </div>
    </div>
  </div>
</div>
```

The div with the outermost region is defined, and the class follows test1.

Declare an area with detailed settings of the outermost area, and class follows test2-1.

For the newly created area within the created area, the div is redefined, and the class follows test3-1. Print Language Book as the subject of this area.

Create the box1-2 setting through class through div commend, and I Love Korean.jpg. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading I Love Korean under the image and print “The series of short-term” with the small font size function of h5-1. Show the Click here as text.

Create the box2-2 setting through class through div commend, and Spot, the Macmillan English.jpg. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the Macmillan English 1 under the image and print “Language Book Paperback” with the small font size function of h5-1. Show the Click here as text.

Create the box3-2 setting through class through div commend and Learn French.jpg. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading Learn French under the image and print “6 Books in 1” with the small font size function of h5-1. Show the Click here as text.

Language Book



The div with the outermost region is defined, and the class follows test1.

Declare an area with detailed settings of the outermost area, and class follows test2-1.

For the newly created area within the created area, the div is redefined, and the class follows test3-1. Print Popular Magazine as the subject of this area.

Create the box1-2 setting through class through div commend, and In Vogue.png. Create an image with a jpg source and follow the box2-2 setting for class. Output text with the heading In Vogue under the image and print “most Famous Fashion Magazine” with the small font size function of h5-1. Show the Click here as text.

Create the box2-2 setting through class through div commend, and Spot, the Macmillan Dazed Magazine.jpg. Create an image with a jpg source and follow the box2-2 setting for class. Output text with Dazed Magazine under the image and print “most influential independent fashion” with the small font size function of h5-1. Show the Click here as text.

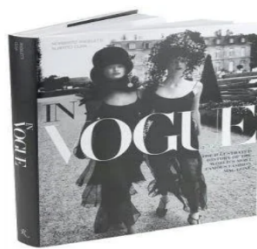
Create the box3-2 setting through class through div commend, and 100 Years of Fashion.jpg.

Create an image with a jpg source and follow the box2-2 setting for class. Output text with the

heading Learn French under the image and print “100 Years of Fashion documents” with the small font size function of h5-1. Show the Click here as text.

This concludes books page coding.

Popular Magazine



In Vogue

most Famous Fashion Magazine
[Click here](#)



Dazed Magazine

most influential independent fashion
[Click here](#)



100 Years of Fashion

100 Years of Fashion documents
[Click here](#)

About us page

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8"/>
  <meta name="viewport" content="width=device-width">
  <title>HGJ Cencol Solution BookStore</title>
  <link href="SearchStylet.css" rel="stylesheet" type="text/css" />
  <style type="text/css">

    a{text-decoration:none; color:#000000;}
    a:hover{color:#ff0000;}

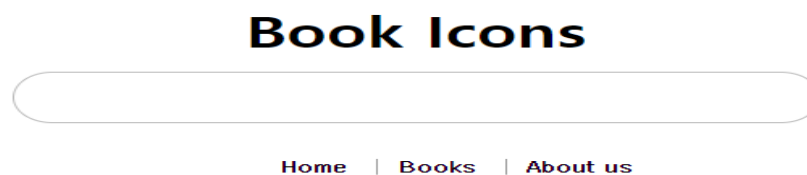
    /* nav tag */
    nav ul{padding-top:10px;}
    nav ul li {
      display:inline;
      border-left:1px solid #999;
      font:bold 12px Dotum;
      padding:0 10px;
    }
    nav ul li:first-child{border-left:none;}
  </style>
</head>
```

The head part is the same as before. we put in HGJ Cencol Solution Bookstore, so we can check the name on the Internet tab.

In the link part, it brings up a CSS file named SearchStyle, so the settings named in all classes are migrated to the coding in this file. in the navigation area, Change the top margin to 10px, vertical column to horizontal column, display | on the left side of each menu (category display), font setting - 12px in bold, menu spacing, menu sorting, delete the leftmost |. as a result, head part is done.

```
<body>

  <h1 class="Title">Book Icons</h1>
  <div class="search">
    <i class="fas fa-search"></i>
    <input type="text">
    <i class="fas fa-keyboard"></i>
    <i class="fas fa-microphone"></i>
  </div>
  <nav>
    <ul class="MenuBar">
      <li><a href="HOME.html">Home </a></li>
      <li><a href="Kids Books.html">Books </a></li>
      <li><a href="about us.html">About us </a></li>
    </ul>
  </nav>
  <br>
</div>
```



In the first line from page, output the Book Icon according to the setting Class="title".

Use div to define the first area and follow the search settings and create a search window using i tag. Follow the fas fa-search, fas fa-keyboard, and fas fa-microphone settings, respectively.

Use div to define the first area and follow the Menmubar settings, and create a navigation tag, follow the Manubar settings, and press three buttons to create a home page and a books page and about us.html to move to home.html.

```
<div class="test1">
  <div class="test2-1">
    <div class="test3-1">
      <div class="box1-1">
        <br><br><br>
        
        <br><br><br>
      </div>
      <div class="box1-1">
        <h1 class="Title">22W --Technologist Project (SEC. 004)</h1>
        <h1 class="firstpara">
          The HGJ Cencol Solution project team for Book Icon will consist of three members: Hanni Lee, Gavin Beckford, JaeHyeon Jeon. The HGJ Cencol project team was organized to achieve the customer needs and business goals of Book
        </h1>
      </div>
    </div>
  </div>
</div>
</body>
</html>
```



22W --Technologist Project (SEC. 004)

The HGJ Cencol Solution project team for Book Icon will consist of three members: Hanui Lee, Gavin Beckford, JaeHyeon Jeon. The HGJ Cencol project team was organized to achieve the customer needs and business goals of Book Icon and was formed by recruiting suitable personnel to carry out the project. This team can be disbanded if the customer's requirements are met. Each member has strengths in proposing and providing various IT solutions and strives to achieve the goals of the project. Efficient communication and cooperation among members will continue to take place for successful project

The div with the outermost region is defined, and the class follows test1.

Declare an area with detailed settings of the outermost area, and class follows test2-1.

For the newly created area within the created area, the div is redefined, and the class follows test3-1.

Use div to create a region, and class defines the setting values according to box1.

Class follows box1-1. It brings up the image. The source is a file named cap.jpg with the class setting follows box2-2.

Print out the text "22W --Technologist Project (SEC. 004) " as the title. Below that, print out explanation of our Capstone project. as the body content.

CSS

```
3 * {
    box-sizing: border-box;
-}
3 .firstpara{
    font-size:1em;
    color: black;
    display: block;
    text-align: left;
    margin: auto;
-}
3 .Title {
    display: block;
    text-align: center;
    margin: auto;
-}
3 .Title2 {
    font-size: 32px;
    margin-left: auto;
    margin-right: auto;
    text-align: center;
-}
3 .Title3 {
    margin-left: auto;
    margin-right: auto;
    text-align: center;
-}
3 .MenuBar {
    display: block;
    text-align: center;
    margin: auto;
-}
```

Firstpara is the body of about us page. The color of the text is black, and the element is displayed as a block. The space around is automatically set to the left of the character alignment.

Title, Title2, and Title3 are each character settings for the h tag. Title2 is a subject in div and has a large font size. And it is always in the center.

```

.MenuBar {
  display: block;
  text-align: center;
  margin: auto;
}
.Cleck {
  list-style: none;
  padding-left: 0px;
  font-size: 16px;
  display: block;
  text-align: bottom;
  margin: auto;
}

```

Munubar is a sort setting for the page item menu. Block settings make it horizontal rather than vertical.

cleck is the setting for click here. The li tag automatically generates a ball on the left based on the default value, but I removed it with list-style: none.

```

input {
  width: 100%;
  border-radius: 20px;
  border: 1px solid #bbb;
  margin: 10px 0;
  padding: 10px 12px;
  font-family: fontAwesome;
}
.fa-search {
  position: absolute;
  left: 15px;
  top: 20px;
  margin: 0;
}
.fa-keyboard {
  position: absolute;
  right: 35px;
  top: 20px;
}
.fa-microphone {
  position: absolute;
  right: 15px;
  top: 20px;
  color: blue;
}

```

Input, fa-search, keyboard, and microphone are settings for the search bar. Fa-search, keyboard, and microphone are each setting for the left magnifying glass, keyboard, and microphone.

```

.test1 {
    display: flex;
    justify-content: center;
    align-items: top;
    min-height: 100vh;
    height: 300px;
}
.test1-1 {
    display: grid;
    place-items: center;
    min-height: 100vh;
    background: #ddd;
    height: 300px;
}
.test2 {
    display: table-cell;
    text-align: center;
    vertical-align: middle;
}
.test3 {
    display: inline-block;
    color: #fff;
}

```

Tests 1, 1-1, 2, and 3 are the div area settings in the body area on all pages. The size is large as a setting for the overall area where the content will be placed.

```

.box1, .box2, .box3{
    width: 450px;
    height: 300px;
    background: #f00;
    color: #111;
    text-align: center;
    float: left;
    margin-right: 10px;
}
.box1-1, .box2-1, .box3-1{
    width: 450px;
    height: 300px;

    color: #111;
    text-align: center;
    float: left;
    margin-right: 10px;
    margin-top: 10px;
}
.box1-2, .box2-2, .box3-2{
    width: 300px;
    height: 300px;

    color: #111;
    text-align: center;
    float: left;
    margin-right: 10px;
    margin-top: 10px;
}

```

The box setting is the div area setting for placing content in the area that was caught in the test. If two contents are placed in one row, the size is 450x300, and if three contents are placed in one row, it is 300x300.

```
] .main {
    display: block;
    float: right;
    margin: auto;
    width: 150px;
    height: 150px;
    display: flex;
    justify-content: center;
    align-items: center;
    flex-direction: column;
    border: 1px solid lightgrey;
    border-radius: 5px;
-}

[ .logo {
    margin-top: 0px;
    margin-bottom: 1px;
-}

[ #login {
    width: 100%;
    background-color: skyblue;
    border-color: transparent;
    color: white;
-}

[ #login2 {
    font-size: 16px;
    width: 100%;
    background-color: skyblue;
    border-color: transparent;
    color: white;
-}

[ .account {
    display: block;
    margin-bottom: 3px;
    padding: 3px;
    border: 1px solid lightgray;
    border-radius: 3px;
-}

[ #alert {
    border-color: transparent;
-}
```

Configuration for login area.

Java script

```
const id = document.getElementById('id')
const password = document.getElementById('password')
const login = document.getElementById('login')
let errStack = 0;

login.addEventListener('click', () => {
  if (id.value === 'Admin') {
    if (password.value === 'Admin') {
      alert('Login Successful!')
    }
    else {
      alert('Please check your ID and Password')
      errStack++;
    }
  }
  else {
    alert('The account does not exist.')
  }

  if (errStack >= 5) {
    alert('Error logging in 5 times, try to find the password.')
  }
})
```

Get the id data value from the id tag.

Get the password data value from the password tag.

When the user presses the click button, the if statement is activated.

Login Successful if the ID is Admin password! print out the phrase

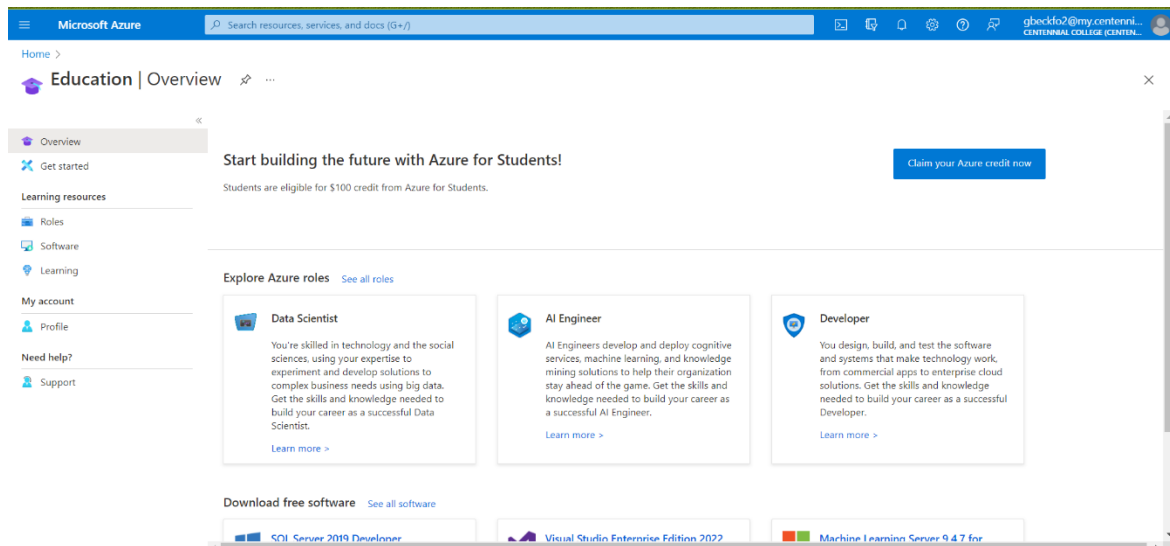
If the ID is Admin or password is incorrect, please check your ID and password will be printed.

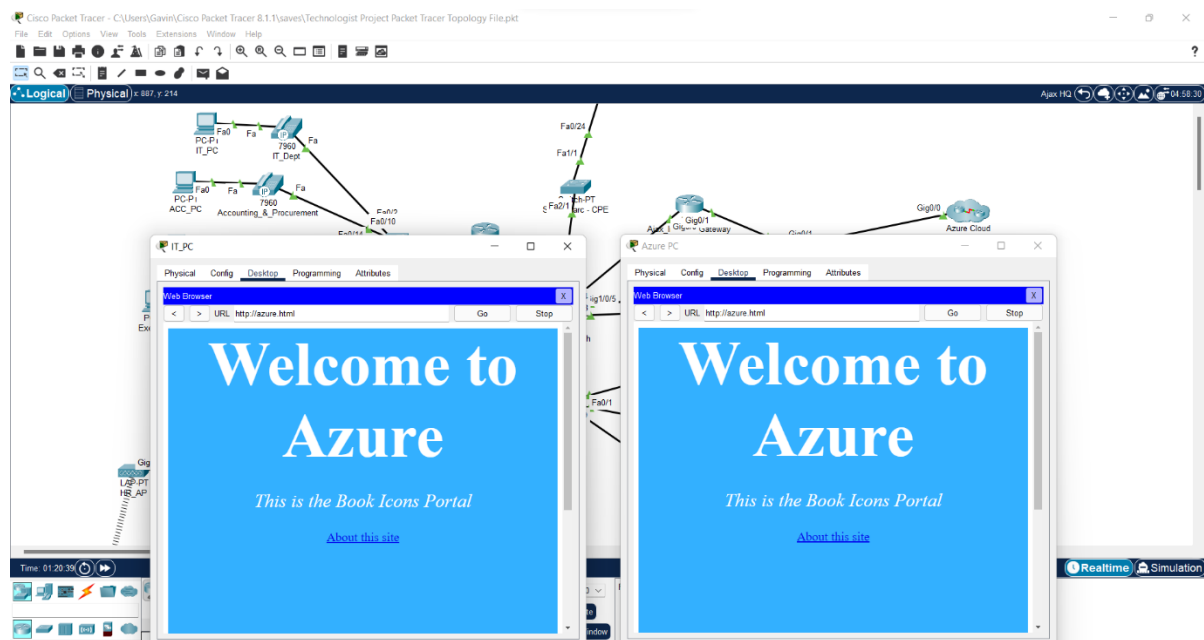
If both the ID and the secret number are incorrect, the account does not exist. will be displayed.

If the ID is correct, but the password is incorrect more than 5 times, the phrase Error logging in 5 times, try to find the password.

Backup and Disaster Recovery

The availability, confidentiality, and integrity of data is critical to any modern organization. HGJ Cencol understands the importance of having a strategic and reliable backup and disaster recovery plan, and how that plan will protect Book Icons information and organisational assets, exacerbated by the fact that the organizations business model is ecommerce and requires a high availability environment. We will implement backup and recovery using warm backup site on the Microsoft Azure Cloud. Microsoft Azure offers end-to-end backup and recovery solutions over a secure, scalable, and cost-effective solution.

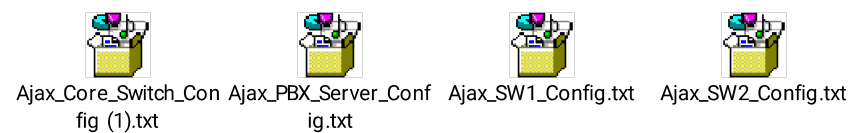




N.B. The complete process could not be completed due to restrictions with student account

Hardware Configuration Files:

Ajax:



Calgary:



Edmonton:



Edmonton_Core_Switch_Config.txt



Edmonton_PBX_Server_Config.txt



Edmonton_SW1_Config.txt

Mississauga:



Mississauga_Core_Switch_Config (1).txt



Mississauga_PBX_Server_Config.txt



Mississauga_SW1_Config.txt



Mississauga_SW2_Config.txt

Montreal:



Montreal_Core_Switch_Config (1).txt



Montreal_PBX_Server_Config.txt



Montreal_SW1_Config.txt

Quebec City:



QuebecC_Core_Switch_Config.txt



QuebecC_PBX_Server_Config.txt



QuebecC_SW1_Config.txt

Toronto:



Toronto_Core_Switch_Config (1).txt



Toronto_PBX_Server_Config.txt



Toronto_SW1_Config.txt

Server Farm:



Server_Farm_1 (1).txt



Server_Farm_2 (1).txt

Internet gateway:



Internet_Gateway_Con
fig (1).txt

Public gateway:



Public Router Config
(1).txt

Addressing Table:



HGJ_Cencol
Subnetting Scheme (3