Student name: Ennio da Silva Vitor

Operating Systems

Continuous Assessment 2

Server virtualization / Active Directory Domain Controller

2016

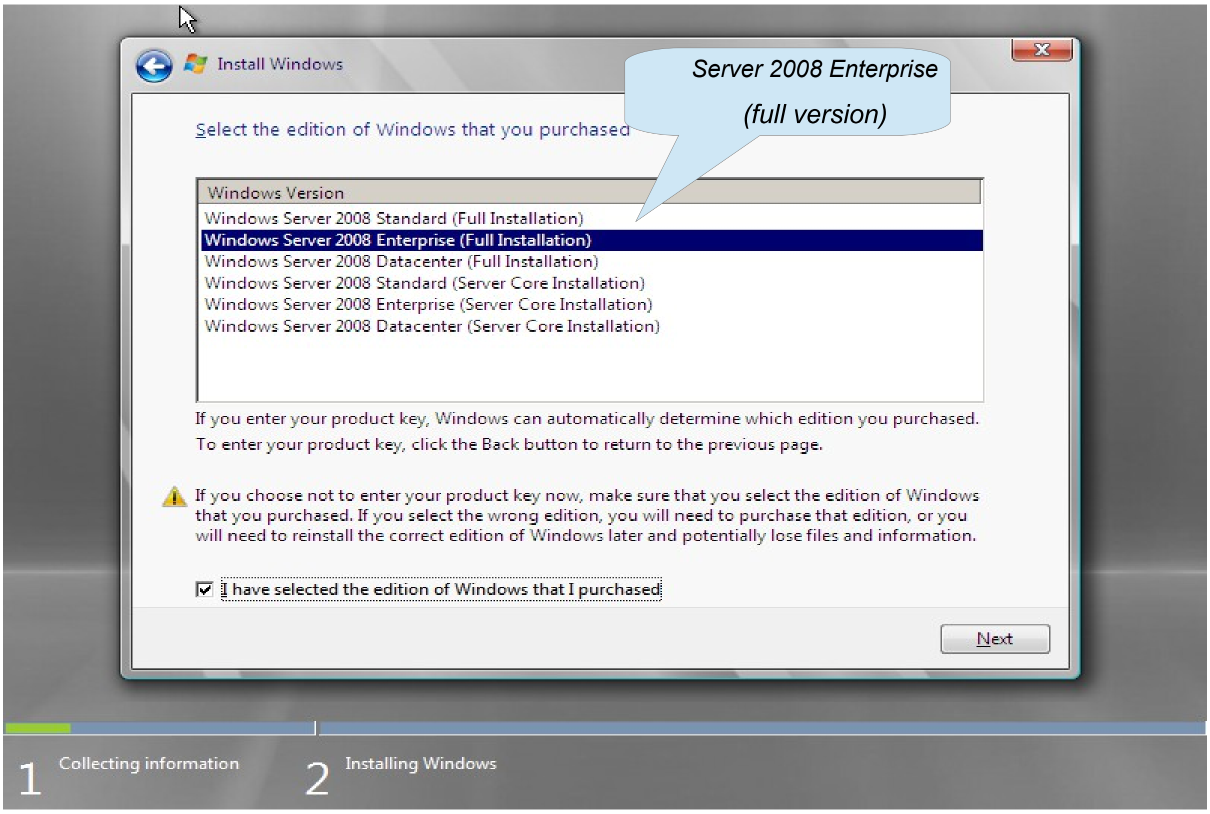
Module Title:	Operating Systems
Project Title:	**Server virtualization / Active Directory Domain Controller**
Project Date:	Wednesday 26 October 2016
Assignment Compiler:	Mr. Michael Weiss
Weighting:	30% of total CA grade
Due Date:	Sunday 6th November 2016 (11:55 pm)

Project Introduction:

Scenario: You are the assistant to the Network Administrator of a busy product services company. You are required to build a fully operational Server that will be running as a Domain Controller for the Network. You will be required to use the Domain Controller to set up user accounts for two different departments within the company and these accounts must be placed into groups and Organizational Units. You will create network resources (a shared folder) for each of the two departments and you will assign access to these resources based on group membership. You will also set up two security policies for the entire Domain (*password policy* and *account lockout policy*). Additionally, provide the explanation and rationale for the policy settings that you choose.

Part A: Specific Requirements for the Domain Controller

1. **Install** 1 virtual server (Using virtualization software). Use *Server 2008 Enterprise (full version)*



Server 2008 Enterprise (full version)

Select the edition of Windows that you purchased

Windows Version
Windows Server 2008 Standard (Full Installation)
Windows Server 2008 Enterprise (Full Installation)
Windows Server 2008 Datacenter (Full Installation)
Windows Server 2008 Standard (Server Core Installation)
Windows Server 2008 Enterprise (Server Core Installation)
Windows Server 2008 Datacenter (Server Core Installation)

If you enter your product key, Windows can automatically determine which edition you purchased. To enter your product key, click the Back button to return to the previous page.

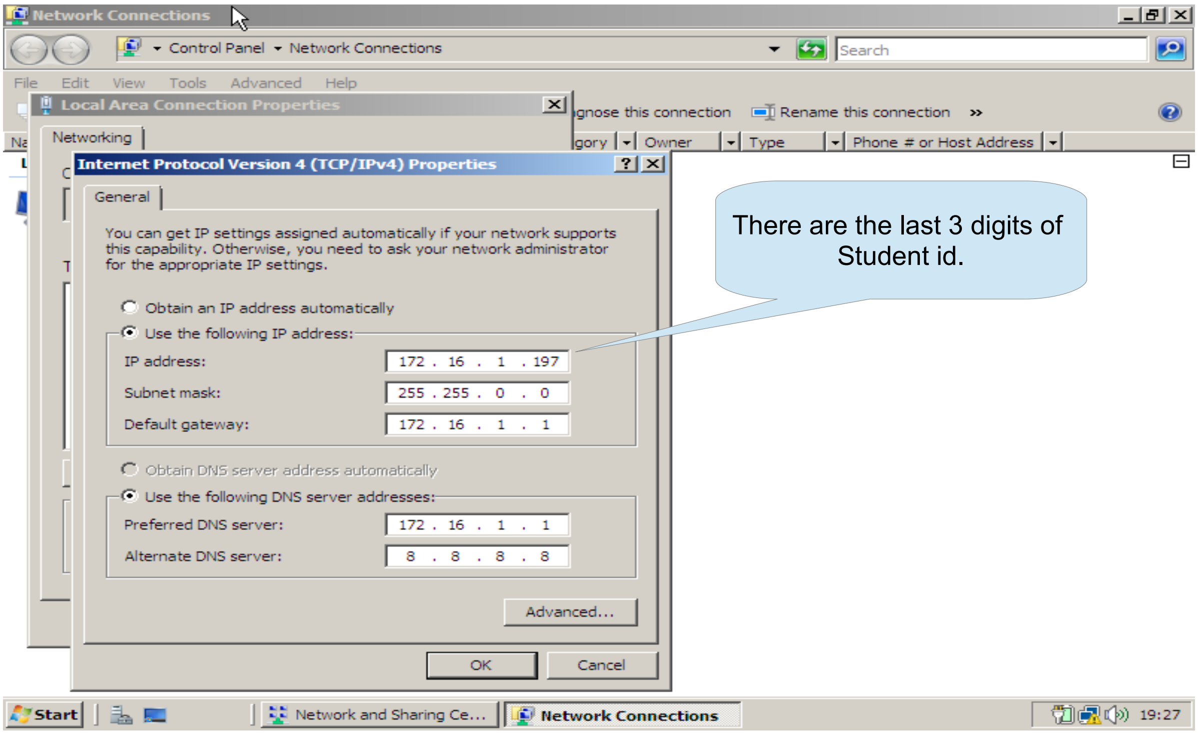
If you choose not to enter your product key now, make sure that you select the edition of Windows that you purchased. If you select the wrong edition, you will need to purchase that edition, or you will need to reinstall the correct edition of Windows later and potentially lose files and information.

☑ I have selected the edition of Windows that I purchased

2. **Assign** the server static IP addressing using the following configuration.

   1st server address: 172.16.1.1yz/16 or 172.16.1.2**yz**/16 where **yz** is the last two digits of your student number. For example, my student number is 2020123 so I would use 172.16.1.223.

   The /16 indicates the subnet mask. Use 172.16.1.1 as the default gateway, for the *preferred DNS Server* address use 172.16.1.1 and for or the alternate DNS Server use 8.8.8.8


Network Connections
Control Panel ▸ Network Connections
Search
File Edit View Tools Advanced Help
Local Area Connection Properties
Networking
gnose this connection
Rename this connection
gory Owner Type Phone # or Host Address
Start
Network and Sharing Ce...
Network Connections
19:27

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address:	172 . 16 . 1 . 197
Subnet mask:	255 . 255 . 0 . 0
Default gateway:	172 . 16 . 1 . 1

○ Obtain DNS server address automatically

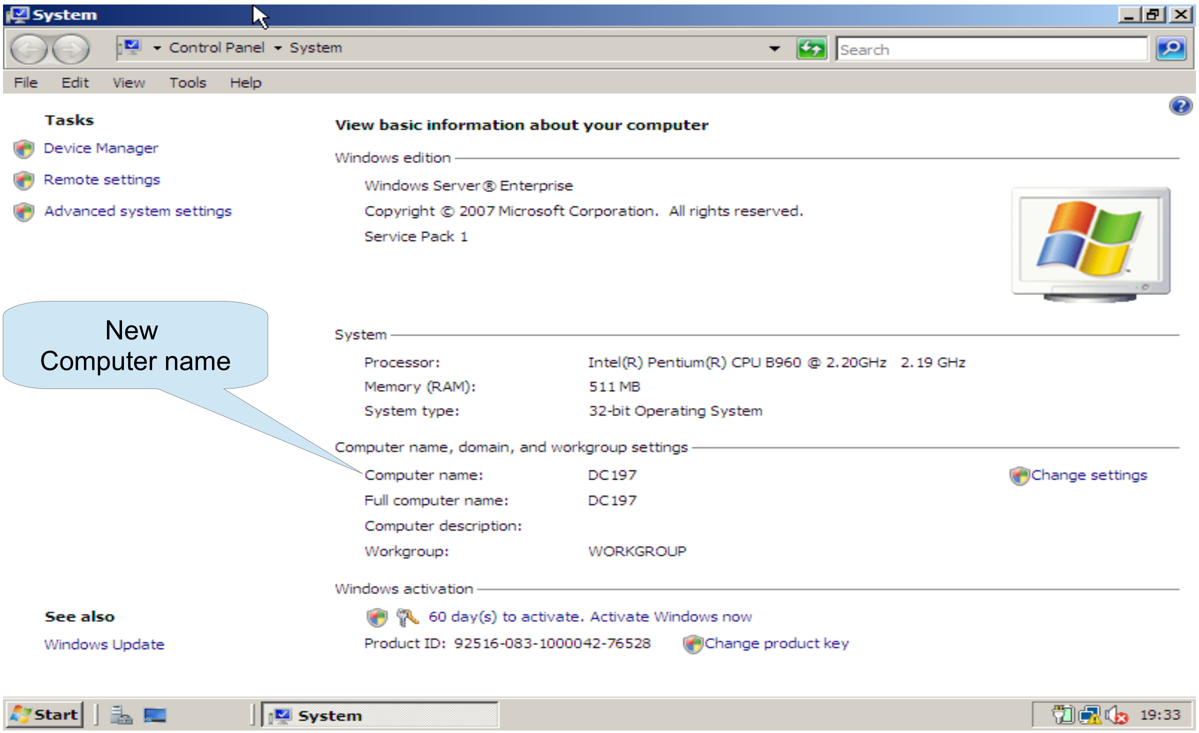
● Use the following DNS server addresses:

Preferred DNS server:	172 . 16 . 1 . 1
Alternate DNS server:	8 . 8 . 8 . 8

Advanced... OK Cancel

There are the last 3 digits of Student id.

3. **Rename** the server using the letters DC followed by the last three digits of your student number as the server name. For example, if my student number is 2010123 I would name my server DC123.



View basic information about your computer

Windows edition

Windows Server® Enterprise

Copyright © 2007 Microsoft Corporation. All rights reserved.

Service Pack 1

System

Processor:	Intel(R) Pentium(R) CPU B960 @ 2.20GHz 2.19 GHz
Memory (RAM):	511 MB
System type:	32-bit Operating System

Computer name, domain, and workgroup settings

Computer name:	DC197
Full computer name:	DC197
Computer description:	
Workgroup:	WORKGROUP

Windows activation

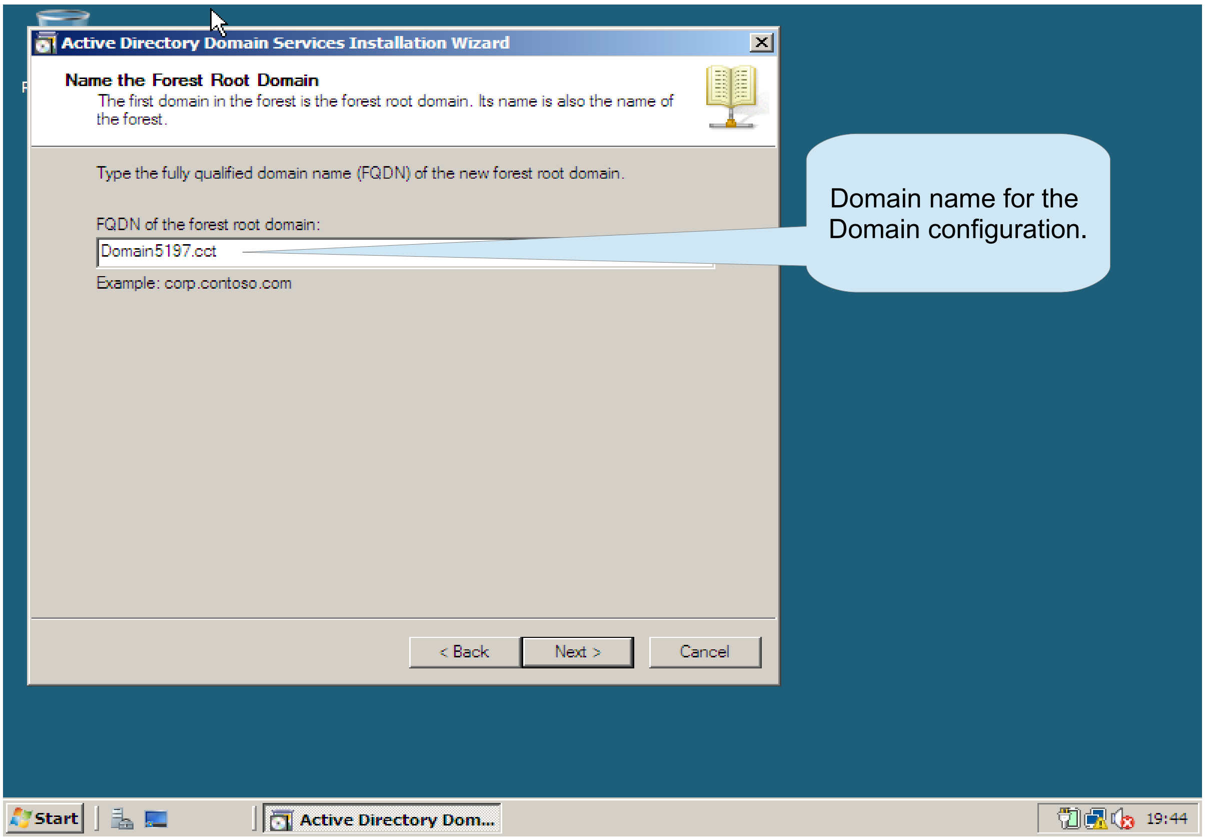
60 day(s) to activate. Activate Windows now

Product ID: 92516-083-1000042-76528 Change product key

New Computer name

4. **Convert** the server into a Domain Controller. Make sure that the DNS service is installed during the DC installation procedure (in other words your server will act as its own DNS server and the DNS service will get installed at the same time that Active Directory is installed). You will now create an Active Directory domain:

   Use the name Domain**wxyz.cct** where **wxyz** are the last 4 numbers of your student number (Example: if your student number is 2020123 you will use the name Domain0123).



Active Directory Domain Services Installation Wizard

Name the Forest Root Domain

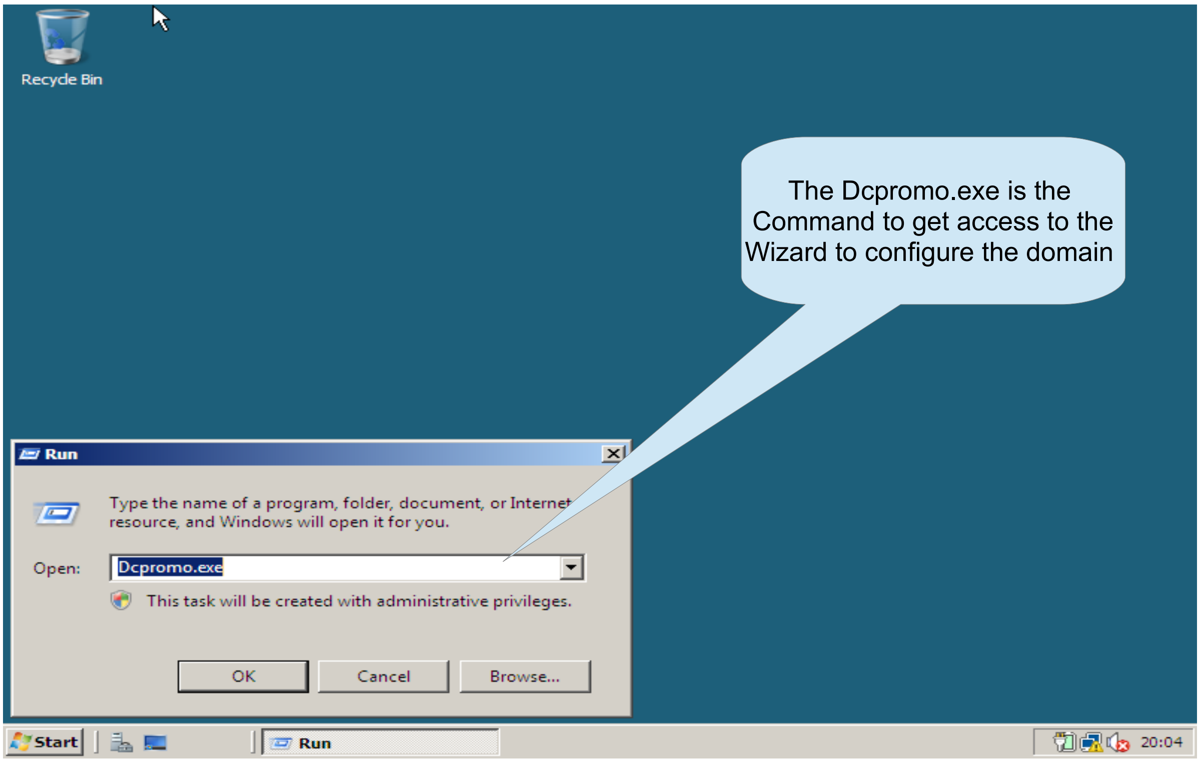
The first domain in the forest is the forest root domain. Its name is also the name of the forest.

Type the fully qualified domain name (FQDN) of the new forest root domain.

FQDN of the forest root domain: Domain5197.cct

Example: corp.contoso.com

Domain name for the Domain configuration.



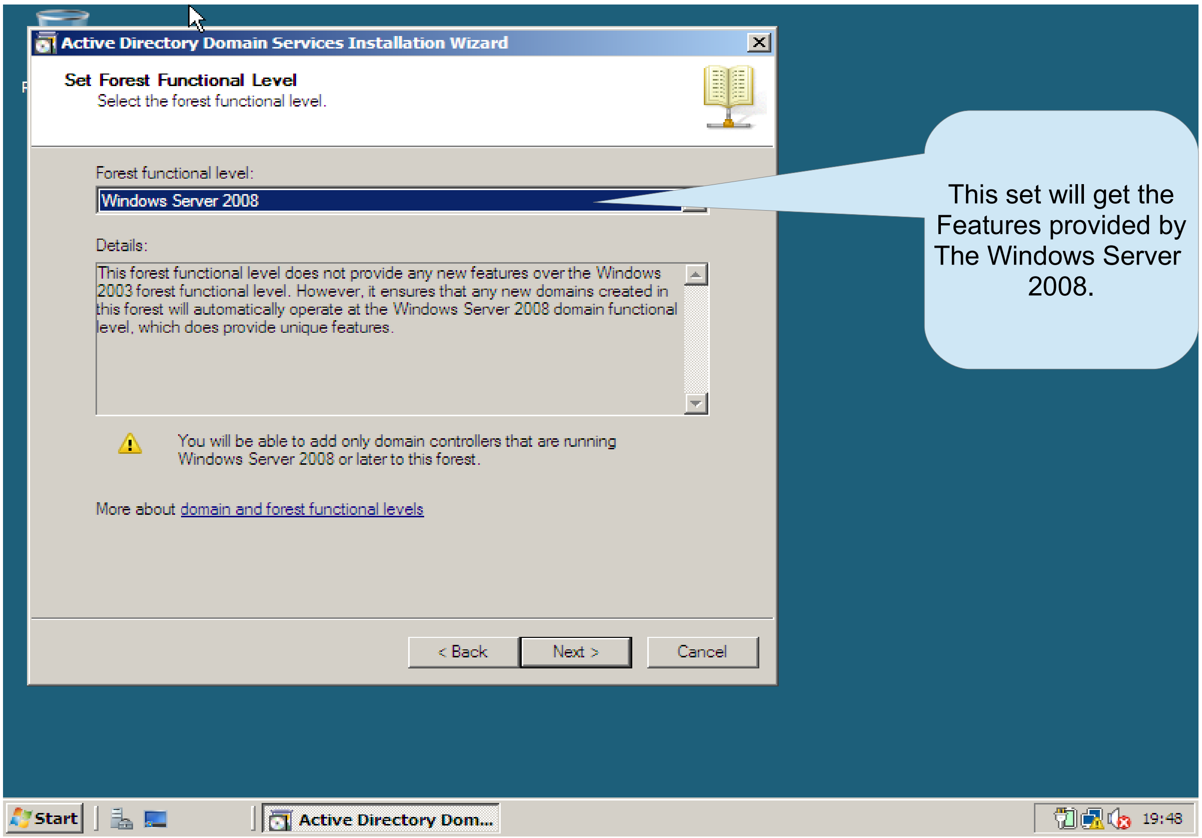
Run

Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.

Open: Dcpromo.exe

This task will be created with administrative privileges.

The Dcpromo.exe is the Command to get access to the Wizard to configure the domain



Set Forest Functional Level

Select the forest functional level.

Forest functional level:

Windows Server 2008

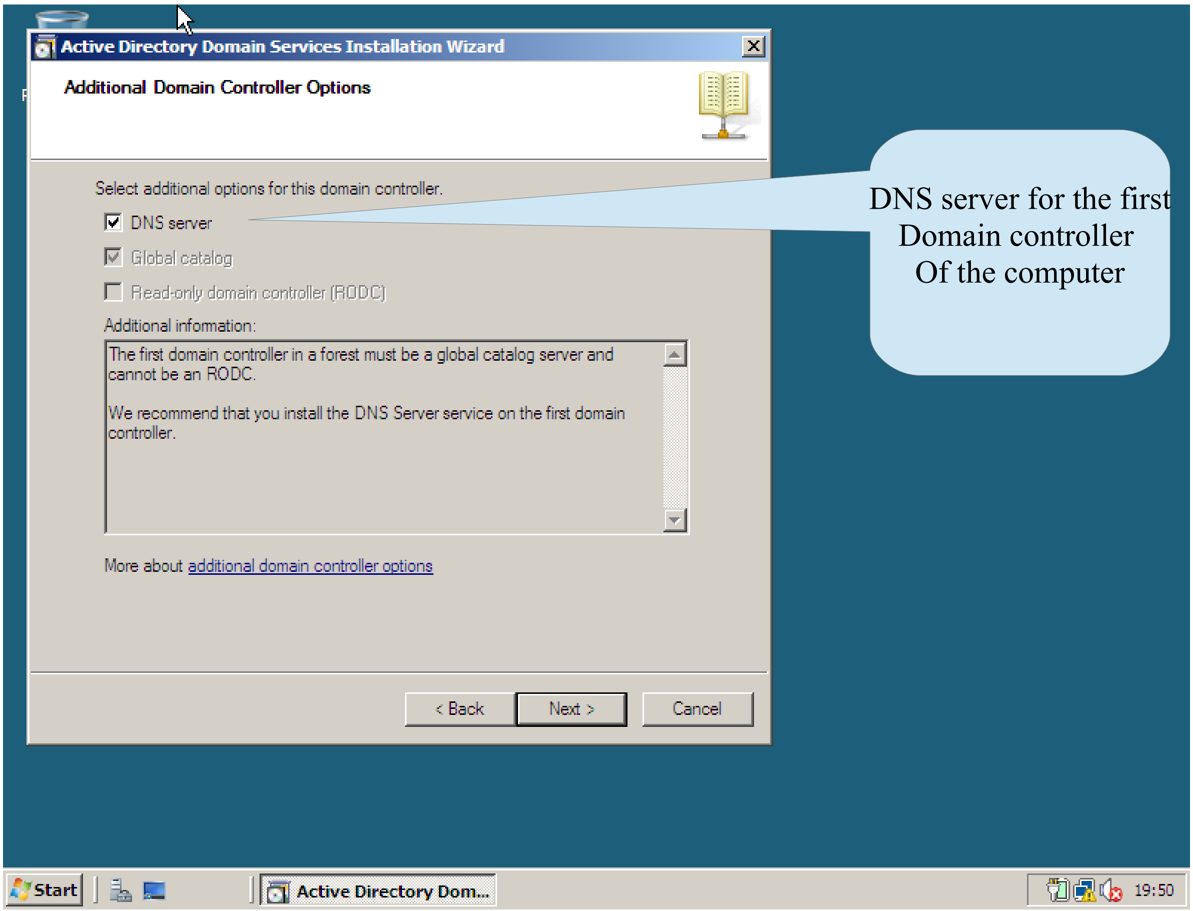
Details:

This forest functional level does not provide any new features over the Windows 2003 forest functional level. However, it ensures that any new domains created in this forest will automatically operate at the Windows Server 2008 domain functional level, which does provide unique features.

You will be able to add only domain controllers that are running Windows Server 2008 or later to this forest.

More about domain and forest functional levels

This set will get the Features provided by The Windows Server 2008.



Additional Domain Controller Options

Select additional options for this domain controller.

☑ DNS server

☑ Global catalog

☐ Read-only domain controller (RODC)

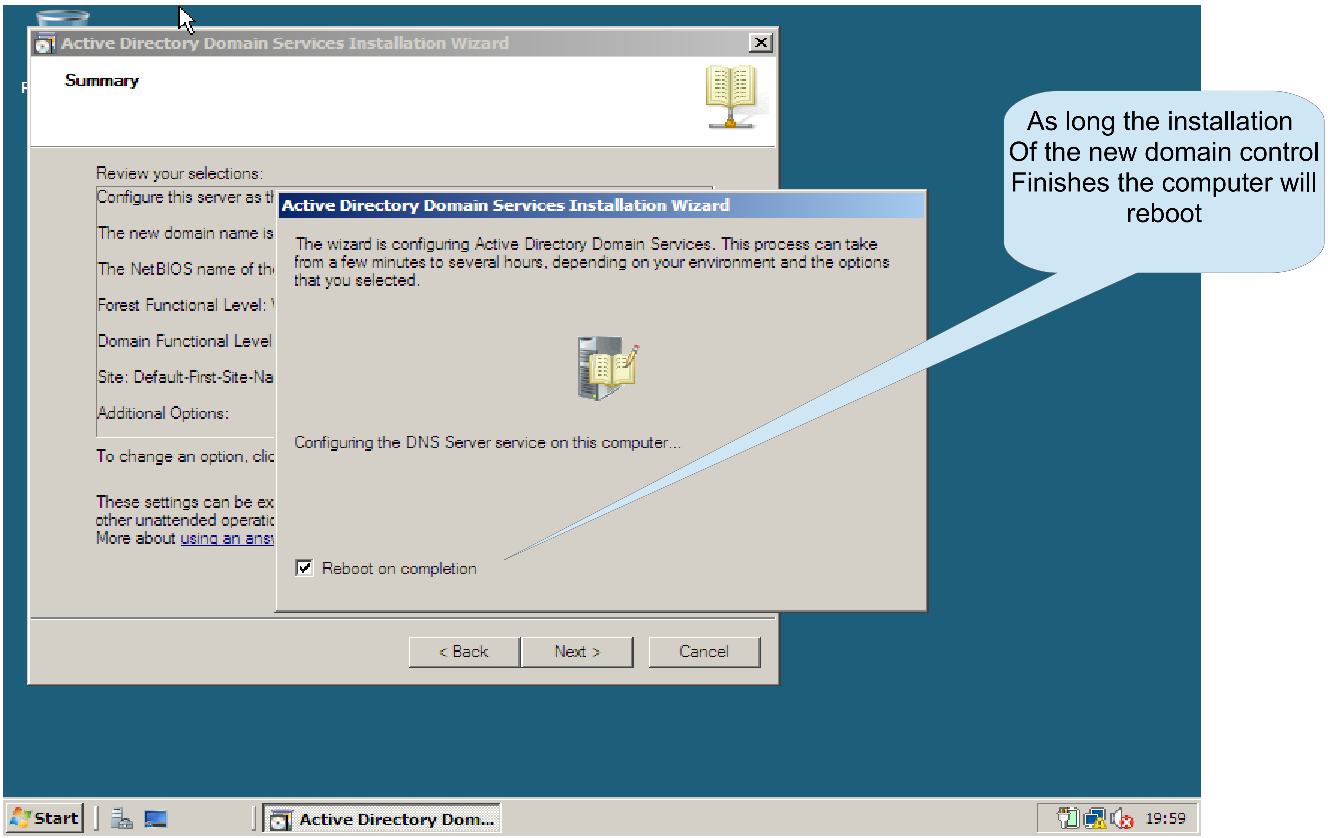
Additional information:

The first domain controller in a forest must be a global catalog server and cannot be an RODC.

We recommend that you install the DNS Server service on the first domain controller.

More about additional domain controller options

DNS server for the first Domain controller Of the computer



Active Directory Domain Services Installation Wizard

Summary

Review your selections:

Configure this server as t

The new domain name is

The NetBIOS name of th

Forest Functional Level:

Domain Functional Level

Site: Default-First-Site-Na

Additional Options:

To change an option, clic

These settings can be ex
other unattended operati
More about using an ans

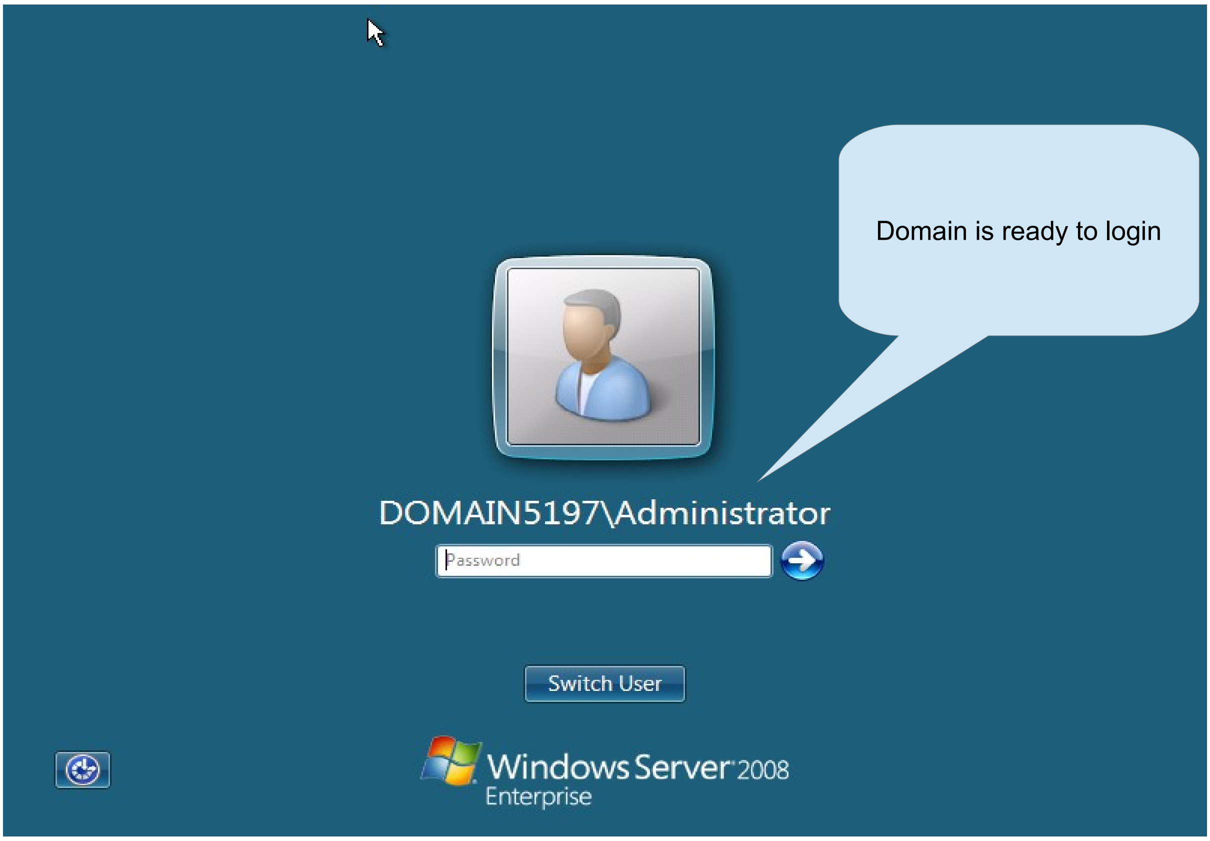
Active Directory Domain Services Installation Wizard

The wizard is configuring Active Directory Domain Services. This process can take from a few minutes to several hours, depending on your environment and the options that you selected.

Configuring the DNS Server service on this computer...

☑ Reboot on completion

As long the installation
Of the new domain control
Finishes the computer will
reboot

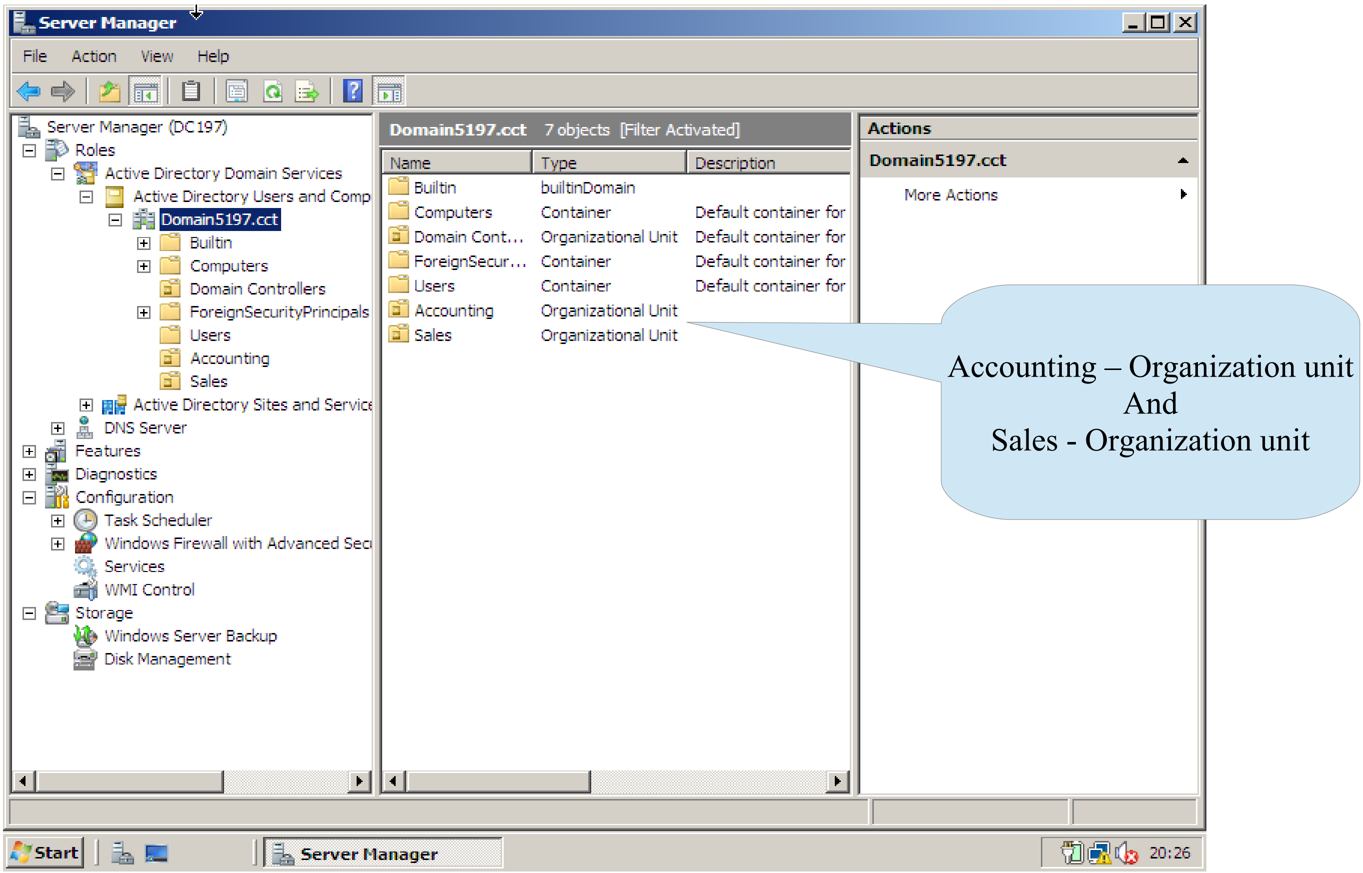


DOMAIN5197\Administrator

Domain is ready to login

Once the Domain Controller has rebooted perform the following tasks:

5. **Create** two Organizational units as specified on the next page.



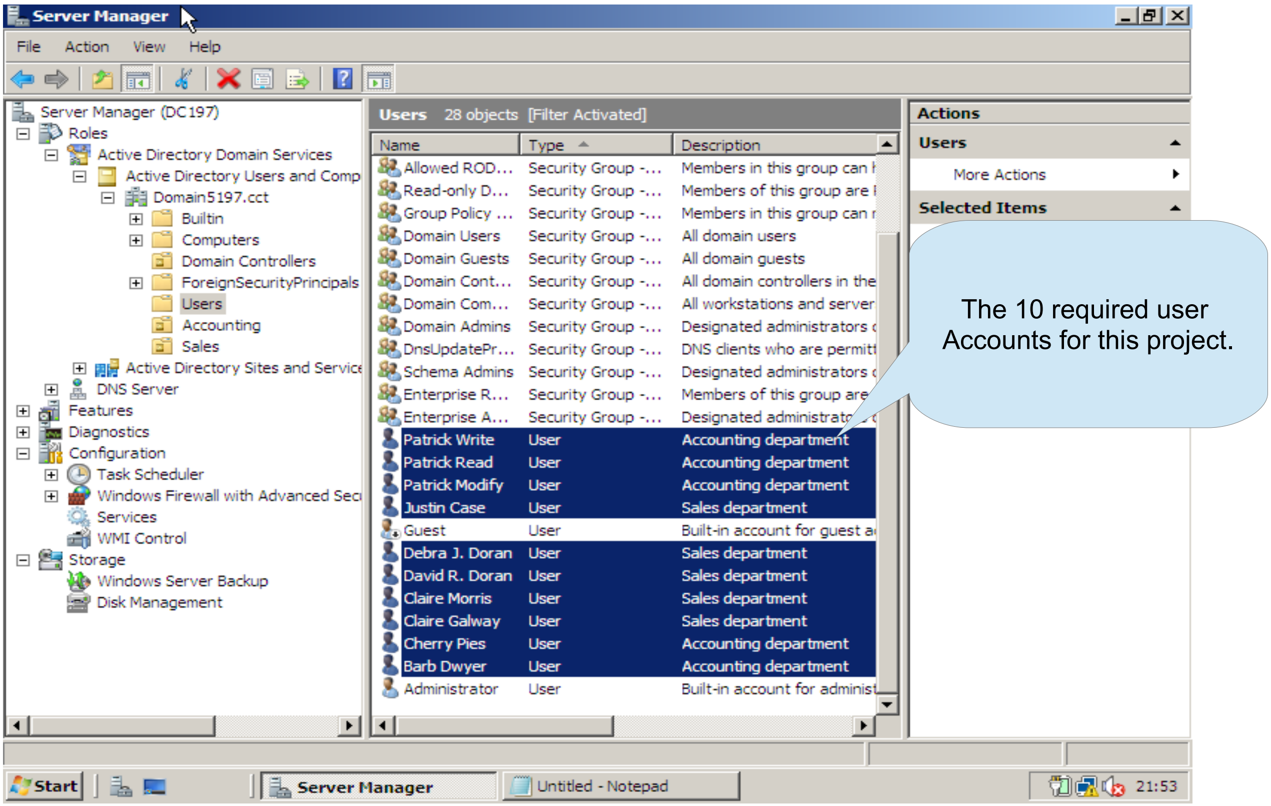
```
Server Manager (DC197)
  Roles
    Active Directory Domain Services
      Active Directory Users and Comp
        Domain5197.cct
          Builtin
          Computers
          Domain Controllers
          ForeignSecurityPrincipals
          Users
          Accounting
          Sales
      Active Directory Sites and Service
    DNS Server
  Features
  Diagnostics
  Configuration
    Task Scheduler
    Windows Firewall with Advanced Sec
    Services
    WMI Control
  Storage
    Windows Server Backup
    Disk Management
```

Domain5197.cct 7 objects [Filter Activated]

Name	Type	Description
Builtin	builtinDomain	
Computers	Container	Default container for
Domain Cont...	Organizational Unit	Default container for
ForeignSecur...	Container	Default container for
Users	Container	Default container for
Accounting	Organizational Unit	
Sales	Organizational Unit	

Accounting – Organization unit
And
Sales - Organization unit

6. **Create** the 10 user accounts as specified on the next page.



```
Server Manager (DC197)
  Roles
    Active Directory Domain Services
      Active Directory Users and Comp
        Domain5197.cct
          Builtin
          Computers
          Domain Controllers
          ForeignSecurityPrincipals
          Users
          Accounting
          Sales
      Active Directory Sites and Service
    DNS Server
  Features
  Diagnostics
  Configuration
    Task Scheduler
    Windows Firewall with Advanced Sec
    Services
    WMI Control
  Storage
    Windows Server Backup
    Disk Management
```

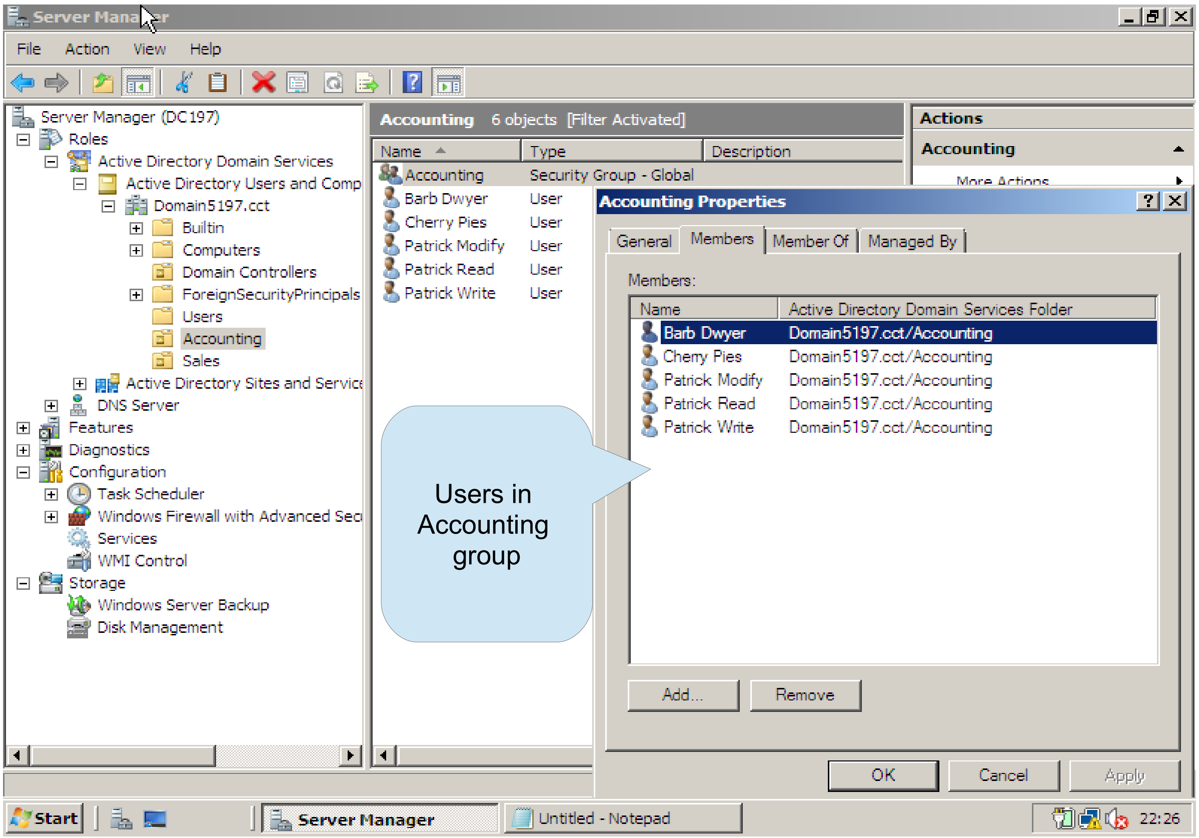
Users 28 objects [Filter Activated]

Name	Type	Description
Allowed ROD...	Security Group -...	Members in this group can
Read-only D...	Security Group -...	Members of this group are
Group Policy ...	Security Group -...	Members in this group can
Domain Users	Security Group -...	All domain users
Domain Guests	Security Group -...	All domain guests
Domain Cont...	Security Group -...	All domain controllers in the
Domain Com...	Security Group -...	All workstations and server
Domain Admins	Security Group -...	Designated administrators
DnsUpdatePr...	Security Group -...	DNS clients who are permitt
Schema Admins	Security Group -...	Designated administrators
Enterprise R...	Security Group -...	Members of this group are
Enterprise A...	Security Group -...	Designated administrato
Patrick Write	User	Accounting department
Patrick Read	User	Accounting department
Patrick Modify	User	Accounting department
Justin Case	User	Sales department
Guest	User	Built-in account for guest a
Debra J. Doran	User	Sales department
David R. Doran	User	Sales department
Claire Morris	User	Sales department
Claire Galway	User	Sales department
Cherry Pies	User	Accounting department
Barb Dwyer	User	Accounting department
Administrator	User	Built-in account for administ

The 10 required user Accounts for this project.

7. **Create** 2 groups as specified on the next page.

Add each of the 10 users to their respective group as specified on the next page.



Server Manager (DC197)
- Roles
  - Active Directory Domain Services
    - Active Directory Users and Comp
      - Domain5197.cct
        - Builtin
        - Computers
        - Domain Controllers
        - ForeignSecurityPrincipals
        - Users
        - Accounting
        - Sales
    - Active Directory Sites and Servic
  - DNS Server
- Features
- Diagnostics
- Configuration
  - Task Scheduler
  - Windows Firewall with Advanced Sec
  - Services
  - WMI Control
- Storage
  - Windows Server Backup
  - Disk Management

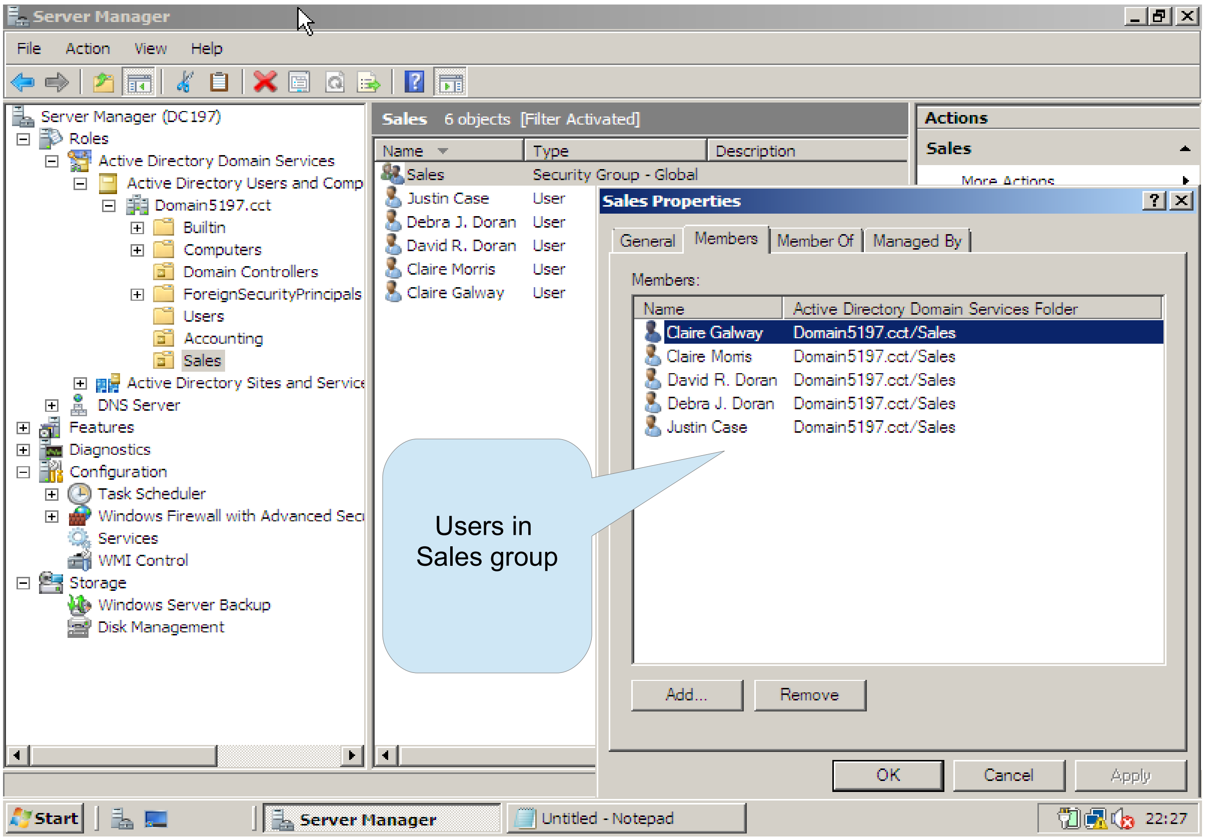
Accounting 6 objects [Filter Activated]

Name	Type	Description
Accounting	Security Group - Global	
Barb Dwyer	User	
Cherry Pies	User	
Patrick Modify	User	
Patrick Read	User	
Patrick Write	User	

Members:

Name	Active Directory Domain Services Folder
Barb Dwyer	Domain5197.cct/Accounting
Cherry Pies	Domain5197.cct/Accounting
Patrick Modify	Domain5197.cct/Accounting
Patrick Read	Domain5197.cct/Accounting
Patrick Write	Domain5197.cct/Accounting

Users in Accounting group



Server Manager (DC197)
- Roles
  - Active Directory Domain Services
    - Active Directory Users and Comp
      - Domain5197.cct
        - Builtin
        - Computers
        - Domain Controllers
        - ForeignSecurityPrincipals
        - Users
        - Accounting
        - Sales
    - Active Directory Sites and Servic
  - DNS Server
- Features
- Diagnostics
- Configuration
  - Task Scheduler
  - Windows Firewall with Advanced Sec
  - Services
  - WMI Control
- Storage
  - Windows Server Backup
  - Disk Management

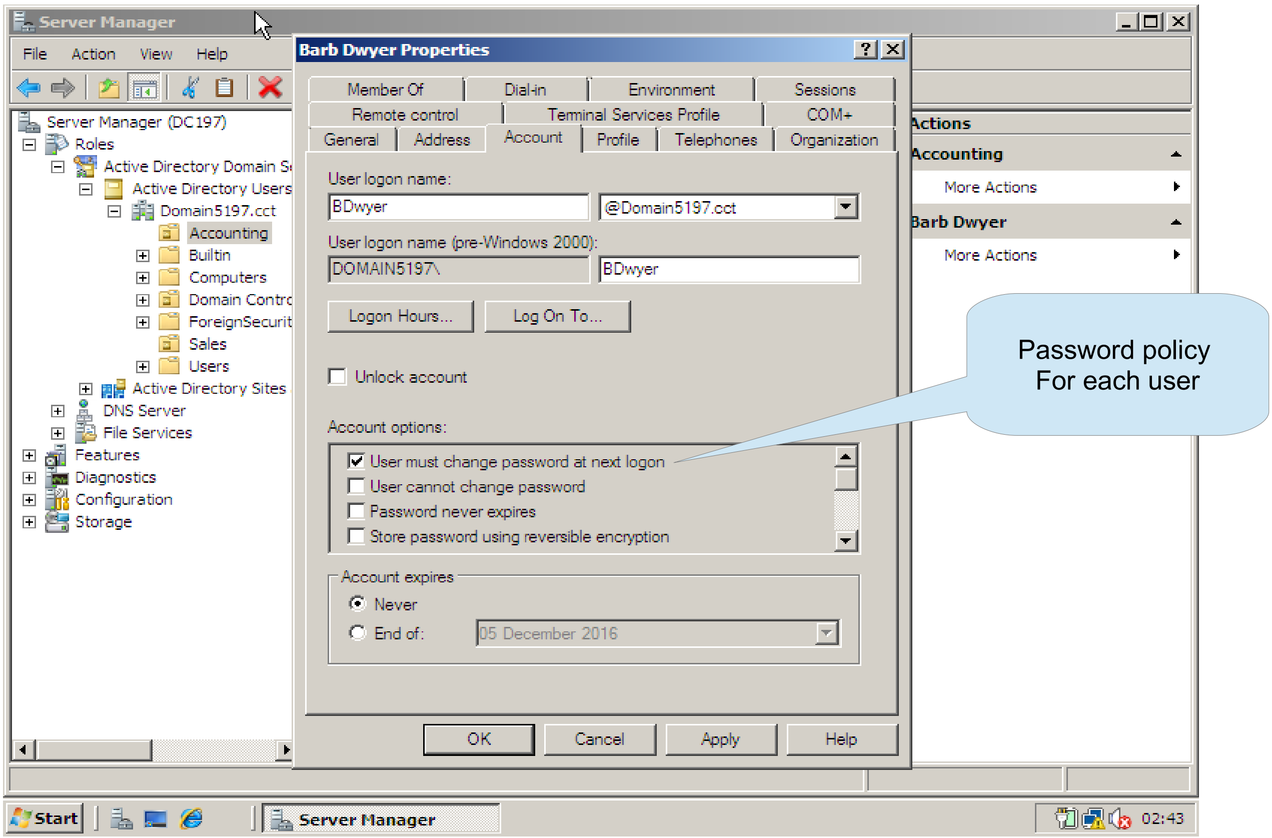
Sales 6 objects [Filter Activated]

Name	Type	Description
Sales	Security Group - Global	
Justin Case	User	
Debra J. Doran	User	
David R. Doran	User	
Claire Morris	User	
Claire Galway	User	

Members:

Name	Active Directory Domain Services Folder
Claire Galway	Domain5197.cct/Sales
Claire Morris	Domain5197.cct/Sales
David R. Doran	Domain5197.cct/Sales
Debra J. Doran	Domain5197.cct/Sales
Justin Case	Domain5197.cct/Sales

Users in Sales group



Barb Dwyer Properties

Tabs: Member Of | Dial-in | Environment | Sessions | Remote control | Terminal Services Profile | COM+ | General | Address | Account | Profile | Telephones | Organization

User logon name: BDwyer @Domain5197.cct

User logon name (pre-Windows 2000): DOMAIN5197\ BDwyer

Logon Hours... Log On To...

□ Unlock account

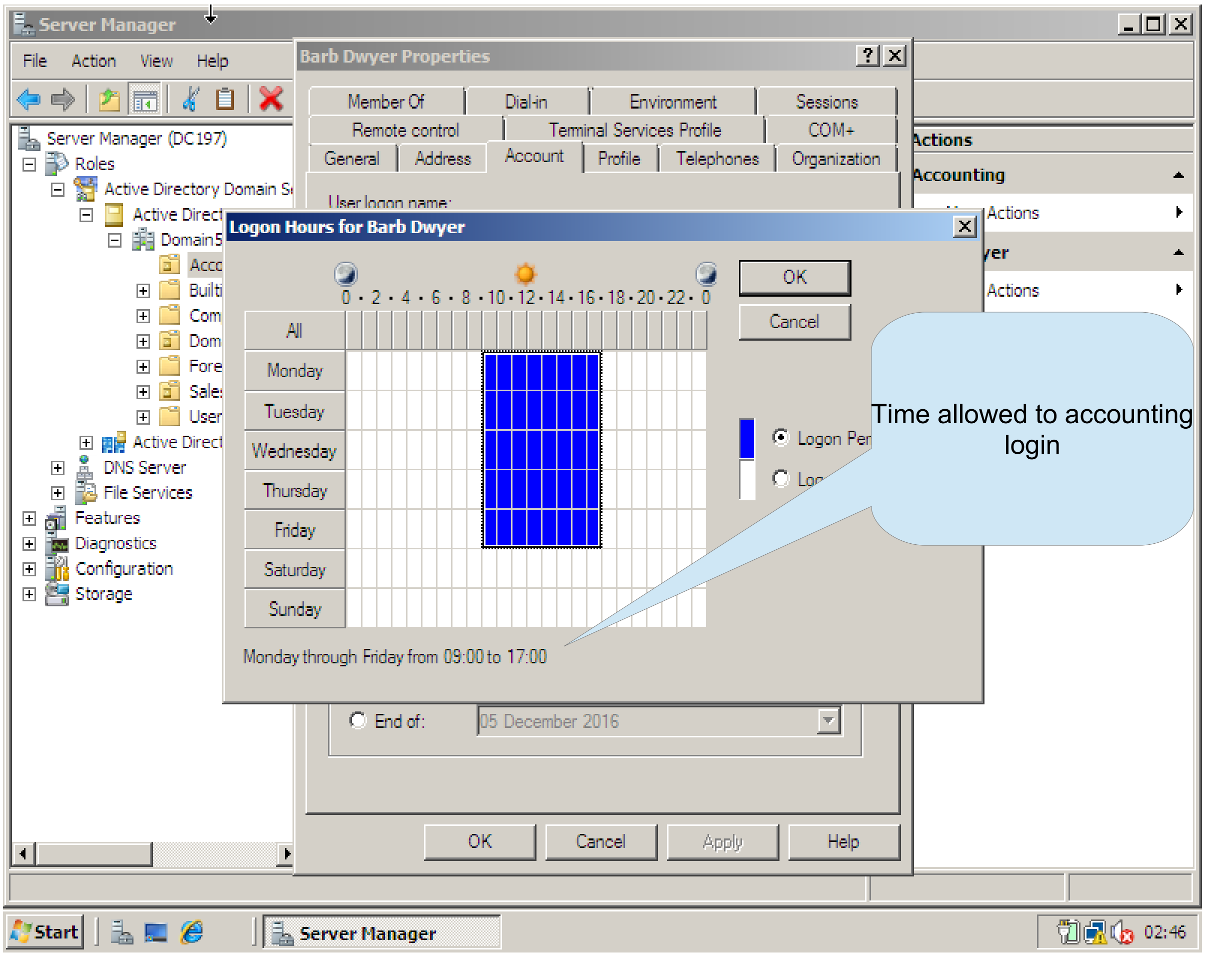
Account options:

☑ User must change password at next logon
□ User cannot change password
□ Password never expires
□ Store password using reversible encryption

Account expires
● Never
○ End of: 05 December 2016

OK Cancel Apply Help

Password policy
For each user



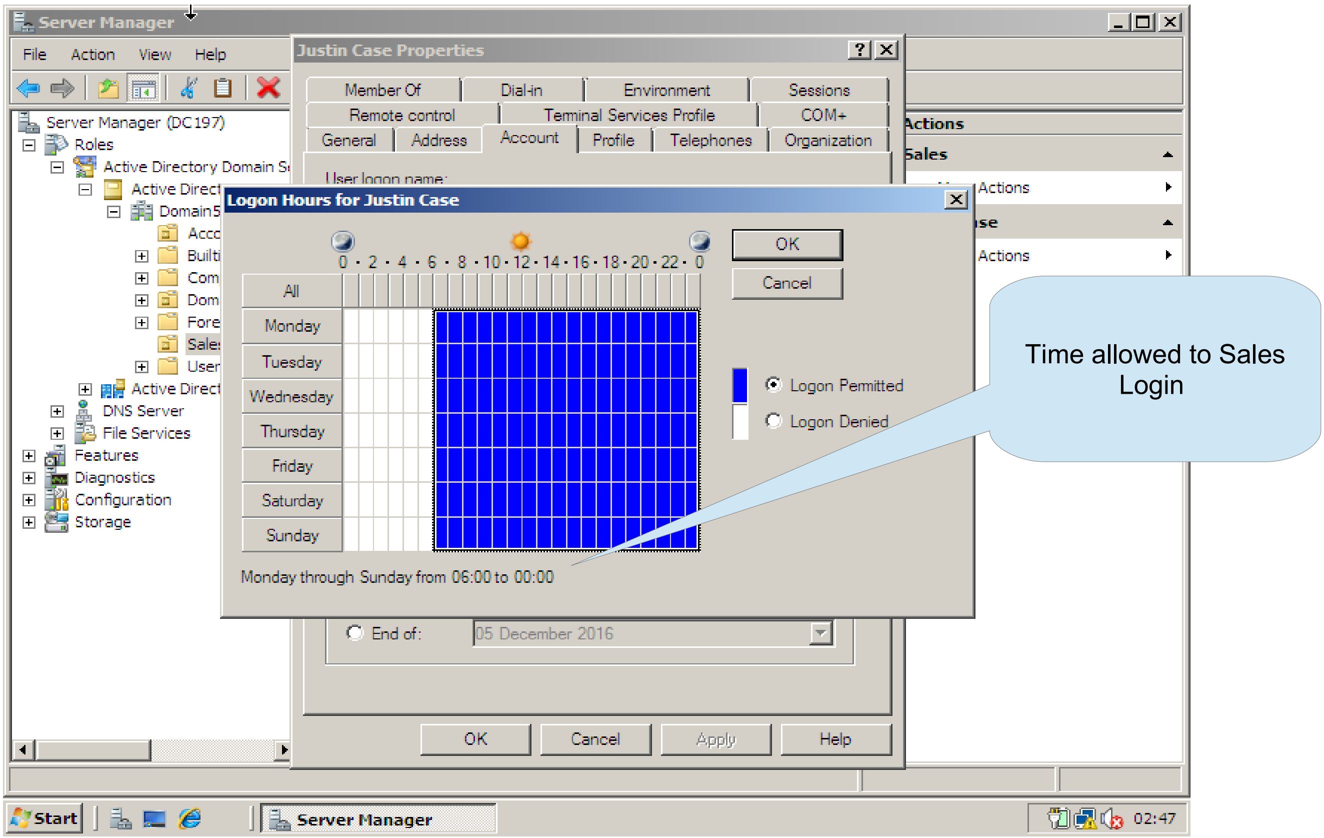
Logon Hours for Barb Dwyer

Monday through Friday from 09:00 to 17:00

● Logon Per[mitted]
○ Lo[gon Denied]

OK Cancel

Time allowed to accounting login



Justin Case Properties

Logon Hours for Justin Case

Monday through Sunday from 06:00 to 00:00

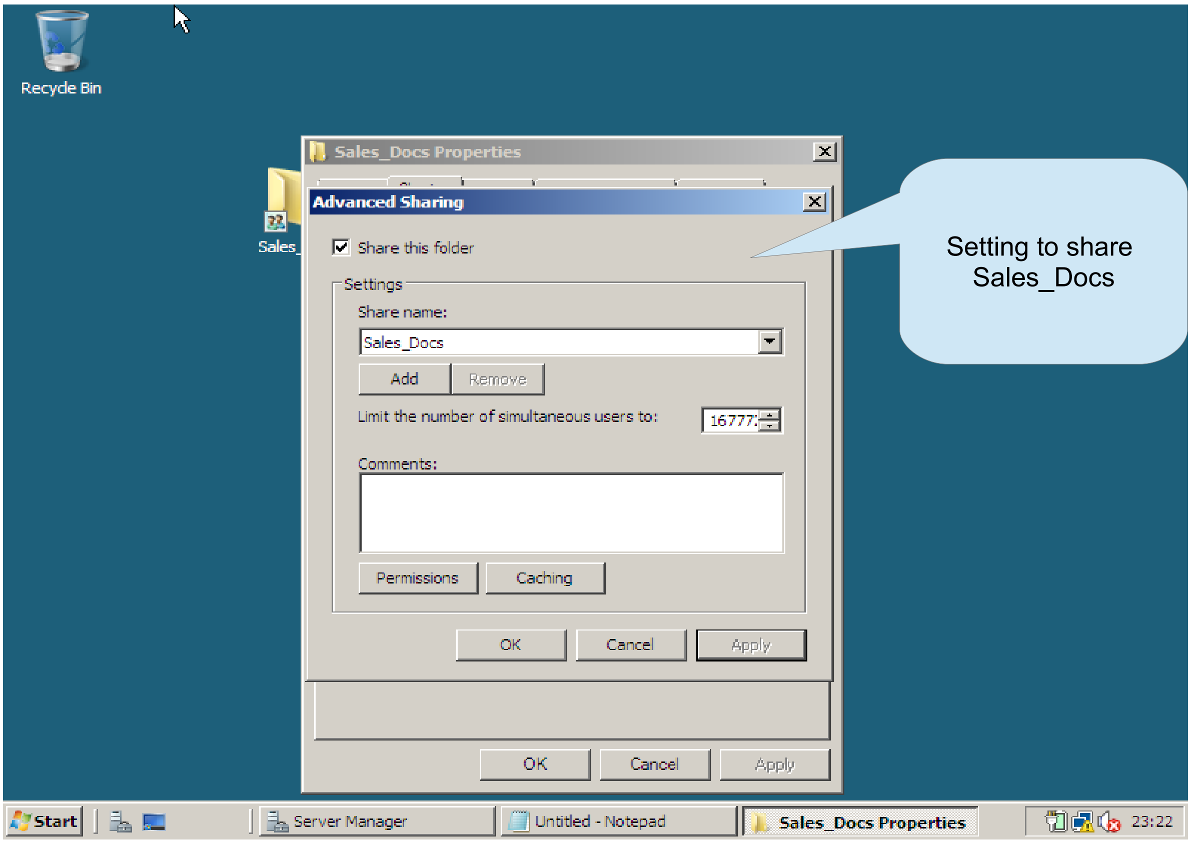
● Logon Permitted

○ Logon Denied

○ End of: 05 December 2016

Time allowed to Sales Login

8. **Create and share** two folders as specified on the next page.



Sales_Docs Properties

Advanced Sharing

☑ Share this folder

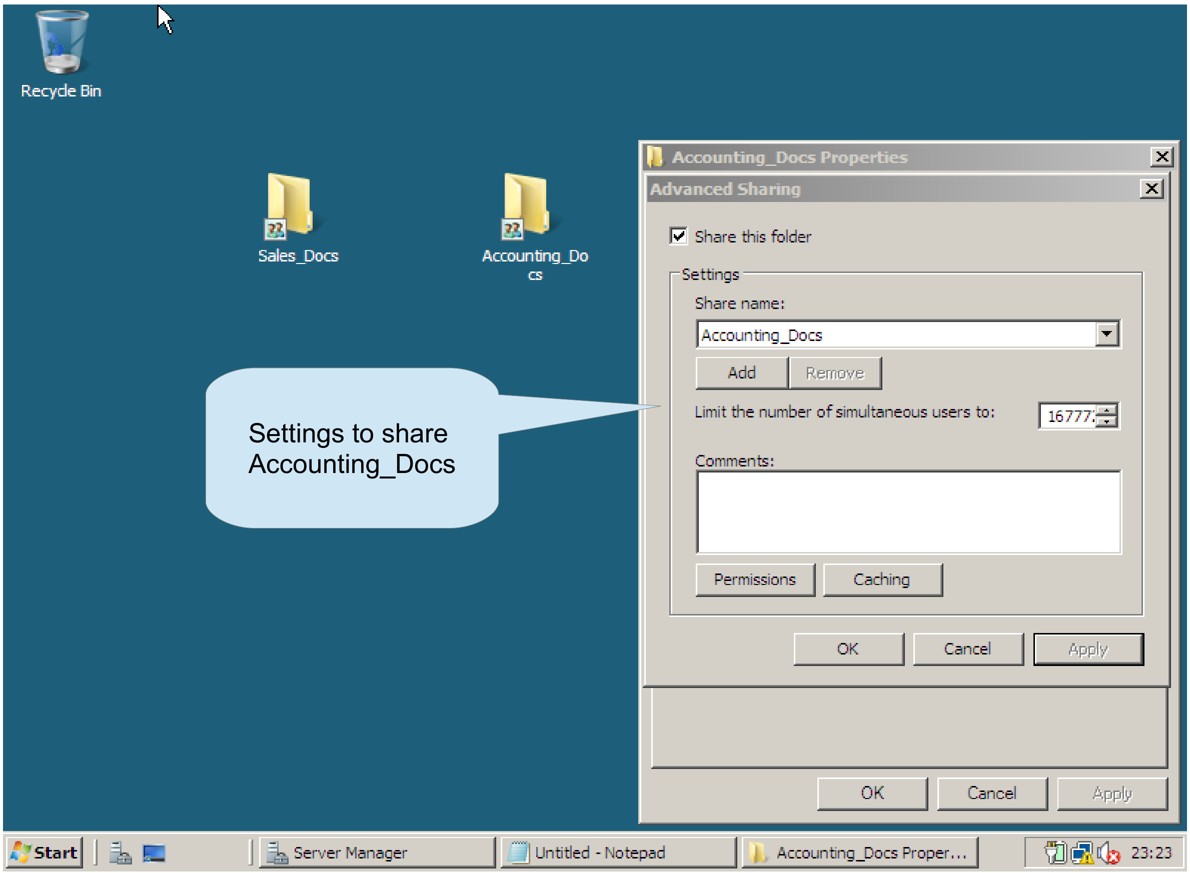
Settings

Share name: Sales_Docs

Limit the number of simultaneous users to: 16777

Comments:

Setting to share Sales_Docs



Settings to share Accounting_Docs

Accounting_Docs Properties

Advanced Sharing

☑ Share this folder

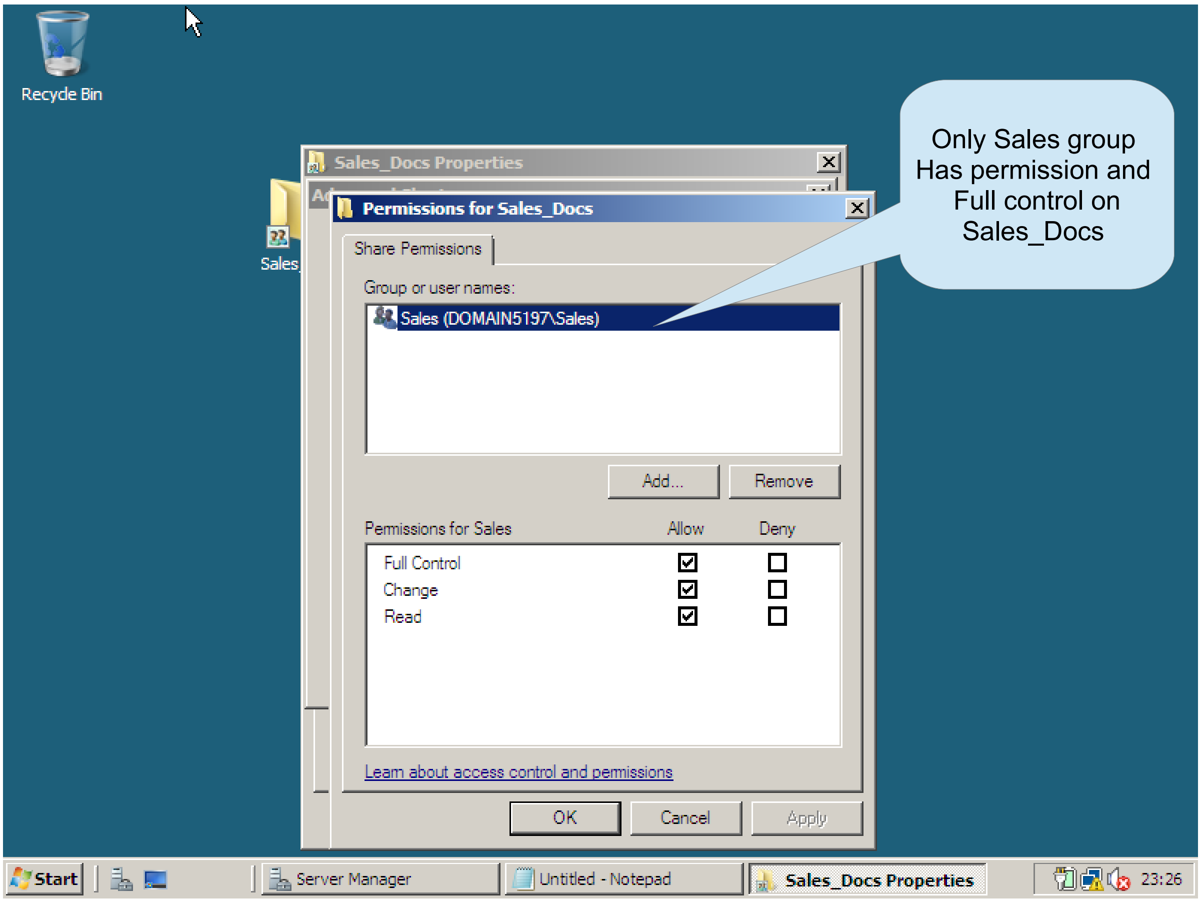
Settings

Share name: Accounting_Docs

Limit the number of simultaneous users to: 16777

Comments:

9. **Apply** permissions as specified on the next page (do this while sharing the folders).



Only Sales group Has permission and Full control on Sales_Docs

Sales_Docs Properties

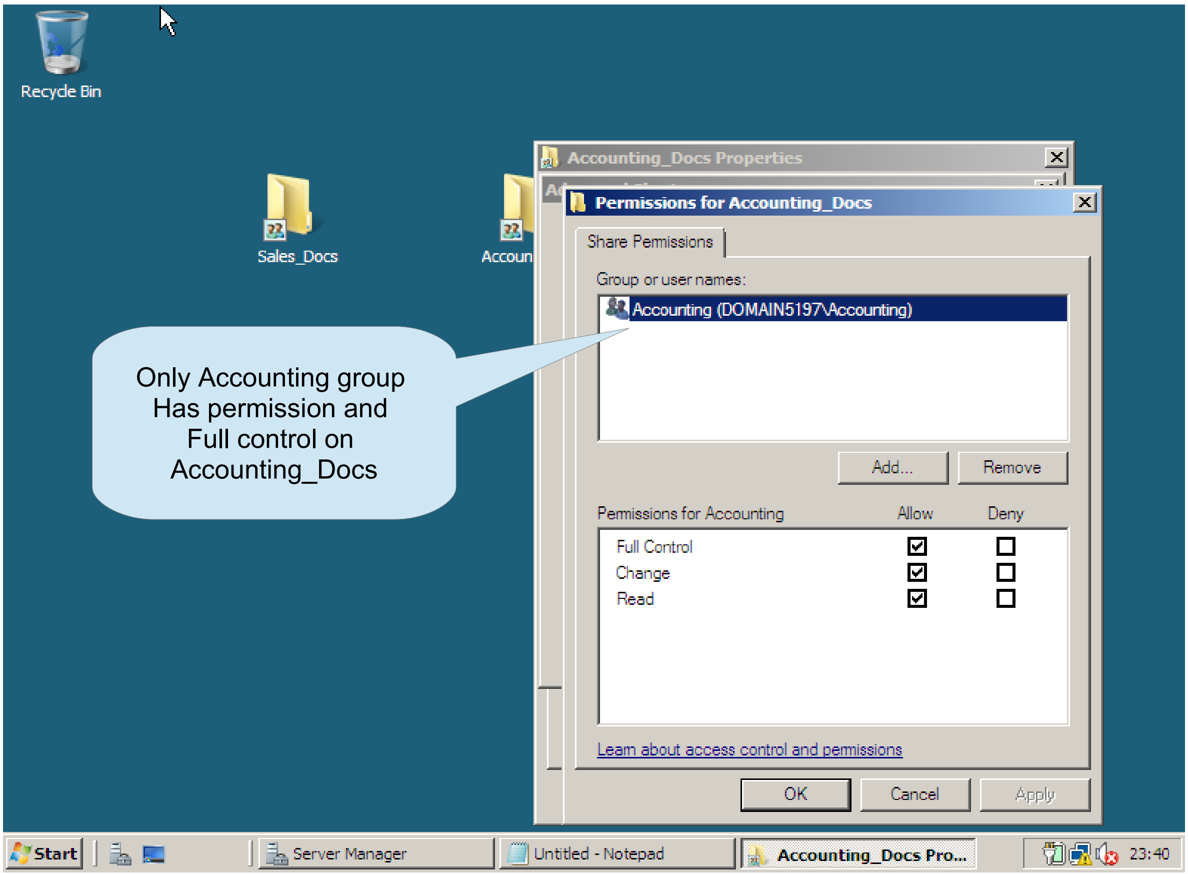
Permissions for Sales_Docs

Share Permissions

Group or user names:

Sales (DOMAIN5197\Sales)

Permissions for Sales	Allow	Deny
Full Control	☑	□
Change	☑	□
Read	☑	□



Only Accounting group
Has permission and
Full control on
Accounting_Docs

Permissions for Accounting_Docs

Share Permissions

Group or user names:

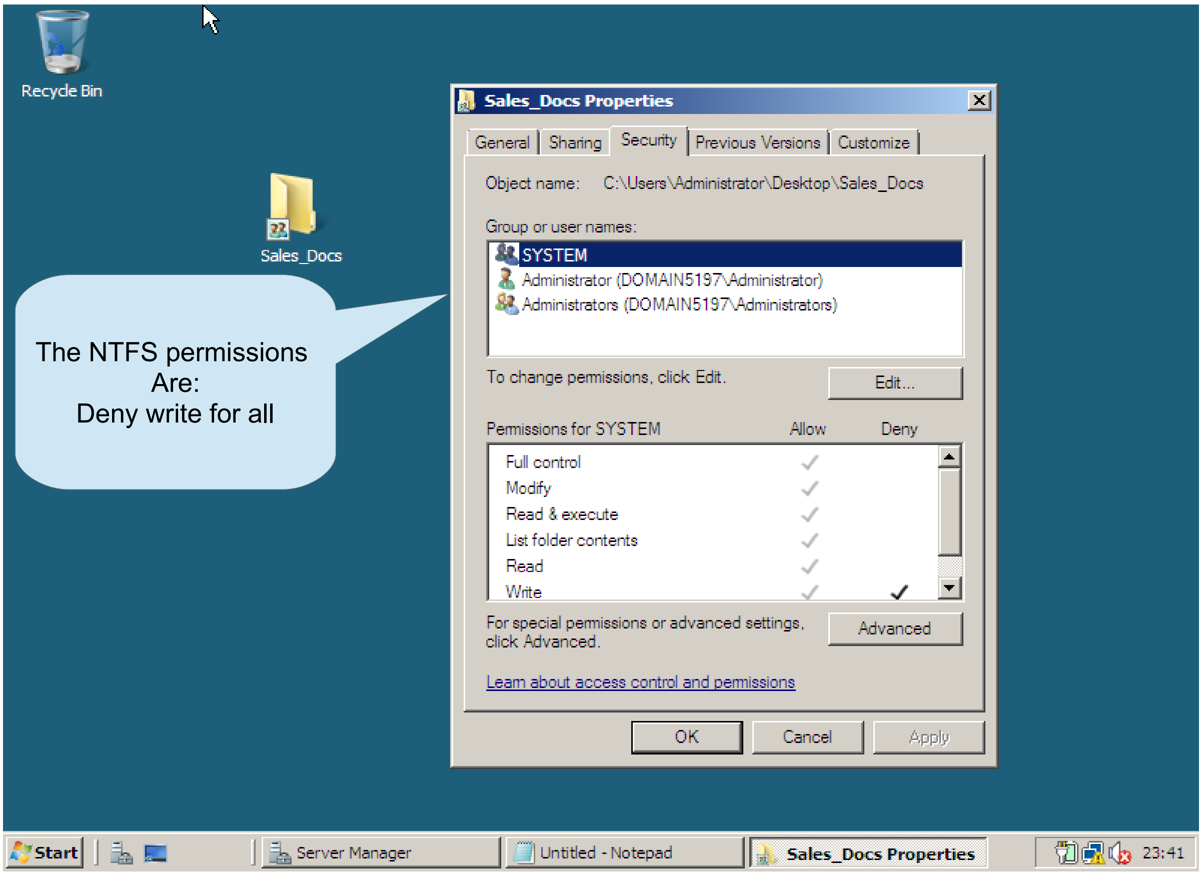
Accounting (DOMAIN5197\Accounting)

Add... Remove

Permissions for Accounting	Allow	Deny
Full Control	☑	□
Change	☑	□
Read	☑	□

Learn about access control and permissions

OK Cancel Apply



The NTFS permissions
Are:
Deny write for all

Sales_Docs Properties

General | Sharing | Security | Previous Versions | Customize

Object name: C:\Users\Administrator\Desktop\Sales_Docs

Group or user names:

SYSTEM
Administrator (DOMAIN5197\Administrator)
Administrators (DOMAIN5197\Administrators)

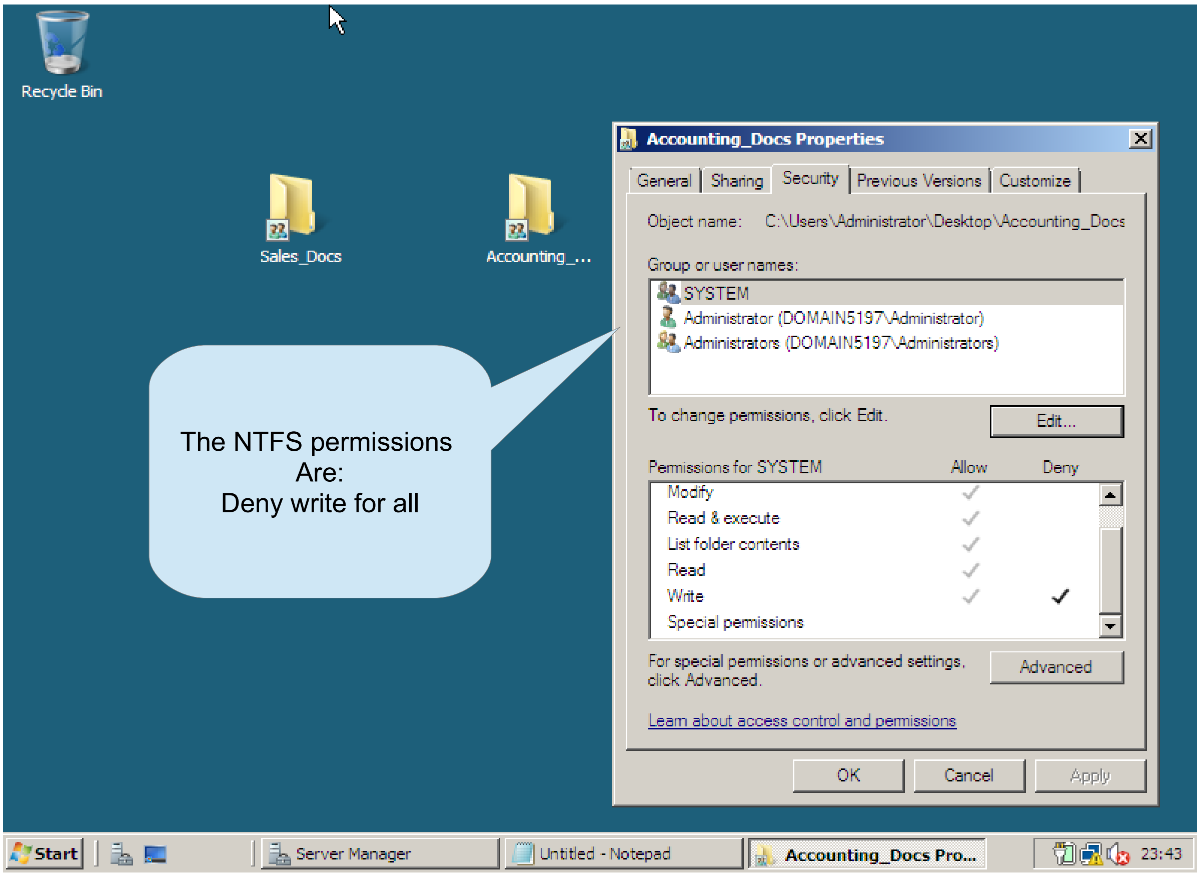
To change permissions, click Edit. Edit...

Permissions for SYSTEM	Allow	Deny
Full control	✓	
Modify	✓	
Read & execute	✓	
List folder contents	✓	
Read	✓	
Write	✓	✓

For special permissions or advanced settings, click Advanced. Advanced

Learn about access control and permissions

OK Cancel Apply


Recycle Bin
Sales_Docs
Accounting_...
Accounting_Docs Properties
General | Sharing | Security | Previous Versions | Customize
Edit...
Advanced
Learn about access control and permissions
OK
Cancel
Apply
Start
Server Manager
Untitled - Notepad
Accounting_Docs Pro...
23:43

Object name: C:\Users\Administrator\Desktop\Accounting_Docs

Group or user names:

- SYSTEM
- Administrator (DOMAIN5197\Administrator)
- Administrators (DOMAIN5197\Administrators)

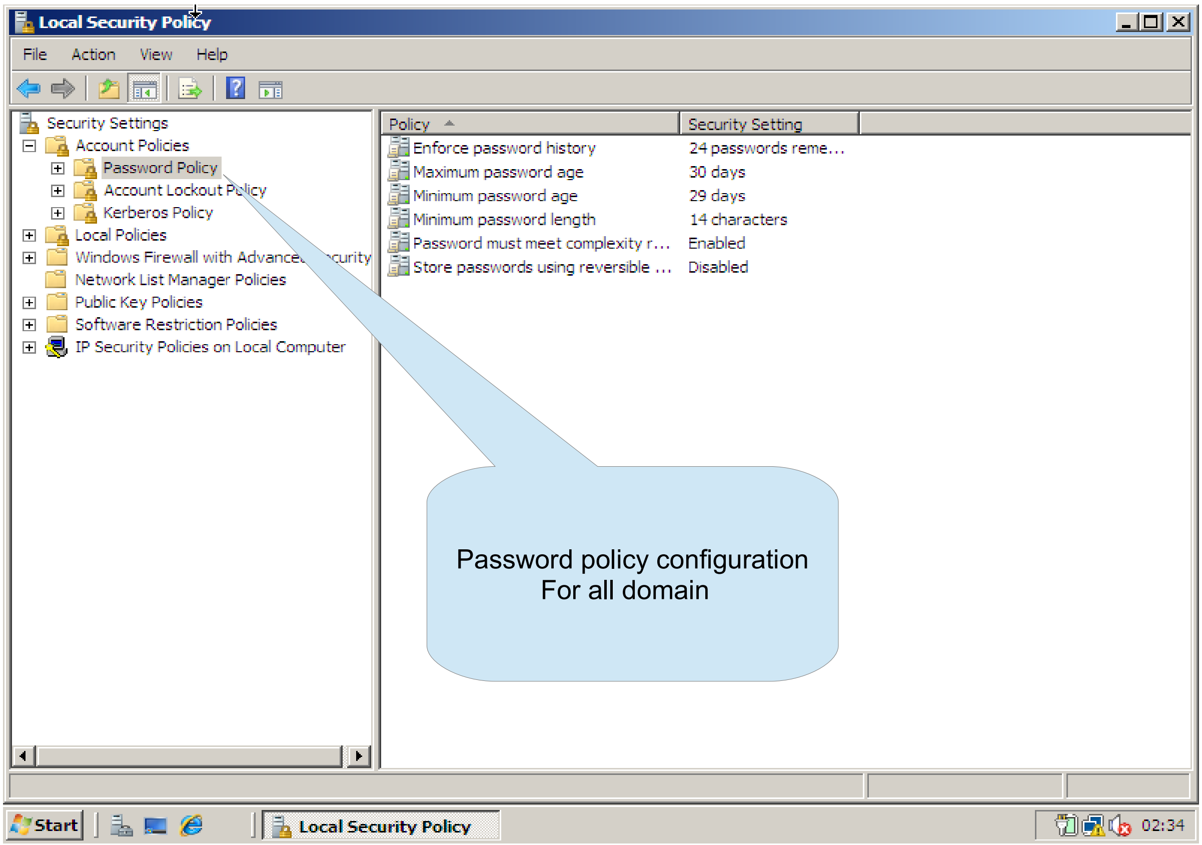
To change permissions, click Edit.

Permissions for SYSTEM	Allow	Deny
Modify	✓	
Read & execute	✓	
List folder contents	✓	
Read	✓	
Write	✓	✓
Special permissions		

For special permissions or advanced settings, click Advanced.

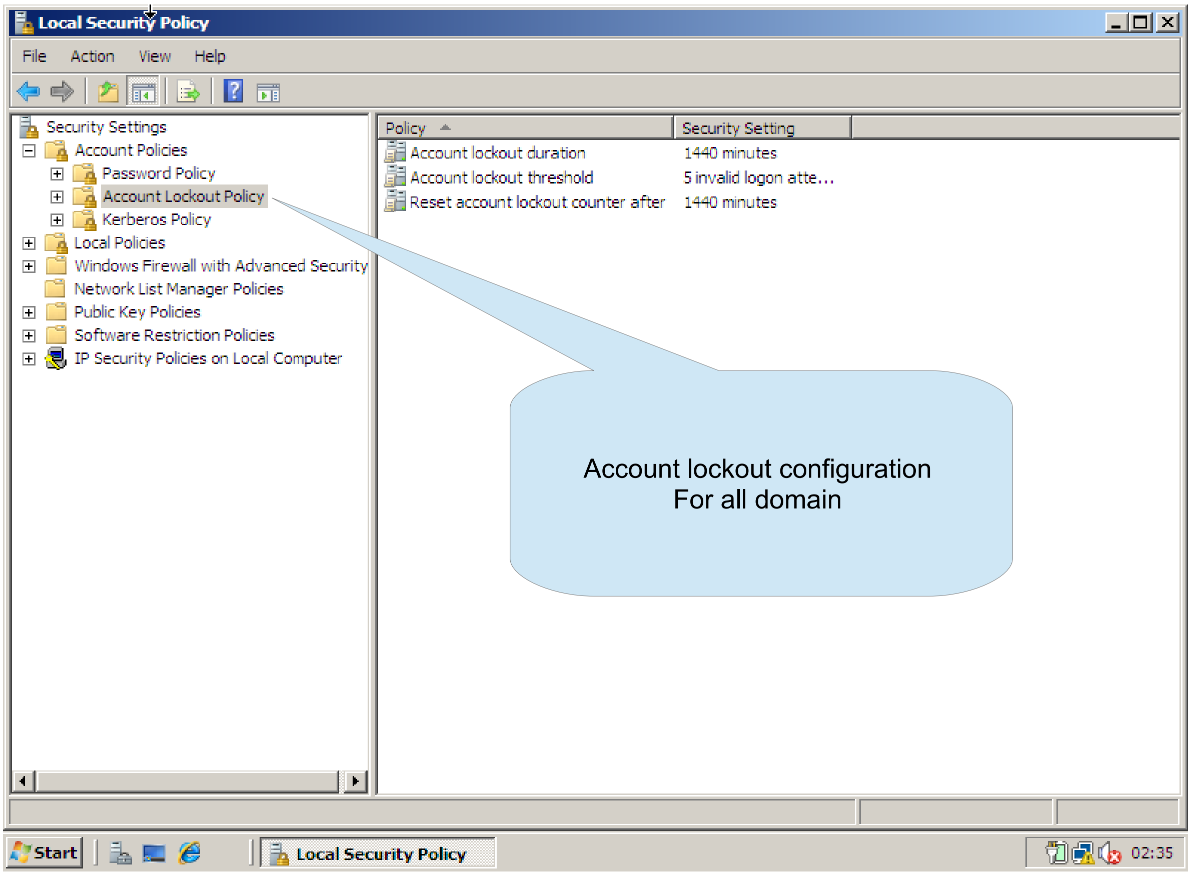
The NTFS permissions
Are:
Deny write for all

10. **Apply** a password policy and an account lockout policy for the entire domain as specified on the following page.



Policy	Security Setting
Enforce password history	24 passwords reme…
Maximum password age	30 days
Minimum password age	29 days
Minimum password length	14 characters
Password must meet complexity r…	Enabled
Store passwords using reversible …	Disabled

Password policy configuration
For all domain



Security Settings
- Account Policies
  - Password Policy
  - Account Lockout Policy
  - Kerberos Policy
- Local Policies
- Windows Firewall with Advanced Security
- Network List Manager Policies
- Public Key Policies
- Software Restriction Policies
- IP Security Policies on Local Computer

Policy	Security Setting
Account lockout duration	1440 minutes
Account lockout threshold	5 invalid logon atte...
Reset account lockout counter after	1440 minutes

Account lockout configuration
For all domain

Conduct research and explain (in your own words) the following topics:

Topic 1: (0 to 10 points) Do research to explain (using examples) what each policy does and explain why you have used the settings that you have chosen for each of these policy settings. Also explain the purpose of the Account Lockout Policy.

Password Policy

Enforce password history : This policy keeps a history of previous passwords, the range is from 0 to 24 passwords, it means that the user is able to use the same password only after it has been changed 24 times.

The enforce password works better when we combine it with the setting of maximum password age and minimum password age. On this way we can define a period of time where the user will be able to re-use the old password.

Maximum password age: Is the password's age in days that the password will expire. The maximum value is 999 (days) and if the user choose 0, the password will never expire.

Minimum password age: The minimum password age should be below the maximum password age, so, if the maximum is set to 999 the minimum age should be maximum 998, and if the user choose 0 the minimum password age will be disabled.

Minimum password length : Is the amount of characters that have in a password. As best practice one password should have about 8 characters, to make difficult to a hacker discover it. The range goes from 0 to 14 characters, and as long the password is, harder will be to a hacker to discover it.

Password must meet complexity : no user account name, or part of users name with two consecutive characters, must have at least 3 roles: A-Z, a-z, 0-9, non-alphabetic characters.

The password complexity is a powerful policy because it forces the user to create a strong password with different characters. Once the password is set on this way, is very hard to some one else discover it.

Store passwords using reversible encryption: The reversible encryption is more used when computers have to communicate over the internet and sending knowledge protocols. In order to keep the password secure, the file is encrypted. It means we do not use this policy for a local domain.

Account Lockout Policy

Account lockout duration: In case that the number of attempts to login goes over the number tolerated by the account lockout threshold the system will be locked for a specified period in minutes by this policy, it protect the system against malicious hackers.

Account lockout threshold: Is the number of attempts that is accepted by the system to a successful login, the number should mach the best practice for specific users, it means that the acceptable number should not be too low or to high, to avoid undesirable lockouts, and avoid to give room to a attack to be successful .

Reset account lockout counter after: Is the policy that track the number of attempts to login in a specific period in minutes. So, within a given period if the number of attempts exceed the number of tolerated attempts the system will be locked but, if the number does not exceed, the lockout counter will return the value to 0 and restart the accounting.

The purpose of a account lockout policy is to prevent people to try to guess the password of a devise, for example, a hacker trying a brute force attack to gain access to the system. If the system have a good password policy and a minimum tolerated amount of attempts to login, the probability that the hacker will get access intro the system is minimum.

For this project the setting for the password policy are:

Password Policy

Enforce password history = 24

Maximum password age = 30

Minimum password age = 29

Minimum password length = 14

Password must meet complexity = enabled

tore passwords using reversible encryption = disable

Account Lockout Policy

Account lockout duration = 1440 minutes or 1 day

Account lockout threshold = 5 invalid logon attempts

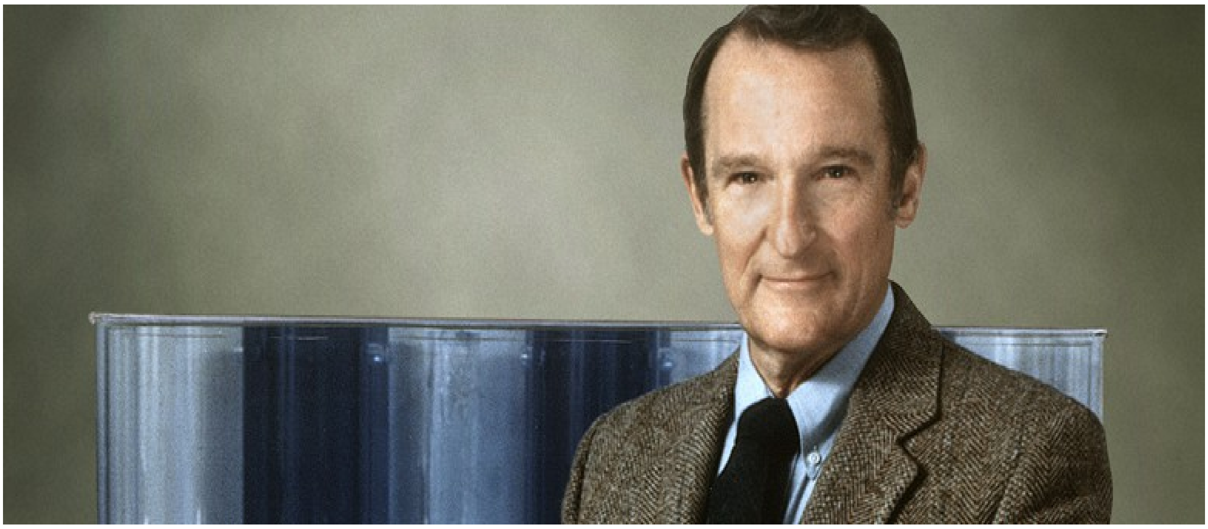
Reset account lockout counter after = 1440 minutes

The intention of this set is to protect the system in a good and efficacy way, the password can be reused only after 2 years, the user will have to change it every 30 days and once changed, it have to be kept for 29 days. The minimum length for the password is 14 characters. It is a good protection, this policy make any hacker to spend a lots of time to find the correct password. The enabled complexity also makes it hard to be discovered.

This policy does not use reversible encryption because the devises are connect in a local business environment that does not use knowledge to transfer files.

Also to complete the policy, the account lockout threshold is set to 5 invalid logon attempts, this number is good enough to let the user to type the correct password without lock the system and short enough to do not let any hacker to keep trying new combinations of passwords, and in case of a attack the system will be locked for 1 day or 1440 minutes or until a administrator unlock it and find a appropriated solution to keep the system out of attacks.

Topic 2: (0 to 10 points) Do research to explain who Seymour Cray was and explain his contribution to Computer Science.



Seymour Cray (1925-1996)

was born in 28 of September of 1925 in Chippewa Falls, Wisconsin. He was always interested in electronic.

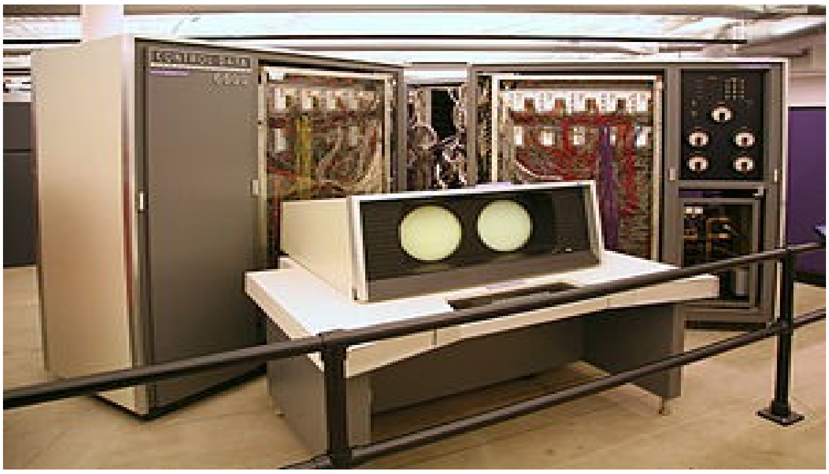
After his graduation from high school, he went to the United States Army, serving to the second world war and the Pacific theater in the Philippine Islands.

After the war he had completed a electrical engineering and a master degree in applied mathematics at the University of Minnesota.

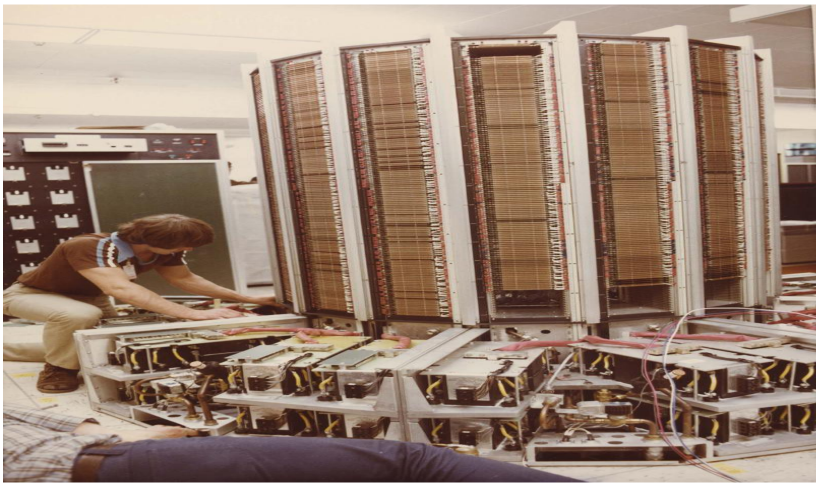
Cray had worked for many companies and for the U.S army too. Creating electronic solutions for his customers needs.

Among many projects that he had created, some of them are:

CD6600 – Considered the world's first supercomputer in 1963.

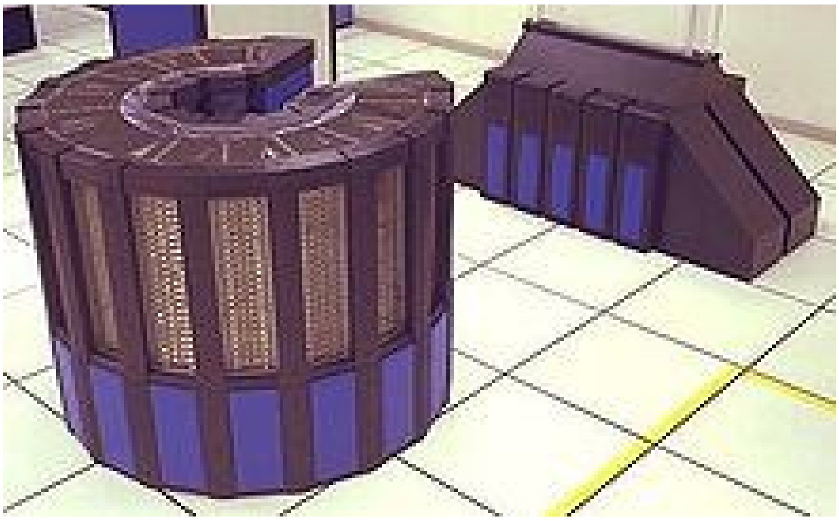


CDC8600 – in 1968



Cray 1 – in 1976

Cray 2- 1985



Also in 1972 the Electrical and Electronics Engineers (IEEE) had recognize his work on large-scale computers.

His computers were so powerful, that at that time even Nasa was using them.

in 1996 he died at the age of 71, two weeks after a car accident.

Reference

Microsoft (2016). Enforce password history. Available at: https://technet.Microsoft. com/en-us/library/hh994571(v=ws.11).aspx [Accessed on 5th November 2016]

Microsoft (2016). Account Lockout Policy. Available at: https://technet.microsoft. com/en-us/library/hh994563(v=ws.11).aspx [Accessed on 5th November 2016]

Microsoft (2016). Domain Controller Security Policy. Available at:https://technet. Microsoft.com/en-us/library/dd277397.aspx [Accessed on 5th November 2016]

Cray (2016). History Seymour Cray. Available at:http://www.cray.com/company/ history/seymour-cray [Accessed on 5th November 2016]

Wikipedia (2016). CDC 6600.Available at: https://en.wikipedia.org/wiki/CDC_6600 [Accessed on 5th November 2016]

Dr Hart (2016). Cray Super Computers. Available at: http://drhart.ucoz.com/index/ cray_super_computer/0-116 [Accessed on 5th November 2016]

Wikipedia (2016). Cray 1. Available at: https://en.wikipedia.org/wiki/Cray-1 [Accessed on 5th November 2016]

Wikipedia (2016). Cray 2. Available at: https://en.wikipedia.org/wiki/Cray-2 [Accessed on 5th November 2016]

Candidate Name: Ennio da Silva Vitor	CCT Student Number: 2015197

#1: Install virtual server (0 to 4 points) _________

#2: Setup static IP address (0 to 10 points)_________

#3: Server correctly renamed (0 to 4 points) _________

#4: Convert server to Domain Controller as specified (0 to 10 points)_________

#5: Create the 10 accounts as specified (0 to 10 points)_________

#6. Create the two groups as specified (0 to 6 points) _________

#7. Create two shared folders as specified (0 to 10 points)_________

#8. Apply permissions as specified (0 to 10 points)_________

#9. Create two Organisational Units as specified (0 to 6 points) _________

#10. Apply the password policy as specified (0 to 10 points)_________

Topic 1: (0 to 10 points) _________

Topic 2: ` (0 to 10 points) _________

Total Grade Achieved: _________ _________

I hereby declare that all of the work is done by my own.

Ennio da Silva Vitor

ID: 2015197