CYBERCENTURION GUIDE

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Leninux

1. Using this Guide

Red – signifies line in a config file
Blue – signifies terminal commands
Green – signifies what a setting should be set to

2. Advice on Cyber Centurion

- Always answer forensics first to avoid affecting the answers
- Always read the readme before attempting to edit any settings
- Don't just disable things in this guide, double check the readme first
- Not everything in this guide will get you points
- If you want to search for a file type, type *.[file type] i.e. *.png – *to search for all PNGs*
- You will also get points for:
    - Delete unrelated media files
    - Delete hacking programs
    - Remove any backdoors

3. Ubuntu

3.1 Overview

Ubuntu is an open-source unix based system. Most of the settings are controlled through the terminal so it is useful to know the basic terminal command.

3.2 Basic Console Terminology

sudo [command] – run command as superuser
cd [directory] – change directory (cd .. to go to parent directory, cd / to go to root directory)
ls – list all files and folders in current directory
mkdir [name] – create folder
grep [keywords] – search for file using keywords
poweroff – shutdown computer
reboot – reboots computer
apt install [program] – install program/service
apt remove [program] – uninstall program/service
cp [source] [destination] – Copy file
sudo gedit [file] – edit file
pwd – Shows the full directory currently open
df – Displays info about current file system
[command] -help – Displays help on said command
chmod [*U (user), G (group of User) and A (everyone***][***+ or - privilege***][***R (read), W (write) or E (execute)***] [file directory] –** gives files permissions
chown -R [User]:[Group] [Directory] – Changes ownership of file2
find . -type f -name "*.[file extenstion]" - finds files with given extension
lsof -Pan -i – lists all open ports with process running on it
lsof -Pan -p [PID] -i – find port that process is running on
ps ax | grep '[PID]' – finds the directory for the package of a process ID that is currently running
rm [directory] – delete file
rm -r [directory] – delete directory
rm -rf [directory] – delete all files within directory

3.3.1 Password Policy

3.3.1.1 Background

Having a strong password is important and to ensure users all have strong passwords, you can enforce a password policy to ensure password complexity.

3.3.1.2 How to Perform

Firstly open terminal (ctrl + alt + T) and type:

```
sudo apt install libpam-cracklib
```

```
sudo gedit /etc/pam.d/common-password
```

Go down to the line “password [success=1 default=ignore] pam_unix.so obscure sha512” and add “remember = 10” – *This will stop the user using the same password for at least 5 password changes.*

Then go to line “pam_cracklib.so” and add “retry=5 minlen=10 difok=3 ucredit=-1 lcredit=-2 dcredit=-1 ocredit=-1” – *This will ensure the users password is long and complex enough.*

Then save and close the file and go back to the terminal and type:

```
sudo gedit /etc/login.defs
```

Then go to “LOGIN_RETRIES” and add “5” – *This will make sure the user only has 5 attempts to enter their password.*

Then go to “Password aging controls” and set “PASS_MAX_DAYS” TO “30” – *This will make sure the user has to change their password every 30 days.*

Then save and close the file and go back to the terminal and type:

```
sudo gedit /etc/pam.d/common-auth
```

Add “auth required pam_tally2.so deny=5 onerr=fail unlock_time=1800” to the bottom of the file and then save and close the file

3.3.2 Firewall

3.3.2.1 Background

Firewalls protect computers from malicious packets.

3.3.2.2 How to Perform

Firstly open terminal (ctrl + alt + T) and type:

```
sudo apt-get install ufw
```

Then wait for all the commands to run and then type:

```
sudo ufw enable
```

If you get the message “Firewall is active and enabled on system startup” then you have successfully enabled the firewall.

3.3.2.3 Additional Security

You can secure the system further by editing some firewall security settings.

Firstly, open terminal (ctrl + alt + T) and type:

```
sudo gedit /etc/sysctl.conf
```

Go down to the line “# Prevent some spoofing attacks” and underneath add “net.ipv4.conf.default.rp_filter=1” and on another newline add “net.ipv4.conf.all.rp_filter=1” – *This will help to prevent spoofing attacks.*

Then go down to the line “# Note: This may impact IPv6 TCP sessions too” and underneath add “net.ipv4.tcp_syncookies = 1” and on another newline add “net.ipv4.tcp_max_syn_backlog = 2048” and on another newline add “net.ipv4.tcp_synack_retries = 3” – *This will enable SYN cookie protection.*

Go down to the line “# Uncomment the next line to enable packet forwarding for IPv4” and underneath add “net.ipv4.ip_forward=0” – *This will disable IPv4 forwarding.*

Go down to the line "# based on Router Advertisements for this host" and underneath add "net.ipv6.conf.all.forwarding=0" – *This will disable IPv4 forwarding.*

Add the end of the file add the following line "net.ipv6.conf.all.disable_ipv6 = 1" – *This will disable IPv6.*

Then type the following into the terminal:

```
sudo ufw logging on
```

This will enable logging for the firewall

3.3.2.4 Other Commands

sudo ufw allow [port] – *This will open said port*
sudo ufw deny [port] – *This will close said port (packet discarded)*
sudo ufw reject [port] – *This will close said port (port unreachable packet sent to source computer)*
sudo ufw delete [rule number] – *This will delete said rule*
sudo ufw reset – *This resets all rules for the firewall*
sudo ufw app list – *The services currently operating on the firewall*

3.3.2.5 GUI firewall

If you don't want to use terminal you can install a GUI firewall by typing into terminal (ctrl + alt + T):

```
sudo apt-get install gufw
```

Then to open the gui, type:

```
sudo gufw
```

3.3.3 Root User

3.3.3.1 Background

A root user is a very powerful user and has very extensive permissions and so most systems should disable the root user.

3.3.3.2 How to Perform

To disable the root user open terminal (ctrl + alt + T) and type:

```
sudo passwd -l root
```

3.3.4 SSH Server

3.3.4.1 Background

Sometimes systems uses an SSH server which is primarily used for remote logon.

3.3.4.2 How to Perform

Firstly, you need to install SSH. Open terminal (ctrl + alt + T) and type:

```
sudo apt-get install ssh
```

If SSH is pre-installed, you should update it so the security updates are up to date, to do this type:

```
sudo apt-get upgrade ssh
```

Now to secure the SSH server, firstly disable the root user. In terminal type:

```
sudo gedit /etc/ssh/sshd_config
```

Then go to the line "PermitRootLogin" and set it to "no" – *This will stop root login through SSH.*

In this file, if you are required to, you can change the port SSH uses (standard port for SSH is 22) by setting the "Port" setting to a different port.

3.3.5 Services

3.3.5.1 Background

Services are programs which involve data transfer in and out of a computer for example FTP (file transfer protocol) and SSH (secure shell). To secure a computer, we can disable unnessary services.

3.3.5.2 How to Perform

Firstly, you need to find all enabled services. Open terminal (ctrl + alt + T) and type:

```
sudo service --status-all
```

This will list all the services. Now look at this list and decide what services are not necessary and disable them by typing this into the terminal:

```
sudo apt remove [insert name of service]
```

If you need to reenable a service, type this into the terminal:

```
sudo apt install [insert name of service]
```

3.3.6 Users

To get a list of users, type this into the terminal:

```
sudo users
```

To get the id of a user, type this into the terminal:

```
sudo id -u [username]
```

To add, delete, change password or change account type of a user click on the settings icon on the sidebar. Then navigate to user accounts.

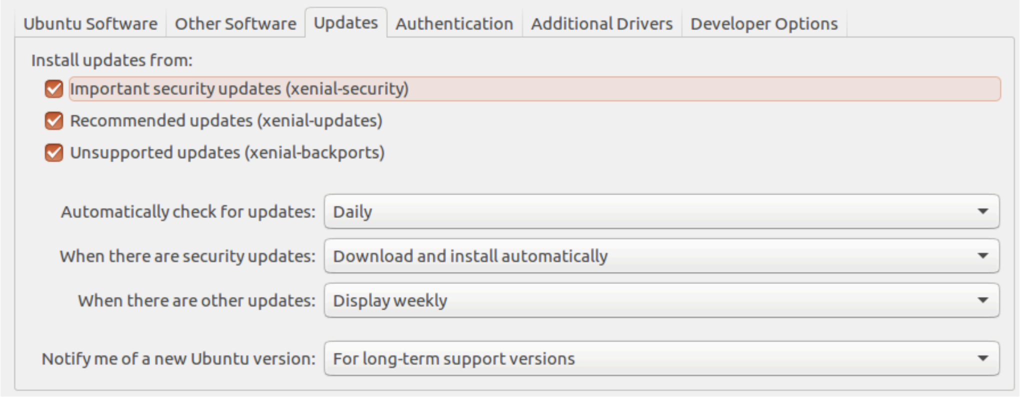
3.3.7 Automatic Updates

3.3.7.1 Background

Automatic updates can provide urgent security updates to your computing and so should be enabled.

3.3.7.2 How to Perform

Click on the settings icon on the sidebar and navigate Software and Update page and click on the Update tab.



Install updates from:

☑ Important security updates (xenial-security)

☑ Recommended updates (xenial-updates)

☑ Unsupported updates (xenial-backports)

Automatically check for updates: Daily

When there are security updates: Download and install automatically

When there are other updates: Display weekly

Notify me of a new Ubuntu version: For long-term support versions

Make sure all the options are ticked and that automatic updates are set to daily and downloaded automatically

3.3.8 Deleting and Installing Program

3.3.8.1 Background

Some programs may be prohibited on a system and so needs to be uninstalled i.e. hacking programs like nmap and wireshark.

3.3.8.2 How to Perform

To install a program, open terminal (ctrl + alt + T) and type:

```
sudo apt install [name of program]
```

To uninstall a program, type:

```
sudo apt remove [name of program]
```

3.3.9 Update the System

3.3.9.1 Background

Update the system to the most up to date security software.

3.3.9.2 How to Perform

open terminal (ctrl + alt + T) and type:

```
sudo apt-get update && apt-get upgrade
```

3.3.10 Guest User

3.3.10.1 Background

A guest account is an account anyone can login to but it can't save any files.

3.3.10.2 How to Perform

To disable the guest user open terminal (ctrl + alt + T) and type:

```
sudo gedit /etc/lightdm/lightdm.conf.d
```

Then go to the bottom and the line "allow-guest: false" – *This will stop guest login.*

3.3.11 Usernames on Login Screen

3.3.11.1 Background

By default a list of usernames is shown on the ubuntu login screen, this should be disable.

3.3.11.2 How to Perform

To disable names on the login screen open terminal (ctrl + alt + T) and type:

```
sudo gedit /etc/lightdm/lightdm.conf.d
```

Then go to the bottom and the line “greeter-hide-users=true”.

3.3.12 Audit Policy

3.3.12.1 Background

An audit policy defines account limits for users of one or more resources.

3.3.12.2 How to Perform

To set up audit policies, open terminal (ctrl + alt + T) and type:

```
sudo apt-get install auditd
```

Then type:

```
sudo auditctl -e 1
```

The audit policies are now setup if you need to edit them, type this into the terminal:

```
sudo gedit /etc/audit/auditd.conf
```

3.3.13 Anti-virus

3.3.13.1 Background

Anti-virus software detects potentially infected files.

3.3.13.2 How to Perform

To install anti-virus, open terminal (ctrl + alt + T) and type:

```
sudo apt install clamav && sudo apt install clamtk
```

3.3.14 FTP Server

3.3.14.1 Background

Sometimes systems use an FTP server which is used for remote file transfer.

3.3.14.2 How to Perform

Firstly, you need to install FTP. Open terminal (ctrl + alt + T) and type:

```
sudo apt install pure-ftpd
```

Then type the following into the terminal.

```
echo 2 > /etc/pure-ftpd/conf/TLS
```

This will disable plain text authentication for FTP. Then type:

```
service pure-ftpd restart
```

This will save the changes to FTP authentication.

4. Windows

4.1 Overview

Windows is probably the most common operating system, for Cyber Centurion they used Windows 8/10 and Windows Server 2008/2016.

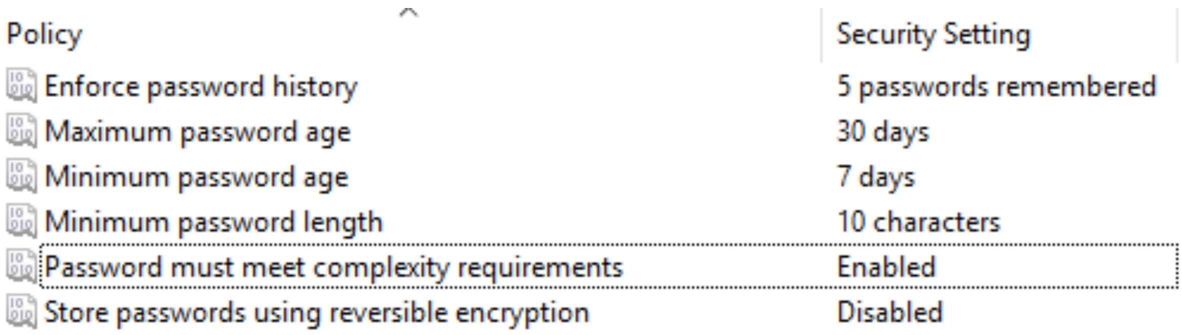
4.2.1 Password Policy

4.2.1.1 Background

Having a strong password is important and to ensure users all have strong passwords, you can enforce a password policy to ensure password complexity.

4.2.1.2 How to Perform

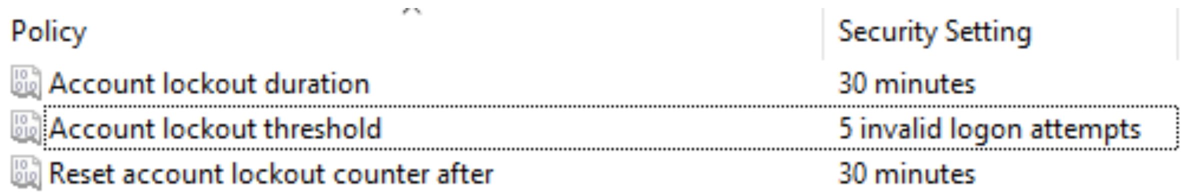
Open search and type *"administrative tools".* Then click on *"Local Security Policy"* then click on *"Account Policies"* then *"Password Policy".*



Policy	Security Setting
Enforce password history	5 passwords remembered
Maximum password age	30 days
Minimum password age	7 days
Minimum password length	10 characters
Password must meet complexity requirements	Enabled
Store passwords using reversible encryption	Disabled

Set the following settings to:

Enforce password history – 5 passwords remembered
Maximum password age – 30 days
Minimum password age – 7 days
Minimum password length – 10 characters
Password must meet complexity requirements – Enabled
Store passwords using reversible encryption – Disabled
Then click on *"Account Lockout Policy".*



Policy	Security Setting
Account lockout duration	30 minutes
Account lockout threshold	5 invalid logon attempts
Reset account lockout counter after	30 minutes

Set the following settings to:

Account lock duration – 30 minutes
Account lockout threshold – 5 invalid logon attempts
Reset account lockout counter after – 30 minutes

4.2.2 Other Security Options

2.2.2.1 Background

Requiring CTRL + ALT + DELETE is a more secure login system.

2.2.2.2 How to Perform

Open search and type *"administrative tools".* Then click on *"Local Security Policy"* then click on *"Local Policies"* then *"Security Options".* Then set the following security settings
Set "Interactive Login, Do not require CTRL + ALT + DELETE" to Disabled.
Set "Interactive Login, Do not display last user name" to Enabled.
Set "Network access, Do not allow Anonymous Enumeration of SAM accounts" to Enabled.
Set "Network access, Do not allow Anonymous Enumeration of SAM accounts and shares" to Enabled.
Set "Network Access, Let Everyone permissions to apply to anonymous users" to Disabled.
Set "Network Security, LAN Manager Authentication level" to NTLMv2.
Set "Domain member, digitally encrypt or sign secure channel data (always)" to Enabled.
Set "Microsoft Network Client, Send unencrypted password to connect to Third-Party SMB Servers." to Disabled.

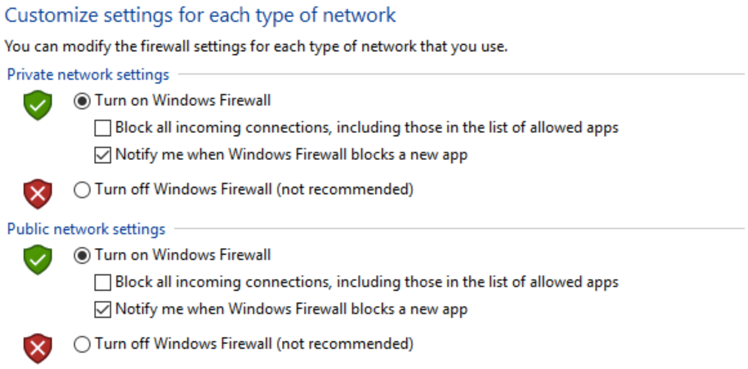
4.2.3 Firewall

4.2.3.1 Background

Firewalls protect computers from malicious packets.

4.2.3.2 How to Perform

Open search and type *"control panel"*. Then click on *"System and Security"* then click on *"Windows Firewall"* then click on "Turn firewall on or off". Make sure firewall is on and notifying the user for both public and private networks.



Customize settings for each type of network

You can modify the firewall settings for each type of network that you use.

Private network settings

● Turn on Windows Firewall

□ Block all incoming connections, including those in the list of allowed apps

☑ Notify me when Windows Firewall blocks a new app

○ Turn off Windows Firewall (not recommended)

Public network settings

● Turn on Windows Firewall

□ Block all incoming connections, including those in the list of allowed apps

☑ Notify me when Windows Firewall blocks a new app

○ Turn off Windows Firewall (not recommended)

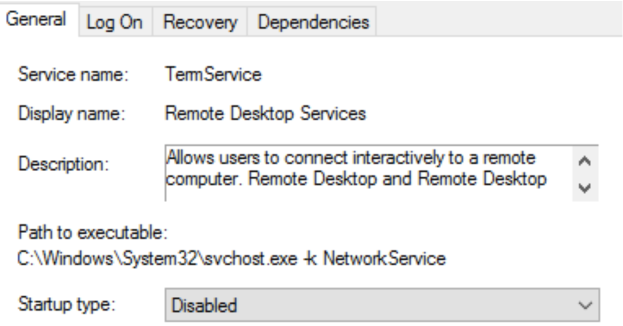
4.2.4 Services

4.2.4.1 Background

Services are programs which involve data transfer in and out of a computer for example FTP (file transfer protocol) and SSH (secure shell). To secure a computer, we can disable unnessary services.

4.2.4.2 How to Perform

Firstly, open search and Open search and type *"administrative tools"*. Then click on *"Services"*. Find the service you need to disable, right click and click stop. Then right click and click properties:



Service name: TermService

Display name: Remote Desktop Services

Description: Allows users to connect interactively to a remote computer. Remote Desktop and Remote Desktop

Path to executable:
C:\Windows\System32\svchost.exe -k NetworkService

Startup type: Disabled

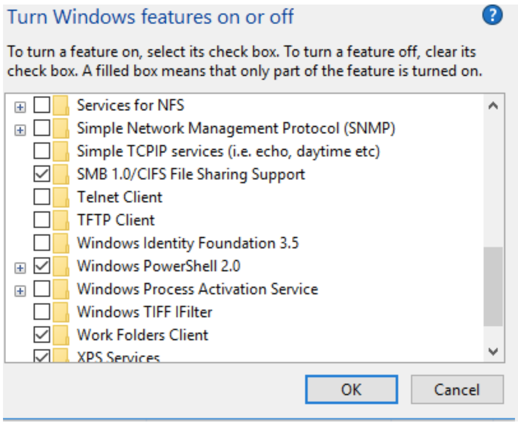
Then set *"Startup type"* to Disabled.

4.2.4.3 Services that should (maybe) be disabled:

- Telnet
- FTP
- SSH
- Samba
- Avahi Server
- SNMP

4.2.4.4 Windows Features:

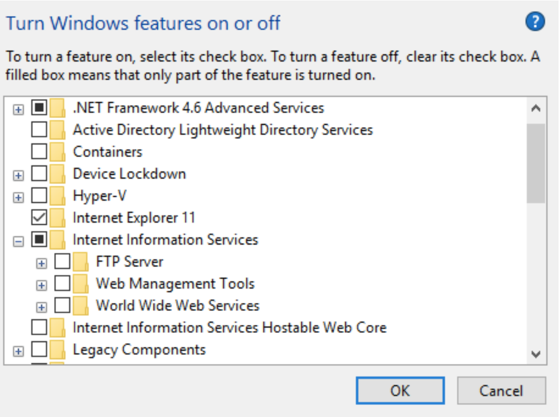
Open search and type *"control panel"*. Then click on *"Programs"* then click on *"Programs and Features"* then click on "Turn windows features on or off". Then check that services like "Telnet client" and "FTP Server" are disabled.



Turn Windows features on or off

To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.

- ⊞ □ Services for NFS
- ⊞ □ Simple Network Management Protocol (SNMP)
- □ Simple TCPIP services (i.e. echo, daytime etc)
- ☑ SMB 1.0/CIFS File Sharing Support
- □ Telnet Client
- □ TFTP Client
- □ Windows Identity Foundation 3.5
- ⊞ ☑ Windows PowerShell 2.0
- ⊞ □ Windows Process Activation Service
- □ Windows TIFF IFilter
- ☑ Work Folders Client
- ☑ XPS Services



Turn Windows features on or off

To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.

- ⊞ ■ .NET Framework 4.6 Advanced Services
- □ Active Directory Lightweight Directory Services
- □ Containers
- ⊞ □ Device Lockdown
- ⊞ □ Hyper-V
- ☑ Internet Explorer 11
- ⊟ ■ Internet Information Services
  - ⊞ □ FTP Server
  - ⊞ □ Web Management Tools
  - ⊞ □ World Wide Web Services
- □ Internet Information Services Hostable Web Core
- ⊞ □ Legacy Components

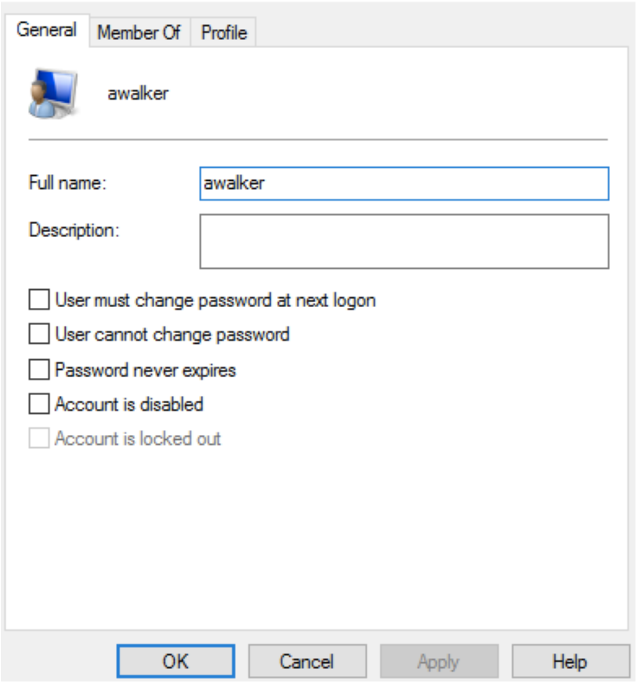
4.2.5 Users

4.2.5.1 Basic Settings

Open search and type *“control panel”*. Then click on *“User Accounts”* then click on *“User Accounts”.* Here you can add users, remove users, change passwords and change account type.

4.2.5.2 Advanced Settings

Firstly, open search and Open search and type *“administrative tools”.* Then click on *“Computer Management”,* then click on *“Local Users and Group”* then click on *“Users”.* Find the user you want to edit, right click and click properties. Here you can disable an account, make sure they can’t change the password, make them change the password on the next login.



awalker

Full name: awalker

Description:

□ User must change password at next logon
□ User cannot change password
□ Password never expires
□ Account is disabled
□ Account is locked out

4.2.6 Clean Host File

4.2.6.1 Background:

A host file is used by operating systems to map connections between an IP address and domain names.

4.2.6.2 How to Perform:

To clean the host file, open the file from directory:
“C:\Windows\System32\drivers\etc\host.txt“
Then replace the all the text with the following:

```
# Copyright (c) 1993-2006 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 handle within DNS itself.
#       127.0.0.1       localhost
#       ::1             localhost
```

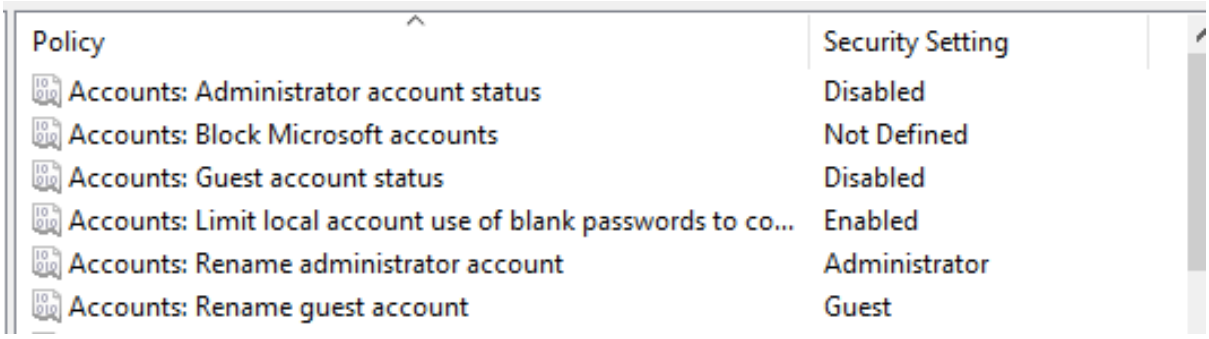
4.2.7 Guest/Admin Account Management

4.2.7.1 Background:

The admin account is a superuser, the guest account is an account that anyone can use but doesn’t save any files.

4.2.7.2 How to Perform:

Open search and type *“administrative tools”.* Then click on *“Local Security Policy”* then click on *“Local Policies”* then *“Security Options”.*



Policy	Security Setting
Accounts: Administrator account status	Disabled
Accounts: Block Microsoft accounts	Not Defined
Accounts: Guest account status	Disabled
Accounts: Limit local account use of blank passwords to co...	Enabled
Accounts: Rename administrator account	Administrator
Accounts: Rename guest account	Guest

Set Guest and Administrator account status to Disabled
Rename the guest and administrator accounts to a different name.

4.2.8 Updates

Install all necessary updates by searching for “Settings” and clicking “Windows Update” and install all necessary updates available.

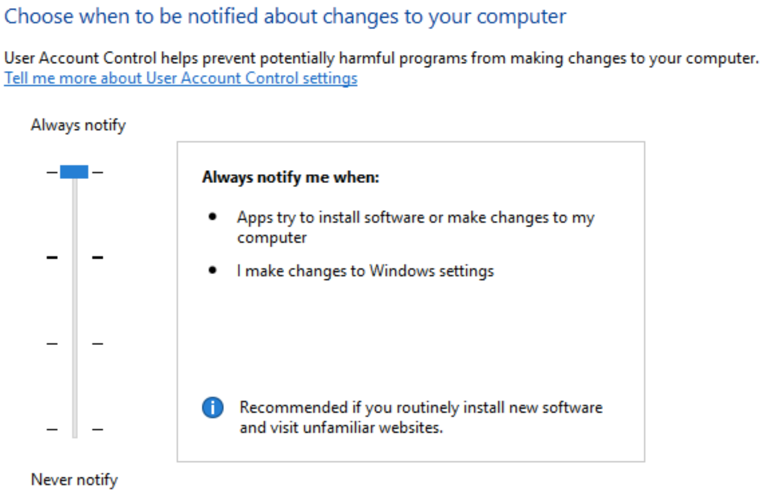
4.2.9 Windows Access Control

4.2.9.1 Background:

UAC (User Account Control) alerts the user if programs attempt to make changes to the computer.

4.2.9.2 How to Perform:

Open search and type *“control panel”.* Then click on *“System and Security”* then click on *“Security and Maintenance”.* Set the dial up to the maximum security setting.



Choose when to be notified about changes to your computer

User Account Control helps prevent potentially harmful programs from making changes to your computer.
Tell me more about User Account Control settings

Always notify

Always notify me when:

- Apps try to install software or make changes to my computer
- I make changes to Windows settings

Recommended if you routinely install new software and visit unfamiliar websites.

Never notify

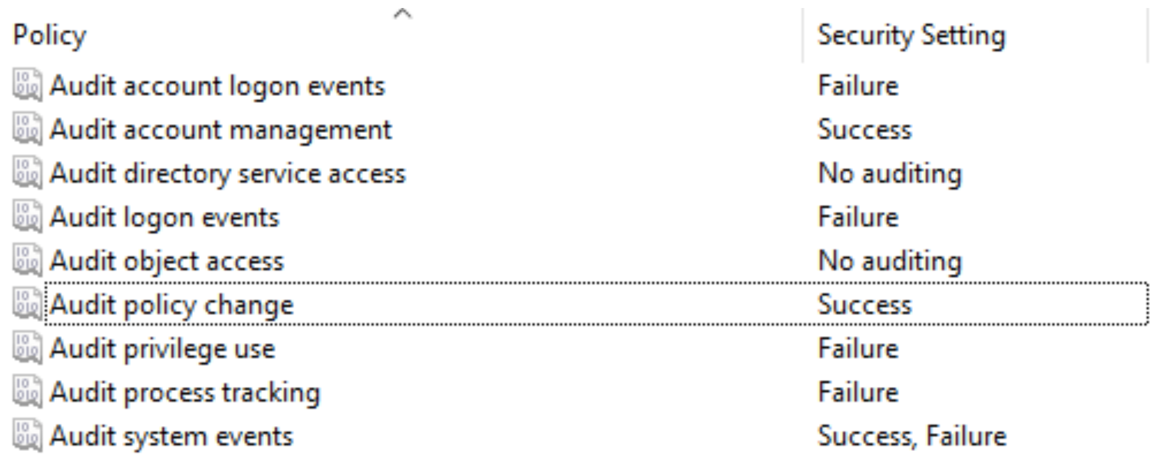
4.2.10 Audit Policy

4.2.10.1 Background:

An audit policy defines account limits for users of one or more resources.

4.2.10.2 How to Perform:

Open search and type *“administrative tools”.* Then click on *“Local Security Policy”* then click on *“Local Policies”* then *“Audit Policy”.*



Policy	Security Setting
Audit account logon events	Failure
Audit account management	Success
Audit directory service access	No auditing
Audit logon events	Failure
Audit object access	No auditing
Audit policy change	Success
Audit privilege use	Failure
Audit process tracking	Failure
Audit system events	Success, Failure

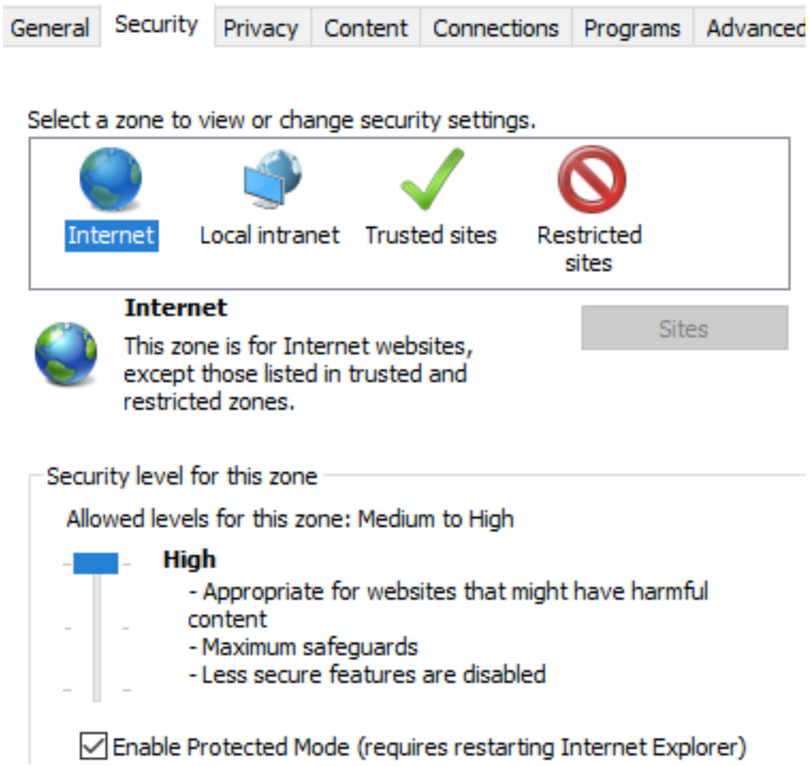
Set the audit settings:

Audit Account Logon Events - Failure
Audit Account Management - Success
Audit Directory Service - ND
Audit Logon Events - Failure
Audit Objects Access - ND
Audit Policy Change - Success
Audit Privilege use success - Failure
Audit Process tracking Success - Failure
Audit System Event – Success, Failure

4.2.11 Secure Internet Connection

4.2.11.1 How to Perform:

Open search and type *"Control Panel".* Then click on *"Network and Internet"* then click on *"Internet Options"* then select the *"Security"* tab and set the dial up to the maximum security setting.



Select a zone to view or change security settings.

Internet

This zone is for Internet websites, except those listed in trusted and restricted zones.

Security level for this zone

Allowed levels for this zone: Medium to High

High

- Appropriate for websites that might have harmful content
- Maximum safeguards
- Less secure features are disabled

☑ Enable Protected Mode (requires restarting Internet Explorer)

4.2.12 Disable File Sharing for C Drive

4.2.12.1 How to Perform:

Open search and type *"administrative tools".* Then click on *"Computer Management"* then click on *"Shared Folders"* then right click on c-drive and select disable sharing. You should also disable sharing for hidden drives.

5. Additional Resources

https://neprisstore.blob.core.windows.net/sessiondocs/doc_362f4940-9202-4477-9f45-b271bc2a9877.pdf - *document of security procedures for ubuntu*

https://s3.amazonaws.com/cpvii/Training+materials/Unit+Eight+-+Ubuntu+Security.pdf – PowerPoint on ubuntu security