

EXPERIMENT 2

Aim :

Build a Computer-to-Computer, Peer-to-Peer, Network (Ad-Hoc Wi-Fi Network).

Theory :

Ad-Hoc mode refers to a wireless network structure where devices can communicate directly with each other. It is an additional feature that is specified in the 802.11 set of standards, which is referred to as an Independent Basic Service Set (IBSS).

This type of wireless network is also called peer-to-peer mode. An ad-hoc wireless network is more cost-effective than its alternative, since it does not require the installation of an access point to operate. In addition, it also needs less time to set up. An ad-hoc mode is often used in urgent situations when fast and efficient communication is needed, such as search-and-rescue operations. This type of network is also used in small groups, where the main purpose of the connection is file-sharing.

On the downside, ad-hoc wireless networks may slow down network performance and are harder to manage. Since there is no centralization, there is practically no distribution system present. Network performance in this mode decreases as the number of devices increases. Because of this limitation, ad-hoc mode is not ideal to use for numerous devices and large work groups.

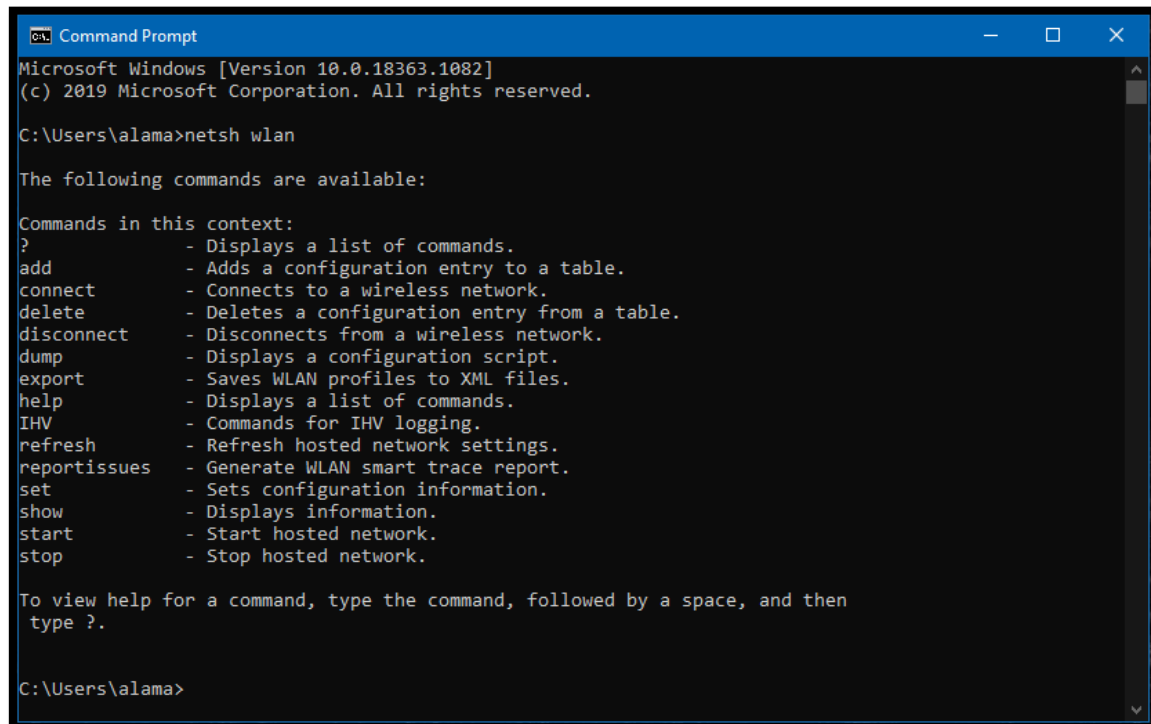
Setting up an ad-hoc network is useful if there isn't a wireless structure built, like if there aren't any access points or routers within range. The devices don't need a central server for file shares, printers, etc. Instead, they can access each other's resources directly through a simple point-to-point wireless connection.

How to Set-Up an Ad-Hoc Network?

Requirements – The devices that are going to take part in the ad-hoc network have to have a wireless network adapter installed. They also have to support a hosted network.

Testing – To see if your wireless adapter has hosted network support, look for it in Command Prompt after running the `netsh wlan` and `netsh wlan show drivers` command. You might need to open Command Prompt as an administrator for that command to work.

Screenshots : Testing



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Command Prompt
Microsoft Windows [Version 10.0.18363.1082]
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C:\Users\alama>netsh wlan

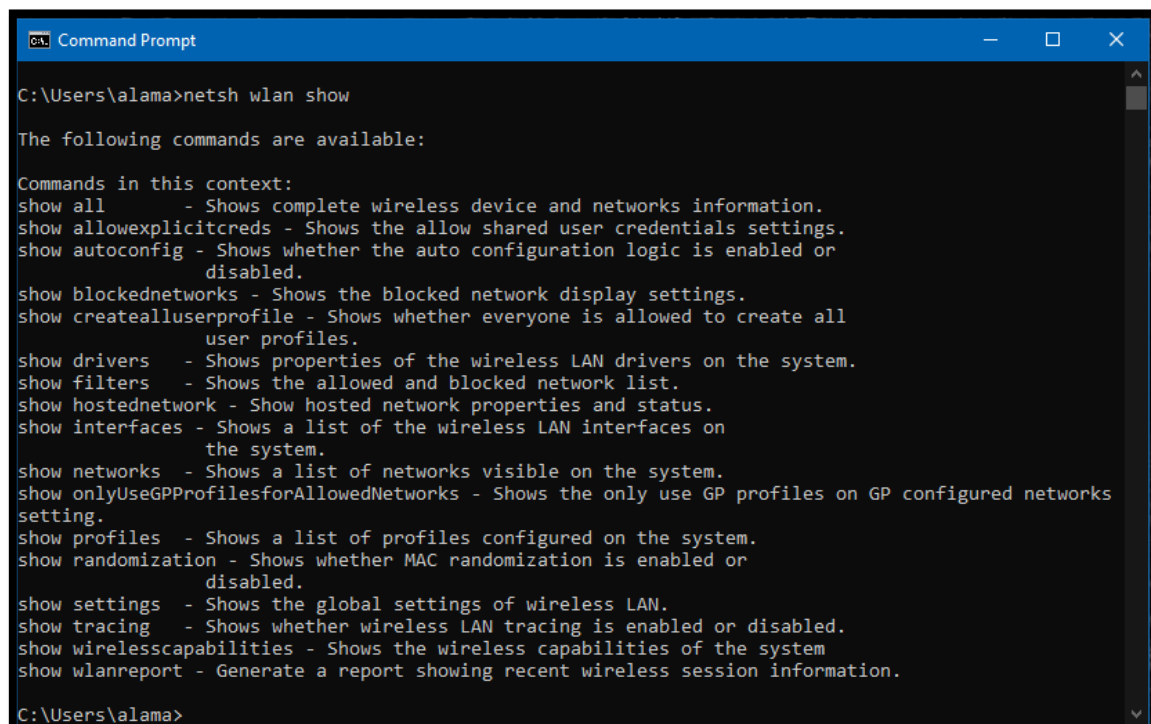
The following commands are available:

Commands in this context:
?                - Displays a list of commands.
add              - Adds a configuration entry to a table.
connect         - Connects to a wireless network.
delete          - Deletes a configuration entry from a table.
disconnect      - Disconnects from a wireless network.
dump            - Displays a configuration script.
export          - Saves WLAN profiles to XML files.
help            - Displays a list of commands.
IHV             - Commands for IHV logging.
refresh         - Refresh hosted network settings.
reportissues    - Generate WLAN smart trace report.
set             - Sets configuration information.
show            - Displays information.
start           - Start hosted network.
stop            - Stop hosted network.

To view help for a command, type the command, followed by a space, and then
type ?.

C:\Users\alama>
```

netsh wlan command



```
Command Prompt

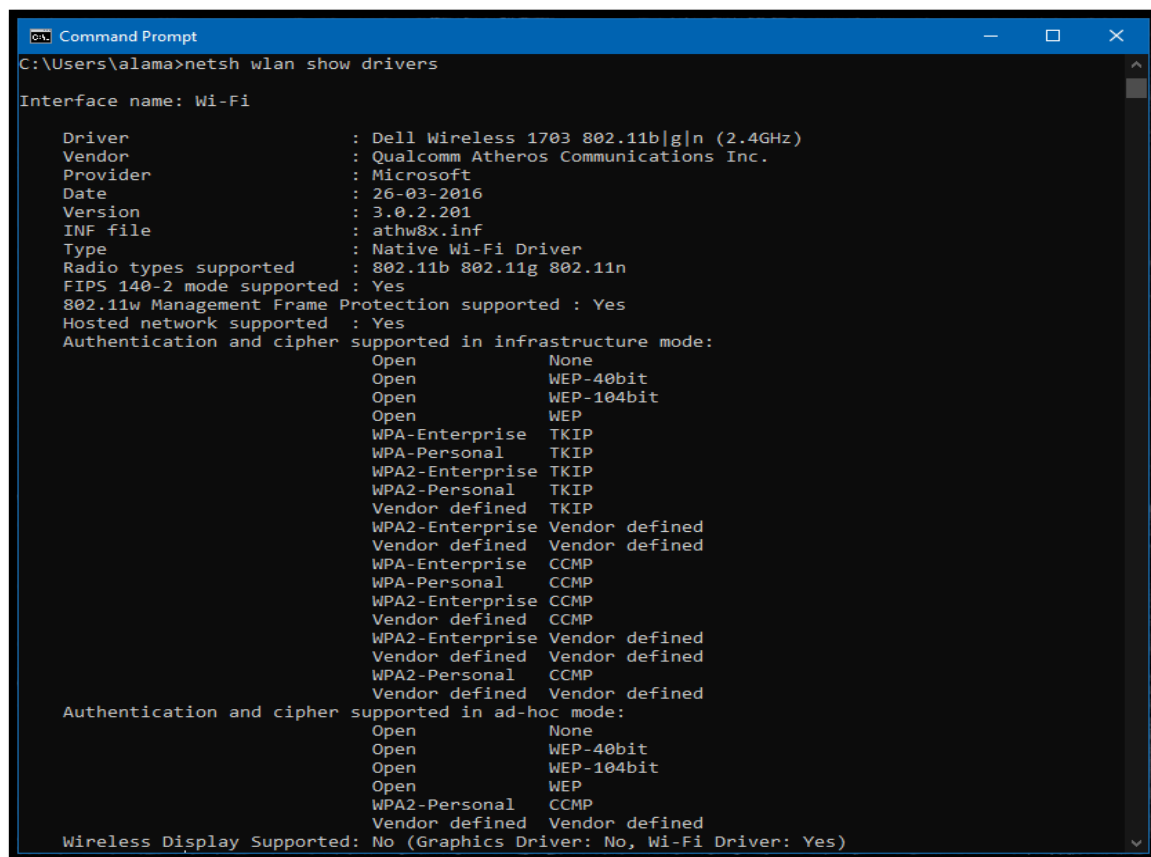
C:\Users\alama>netsh wlan show

The following commands are available:

Commands in this context:
show all        - Shows complete wireless device and networks information.
show allowexplicitcreds - Shows the allow shared user credentials settings.
show autoconfig - Shows whether the auto configuration logic is enabled or
                  disabled.
show blockednetworks - Shows the blocked network display settings.
show createalluserprofile - Shows whether everyone is allowed to create all
                           user profiles.
show drivers    - Shows properties of the wireless LAN drivers on the system.
show filters    - Shows the allowed and blocked network list.
show hostednetwork - Show hosted network properties and status.
show interfaces - Shows a list of the wireless LAN interfaces on
                  the system.
show networks   - Shows a list of networks visible on the system.
show onlyUseGPProfilesforAllowedNetworks - Shows the only use GP profiles on GP configured networks
setting.
show profiles   - Shows a list of profiles configured on the system.
show randomization - Shows whether MAC randomization is enabled or
                  disabled.
show settings   - Shows the global settings of wireless LAN.
show tracing    - Shows whether wireless LAN tracing is enabled or disabled.
show wirelesscapabilities - Shows the wireless capabilities of the system
show wlanreport - Generate a report showing recent wireless session information.

C:\Users\alama>
```

netsh wlan show command



```

C:\Users\alama>netsh wlan show drivers

Interface name: Wi-Fi

Driver               : Dell Wireless 1703 802.11b|g|n (2.4GHz)
Vendor               : Qualcomm Atheros Communications Inc.
Provider             : Microsoft
Date                 : 26-03-2016
Version              : 3.0.2.201
INF file             : athw8x.inf
Type                 : Native Wi-Fi Driver
Radio types supported : 802.11b 802.11g 802.11n
FIPS 140-2 mode supported : Yes
802.11w Management Frame Protection supported : Yes
Hosted network supported : Yes
Authentication and cipher supported in infrastructure mode:
    Open                None
    Open                WEP-40bit
    Open                WEP-104bit
    Open                WEP
    WPA-Enterprise      TKIP
    WPA-Personal         TKIP
    WPA2-Enterprise      TKIP
    WPA2-Personal        TKIP
    Vendor defined       TKIP
    WPA2-Enterprise      Vendor defined
    Vendor defined       Vendor defined
    WPA-Enterprise       CCMP
    WPA-Personal         CCMP
    WPA2-Enterprise      CCMP
    Vendor defined       CCMP
    WPA2-Enterprise      Vendor defined
    Vendor defined       Vendor defined
    WPA2-Personal        CCMP
    Vendor defined       Vendor defined
Authentication and cipher supported in ad-hoc mode:
    Open                None
    Open                WEP-40bit
    Open                WEP-104bit
    Open                WEP
    WPA2-Personal        CCMP
    Vendor defined       Vendor defined
Wireless Display Supported: No (Graphics Driver: No, Wi-Fi Driver: Yes)
  
```

`netsh wlan show drivers` command

Setting-Up Ad-Hoc Network in Windows 10 :

1. Open Command Prompt and run this command, replacing the italicized words with your own network name and password for the wireless network :
`netsh wlan set hostednetwork mode=allow ssid=network name key=password`
2. Start the hosted network :
`netsh wlan start hostednetwork`
3. Open Control Panel, navigate to \Network and Internet\Network and Sharing Center. All the active networks will be available here.

Steps :

1. Open Command Prompt using “Run as Administrator” option.
2. Enter the following command and press “Enter” :

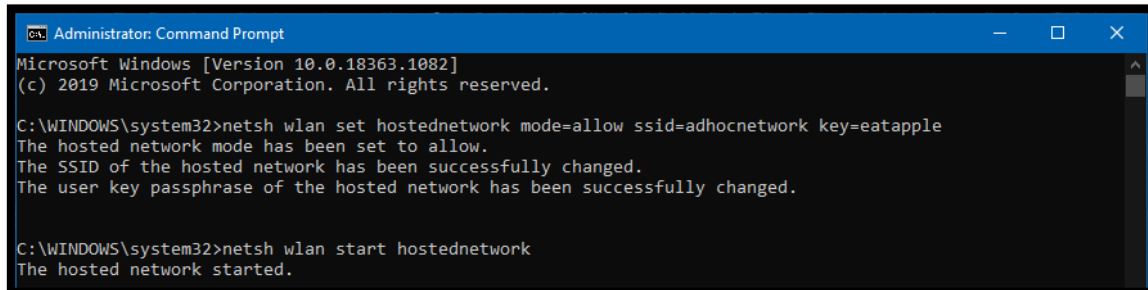
`netsh wlan set hostednetwork mode=allow ssid=adhocnetwork key=eatapple`

Here, network name is *adhocnetwork* and password is *eatapple*.

3. The hosted network mode has been set to allow. Now enter the following command and press “Enter” to start the hosted network :

```
netsh wlan start hostednetwork
```

The hosted network has started, close the Command Prompt.

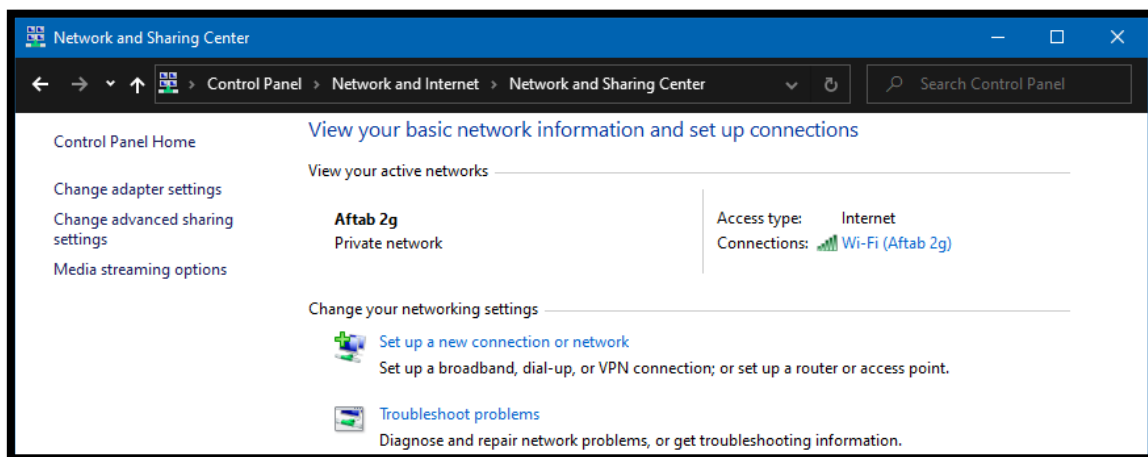


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Administrator: Command Prompt
Microsoft Windows [Version 10.0.18363.1082]
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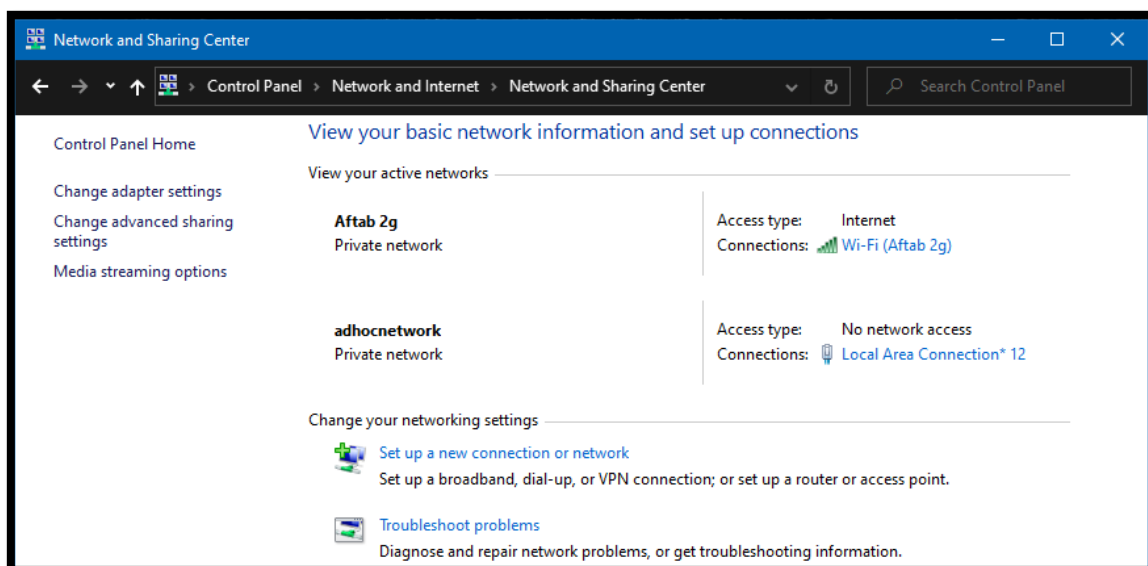
C:\WINDOWS\system32>netsh wlan set hostednetwork mode=allow ssid=adhocnetwork key=eatapple
The hosted network mode has been set to allow.
The SSID of the hosted network has been successfully changed.
The user key passphrase of the hosted network has been successfully changed.

C:\WINDOWS\system32>netsh wlan start hostednetwork
The hosted network started.
```

4. Open Control Panel, navigate to \Network and Internet\Network and Sharing Center. All the active networks will be available here.



Network and Sharing Center before setting-up ad-hoc network

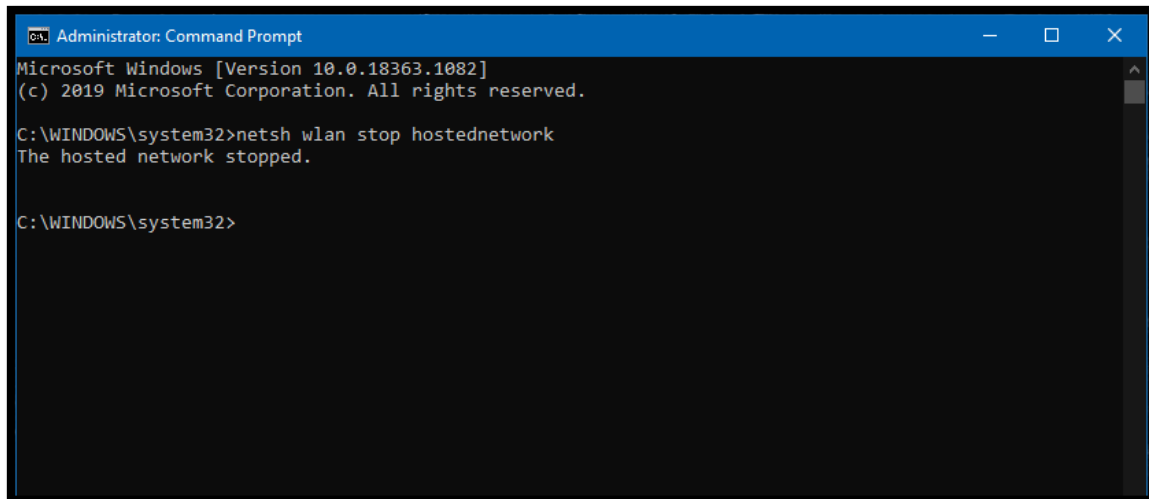


Network and Sharing Center after setting-up ad-hoc network

5. Enter the following command in the Command Prompt and press “Enter” to stop the network :

`netsh wlan stop hostednetwork`

The hosted network has stopped, close the Command Prompt.



6. Open Control Panel, navigate to \Network and Internet\Network and Sharing Center. Only your Internet Network will be available in the active networks. Your ad-hoc network set-up is complete and you can always turn it on by the above mentioned steps.

