

NOS3 WINDOWS WSL KURULUMU ADIMLARI

WSL Kurulum Adımları

Windows powershell ya da varsayılan komut satırını açarak wsl yükleme işlerini alttaki komutu girerek başlatın.

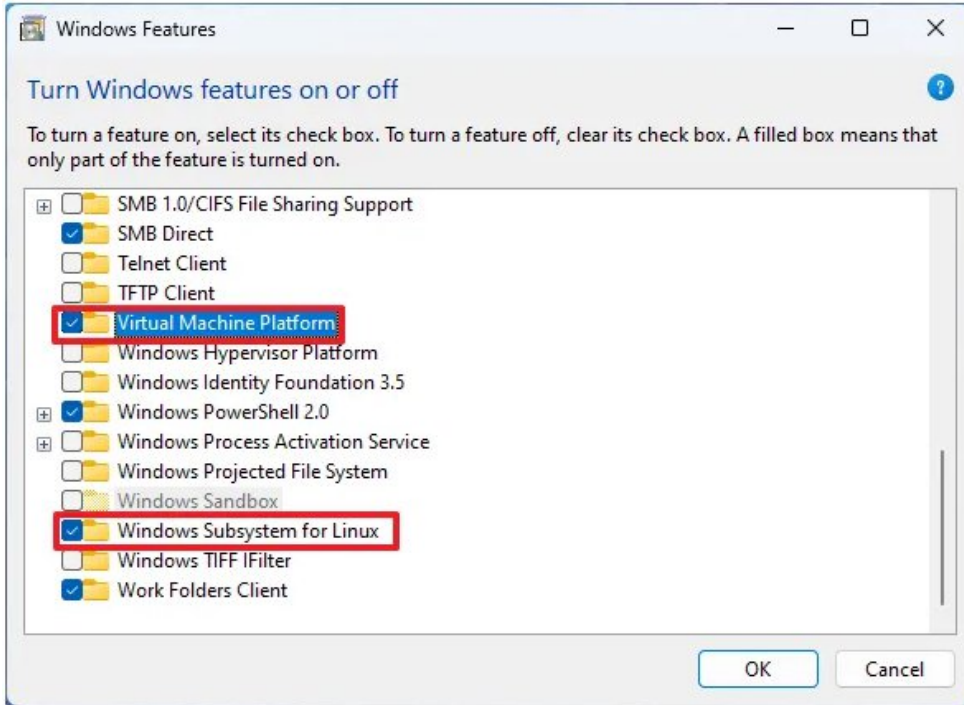
```
wsl --install
```

```
PS C:\Users\erhamas> wsl --install
Installing: Virtual Machine Platform
Virtual Machine Platform has been installed.
Installing: Windows Subsystem for Linux
Windows Subsystem for Linux has been installed.
Installing: Ubuntu
Ubuntu has been installed.
The requested operation is successful. Changes will not be effective until the system is rebooted.
PS C:\Users\erhamas>
```

Yükleme tamamlandıktan sonra bilgisayarınızı yeniden başlatın.

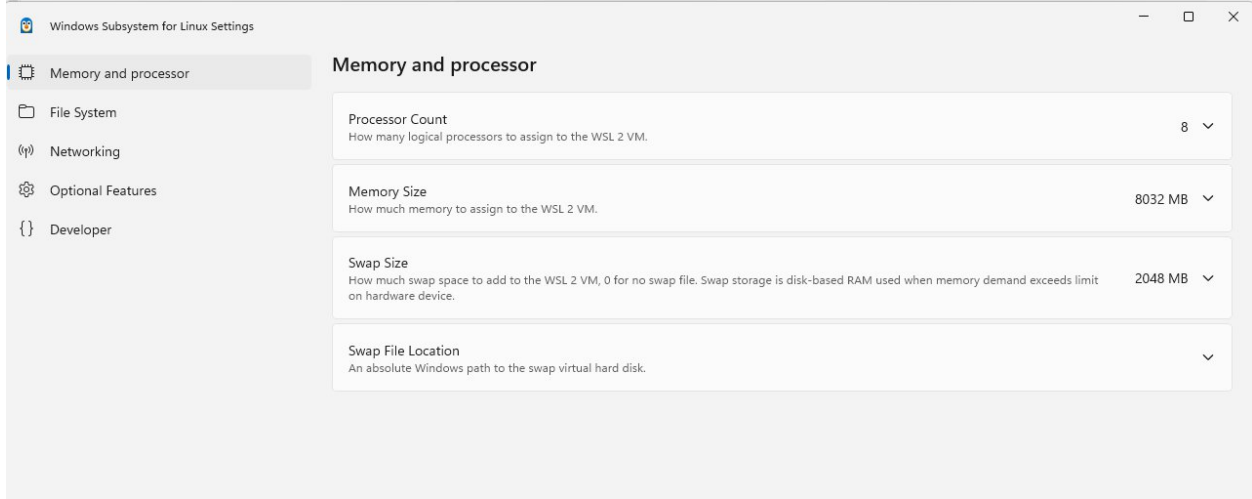
Windows Ortamını Hazırlama

- **Başlat** menüsüne tıkla
- **“Turn Windows Features On Or Off”** ara ve menüyü aç
- Görselde görünen alanların seçili olduğundan emin ol



- **Tamam** tuşuna ve ardından da **bilgisayarı yeniden başlatma** butonuna tıkla

WSL ortamınıza yeterli kaynak ayırdığınızdan emin olun, arama yerine **WSL Settings** yazın ve tıklayın, CPU ve Memory'nin minimum alttaki görseldeki kadar ya da ondan daha yüksek olduğundan emin olun. **12GB RAM, 12 CORE önerilir.**



Linux Sistemini Getirme (Ubuntu)

Wsl'in listeleme komutuyla güncel Linux dağıtıcılarının listesini görebiliriz.

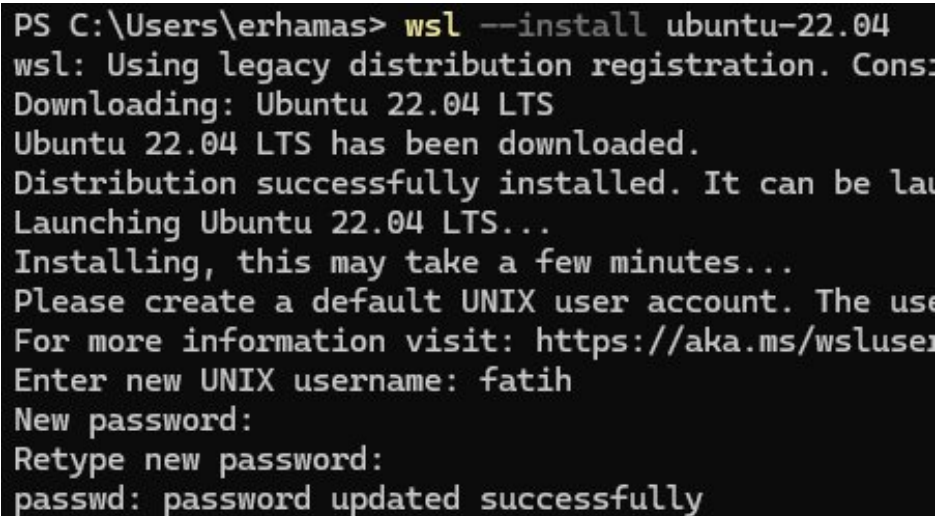
```
wsl.exe --list --online
```

```
PS C:\Users\erhamas> wsl.exe --list --online
The following is a list of valid distributions that can be installed.
Install using 'wsl.exe --install <Distro>'.

NAME                                FRIENDLY NAME
AlmaLinux-8                         AlmaLinux OS 8
AlmaLinux-9                         AlmaLinux OS 9
AlmaLinux-Kitten-10                 AlmaLinux OS Kitten 10
AlmaLinux-10                        AlmaLinux OS 10
Debian                              Debian GNU/Linux
FedoraLinux-42                      Fedora Linux 42
SUSE-Linux-Enterprise-15-SP6        SUSE Linux Enterprise 15 SP6
SUSE-Linux-Enterprise-15-SP7        SUSE Linux Enterprise 15 SP7
Ubuntu                              Ubuntu
Ubuntu-24.04                        Ubuntu 24.04 LTS
archlinux                           Arch Linux
kali-linux                          Kali Linux Rolling
openSUSE-Tumbleweed                 openSUSE Tumbleweed
openSUSE-Leap-15.6                  openSUSE Leap 15.6
Ubuntu-18.04                        Ubuntu 18.04 LTS
Ubuntu-20.04                        Ubuntu 20.04 LTS
Ubuntu-22.04                        Ubuntu 22.04 LTS
OracleLinux_7_9                     Oracle Linux 7.9
OracleLinux_8_10                    Oracle Linux 8.10
OracleLinux_9_5                     Oracle Linux 9.5
PS C:\Users\erhamas>
```

Bu dökümanda, ubuntu-22.04 sürümünü kuruyor olacağız.

```
wsl --install ubuntu-22.04
```



```
PS C:\Users\erhamas> wsl --install ubuntu-22.04
wsl: Using legacy distribution registration. Cons:
Downloading: Ubuntu 22.04 LTS
Ubuntu 22.04 LTS has been downloaded.
Distribution successfully installed. It can be lau
Launching Ubuntu 22.04 LTS...
Installing, this may take a few minutes...
Please create a default UNIX user account. The use
For more information visit: https://aka.ms/wsluser
Enter new UNIX username: fatih
New password:
Retype new password:
passwd: password updated successfully
```

Yükleme tamamlandıktan sonra kullanıcı adı ve şifrenizi belirleyin, artık hazırsınız.

Docker ve Git Bağımlılıklarının İndirilmesi

Sistem güncellemesi

```
sudo apt-get update

sudo apt-get install -y ca-certificates curl gnupg lsb-release
apt-transport-https software-properties-common
```

Docker resmi reposunu NOS3 ayarlarına göre ekleyin

```
sudo install -m 0755 -d /etc/apt/keyrings

sudo curl -fsSL https://download.docker.com/linux/ubuntu/gpg -o
/etc/apt/keyrings/docker.asc

sudo chmod a+r /etc/apt/keyrings/docker.asc

echo "deb [arch=$(dpkg --print-architecture) signed-
by=/etc/apt/keyrings/docker.asc] \
https://download.docker.com/linux/ubuntu \
$(. /etc/os-release && echo "${UBUNTU_CODENAME:-
$VERSION_CODENAME}") stable" | \
sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
```

Sistemi tekrar güncelleme ve Docker'ın ilgili plugin

```
sudo apt-get update

sudo apt-get install -y docker-ce docker-ce-cli containerd.io
docker-buildx-plugin docker-compose-plugin
```

Sudo komutu olmadan Docker kullanmak için ilgili komutları girin

```
sudo groupadd docker 2>/dev/null || true

sudo usermod -aG docker $USER
```

Bu noktada, ayrı bir terminal penceresinden alttaki komutu girerek Docker bileşenlerinin Linux ortamında çalışmasını sağlayın

```
wsl --shutdown
```

Git güncellemesini yapacağız, NOS3'ün önerdiği Git sürümünün 2.47+ olması gerekmektedir.

```
sudo add-apt-repository -y ppa:git-core/ppa

sudo apt-get update

sudo apt-get install -y git

git --version # 2.47+ görmelisin
```

```
git-doc git-email git-gui gitk gitweb git-cvs git-medi
The following packages will be upgraded:
git git-man
2 upgraded, 0 newly installed, 0 to remove and 99 not u
Need to get 9408 kB of archives.
After this operation, 16.7 MB of additional disk space
Get:1 https://ppa.launchpadcontent.net/git-core/ppa/ubu
kB]
Get:2 https://ppa.launchpadcontent.net/git-core/ppa/ubu
00 kB]
Fetched 9408 kB in 1s (6644 kB/s)
(Reading database ... 42853 files and directories curre
Preparing to unpack .../git_1%3a2.50.1-0ppal~ubuntu22.0
Unpacking git (1:2.50.1-0ppal~ubuntu22.04.1) over (1:2.
Preparing to unpack .../git-man_1%3a2.50.1-0ppal~ubuntu
Unpacking git-man (1:2.50.1-0ppal~ubuntu22.04.1) over (
Setting up git-man (1:2.50.1-0ppal~ubuntu22.04.1) ...
Setting up git (1:2.50.1-0ppal~ubuntu22.04.1) ...
Processing triggers for man-db (2.10.2-1) ...
git version 2.50.1
fatim@E-5C82262F1D:/mnt/c/Users/erhamas$
```

Sim, 42 ve GUI bileşenlerinin sağlıklı çalışabilmesi için ilgili komutu girin.

```
sudo apt update  
sudo apt install -y mesa-utils x11-xserver-utils gnome-terminal
```

İlgili paketlerin yüklendiğini doğrulamak için alttaki komutu giriniz ve çıktıda beklenenlerin yazdığını doğrulayın.

```
glxinfo -B | egrep 'OpenGL vendor|renderer|version'
```

```
fatih@E-5CG2282FTD:/mnt/c/Users/erhamas$ glxinfo -B | egrep 'OpenGL vendor|renderer|version'  
Extended renderer info (GLX_MESA_query_renderer):  
  Max core profile version: 4.1  
  Max compat profile version: 4.1  
  Max GLES1 profile version: 1.1  
  Max GLES[23] profile version: 3.0  
OpenGL vendor string: Microsoft Corporation  
OpenGL renderer string: D3D12 (Intel(R) Iris(R) Xe Graphics)  
OpenGL core profile version string: 4.1 (Core Profile) Mesa 23.2.1-1ubuntu3.1~22.04.3  
OpenGL core profile shading language version string: 4.10  
OpenGL version string: 4.1 (Compatibility Profile) Mesa 23.2.1-1ubuntu3.1~22.04.3  
OpenGL shading language version string: 4.10  
OpenGL ES profile version string: OpenGL ES 3.0 Mesa 23.2.1-1ubuntu3.1~22.04.3  
OpenGL ES profile shading language version string: OpenGL ES GLSL ES 3.00
```

NOS3'ün istediğiniz ya da güncel paketini aşağıdaki git komutlarıyla Linux ortamınıza çekin.

```
git clone https://github.com/nasa/nos3.git  
cd nos3  
git submodule update --init --recursive
```

Modüllerin sağlıklı ve sorunsuz terminal üzerinde Windows masaüstünde görünebilmesi için Igniter'a ihtiyacımız var. Igniter'ın düzgün çalışabilmesi için gerekli **python** ortamını kurun ve **python activate** ile izole ortamın içinde olduğunuzdan emin olun.

```
sudo apt-get install -y python3-venv python3-pip python3-dev  
python3 -m venv .venv  
source .venv/bin/activate
```

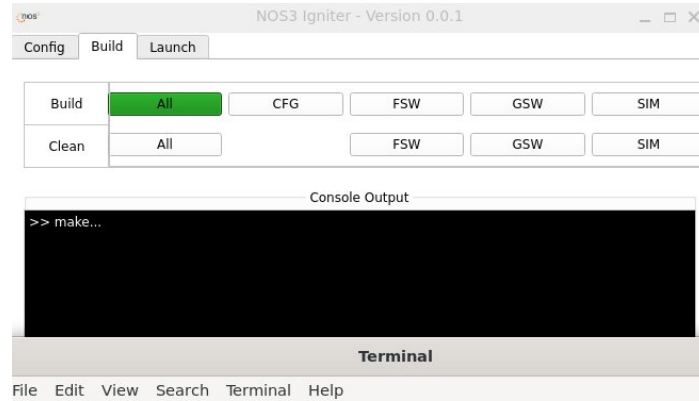
make prep komutunu girdikten sonra **igniter** arayüzü açılacak. Bu arayüz açıldıktan sonra bütün **build**, **launch** ve **clean** işlerini igniter üzerinden gerçekleştirebilirsiniz.

make prep

Yüklemelerden sonra NOS3 Igniter arayüzü açılacak



Igniter Build işlemleri



Update the VERSION argument <min> value or use a ...<max> suffix to tell CMake that the project does not need compatibility with older versions.

```
- Building Dynamic App: syn/fsw/cfs targets=cpu1
Make Deprecation Warning at /mnt/c/Users/erhamas/nos3/components/syn/fsw/
keLists.txt:1 (cmake_minimum_required):
Compatibility with CMake < 2.8.12 will be removed from a future version
CMake.
```

Update the VERSION argument <min> value or use a ...<max> suffix to tell CMake that the project does not need compatibility with older versions.

```
- The CXX compiler identification is GNU 11.4.0
- Detecting CXX compiler ABI info
- Detecting CXX compiler ABI info - done
- Check for working CXX compiler: /usr/bin/g++ - skipped
- Detecting CXX compile features
- Detecting CXX compile features - done
- Using the single-header code from /mnt/c/Users/erhamas/nos3/components/
opsis/json/single_include/
```


Make launch işlemi sonrası windows masasütü ekranımızda bileşenlerimiz görünmeli.

The screenshot displays a Windows desktop environment during the launch of the NOS3 Flight Software. The desktop includes several open windows:

- NOS Time Driver**: A terminal window showing the command prompt and the execution of the NOS Time Driver. It displays the current time, the absolute time, and the real microseconds per tick.
- sc01 - NOS3 Flight Software**: A terminal window showing the execution of the NOS3 Flight Software. It displays the status of various components, including the AP state, device enabled status, and the execution of the NOS3 Flight Software.
- 42 Cam**: A window showing a 3D model of a satellite in space. The satellite is labeled "42" and is shown in a 3D perspective view. The view is labeled "View in B: [0.9242 -0.5596 0.6419]".
- COSMOS Command and Telemetry Server - NOS3 Configuration**: A window showing the configuration of the COSMOS Command and Telemetry Server. It includes a table of connections and a log of events.
- 42 Unit Sphere Viewer**: A window showing a 3D model of a unit sphere. The sphere is labeled "42" and is shown in a 3D perspective view. The view is labeled "View in B: [0.9242 -0.5596 0.6419]".

The terminal windows show the following output:

NOS Time Driver

```
TimeDriver::send tick to nos engine:
tick = 6710, absolute time = 814254267.100000 = 2025/10/20T17:44:27.10
real microseconds per tick = 10000, attempted speed-up = 1.00
actual speed-up = 0.91, state = playing

Press: 'p' to pause/play,
'+' to decrease delay by 2x,
'-' to increase delay by 2x,
'r <number>' to run <number> more seconds,
'u <number>' to run until <number> absolute time
```

sc01 - NOS3 Flight Software

```
EVS Port1 EVS Port1 42/1/LC 33: Set AP state command: AP = 26, New state = 1
EVS Port1 EVS Port1 42/1/FSS 14: GENERIC_FSS: Device enabled
EVS Port1 EVS Port1 42/1/FSS 13: GENERIC_FSS: Enable command received
EVS Port1 EVS Port1 42/1/LC 30: Reset AP state command: AP = 25
EVS Port1 EVS Port1 42/1/IMU 13: GENERIC_IMU: Enable command received
EVS Port1 EVS Port1 42/1/IMU 14: GENERIC_IMU: Device enabled
EVS Port1 EVS Port1 42/1/MAG 13: GENERIC_MAG: Enable command received
EVS Port1 EVS Port1 42/1/LC 33: Set AP state command: AP = 25, New state = 1
MGR: TimeTics = 1000000000001300
EVS Port1 EVS Port1 42/1/MAG 14: GENERIC_MAG: Device enabled
EVS Port1 EVS Port1 42/1/SC 86: RTS 001 Execution Completed
EVS Port1 EVS Port1 42/1/MGR 24: MGR: Set science status command received [0]
EVS Port1 EVS Port1 42/1/TORQUER 13: GENERIC_TORQUER: Enable command received
EVS Port1 EVS Port1 42/1/TORQUER 14: GENERIC_TORQUER: Device enabled
EVS Port1 EVS Port1 42/1/NAV 14: NOVATEL_OEM615: Device enabled
EVS Port1 EVS Port1 42/1/NAV 13: NOVATEL_OEM615: Enable command received
EVS Port1 EVS Port1 42/1/SC 86: RTS 003 Execution Completed
EVS Port1 EVS Port1 42/1/ADCS 20: **ADCS** Changed mode to: 2
MGR: TimeTics = 1000000000002300
MGR: TimeTics = 1000000000003300
MGR: TimeTics = 1000000000004300
MGR: TimeTics = 1000000000005300
MGR: TimeTics = 1000000000006300
```

COSMOS Command and Telemetry Server - NOS3 Configuration

Interface	Connect/Disconnect	Connected?	Clients	Tx Q Size	Rx Q Size	Bytes Tx	Bytes Rx
DEBUG	Disconnect	true	0	0	0	0	63052
RADIO	Disconnect	true	0	0	0	0	0
FDP_INT	Disconnect	true	0	0	0	0	11648
TRUTH_INT	Disconnect	true	0	0	0	0	66253
DBUS_BRIDGE	Disconnect	true	0	0	0	0	0

42 Unit Sphere Viewer

The 42 Unit Sphere Viewer window shows a 3D model of a unit sphere. The sphere is labeled "42" and is shown in a 3D perspective view. The view is labeled "View in B: [0.9242 -0.5596 0.6419]".