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BeagleBone Black (BBB) Networking Configuration

The BeagleBone Black supports multiple ways to connect to a network or your host PC. Below is a breakdown of networking setup and configuration options.

🔷 1. Networking Options on BBB

Connection Method	Interface Type	Description
USB Ethernet (default)	USB	Virtual network over USB cable
Ethernet (RJ45 port)	Ethernet	Wired LAN connection
Wi-Fi (via dongle)	USB	External Wi-Fi adapter needed
Internet Sharing	Host PC	Share internet from Windows/Linux

🔹 2. Default USB Ethernet Configuration

When you connect BBB to your PC via **USB**, it creates a virtual Ethernet interface:

- PC IP: 192.168.7.1
- BBB IP: 192.168.7.2

🔧 To Access BBB:

1. Connect BBB to PC via USB.
2. Open terminal (Linux/macOS) or PuTTY (Windows).
3. Use:

ssh debian@192.168.7.2

Default password is: temppwd (or blank in newer images)

🔹 **3. Ethernet Configuration (Wired)**

✅ **Automatic IP using DHCP:**

If a DHCP server is available (e.g., from router):

sudo dhclient eth0

To verify:

ifconfig eth0

✅ **Static IP Configuration:**

Edit the config file (Debian-based systems):

sudo nano /etc/network/interfaces

Add:

auto eth0

iface eth0 inet static

address 192.168.1.50

netmask 255.255.255.0

gateway 192.168.1.1

Then restart networking:

sudo systemctl restart networking

- **4. Wi-Fi Configuration (using USB Wi-Fi Dongle)**

Check USB Wi-Fi device:

lsusb

Connect via command line:

sudo nano /etc/wpa_supplicant/wpa_supplicant.conf

Add:

```
network={
   ssid="Your_SSID"
   psk="Your_PASSWORD"
}
```

Then connect:

sudo wpa_supplicant -B -i wlan0 -c /etc/wpa_supplicant/wpa_supplicant.conf

sudo dhclient wlan0

- **5. Enable Internet Sharing (PC to BBB)**

If you want BBB to access the internet via your PC's internet:

On Windows:

1. Go to Network and Sharing Center.

2. Right-click on your internet connection → Properties.
3. Enable "**Internet Connection Sharing**" and select BBB's USB network interface (like USB Ethernet/RNDIS Gadget).

On Linux/macOS:

Use iptables or nmcli to share internet from eth0 to usb0.

🔹 6. Check Network Status

```
ifconfig      # or ip a
ping 8.8.8.8   # check internet connectivity
ping 192.168.7.1  # ping host PC
```

📜 Summary

Task	Command / File
SSH into BBB via USB	ssh debian@192.168.7.2
Check interfaces	ifconfig or ip a
DHCP Ethernet	sudo dhclient eth0
Static IP config	/etc/network/interfaces
Wi-Fi setup	wpa_supplicant.conf
Internet sharing	OS-specific (ICS or iptables)