Contents

[Bringing Up an Ethernet Interface Over PCIE 1](#_Toc168606228)

[Tegra Virtual Ethernet over PCIe 2](#_Toc168606229)

[Memory Range and Inbound ATU 2](#_Toc168606230)

[References 2](#_Toc168606231)

## Bringing Up an Ethernet Interface Over PCIE

Use the following procedure to bring up an Ethernet interface over PCIE.

To bring up an Ethernet interface over PCIE

1.Connect the systems using the appropriate PCIe cable.

2.Boot the endpoint Jetson system.

3.Enter the following commands to configure and enable PCIe endpoint mode:

cd /sys/kernel/config/pci\_ep/

mkdir functions/pci\_epf\_tvnet/func1

echo 16 > functions/pci\_epf\_tvnet/func1/msi\_interrupts

ln -s functions/pci\_epf\_tvnet/func1 controllers/141a0000.pcie\_ep/

echo 1 > controllers/141a0000.pcie\_ep/start

4.Boot the root port system.

5.Verify that the PCIe link is up by entering the lspci command in root port system.

The console output should include “PCIe device with vendor id: 0x10de and device id: 0x2296.”

6.Bring up both interfaces to establish an Ethernet link between the systems. Then assign them dynamic or static IP addresses.

For example, enter the following commands, in the order shown, to bring up the Ethernet interfaces and assign static IP addresses:

On the endpoint system: ifconfig eth1 up

On the root port system: ifconfig eth1 up

On the endpoint system: ifconfig eth1 192.168.2.1

On the root port system: ifconfig eth1 192.168.2.2

Ethernet interface eth1 is created in both systems.

## Tegra Virtual Ethernet over PCIe

PCIe to communication between two xaviers. One is in the default mode (root complex). Another is configured as endpoint mode.

Ep-xavier is started up firstly and I typed the following commands:

On the endpoint board:

cd /sys/kernel/config/pci\_ep/

mkdir functions/pci\_epf\_tvnet/func1

ln -s functions/pci\_epf\_tvnet/func1 controllers/141a0000.pcie\_ep/

echo 1 > controllers/141a0000.pcie\_ep/start

On the host, simply make sure the tegra\_vnet driver is plugged in, and it should automatically bind to the PCIe EP device once the two systems are booted. “ifconfig -a” should show an Ethernet interface, which you can use just like any other Linux Ethernet interface.

Host driver: drivers/net/ethernet/nvidia/pcie/tegra\_vnet.c

Endpoint driver: drivers/pci/endpoint/functions/pci-epf-tegra-vnet.c

## Memory Range and Inbound ATU

https://forums.developer.nvidia.com/t/xavier-pcie-endpoint-share-memory-size/77936/3

## References

1. <https://docs.nvidia.com/jetson/archives/l4t-archived/l4t-3243/index.html#page/Tegra%2520Linux%2520Driver%2520Package%2520Development%2520Guide%2Fintroduction.html%23wwpID0EPHA>
2. <https://developer.nvidia.com/embedded/linux-tegra-r321>
3. <https://www.youtube.com/watch?v=1ZyACoenTNM>
4. <https://gist.github.com/jetsonhacks/2717a41f7e60a3405b34>
5. <https://github.com/nxp-auto-linux/vnet/tree/pci-vdev>
6. <https://github.com/nxp-auto-linux/linux>
7. <https://developer.nvidia.com/embedded/jetpack-43-archive>
8. <https://developer.nvidia.com/sdk-manager>
9. Path: - /home/mir/Downloads/nvidia/sdkm\_downloads/Jetson\_Linux\_R36.3.0\_aarch64/Linux\_for\_Tegra/source/nvidia-oot/

Files: -

drivers/net/ethernet/nvidia/pcie/tegra\_vnet.c

drivers/pci/endpoint/functions/pci-epf-tegra-vnet.c

1. https://forums.developer.nvidia.com/t/how-to-test-xavier-which-is-in-endpoint-mode-in-jetpack-4-2/72018/19