

TITAN4 系列产品  
时间同步——PTP 方式



### 版本历史

版本号	适用于	时间	说明
Ver1.0.0	TITAN4	2021.5	初始版本

# TITAN4 时间同步-PTP 方式

## 一、 准备工作

在进行 PTP 方式的时间同步操作前，请做好以下准备：

1. 一台双 Xavier 的 TITAN4 的控制器，两台键鼠，带 HDMI 接口的显示器两台、电源适配器一个。

2. 配置 IP 地址，确保主从 Xavier 在同一个网段，能够互相 ping 通网络，例如：

Master PC: IP: 192.168.4.101 Mask: 255.255.255.0

Slave PC: IP: 192.168.4.102 Mask: 255.255.255.0

3. 同步脚本：① ptp\_master\_setup.sh

② ptp\_slave\_setup.sh

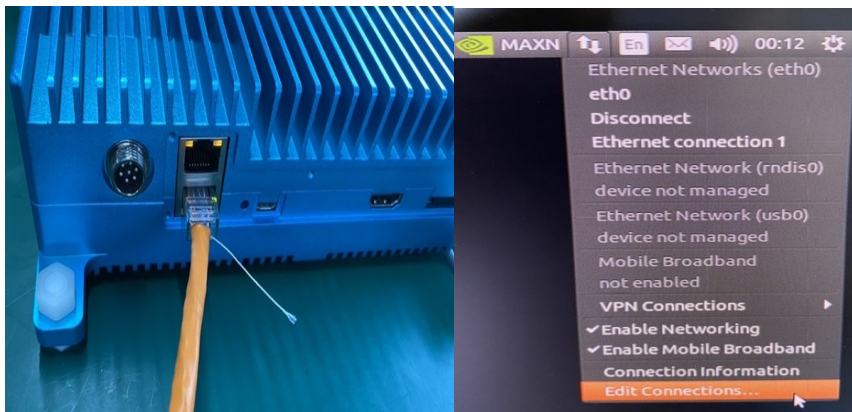
## 二、 同步操作步骤

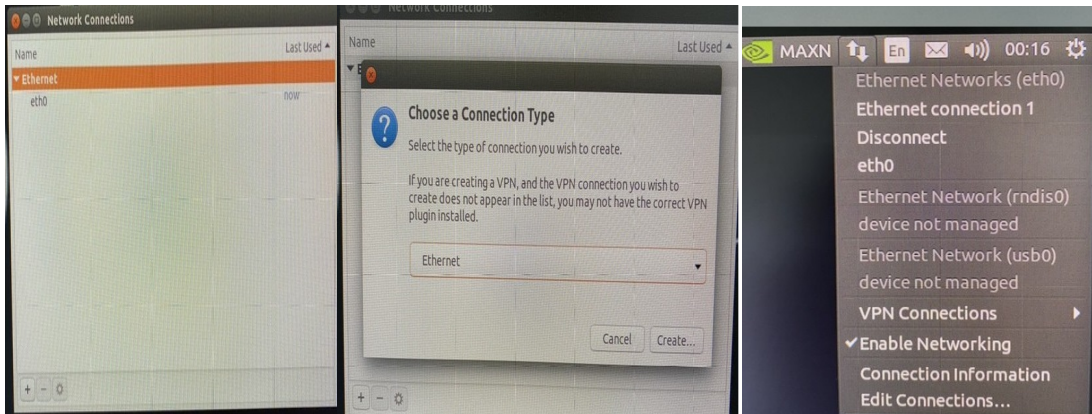
1. 把准备好的脚本文件 ptp\_master\_setup.sh 拷贝到主 Xavier 的 home 目录下；把脚本 ptp\_slave\_setup.sh 拷贝到从 Xavier 的 home 目录下。

2. 在连接网络的情况下，主从控制器上分别安装 LinuxPTP，在终端执行如下命令进行安装 PTP：

a) 配置控制器网络

通过网线连接服务器，配置以太网接口 Edit Connections...—加号—选择 (Ethernet)—断开网络 (Disconnect)—连接网络 (Ethernet connection)





b) 通过网线连接服务器，并下载 LinuxPTP

```
$ sudo git clone git://git.code.sf.net/p/linuxptp/code linuxptp
```

```
titan@titan-ubuntu1:~$ sudo git clone git://git.code.sf.net/p/linuxptp/code linu
xptp
[sudo] password for titan:
Cloning into 'linuxptp'...
remote: Enumerating objects: 5799, done.
remote: Counting objects: 100% (5799/5799), done.
remote: Compressing objects: 100% (5065/5065), done.
remote: Total 5799 (delta 4339), reused 854 (delta 733)
Receiving objects: 100% (5799/5799), 1.24 MiB | 1.38 MiB/s, done.
Resolving deltas: 100% (4339/4339), done.
```

c) 切换到 linuxptp 目录下

```
$ cd linuxptp
```

d) 执行编译命令

```
$ sudo make
```

```
titan@titan-ubuntu1: ~/linuxptp
titan@titan-ubuntu1:~$ cd linuxptp
titan@titan-ubuntu1:~/linuxptp$ sudo make
[sudo] password for titan:
make: Warning: File 'makefile' has modification time 387 s in the future
DEPEND ts2phc_slave.c
DEPEND ts2phc_nmea_master.c
DEPEND ts2phc_phc_master.c
DEPEND ts2phc_master.c
DEPEND ts2phc_generic_master.c
DEPEND sock.c
DEPEND serial.c
DEPEND nmea.c
DEPEND lstab.c
DEPEND ts2phc.c
DEPEND timemaster.c
DEPEND sysoff.c
DEPEND pmc_common.c
DEPEND pmc_agent.c
DEPEND pmc.c
DEPEND phc_ctl.c
DEPEND phc2sys.c
DEPEND nsm.c
DEPEND hwstamp_ctl.c
DEPEND version.c
```

e) 执行安装命令

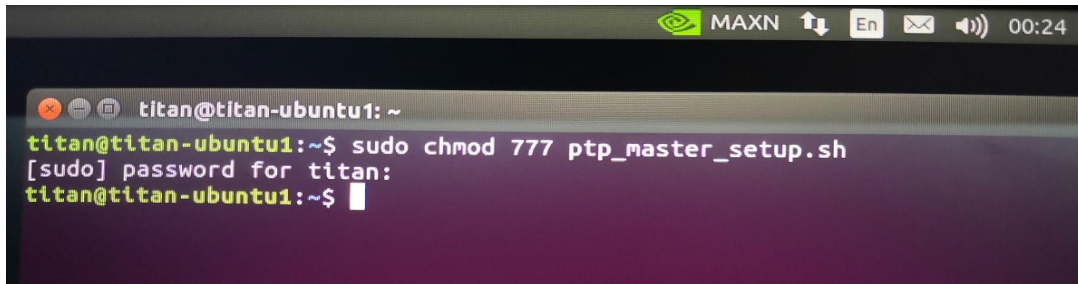
```
$ sudo make install
```



```
titan@titan-ubuntu1:~/linuxptp$ sudo make install
install -p -m 755 -d /usr/local/sbin /usr/local/man/man8
install ptp4l hwstamp_ctl nsm phc2sys phc_ctl pnc timemaster ts2phc /usr/local/s
bin
for x in ptp4l.8 hwstamp_ctl.8 nsm.8 phc2sys.8 phc_ctl.8 pnc.8 timemaster.8 ts2p
hc.8; do \
    [ -f $x ] && install -p -m 644 -t /usr/local/man/man8 $x ; \
done
```

3. 对脚本文件进行授权, 首先在主控制器的终端执行如下命令:

```
$ sudo chmod 777 ptp_master_setup.sh
```

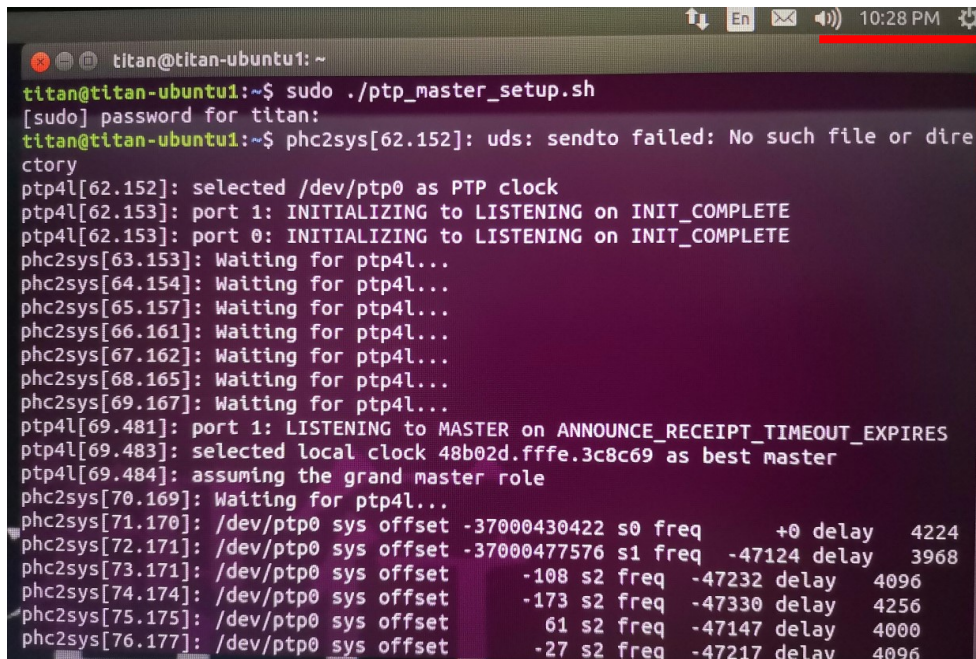


其次在从控制器上做同样的操作, 对脚本 `ptp_slave_setup.sh` 进行授权。

4. 分别在主从控制器上执行命令进行 PTP 时间同步:

主控制器: `$ sudo ./ptp_master_setup.sh`

从控制器: `$ sudo ./ptp_slave_setup.sh`



A terminal window screenshot showing the execution of `sudo ./ptp_master_setup.sh`. The output shows the initialization of the PTP clock and the selection of the local clock as the best master. The output also shows the synchronization of the slave clocks, with the following table of results:

Device	sys offset	freq	delay
phc2sys[71.170]	-37000430422	s0	4224
phc2sys[72.171]	-37000477576	s1	3968
phc2sys[73.171]	-108	s2	4096
phc2sys[74.174]	-173	s2	4256
phc2sys[75.175]	61	s2	4000
phc2sys[76.177]	-27	s2	4096

```
titan@titan-ubuntu1: ~  
titan@titan-ubuntu1:~$ sudo ./ptp_slave_setup.sh  
[sudo] password for titan:  
titan@titan-ubuntu1:~$ ptp4l[72.322]: selected /dev/ptp0 as PTP clock  
ptp4l[72.323]: port 1: INITIALIZING to LISTENING on INIT_COMPLETE  
ptp4l[72.324]: port 0: INITIALIZING to LISTENING on INIT_COMPLETE  
ptp4l[73.604]: port 1: new foreign master 48b02d.ffe.3c8c69-1  
ptp4l[77.604]: selected best master clock 48b02d.ffe.3c8c69  
ptp4l[77.604]: port 1: LISTENING to UNCALIBRATED on RS_SLAVE  
ptp4l[79.604]: master offset -88942023798845412 s0 freq +0 path delay  
7926  
ptp4l[80.604]: master offset -88942023798898282 s1 freq -52864 path delay  
9356  
ptp4l[81.604]: master offset 1328 s2 freq -51536 path delay 19356  
ptp4l[81.606]: port 1: UNCALIBRATED to SLAVE on MASTER_CLOCK_SELECTED  
ptp4l[82.604]: master offset 4276 s2 freq -48190 path delay 16496  
ptp4l[83.604]: master offset 1012 s2 freq -50171 path delay 16496  
ptp4l[84.604]: master offset 6290 s2 freq -44590 path delay 9994  
ptp4l[85.604]: master offset -566 s2 freq -49559 path delay 9994  
ptp4l[86.604]: master offset 3712 s2 freq -45450 path delay 3780  
ptp4l[87.605]: master offset -2272 s2 freq -50321 path delay 3780  
ptp4l[88.605]: master offset -3272 s2 freq -52002 path delay 3636  
ptp4l[89.605]: master offset -2520 s2 freq -52232 path delay 3492
```

分别在主从控制器上执行完相应脚本后(应先启动主控制器脚本,再启动从控制器脚本),等待一分钟左右,可见主从 Xavier 之间的时间同步一致,即完成了 PTP 方式的时间同步。