



<b>LAN937x RTOS User Guide</b> <b>0.5.29 Release</b>	
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*Revision History*

<b>Name</b>	<b>Revision Level</b>	<b>Date</b>	<b>Remarks</b>
DM	0.1	13-02-2020	Initial Draft
DM	0.2	26-02-2020	Added System CLI commands description
DM, PS, SM	0.3	01-04-2020	Added Debug Tag for port mirroring example, Qav (credit-based shaper) example & calculation
NS	0.4	18-06-2020	Add Command Script
RH, NS	0.5	25-06-2020	Added ptpcfg, SQL, Cable Diag command details
NS	0.6	29-07-2020	Scripting and SQL, Cable Diags commands updated
DC	0.7	19-10-2020	TC10 commands
NS	0.8	19-04-2021	Baud rate change update, firmware programming update, ip, mac command update
RH	0.9	27-19-2021	Baud rate change update, phy address setting and xmii settings
RH	1.0	02-06-2021	Corrected the ACL rule configuration example

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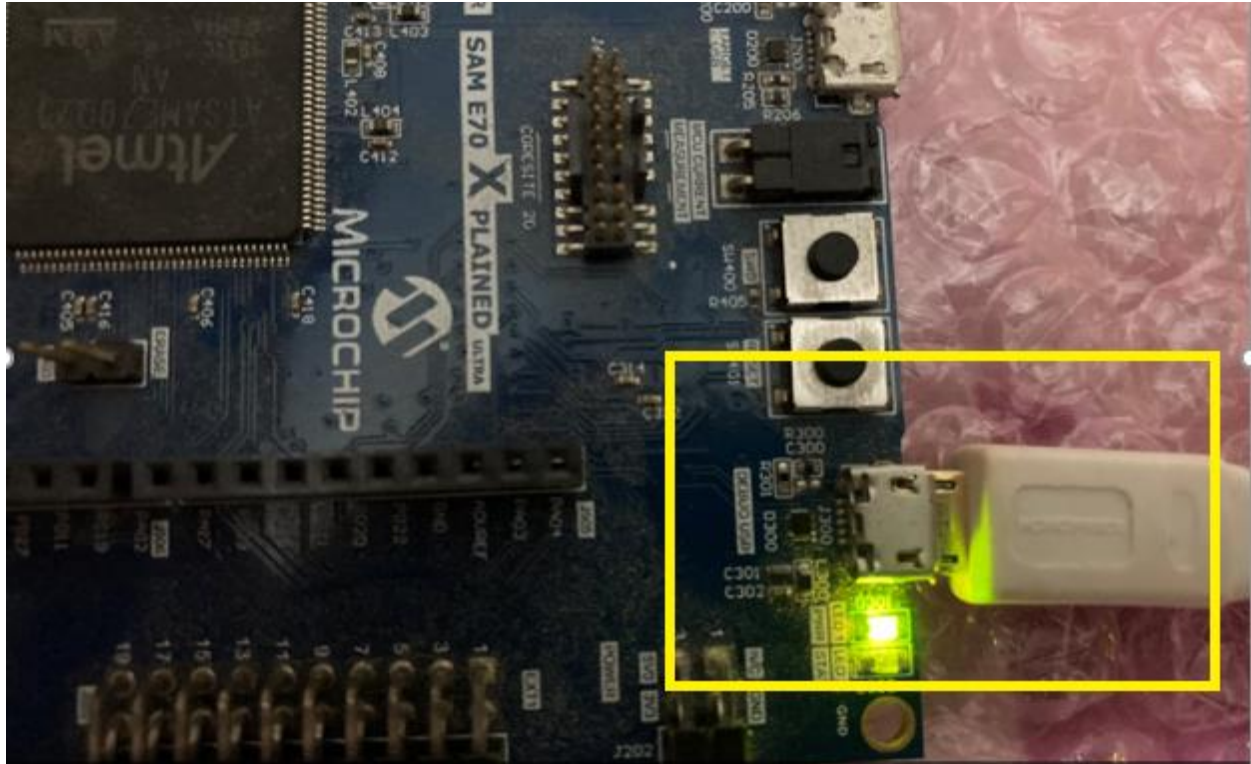
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# 1 Firmware Upgrade

The firmware upgrade will be done using “Atmel Studio Tool” over the USB interface connected to host PC.

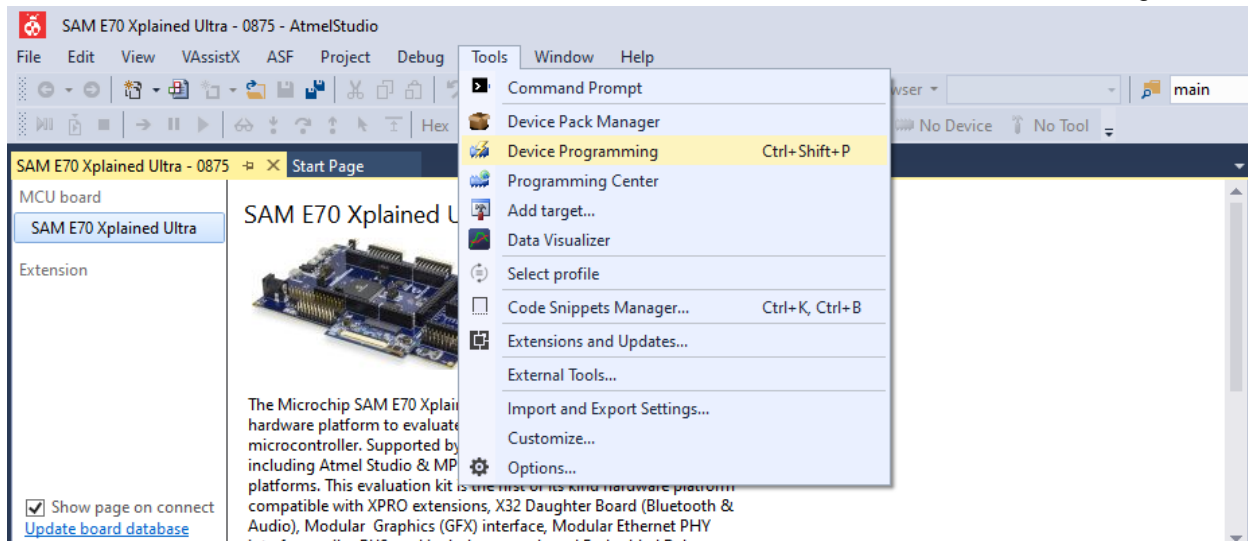
## 1.1 DUT connection

The USB cable must be connected to “DEBUG USB” port on the DUT as shown bellow.

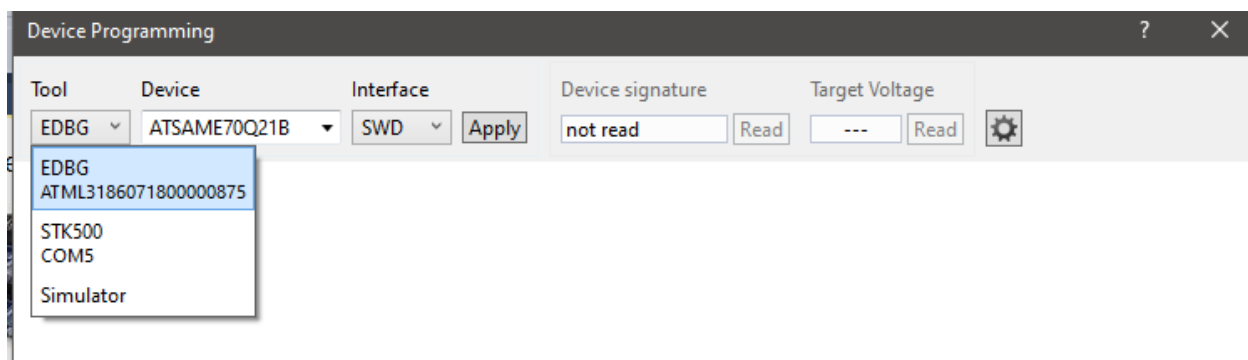


## 1.2 Atmel Studio flash programming

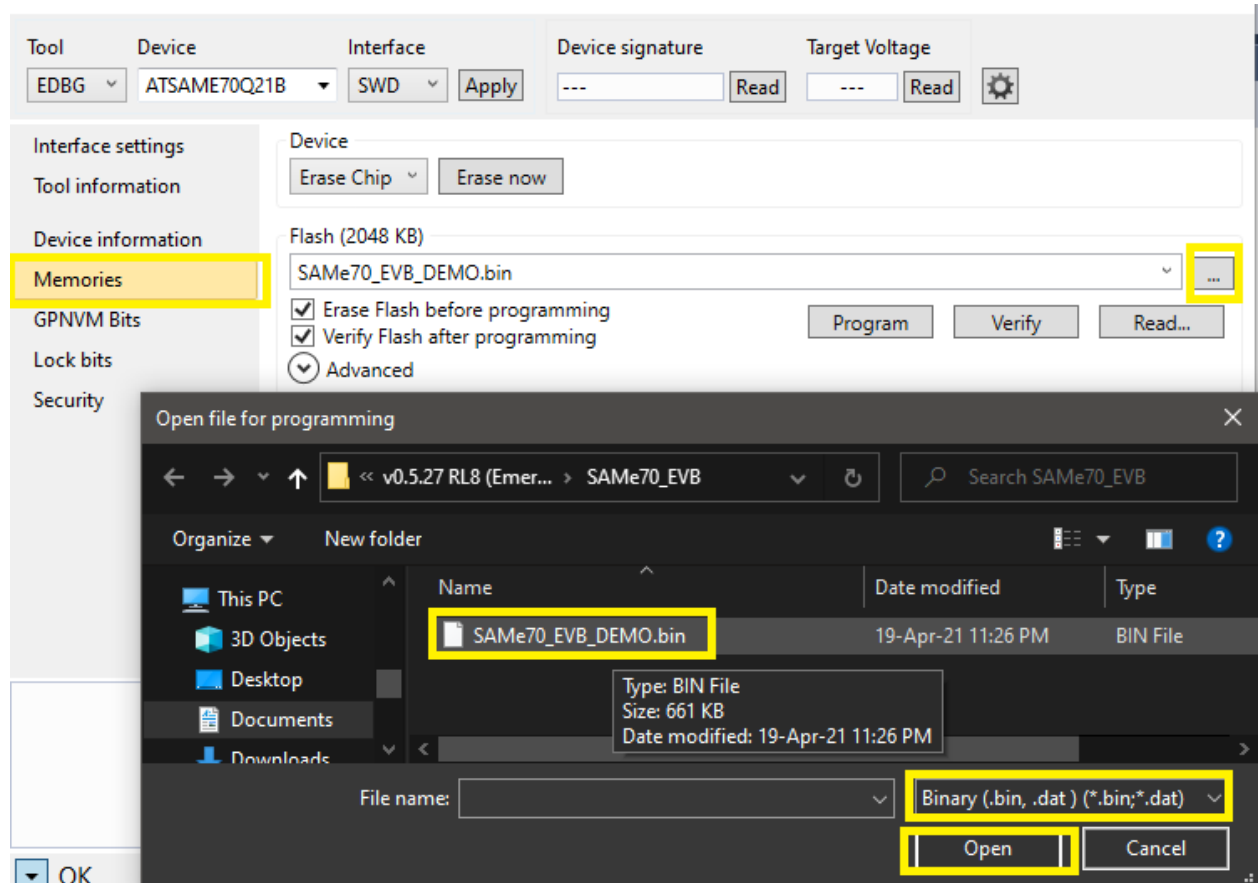
- Launch the Atmel studio and navigate as follows.



- Select the interface and click apply.



- Click on “Memories” and select the firmware and click on “Program” and wait for completion.



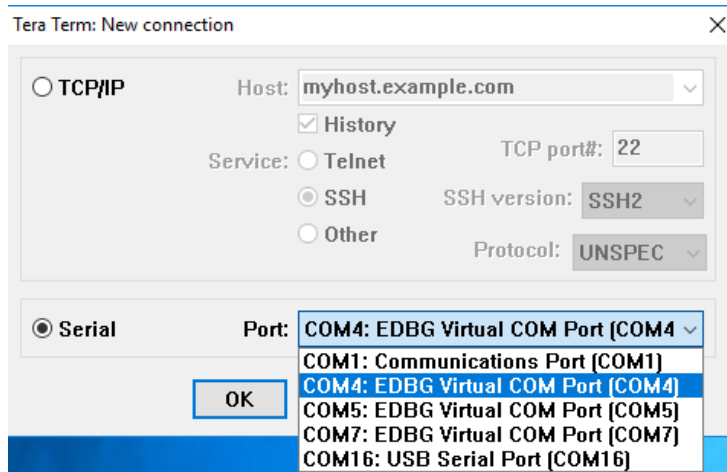
Note: Sometime you may encounter a warning “Waiting for operation to Complete”, just click on “Wait for 1 more minute”

## 2 Console Access

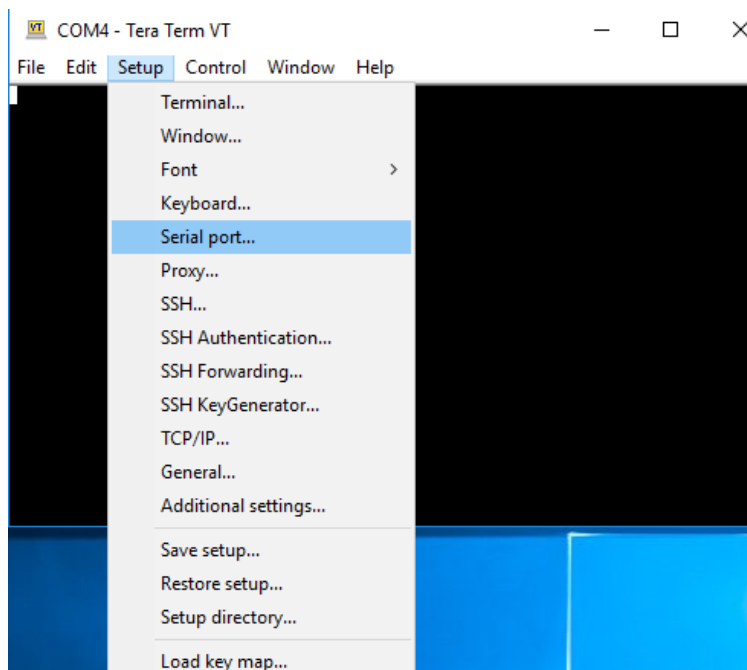
The device can be configured in console window by connecting to device's Debug USB port.

Steps to access device's console:

- Open Tera Term and select COM port of the device

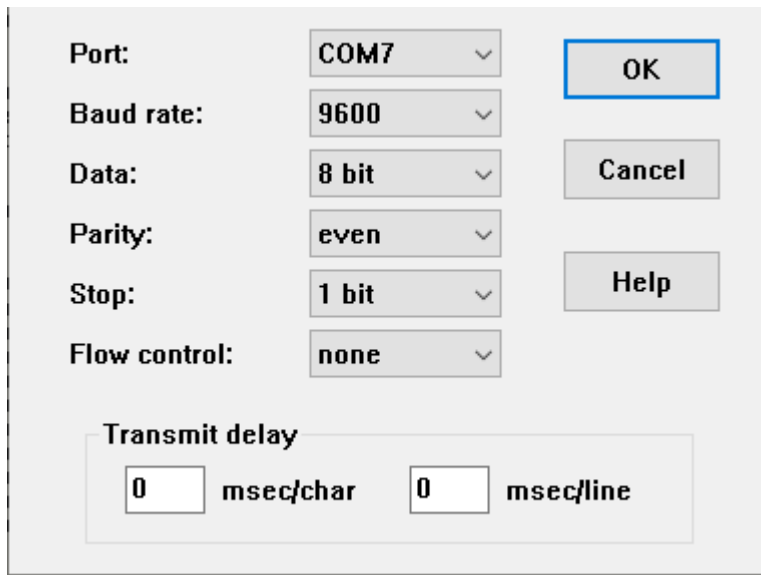


- Click on Setup and Select Serial Port





- Change the baud rate to 9600, Even parity, stop bit to 1.



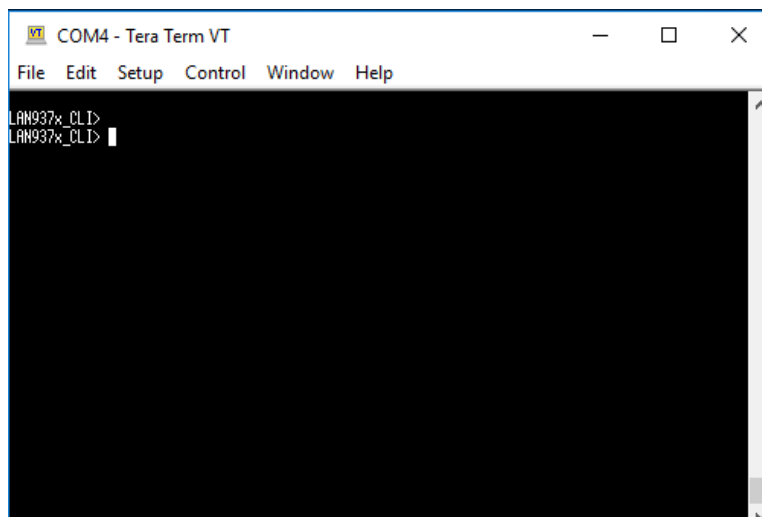
A serial port configuration dialog box with the following settings:

Port:	COM7	OK Cancel Help
Baud rate:	9600	
Data:	8 bit	
Parity:	even	
Stop:	1 bit	
Flow control:	none	

Transmit delay

0	msec/char	0	msec/line
---	-----------	---	-----------

- Press Enter, Device's prompt will be displayed as below

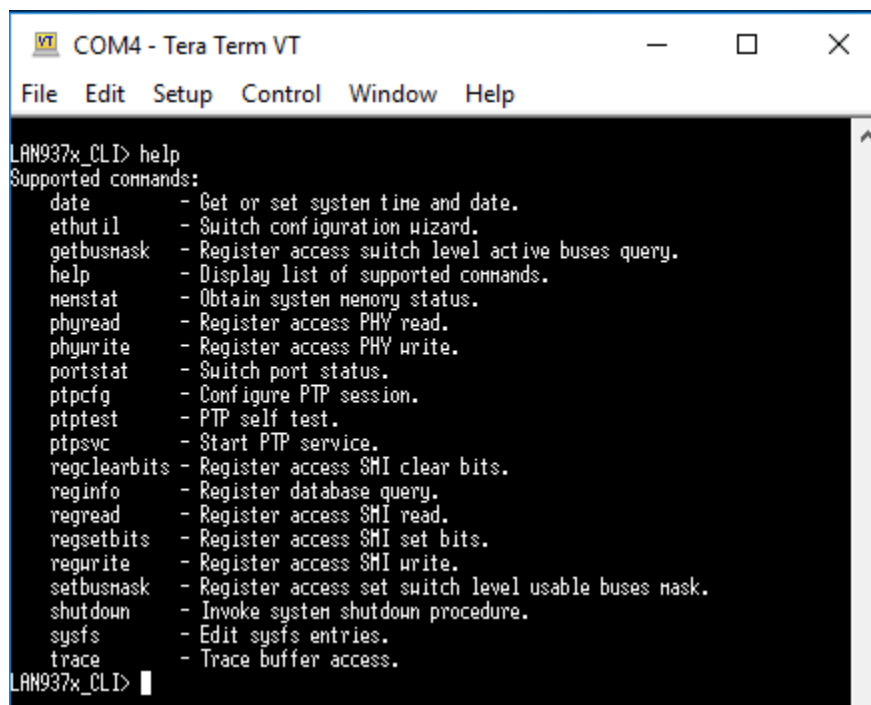


### 3 System CLI Commands

The prompt which appears after successfully connecting to the device, is the system console window.

- **help**

List all available commands



```

COM4 - Tera Term VT
File Edit Setup Control Window Help
LAN937x_CLI> help
Supported commands:
date          - Get or set system time and date.
ethutil       - Switch configuration wizard.
getbusmask    - Register access switch level active buses query.
help          - Display list of supported commands.
memstat       - Obtain system memory status.
phyread       - Register access PHY read.
phywrite      - Register access PHY write.
portstat      - Switch port status.
ptpcfg        - Configure PTP session.
ptpstest      - PTP self test.
ptpsvc        - Start PTP service.
regclearbits  - Register access SMI clear bits.
reginfo       - Register database query.
regread       - Register access SMI read.
regsetbits    - Register access SMI set bits.
regwrite      - Register access SMI write.
setbusmask    - Register access set switch level usable buses mask.
shutdown      - Invoke system shutdown procedure.
sysfs         - Edit sysfs entries.
trace         - Trace buffer access.
LAN937x_CLI>

```

- **Command help**

Command name followed by **-h** can be used to get more information on the command's usage.

For ex:           LAN937x\_CLI> **date -h**

Usage: date [-u|--utc|--universal] [MMDDhhmm[[CC]YY][.ss]]

Display the current time, or set the system date.

-u, --utc, --universal   print or set Coordinated Universal Time (UTC)

-h, --help               display this help and exit

- **Reset**

Performs system reset

Command:

```

LAN937x_CLI> sys
sys> reset

```

```

COM4 - Tera Term VT
File Edit Setup Control Window Help

LAN937x CLI> sys
sys> reset
PIOR handler init.

*****
***** LAN937x Management Software Demo *****
*****
Copyright (C) 2019 Microchip Technology Corporation

Contains CycloneTCP code, (C) Oryx Embedded SARL
-> Utilized under a private license.
Contains FreeRTOS code, (C) Amazon.com Inc.
-> Utilized under an MIT license.
Contains Stack Backtrace code, (C) Stephen Street.
-> Utilized under the MPL 2.0 license.
Compiled: Jan 6 2020 19:19:52
Release: v0.4.17 (Defiant Darkness)
Target: SRMe70Q21B

ROM: 652k used, 2048k total = 31%
SRAM: 67k used, 352k total = 19%
DMA: 5k used, 32k total = 16%
DRAM: 0k used, 2048k total = 0%
HEAP: 4k used, 2048k total = 0%

Scanning mdio0 bus for devices:
  OUI: 0001F0h, Model: 0, Revision: 0.
  Found LAN937x vphy at address 1.
  OUI: 0001F0h, Model: 21, Revision: 0.
  Found LAN937x T1 phy at address 2.
  OUI: 0001F0h, Model: 21, Revision: 0.
  Found LAN937x T1 phy at address 3.
  OUI: 0001F0h, Model: 21, Revision: 0.
  Found LAN937x T1 phy at address 5.
  OUI: 0001F0h, Model: 21, Revision: 0.
  Found LAN937x T1 phy at address 6.
  OUI: 0001C6h, Model: 21, Revision: 1.
  Found LAN937x TX phy at address 8.
Scanning spi0 bus for devices:
  OUI: 009370h, Revision: 0.
  Found LAN9370 at chip select 00000053h.
No iba buses defined.
Switch device enumerations:
  switch0: mdio0e0      spi0e0      (virtual)
           mdio0e1      spi0e00000053h (real)
           Port Count: 5
Starting the network thread.
Initializing Ethernet MAC...
Unknown phy, loading null driver.
Initializing SLAAC...
Starting SLAAC...
Link is up (eth0)...
  Link speed = 100 Mbps
  Duplex mode = Full-Duplex
LAStarting the heartbeat thread.
Starting the switch monitor thread.
M937x_CLI> No iba buses defined.
Switch device enumerations:
  switch0: mdio0e0      spi0e0      (virtual)
           mdio0e1      spi0e00000053h (real)
           Port Count: 5
Updated DSP settings for switch 0, port AFE1.
Updated DSP settings for switch 0, port AFE2.
Updated DSP settings for switch 0, port AFE4.
Updated DSP settings for switch 0, port AFE5.
PTP external IRQ handler init.

LAN937x_CLI> Starting the gPTP task...
drift=0 version=3 ports=4
L: bmca_802_1as_gptp_tx 94032000 1000000; L: bmca_802_1as_gptp_tx 94032000 1000000;
<189.539234324>: Pdelay interval changes to 1 at port 1
<200.555347588>: Pdelay interval changes to 1 at port 2

```

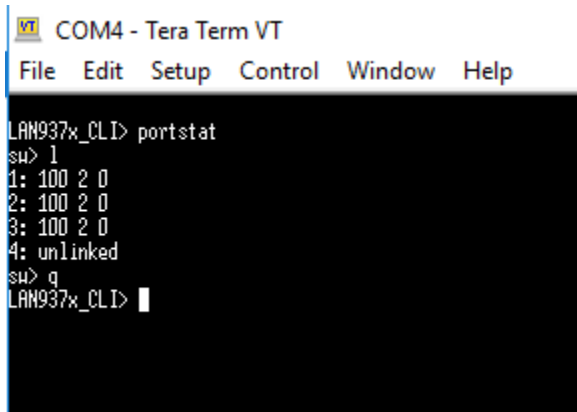
The above image shows the initialization logs.

- **Show Port Speed**

Shows port speed, T1 PHY status. If the status shows unlinked, then there is T1 PHY master/slave mismatch between two nodes.

Command:

```
LAN937x_CLI> portstat  
sw> l
```



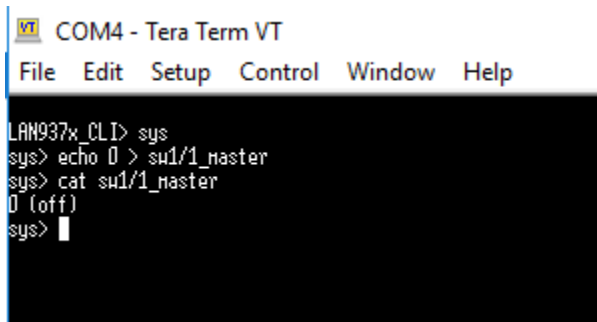
```
COM4 - Tera Term VT  
File Edit Setup Control Window Help  
LAN937x_CLI> portstat  
sw> l  
1: 100 2 0  
2: 100 2 0  
3: 100 2 0  
4: unlinked  
sw> q  
LAN937x_CLI>
```

- **System File System – To fix Speed Unlinked error**

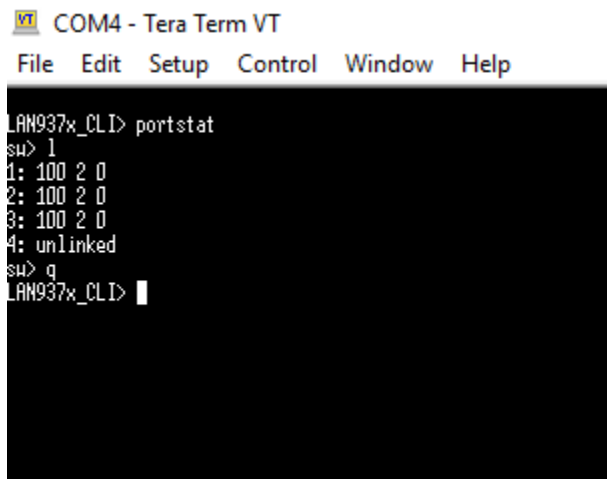
To set Port1 T1 PHY to slave - fixes port unlinked error

```
LAN937x_CLI> sys  
sys> echo 0 > sw1/1_master  
sys> <172.468065800>: Pdelay interval changes to 1 at port 1  
q
```

```
LAN937x_CLI> portstat  
sw> l  
1: 100 2 0  
2: 100 2 0  
3: 100 2 0  
4: 100 2 0  
sw> q
```



```
COM4 - Tera Term VT  
File Edit Setup Control Window Help  
LAN937x_CLI> sys  
sys> echo 0 > sw1/1_master  
sys> cat sw1/1_master  
0 (off)  
sys>
```



```
COM4 - Tera Term VT
File Edit Setup Control Window Help

LAN937x_CLI> portstat
su> 1
1: 100 2 0
2: 100 2 0
3: 100 2 0
4: unlinked
su> q
LAN937x_CLI> 
```

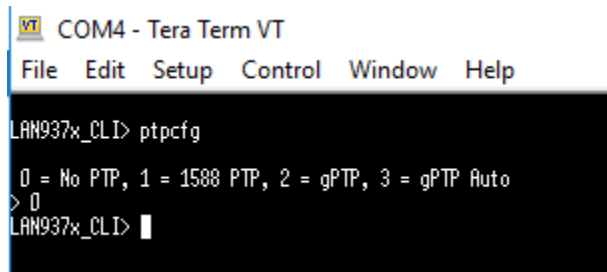
- **Choose PTP Profile**

Upon power up on the board or following a reset, the OS will automatically run the automotive-gPTP profile (gPTP Auto). The PTP stack takes about a minute to auto start this auto-gPTP after a reset. Therefore, to avoid the default choice you need to use the `ptpcfg` command to choose one of the other choices (0 = No PTP, 1 = 1588 PTP, 2 = gPTP, 3 = gPTP Auto). Again, you need to do so before choice 3 starts automatically. Currently the default choice timeout is 90 seconds before choice 3 = gPTP Auto starts.

- i) No PTP Mode

Command:

```
LAN937x_CLI> ptpcfg
> 0
```



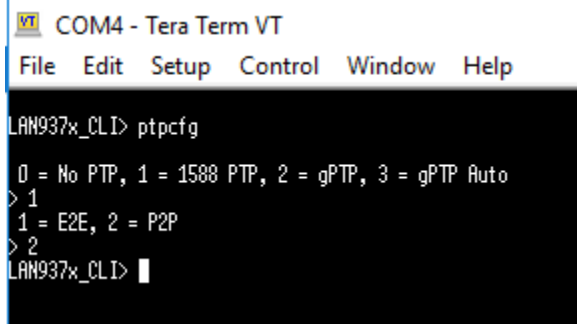
```
COM4 - Tera Term VT
File Edit Setup Control Window Help

LAN937x_CLI> ptpcfg
0 = No PTP, 1 = 1588 PTP, 2 = gPTP, 3 = gPTP Auto
> 0
LAN937x_CLI> 
```

- ii) 1588 PTP Mode in P2P configuration

Command:

```
LAN937x_CLI> ptpcfg
> 1
> 2
```



```

COM4 - Tera Term VT
File Edit Setup Control Window Help

LAN937x_CLI> ptpcfg

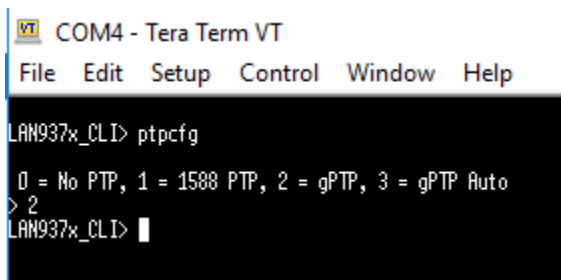
0 = No PTP, 1 = 1588 PTP, 2 = gPTP, 3 = gPTP Auto
> 1
1 = E2E, 2 = P2P
> 2
LAN937x_CLI>

```

iii) gptp mode

Command:

```
LAN937x_CLI> ptpcfg
> 2
```



```

COM4 - Tera Term VT
File Edit Setup Control Window Help

LAN937x_CLI> ptpcfg

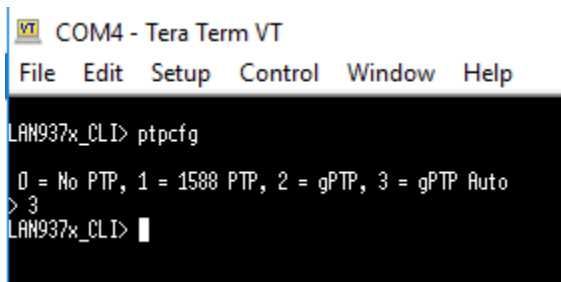
0 = No PTP, 1 = 1588 PTP, 2 = gPTP, 3 = gPTP Auto
> 2
LAN937x_CLI>

```

iv) Auto gptp mode

Command:

```
LAN937x_CLI> ptpcfg
> 3
```



```

COM4 - Tera Term VT
File Edit Setup Control Window Help

LAN937x_CLI> ptpcfg

0 = No PTP, 1 = 1588 PTP, 2 = gPTP, 3 = gPTP Auto
> 3
LAN937x_CLI>

```

Notice that once a profile is selected a message confirms, "Starting the gPTP task..."

v) Additional ptpcfg menus:

Just hitting <return> will disable PTP stack.

Entering "0" also disables the stack, but there are submenus to set for T1 PHY configurations. Hitting <return> will accept the default value, shown in [ ].

# Set T1 phy master/slave mode. 1 means master. This is a bitmap: 1 for port 1, 2 for port 2, 4 for port 3...

```
t1_master = 0x[00] >
```

# Default for AVB demo should be 0x3f.

Note that currently below 3 different latencies for T1 connection available. Select depending on your partner T1 phys.

T1 to T1 using LAN937X chips (default).

T1 to TX using T1-to-TX (LAN8770-to-KSZ8061) bridge board to connect to regular TX PHY.

T1 to LAN9360 endpoint using T1 LAN8770 PHY.

# Set if using T1-to-TX bridge board

t1\_tx = 0x[00] >

# Set if using T1 endpoints

t1\_end = 0x[3f] >

When ptpcfg option 3 is selected for gPTP automotive profile these submenus are available:

# Selecting slave port. Please specify only one slave port.

slave port = [1] >

# Specify the port forwarding for AVB streams. 1 for port 1, 2 for port 2, 4 for port 3.... These settings are Microchip demo settings. If you are not using please select 00.

#Stream 1

91:e0:f0:00:fe:01 = 0x[0e] ->

#Stream 2

91:e0:f0:00:fe:02 = 0x[0f] ->

# Stream 3

91:e0:f0:00:fe:03 = 0x[28] ->

# Specify ports to be mirrored. Only applies when there is a mirroring port.

mirrored ports = 0x[0f] >

# Specify the mirroring port. Only applies when there are more than 4 ports. 7 is port 7. If you do not mirroring option please select 0.

mirror port = [7] >

The corresponding sysfs files for mirroring:

cat sw7/7\_mirror\_port

cat sw1/1\_mirror\_tx

cat sw2/2\_mirror\_tx

cat sw3/3\_mirror\_tx

cat sw4/4\_mirror\_tx

- **Get / Set PTP Path delay**

Get Delay Commands:

LAN937x\_CLI> **ptpsvc**

drift=0 version=3 ports=4

units=2 events=8 num=0

sw> **hw**

**access delay = 649000**

hw> **help**

hw> **gd 1**

1:600 300 0

hw> **gd 2**

2:600 300 0

```

hw> gd 3
3:600 300 0
hw> gd 4
4:600 300 0

```

gd <port number>: Shows delay for the chosen port.

#### Set Delay Commands:

Note: During stack starting the ptpcfg command provides delay selection for different interfaces. If you are using those interfaces, you do not have to set the values again. The below sd command is provided to change delay values in the case of debugging or for different partner interfaces other than the default list.

Set Rx, Tx, Asymmetry path delays for PTP.

Depending on the port configuration shown in the table below, the PTP path delays may need to be set differently than the default settings. Silicon Evaluation boards running FreeRTOS or Linux OS will automatically set the Rx, Tx, Asymmetry path delays to 600, 300, 0 for T1-T1 connections. Therefore, no adjustments needed. If you need to bridge T1 to a Tx port the LAN8770 board does that but it requires manually setting the Rx, Tx, Asymmetry path delays to 1460, 980, 0. The gd # command is used to get delay settings and sd # command to set delay. Where, # = port number. See the examples in the table below.

Port Configuration values for PTP Path Delay Symmetry Settings	Rx ns	Tx ns	Asymmetry ns
Tx to Tx (LAN937x default for 100Tx to 100Tx connection)	760	280	0
T1 to T1 (LAN937x default PTP path delays set in driver so no need for adjustments)	600	300	0
LAN937x T1 <-> LAN8770 T1 to 100Tx Bridge (manual config needed as shown in example below)	1460	980	0
T1 to T1 (LAN937x connected to AIS Audio Endpoints requires manual configuration)	1700	500	0

```

hw> sd 1 1460 980 0
hw> sd 2 1460 980 0
hw> sd 3 1460 980 0
hw> sd 4 1460 980 0
hw> gd 3
3:1460 980 0
hw> q
LAN937x_CLI>

```

sd <port number> <Rx ns> <Tx ns> <Asymmetry ns>: Sets delay for the chosen port.

q: quit

- **Display PTP delay offset**

Type 'd' in sys> prompt to see continuous display of delay, offset. Type 'd' to disable the output.

On terminal screen you will see the LAN937x PTP values as shown below. The output represents our Slave clock syncing to Master. Where: Offset [o], frequency[f], and Path delay [d], p and i are related to the P and I in adjust clock algorithm  $A = P * kp + I * ki$ , s – internal synchronization debug parameter.

Commands:

```
LAN937x_CLI> sys
```

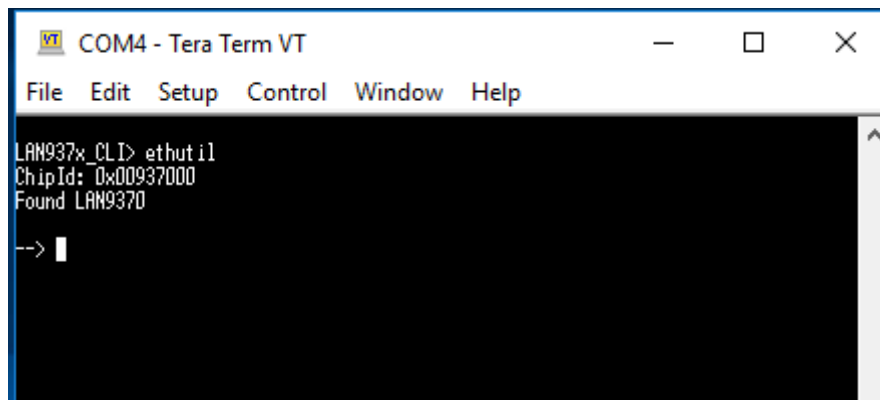


```
sys> d
sys> o: [187] p: 93 i: 18 f: <-1863> d: [867] s: 7
o: [88] p: 44 i: 8 f: <-1729> d: [856] s: 7
o: [-14] p: -7 i: -2 f: <-1682> d: [868] s: 7
o: [-50] p: -25 i: -5 f: <-1722> d: [868] s: 7
o: [-63] p: -32 i: -7 f: <-1777> d: [870] s: 7
o: [-41] p: -21 i: -5 f: <-1811> d: [871] s: 7
o: [40] p: 20 i: 4 f: <-1798> d: [865] s: 7
o: [-11] p: -6 i: -2 f: <-1784> d: [869] s: 7
o: [47] p: 23 i: 4 f: <-1776> d: [857] s: 7
o: [-36] p: -18 i: -4 f: <-1776> d: [849] s: 7
o: [-47] p: -24 i: -5 f: <-1778> d: [857] s: 7
o: [-32] p: -16 i: -4 f: <-1790> d: [856] s: 7
o: [-2] p: -1 i: -1 f: <-1796> d: [862] s: 7
o: [32] p: 16 i: 3 f: <-1788> d: [862] s: 7
o: [-17] p: -9 i: -2 f: <-1784> d: [859] s: 7
o: [-18] p: -9 i: -2 f: <-1783> d: [871] s: 7
o: [2] p: 1 i: 0 f: <-1782> d: [865] s: 7
o: [-23] p: -12 i: -3 f: <-1769> d: [874] s: 7
o: [-58] p: -29 i: -6 f: <-1778> d: [867] s: 7
o: [-66] p: -33 i: -7 f: <-1787> d: [869] s: 7
o: [8] p: 4 i: 0 f: <-1785> d: [864] s: 7
o: [6] p: 3 i: 0 f: <-1777> d: [854] s: 7
```

## 4 Switch CLI Commands

- Enter Switch CLI

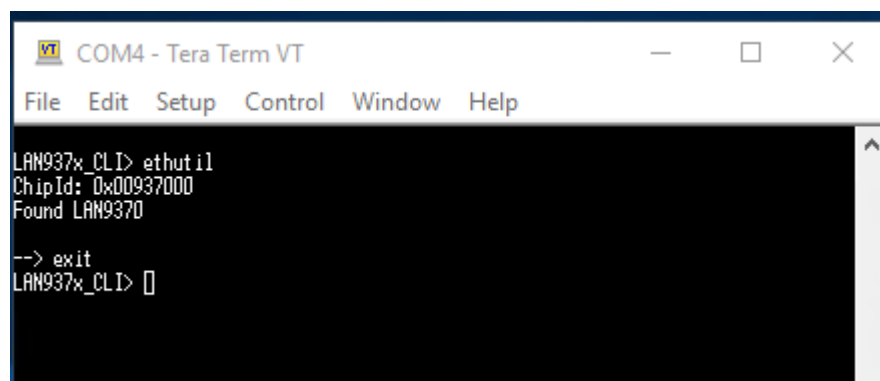
From the system CLI, type “**ethutil**” and give enter. The Switch CLI prompt will be displayed as below.



```
COM4 - Tera Term VT
File Edit Setup Control Window Help
LAN937x_CLI> ethutil
ChipId: 0x00937000
Found LAN9370
--> |
```

- Exit Switch CLI

Type “**exit**” and give enter



```
COM4 - Tera Term VT
File Edit Setup Control Window Help
LAN937x_CLI> ethutil
ChipId: 0x00937000
Found LAN9370
--> exit
LAN937x_CLI> |
```

- Switch Help

Enter Switch CLI and type “**help**”

### 4.1 Switch Register Access

The following commands are used to access the switch registers based on the size of the register (Refer Datasheet).

- To read register byte

#### **r reg**

r : To read register byte  
reg : Register address according to Datasheet

**Ex:**     **> r 0x01**  
           read reg 0x01 = 0x93

```
-->r 0x01
read reg 0x1 = 0x93
```

- To read register word

### **rw reg**

**rw**               : To read register word  
**reg**             : Register address according to Datasheet

**Ex:**     **> rw 0x01**  
           read reg 0x01 = 0x9394

```
-->rw 0x01
read reg 0x1 = 0x9394
```

- To read register long

### **rl reg**

**rl**               : To read register long  
**reg**             : Register address according to Datasheet

**Ex:**     **> rl 0x01**  
           read reg 0x01 = 0x93740000

```
-->rl 0x01
read reg 0x1 = 0x93740000
```

- To write register byte and read back

### **w reg value**

**w**               : To write register byte  
**reg**             : Register address according to Datasheet

**Ex:**     **> w 0x1600 0xff**  
           read reg 0x1600 = 0xff

```
-->w 0x1600 0xff
read reg 0x1600 = 0xff
```

- To write register word and read back

### ww reg value

ww : To write register word  
reg : Register address according to Datasheet

**Ex:** > ww 0x1600 0x1234  
read reg 0x1600 = 0x1234

```
-->ww 0x1600 0x1234
read reg 0x1600 = 0x1234
```

- To write register long and read back

### wl reg value

ww : To write register long  
reg : Register address according to Datasheet

**Ex:** > wl 0x1600 0x12344321  
read reg 0x1600 = 0x12344321

```
-->wl 0x1600 0x12344321
read reg 0x1600 = 0x12344321
```

- To write register byte only

### wo reg value

wo : To write register byte  
reg : Register address according to Datasheet

**Ex:** > wo 0x1600 0x11

```
-->wo 0x1600 0x11
```

## 4.2 Switch PHY Register Access

Commands to read the PHY registers

- To read PHY register

### vphyindr port reg

vphyindr : To read PHY register  
port : T1/Tx PHY port number  
reg : PHY Register address

**Ex:** > vphyindr 1 0

```
-->vphyindr 1 0
VPHY SPI Indirect regData: 2100
```

- To write PHY register

### vphyindw port reg value

vphyindw : To read PHY register  
 port : T1/Tx PHY port number  
 reg : PHY Register address  
 value : value to be written

Ex: >vphyindw 1 0 0x10

```
-->vphyindw 1 0 0x10
```

## 4.3 Switch VLAN Configurations

To view or configure parameters of Virtual LANs.

- To configure vlan

### vlan vid valid fid ports untags prio mstp fo

vlan : To get or set vlan configurations  
 vid : VLAN Index  
 valid : Set / Clear vlan table entry [0: Invalid, 1: Valid]  
 fid : FID index  
 ports : Port to be part of VLAN [0x00 – 0xFF]  
 untags : Port membership [0x00 – 0xFF] (0: tagged, 1: untagged)  
 prio : priority level [0x00 – 0x07]  
 mstp : mstp index [0x00 – 0x07]  
 fo : forward options [0x00 – 0x01]

>vlan 2 1 1 0xF0 0x03 1 1 1

```
-->vlan 2 1 1 0xF0 0x03 1 1 1
```

- To view all active vlans

### Vlan

vlan : To get or set vlan configurations

Ex: >vlan

```
-->vlan
UID  Status  FID  Port<1 2 3 4 5 6 7 8>  Untag<1 2 3 4 5 6 7 8>  FO  PRI  MSTP
1      y      0      Y Y Y Y Y Y Y -      - - - - - - - -      0  0  0
```

- To view vlan by index

### vlan vid

vlan : To get or set vlan configurations  
 vid : VLAN Index

Ex: >vlan 1

```
-->vlan 1
VID   Status   FID   Port<1 2 3 4 5 6 7 8> Untag<1 2 3 4 5 6 7 8> FO   PRI   MSTP
1     y        0      Y Y Y Y Y Y Y -    - - - - - - - 0   0   0
```

- To set vlan valid/invalid by index

### vlan vid valid

vlan : To get or set vlan configurations  
 vid : VLAN Index  
 valid : Set / Clear vlan table entry [0: Invalid, 1: Valid]

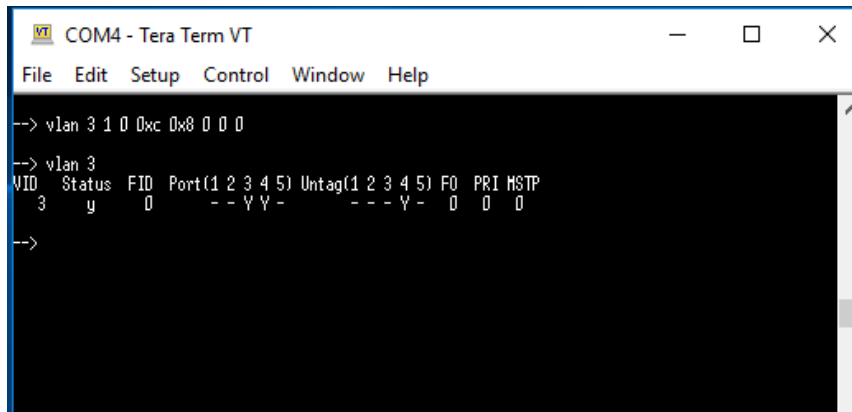
Ex: >vlan 1 0

```
-->vlan 1 0
```

## VLAN Configuration Example

To create VLAN 3 with ports 3,4 as member ports and enable tag removal at port 4.

- Configure VLAN 3  
 --> **vlan 3 1 0 0xc 0x8 0 0 0**
- Use view VLAN by Index to verify the parameters  
 --> **vlan 3**



```
COM4 - Tera Term VT
File Edit Setup Control Window Help

--> vlan 3 1 0 0xc 0x8 0 0 0
--> vlan 3
VID   Status   FID   Port(1 2 3 4 5) Untag(1 2 3 4 5) FO   PRI   MSTP
3     y        0      - - Y Y -    - - Y - 0   0   0
-->
```

## 4.4 Switch Mac Table Configurations

### 3.4.1 Dynamic MAC Table

- To view the dynamic table mac entries

### showmac

showmac : To view dynamic mac entries

**Ex:**     **>showmac**

```
-->showmac
read device dynamic MAC table by 'search'
valid_count 1 : (dyn_mac_index=1)
The dynamic mac table has 1 valid entries
Entry VALID DYN MAC                FID P(12345678) SF DF MS OVERR USEF AGE/PRI
   0      y   n 00:22:33:44:55:66    0  YYYYYYYY  0  0  0  0    1  0
```

- To view the dynamic table with index

### showmac entry

showmac                   : To view dynamic mac entries  
entry                     : Index of the mac entry

**Ex:**     **>showmac 339**

```
-->showmac 339
read device dynamic MAC table by 'direct' entry 339
The entry 339 is not ready for read (0x41B:06)
```

- To view the dynamic table mac entry with index

### showmac entry mac

showmac                   : To view dynamic mac entries  
entry                     : FID index  
mac                       : MAC Addr

**Ex:**     **>showmac 0 00:22:33:44:55:66**

```
-->showmac 0 00:22:33:44:55:66
read device dynamic MAC table by 'hash index'(fid 0, mac 00:22:33:44:55:66)
0x316: 340(0x154)
Entry VALID DYN MAC                FID P(12345678) SF DF MS OVERR USEF AGE/PRI
 339      y   n 00:22:33:44:55:66    0  YYYYYYYY  0  0  0  0    1  0
```

- To configure static mac entry in dynamic table

### dynmac valid fid override srcfilter desfilter pri mstp ports mac

dynmac                   : To set static entry in dynamic table  
valid                    : set or clear entry  
fid                       : FID index  
override                 : override field, this bit does not have any effect on KSZ937X platform  
srcfilter                : Source filter enable  
dstfilter                : Destination filter enable  
pri                       : Priority value  
mstp                     : mstp index  
port                     : port map  
mac                       : MAC address

**Ex:** >dynmac 1 0 0 0 0 0 0 0xff 00:22:33:44:55:66

```
-->dynmac 1 0 0 0 0 0 0 0xff 00:22:33:44:55:66
SwitchWriteDynMacTable: 0x314=0x00
Dynamic MAC table 340 entry has been updated
```

### 3.4.2 Static MAC Table

- To view the static table mac entry

#### mac

mac : To view static mac entries

**Ex:** >mac

```
-->mac
Display static unicast MAC table
Entry VALID DYN MAC FID P(12345678) SF DF MS OVERR USEF PRI
0 y n 00:11:22:33:44:00 0 YYYY---- 0 0 0 0 0 0
1 y n 00:11:22:33:44:55 0 YYYY---- 0 0 0 0 0 0
```

- To create static mac table entry

#### mac entry valid fid usefid override srcfilter desfilter pri mstp ports mac

mac : To create static mac entries  
 entry : Index of the mac entry  
 valid : To set or clear entry  
 fid : FID index  
 usefid : Use FID setting  
 override : override field  
 srcfilter : Source address filter  
 desfilter : Destination address filter  
 pri : Priority value  
 mstp : mstp index  
 ports : Port map  
 mac : mac address

**Ex:** >mac 0 1 0 0 0 0 0 0 0x0f 00:11:22:33:44:55

```
-->mac 0 1 0 0 0 0 0 0 0x0f 00:11:22:33:44:55
Static unicast MAC table 0 entry has been updated
```

### 4.4.3 Reserved Multicast Table

- To view reserved multicast table

#### macm

macm : To view reserved multicast mac entries



**Ex:** >macm

```
-->macm
Display static multicast MAC table
Entry  MAC                               P(1 2 3 4 5 6 7 8)
  0    01:80:c2:00:00:00                 - - - - Y - - -
  1    01:80:c2:00:00:01                 - - - - - - - -
  2    01:80:c2:00:00:03                 - - - - Y - - -
  3    01:80:c2:00:00:10                 Y Y Y Y Y Y Y Y
  4    01:80:c2:00:00:20                 Y Y Y Y - Y Y Y
  5    01:80:c2:00:00:21                 Y Y Y Y - Y Y Y
  6    01:80:c2:00:00:02                 - - - - Y - - -
  7    01:80:c2:00:00:11                 Y Y Y Y - Y Y Y
```

- To configure the static multicast table port map

### macm macm\_6 ports

macm : To set static multicast port map  
 macm\_6 : last octet of mac address  
 ports : port map

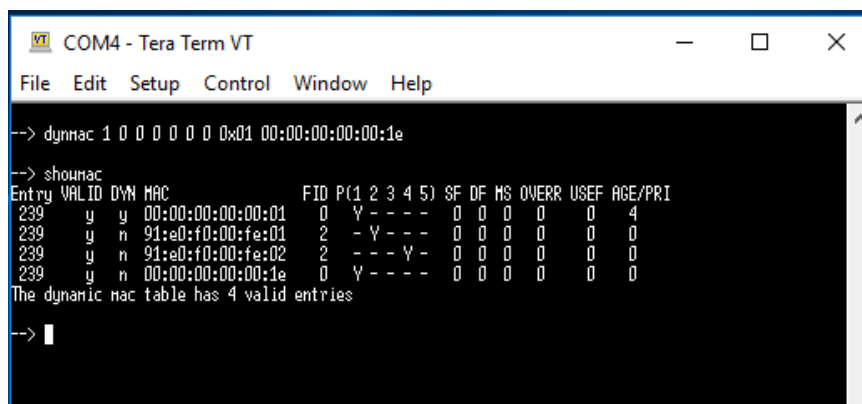
**Ex:** >macm 03 0xff

```
-->macm 03 0xff
Update static multicast MAC table
```

## MAC Configuration Examples

### Example 1: To manually create an entry in dynamic MAC table

- Add an entry manually in dynamic MAC Table for MAC "00:00:00:00:00:1e" with port map = port 1  
 -->**dynmac 1 0 0 0 0 0 0x01 00:00:00:00:00:1e**
- Use showmac command to view dynamic MAC Table entries  
 -->**showmac**



```
COM4 - Tera Term VT
File Edit Setup Control Window Help

--> dynmac 1 0 0 0 0 0 0x01 00:00:00:00:00:1e

--> showmac
Entry VALID DYN MAC          FID P(1 2 3 4 5) SF DF MS OVERR USEF AGE/PRI
239 y y 00:00:00:00:00:01 0 Y - - - - 0 0 0 0 0 4
239 y n 91:e0:f0:00:fe:01 2 - Y - - - 0 0 0 0 0 0
239 y n 91:e0:f0:00:fe:02 2 - - - Y - 0 0 0 0 0 0
239 y n 00:00:00:00:00:1e 0 Y - - - - 0 0 0 0 0 0
The dynamic mac table has 4 valid entries

--> |
```

**Example 2: To create a Static MAC table entry**

- Create a static MAC table entry  
-->**mac 16 1 0 0 0 0 0 0 00:00:20:00:00:11 0x02**
- Use mac command to view static MAC table entries  
-->**mac**

```
COM4 - Tera Term VT
File Edit Setup Control Window Help

--> mac 16 1 0 0 0 0 0 0 00:00:20:00:00:11 0x02

--> mac
Entry  VALID DYN  MAC                FID P(1 2 3 4 5) SF DF MS OVERR USEF AGE/PRI
0      y   n   91:e0:f0:00:ff:00      0  Y Y Y Y Y  0 0 0 0  0  0  0
1      y   n   91:e0:f0:01:00:00      0  Y Y Y Y Y  0 0 0 0  0  0  0
2      y   n   01:1b:c5:0a:c0:00      0  Y Y Y Y Y  0 0 0 0  0  0  0
3      y   n   01:00:5e:00:00:01      0  Y Y Y Y Y  0 0 0 0  0  0  0
4      y   n   33:33:00:00:00:01      0  Y Y Y Y Y  0 0 0 0  0  0  0
5      y   n   01:00:5e:00:00:02      0  Y Y Y Y Y  0 0 0 0  0  0  0
6      y   n   33:33:00:00:00:02      0  Y Y Y Y Y  0 0 0 0  0  0  0
7      y   n   01:00:5e:00:00:16      0  Y Y Y Y Y  0 0 0 0  0  0  0
8      y   n   33:33:00:00:00:16      0  Y Y Y Y Y  0 0 0 0  0  0  0
9      y   n   01:00:5e:00:00:fb      0  Y Y Y Y Y  0 0 0 0  0  0  0
10     y   n   33:33:00:00:00:fb      0  Y Y Y Y Y  0 0 0 0  0  0  0
11     y   n   01:00:5e:00:00:fc      0  Y Y Y Y Y  0 0 0 0  0  0  0
12     y   n   33:33:00:01:00:03      0  Y Y Y Y Y  0 0 0 0  0  0  0
13     y   n   01:00:5e:7f:ff:fa      0  Y Y Y Y Y  0 0 0 0  0  0  0
14     y   n   33:33:00:00:00:0c      0  Y Y Y Y Y  0 0 0 0  0  0  0
15     y   n   33:33:00:01:00:02      0  Y Y Y Y Y  0 0 0 0  0  0  0
16     y   n   00:00:20:00:00:11      0  - - - - -  0 0 0 0  0  0  0

-->
```

**Example 3: To change the port map for a Reserved Multicast table entry**

- Change the port map for entry 0 to 0x1f (all ports)  
-->**macm 0 0x1f**
- Use macm command to view the reserved multicast table entries  
-->**macm**

```
COM4 - Tera Term VT
File Edit Setup Control Window Help

Entry  MAC                P(1 2 3 4 5)
0      01:80:c2:00:00:00    Y - - - -
1      01:80:c2:00:00:01    - - - - -
2      01:80:c2:00:00:03    - - - - Y
3      01:80:c2:00:00:10    Y Y Y Y Y
4      01:80:c2:00:00:20    Y Y Y Y -
5      01:80:c2:00:00:21    Y Y Y Y -
6      01:80:c2:00:00:02    - - - - Y
7      01:80:c2:00:00:11    Y Y Y Y -

--> macm 0 0x1f

--> macm
Entry  MAC                P(1 2 3 4 5)
0      01:80:c2:00:00:00    Y Y Y Y Y
1      01:80:c2:00:00:01    - - - - -
2      01:80:c2:00:00:03    - - - - Y
3      01:80:c2:00:00:10    Y Y Y Y Y
4      01:80:c2:00:00:20    Y Y Y Y -
5      01:80:c2:00:00:21    Y Y Y Y -
6      01:80:c2:00:00:02    - - - - Y
7      01:80:c2:00:00:11    Y Y Y Y -

-->
```

## 4.5 Switch Egress Control

### 4.5.1 Queue Configurations

- To view current egress queue configurations

#### egqcfg port

egqcfg : Egress queue configurations option  
 port : Port selection [1 - 8]

Ex: >egqcfg 7

```
-->egqcfg 7
```

Egress Queue Configurations on Port:7								
Queue	Scheduler	QWeight	Shaper	CHigh	CLow	CInc	SDUCheck	MaxSDU
0	Strict	7	SRP	0x0010	0x0100	0x000100	Enabled	2000
1	WRR	1	DIS	0x0534	0x05F2	0x200000	disabled	1536
2	WRR	1	DIS	0x0534	0x05F2	0x200000	disabled	1536
3	WRR	1	DIS	0x0534	0x05F2	0x200000	disabled	1536
4	WRR	1	DIS	0x0534	0x05F2	0x200000	disabled	1536
5	WRR	1	DIS	0x0534	0x05F2	0x200000	disabled	1536
6	WRR	1	DIS	0x0534	0x05F2	0x200000	disabled	1536
7	Strict	1	SRP	0x0010	0x0100	0x000100	Enabled	2000

- To Configure queue configurations

#### egqcfg port queue scheduler qweight shaper chigh clow cinc sducheck maxsdu

egqcfg : Egress queue configurations option  
 port : Port Selection [1 - 8]  
 queue : Queue Index [0 - 7]  
 scheduler : Scheduler selection [0: Strict, 1: WRR (weighted round robin)]  
 qweight : Queue weight for WRR [1 - 128] (In Decimal)  
 shaper : Shaper selection [0: No shaping, 1: SRP Enable]  
 chigh : Shaper Credit High [0x0000 – 0xFFFF] (In Hex)  
 clow : Shaper Credit Low [0x0000 – 0xFFFF] (In Hex)  
 cinc : Shaper Credit Increment [0x000000 – 0x000000] (In Hex)  
 sducheck : SDU Length Check [0: Disable, 1: Enable]  
 maxsdu : SDU Max Size [0 - 16384] (In Decimal)

Ex: egqcfg 7 0 0 7 1 10 100 100 1 2000

```
-->egqcfg 7 0 0 7 1 10 100 100 1 2000
```

- To view current cut-through configurations

#### cut-through port

cut-through : Egress port queue port cut-through configuration option  
 port : Port Selection [1 - 8]

Ex: >cut-through port 7

```
-->cut-through 7
Egress Queue Cut-Through Configurations on Port:7
Queue Cut-Through
0      Enabled
1      Disabled
2      Disabled
3      Disabled
4      Disabled
5      Disabled
6      Disabled
7      Enabled
```

- To Configure cut-through configurations

### cut-through port queue enable

cut-through : Egress port queue port cut-through configuration option  
 port : Port Selection [1 – 8]  
 queue : Queue Index [0 – 7]  
 enable : Enable/Disable [0: Disable, 1: Enable]

Ex: >cut-through 7 7 1

```
-->cut-through 7 7 1
```

## Credit Based Shaper Configuration Example

To Configure egress traffic shaping for Queue 0,1,2,3 of port 6 to 10%, 20%, 30% and 40% respectively.

### Commands:

- Set the traffic shaping of Q0 of port 6 to 10 %  
 egqcfg 6 0 0 5 1 0x0606 0x0606 0x0199998 0 1536
- Set the traffic shaping of Q1 of port 6 to 20 %  
 egqcfg 6 1 0 5 1 0x0606 0x0606 0x00333333 0 1536
- Set the traffic shaping of Q2 of port 6 to 30 %  
 egqcfg 6 2 0 5 1 0x0606 0x0606 0x004cccc 0 1536
- Set the traffic Shaping of Q3 of port 6 to 40%  
 egqcfg 6 3 0 5 1 0x0606 0x0606 0x00666666 0 1536

**Calculation to find the value of cinc according to the required bandwidth:**

Example calculation for 10 % bandwidth:

It is a 24-bit field, the maximum possible value is 16777215'd

Hence, 10% of 16777215'd is 1677721'd .ie, 0x0199998'h

**Values of clow and chigh Explanation:**

Max ethernet frame size = 1500 bytes, CRC = 4 bytes, VLAN tag = 4 bytes, Preamble + IFG = 20 bytes

So, 1500+42 = 1542'd = 606'h

**4.5.2 PTP Configurations**

- To view PTP configurations

**ptp port**

ptp : Egress port PTP trigger configurations  
port : Port Selection [1 – 8]

**Ex:** >ptp 7

```
-->ptp 7
PTP Configurations on Port:7
TStimeSec      TStimeNsec      OCtime
00000650000    0000610000      0000234567
```

- To set PTP configurations

**ptp port tstsec tstnsec oct**

ptp : Egress port PTP trigger configurations  
port : Port Selection [1 – 8]  
tstsec : Trigger start time in sec [0 – 4294967296] or in Hex  
tstnsec : Trigger start time in nsec [0 – 1073741823] or in Hex  
oct : Output cycle time [0 – 4294967296] or in Hex

**Ex:** >ptp 7 65000 61000 234567

```
-->ptp 7 650000 610000 234567
```

- To view current HW RTC values

**ptptrg port**

ptp : Egress port PTP trigger configurations  
port : Port Selection [1 – 8]

**Ex:** >ptptrg 7

```
-->ptptrg 7
PTP RTC Settings
TstimeSec      TstimeNsec
0000000000    0000000000
```

- To set PTP trigger configurations

### **ptptrg port tstsec tstnsec oct**

ptptrg : Egress port PTP trigger configurations  
 port : Port Selection [1 – 8]  
 ofstsec : Offset Trigger start time in sec [0 – 4294967296] or in Hex  
 ofstnsec : Offset Trigger start time in nsec [0 – 1073741823] or in Hex  
 obsoct : Absolute Output cycle time [0 – 4294967296] or in Hex

**Ex: >ptptrg 7 100 20 10**

```
-->ptptrg 7 100 20 10
```

## **4.5.3 TAS (Time aware shaper) Configurations**

- To view TAS event configurations

### **tasevtcfg port**

tasevtcfg : Egress port TAS event configurations  
 port : Port selection [1 – 8]

**Ex: >tasevtcfg 7**

```
-->tasevtcfg 7
TAS Event Configurations on Port:7
EvtIdx  QState  CycleCount
0       0xFF   0x0000000
1       0xFE   0x0020000
2       0xFF   0x0000000
3       0xFF   0x0000000
4       0xFF   0x0000000
5       0xFF   0x0000000
6       0xFF   0x0000000
7       0xFF   0x0000000
8       0xFF   0x0000000
```

- To view TAS event configurations with evt id

### **tasevtcfg port evtidx**

tasevtcfg : Egress port TAS event configurations  
 port : Port selection [1 – 8]  
 evtidx : Event index [0 – 255]

**Ex: >tasevtcfg 7 1**

```
-->tasevtcfg 7 1
TAS Event Configurations on Port:7
EvtIdx  QState  CycleCount
1       0xFE   0x0020000
```

- To set TAS event configurations

### **tasevtcfg port evtidx gstate cctime**

tasevtcfg : Egress port TAS event configurations  
 port : Port selection [1 – 8]  
 evtidx : Event index [0 – 255]  
 gstate : Gate status for each queue [0x00 – 0xFF] (In Hex)  
 cctype : Cycle count [0x000000 – 0xFFFFFFFF] (In Hex)

**Ex: >tasevtcfg 7 1 0xfe 0x2000**

```
-->tasevtcfg 7 1 0xfe 0x2000
```

- To view TAS last gate control configurations

### **tasgctrllastidx port**

tasgctrllastidx : Egress port TAS last gate control configurations  
 port : Port selection [1 – 8]

**Ex: >tasgctrllastidx 7**

```
-->tasgctrllastidx 7
TAS Last Gate Configurations on Port:7
Last Gate Index: 31
```

- To set TAS last gate control configurations

### **tasgctrllastidx port idx**

tasgctrllastidx : Egress port TAS last gate control configurations  
 port : Port selection [1 – 8]  
 idx : Gate index [0 – 255]

**Ex: >tasgctrllastidx 7 10**

```
-->tasgctrllastidx 7 10
```

- To view TAS gate control configurations

### **tasgctrlcfg port**

tasgctrlcfg : Egress port TAS gate control configurations  
 port : Port selection [1 – 8]

**Ex: >tasgctrlcfg 7**

```
-->tasgctrlcfg 7
TAS Gate Control Configurations on Port:7
ConfigChange GateState GateAccess
Init Enabled Shadow
```

- To set TAS gate control configurations

### **tasgctrlcfg port cfgchange genable gaccess**

tasgctrlcfg : Egress port TAS gate control configurations  
 port : Port selection [1 – 8]  
 cfgchange : Config change indicator [0: No change, 1:Change in cfg]  
 genable : Enable/Disable gating func [0: Disable, 1:Enable]  
 gaccess : Shadow gate read/write [1: Gate Read, 0:Read/Write Shadow Gate]

**Ex: >tasgctrlcfg 7 1 1 1**

```
-->tasgctrlcfg 7 1 1 1
```

## **4.5.4 Status/Statistics**

- To view TAS interrupt mask configurations

### **tasint port**

tasint : TAS interrupt mask configuration  
 port : Port selection [1 – 8]

**Ex: >tasint 7**

```
-->tasint 7
TAS Interrupt Configurations on Port:7
ConfigChangeDone Interrupt: Disabled
ConfigChangeError Interrupt: Disabled
QueueOverrun Interrupt Mask: ff
```

- To set TAS interrupt mask configurations

### **tasint port ccdone ccerr qoverrun setclear**

tasint : TAS interrupt mask configuration  
 port : Port selection [1 – 8]  
 ccdone : Config Change indication [0: Disable, 1: Enable]  
 ccerr : Config Change error indication [0: Disable, 1: Enable]  
 qoverrun : Queue overrun indication [0x00 – 0xff]  
 setclear : clear/set the interrupts [0: clear, 1:set ]

**Ex: >tasint 7 1 1 0x0f 0**

```
-->tasint 7 1 1 0x0f 0
```

- To view Status/Statistics

### **showtasstat port**

tastat : To view the TAS status and statistics  
 port : Port selection [1 – 8]



**Ex:**     **>showtasstat 7**

```
-->showtasstat 7
TAS Status/Statistics on Port:7
Cfg Chage Done : No
Cfg Chage Error : No
Queue Overrun Count
0          No      0
1          No      0
2          No      0
3          No      0
4          No      0
5          No      0
6          No      0
7          No      0
Current Gate Index: 0
Gate State: 0xFF
```

## 4.5.5 Egress Control

### 4.5.5.1 Debug Tag

The debug tag is a 4-byte tag that can be appended to the mirrored packets. It is useful in identifying the source port of the mirrored packets. A debug tag is similar to a VLAN tag. The first two bytes is similar to TPID field of a VLAN Tag: It contains CPU Debug ID. Next two bytes contain source port ID.

- To view egress debug tag configurations

#### **egdbgtag port**

egdbgtag       : Egress port debug tag configuration  
port           : Port selection                   [1 - 8]

**Ex:**     **>egdbgtag 7**

```
-->egdbgtag 7
Egress Port:7
DebugTag: Enabled
```

- To set egress debug tag configurations

#### **egdbgtag port enable**

egdbgtag       : Egress port debug tag configuration  
port           : Port selection                   [1 - 8]  
enable         : Enable/Disable                   [0: Disable, 1: Enable]

**Ex:**     **>egdbgtag 7 1**

```
-->egdbgtag 7 1
```

- To view port VID replacement configurations

### egvidrep port

egvidrep : Egress port VID replacement configuration  
 port : Port selection [1 - 8]

Ex: >egvidrep 7

```
-->egvidrep 7
Egress Port:7
PVID:1 Replacement : Enabled!
```

- To set port VID replacement configurations

### egvidrep port enable

egvidrep : Egress port VID replacement configuration  
 port : Port selection [1 - 8]  
 enable : Enable/Disable [0: Disable, 1: Enable]

Ex: >egvidrep 7 1

```
-->egvidrep 7 1
```

## 4.6 Switch Ingress Control

### 4.6.1 Port Mirroring

Port mirroring is used to copy/mirror all Tx and Rx packets of a port (*Sniffer port*) on another port (*monitor port*) for monitoring purpose.

- To view mirroring and snooping configurations

### mirrsnpcfg

mirrsnpcfg : Mirroring and Snooping configurations

Ex: >mirrsnpcfg

```
-->mirrsnpcfg
IGMP : Enabled
MLD Option : IPv6 Next Header 43,44,50,51 or 60
MLD : Enabled
Sniff Mode : Rx & Tx
```

- To configure mirroring and snooping configurations

### **mirrsnpcfg igmp mldopt mld sniffmode**

mirrsnpcfg : Mirroring and Snooping configurations  
 igmp : Snoop Enable/Disable [0: Disable, 1: Enable]  
 mldopt : IPv6 next header selection [0-1] (0: 1/58, 1:43/44/50/51/60)  
 mld : Snoop Enable/Disable [0: Disable, 1: Enable]  
 sniffmode : Sniff mode selection [0-1] (0: Rx | Tx, 1: Rx & Tx)

**Ex:** >mirrsnpcfg 1 1 1 1

```
-->mirrsnpcfg 1 1 1 1
```

- To view port mirroring configurations

### **rxmirrcfg port**

rxmirrcfg : Receive port mirroring configurations  
 port : Port selection [1 - 8]

**Ex:** >rxmirrcfg 1

```
-->rxmirrcfg 1
Port:1
Rx Sniff: Enabled
Tx Sniff: Disabled
Sniff Port: Yes
```

- To configure port mirroring configurations

### **rxmirrcfg port rxsniff txsniff sniffport**

rxmirrcfg : Receive port mirroring configurations  
 port : Port selection [1 - 8]  
 rxsniff : Receive monitoring config [0-1] (0: No Rx Monitor, 1: Monitor all)  
 txsniff : Transmit monitoring config [0-1] (0: No Tx Monitor, 1: Monitor all)  
 sniffport : Sniff port selection [0-1] (0: Not a Sniff port, 1: Sniff port)

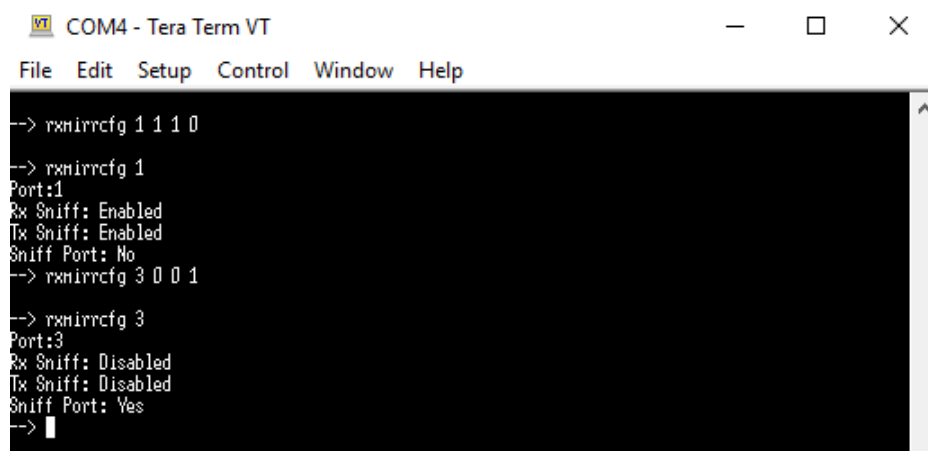
**Ex:** >rxmirrcfg 1 1 0 1

```
-->rxmirrcfg 1 1 0 1
```

## **Port Mirroring Configuration Example**

**To monitor the Tx and Rx Traffic of port 1 on port 3**

- Enable Rx and Tx sniff on port 1  
-->rxmirrcfg 1 1 1 0
- Make port 3 as monitor port (sniff port)  
-->rxmirrcfg 3 0 0 1



```

COM4 - Tera Term VT
File Edit Setup Control Window Help

--> rxmirrcfg 1 1 1 0
--> rxmirrcfg 1
Port:1
Rx Sniff: Enabled
Tx Sniff: Enabled
Sniff Port: No
--> rxmirrcfg 3 0 0 1
--> rxmirrcfg 3
Port:3
Rx Sniff: Disabled
Tx Sniff: Disabled
Sniff Port: Yes
-->

```

## Egress Debug Tag for Port Mirroring Configuration Example

This example is like the previous one with egress debug tagging enabled for the mirrored packets.

### To Monitor the Tx and Rx packets in port 1 on port 3

- Create a new VLAN – VLAN 2 with port 1 and port 2 as tagged member

```
vlan 2 1 0 03 00 0 0 0
```

- Read back the VLAN configuration

```
vlan
```

- Enable VLAN

```
w 310 e3
```

- Enable Tx and Rx traffic mirroring on port 1

```
rxmirrcfg 1 1 1 0
```

- Set Port 3 as sniffer port to monitor the mirrored packets

```
rxmirrcfg 3 0 0 1
```

- Read back the port mirroring configurations on ports 1, 3

```
rxmirrcfg 1
```

```
rxmirrcfg 3
```

- Configure CPU Debug ID (First two bytes of the 4-byte Debug Tag)

```
wl 380 0x0000888a8
```

- Enable Egress Debug Tag for sniffer port where mirrored packets are monitored

```
W 3907 0x02
```

## 4.6.2 Receive Port Configurations

- To view receive port priority control configurations

### rxprictrlcfg port

rxprictrlcfg : Receive port priority control configurations  
 port : Port selection [1 - 8]

**Ex:** >rxprictrlcfg 1

```
-->rxprictrlcfg 1
Highest Priority      : Enabled
OR'ed Priority       : Enabled
MAC Priority         : Enabled
VLAN Priority        : Enabled
802.1p Priority      : Disabled
Diffserv Priority    : Disabled
ACL Priority         : Enabled
```

- To configure port priority control configurations

### rxprictrlcfg port high or mac vlan 8021p diffserv acl

rxprictrlcfg : Receive port priority control configurations  
 port : Port selection [1 - 8]  
 high : Highest Priority config [0-1] (0: disable 1: enable)  
 or : OR' ed Priority config [0-1] (0: disable 1: enable)  
 mac : MAC addr Priority config [0-1] (0: disable 1: enable)  
 vlan : VLAN Priority config [0-1] (0: disable 1: enable)  
 8021p : 802.1p Priority config [0-1] (0: disable 1: enable)  
 diffserv : Diffserv Priority config [0-1] (0: disable 1: enable)  
 acl : acl Priority config [0-1] (0: disable 1: enable)

**Ex:** >rxprictrlcfg 1 1 1 1 1 0 0 1

```
-->rxprictrlcfg 1 1 1 1 1 0 0 1
```

- To view receive port mac control configurations

### rxmacctrlcfg port

rxmacctrlcfg : Receive mac control configurations  
 port : Port selection [1 - 8]

**Ex:** >rxmacctrlcfg 1

```
-->rxmacctrlcfg 1
Priority Ceiling      : Enabled
VLAN Hop Detect      : Enabled
Discard UnTagged     : No
Discard Tagged       : Yes
Port Default Priority : 1
```

- To configure receive port mac control configurations

### **rxmacctrlcfg port pricei vlanhop duntag dtag defpri**

rxmacctrlcfg : Receive port mac control configurations  
 port : Port selection [1 - 8]  
 pricei : Priority ceiling config [0-1] (0: disable 1: enable)  
 vlanhop : VLAN hopping detect config [0-1] (0: disable 1: enable)  
 duntag : Discard untagged packets [0-1] (0: disable 1: enable)  
 dtag : Discard tagged packets [0-1] (0: disable 1: enable)  
 defpri : Port default priority [0-7]

**Ex: >rxmacctrlcfg 1 1 1 0 1 1**

```
-->rxmacctrlcfg 1 1 1 0 1 1
```

- To view receive port authentication control configurations

### **rxauthctrlcfg port**

rxauthctrlcfg : Receive port authentication control configurations  
 port : Port selection [1 - 8]

**Ex: >rxauthctrlcfg 1**

```
-->rxauthctrlcfg 1
ACL : Enabled
Auth Mode : Block
```

- To configure receive port authentication control configurations

### **rxauthctrlcfg port acl authmode**

rxauthctrlcfg : Receive port authentication control configurations  
 port : Port selection [1 - 8]  
 acl : Enable/Disable ACL [0-1] (0: disable 1: enable)  
 authmode : Authentication mode select [0-2] (0: Pass, 1: Block, 2: Trap)

**Ex: >rxauthctrlcfg 1 1 1**

```
-->rxauthctrlcfg 1 1 1
```

- To view Traffic class map of 802.1p

### **rxtcmap8021p port**

rxtcmap8021p : Receive port 802.1p traffic class map configurations  
 port : Port selection [1 - 8]

**Ex:** >rxtcmap802p 1

```
-->rxtcmap8021p 1
802.1p TC Map
Priority      PriorityQueue
0             7
1             6
2             5
3             4
4             3
5             2
6             1
7             0
```

- To configure traffic class map of 802.1p

**rxtcmap8021p port rpq0 rpq1 rpq2 rpq3 rpq4 rpq5 rpq6 rpq7**

rxtcmap8021p : Receive port traffic class map for 802.1p  
 port : Port selection [1 - 8]  
 rpqx : Regenerated priority queue [0-7]

**Ex:** >rxtcmap8021p

```
-->rxtcmap8021p 1 7 6 5 4 3 2 1 0
```

- To view Traffic class map of dscp

**rxtcmapdscp port**

rxtcmapdscp : Receive port dscp traffic class map configurations  
 port : Port selection [1 - 8]

**Ex:** >rxtcmapdscp 1

```
-->rxtcmapdscp 1
0 0
1 0
2 1
3 1
4 2
5 2
6 3
7 3
8 0
9 0
10 1
11 1
12 2
13 2
14 3
15 3
16 0
17 0
18 1
19 1
20 2
```

- To configure traffic class map of dscp color remap 0

### **rxtcmapdscp\_0 port rpq0 rpq1 rpq2 rpq3 rpq4 .... rpq15**

rxtcmapdscp\_0 : Receive port traffic class map for dscp  
 port : Port selection [1 - 8]  
 rpqx : Regenerated priority queue [0-3]

**Ex: >rxtcmapdscp\_0 1 1 2 3 0 0 1 2 3 0 1 2 3 0 1 2 3**

```
-->rxtcmapdscp_0 1 1 2 3 0 0 1 2 3 0 1 2 3 0 1 2 3
```

- To configure traffic class map of dscp color remap 1

### **rxtcmapdscp\_1 port rpq0 rpq1 rpq2 rpq3 rpq4 .... rpq15**

rxtcmapdscp\_1 : Receive port traffic class map for dscp  
 port : Port selection [1 - 8]  
 rpqx : Regenerated priority queue [0-3]

**Ex: >rxtcmapdscp\_1 1 1 2 3 0 0 1 2 3 0 1 2 3 0 1 2 3**

```
-->rxtcmapdscp_1 1 1 2 3 0 0 1 2 3 0 1 2 3 0 1 2 3
```

- To configure traffic class map of dscp color remap 2

### **rxtcmapdscp\_2 port rpq0 rpq1 rpq2 rpq3 rpq4 .... rpq15**

rxtcmapdscp\_2 : Receive port traffic class map for dscp  
 port : Port selection [1 - 8]  
 rpqx : Regenerated priority queue [0-3]

**Ex: >rxtcmapdscp\_2 1 1 2 3 0 0 1 2 3 0 1 2 3 0 1 2 3**

```
-->rxtcmapdscp_2 1 1 2 3 0 0 1 2 3 0 1 2 3 0 1 2 3
```

- To configure traffic class map of dscp color remap 0

### **rxtcmapdscp\_3 port rpq0 rpq1 rpq2 rpq3 rpq4 .... rpq15**

rxtcmapdscp\_3 : Receive port traffic class map for dscp  
 port : Port selection [1 - 8]  
 rpqx : Regenerated priority queue [0-3]

**Ex: >rxtcmapdscp\_3 1 1 2 3 0 0 1 2 3 0 1 2 3 0 1 2 3**

```
-->rxtcmapdscp_3 1 1 2 3 0 0 1 2 3 0 1 2 3 0 1 2 3
```



### 4.6.3 Receive port QCI configurations

- To view receive PSFP configurations

#### rxpsfpcfg port

rxpsfpcfg : Receive port PSFP configurations  
port : Port selection [1 - 8]

**Ex:** >rxpsfpcfg 1

```
-->rxpsfpcfg 1
PSFP Configurations
Non Dscp Color      : 1
DSCP Color Remap    : Enabled
Counter Reset       : Done
PSFP                : Enabled
```

- To configure receive PSFP settings

#### rxpsfpcfg port color remapcolor psfp cntrst

rxpsfpcfg : Receive port psfp configurations  
port : Port selection [1 - 8]  
color : color for non-ip frame [0-3]  
remapcolor : enable/disable dscp remap [0: disable 1: enable]  
cntrst : Clear counters [Optional] [0: none 1: clear]  
psfp : enable/disable psfp [0: disable 1: enable]

**Ex:** >rxpsfpcfg 1 1 1 1 1

```
-->rxpsfpcfg 1 1 1 1 1
```

- To view receive QCI Meter control configurations

#### rxqci-meterctrlcfg port qciidx

rxqci-meterctrlcfg : Receive port QCI meter configurations  
port : Port selection [1 - 8]  
qciidx : Qci index selection [0 - 7]

**Ex:** >rxqci-meterctrlcfg 1 0

```
-->rxqci-meterctrlcfg 1 0
QCI Meter Configurations
Coupling          : Use Overflow tokens
Color Mode        : Aware
Remap qci meter prio : enabled
Qci Remap Prio     : 1
Remark qci meter prio : enabled
Qci remark prio    : 1
Drop qci meter yellow : enabled
MarkRed           : Enabled
```

- To configure QCI meter control configurations

### **rxqcmeterctrlcfg port qciidx coup color reprien repri remprien rempri drpy mre**

rxqcmeterctrlcfg	: Receive QCI Meter configurations	
port	: Port selection	[1 - 8]
qciidx	: Qci index selection	[0 - 7]
coup	: Coupling config	[0 - 1] (0: discard overflow token, 1: use overflow token)
color	: Color Mode	[0 - 1] (0: Blind, 1: Aware)
reprien	: Remap Prio enable	[0 - 1] (0: disable 1: enable)
repri	: Remap priority	[0 - 7]
remprien	: Remark prio enable	[0 - 1] (0: disable, 1: enable)
rempri	: Remark priority	[0 - 7]
drpy	: Drop yellow enable	[0 - 1] (0: disable, 1: enable)
mre	: mark red enable	[0 - 1] (0: disable, 1: enable)
mr	: Reserved for backward compability	

**Ex:** >rxqcmeterctrlcfg 1 0 1 1 1 1 1 1 1 1 1

```
->rxqcmeterctrlcfg 1 0 1 1 1 1 1 1 1 1 1
```

- To view receive qci metering stream configurations

### **rxqcmeterstrcfg port**

rxpqcmeterstrcfg	: Receive port metering stream configurations
port	: Port selection [1 - 8]

**Ex:** >rxqcmeterstrcfg 1

```
-->rxqcmeterstrcfg 1
QCI Metering stream configurations
QCIindex    CIR      PIR      CBS      PBS
0           8000    9000    10000    11000
1           4096    8192    4096     12288
2           4096    8192    4096     12288
3           4096    8192    4096     12288
```

- To configure qci metering stream configurations

### **rxqcmeterstrcfg port qciidx cir pir cbs pbs**

rxpqcmeterstrcfg	: Receive port metering stream configurations
port	: Port selection [1 - 8]
qciidx	: qci index [0 - 7]
cir	: committed information rate [0 - 65535]
pir	: peak information rate [0 - 65535]
cbs	: committed burst size [0 - 65535]
pbs	: peak burst size [0 - 65535]

**Ex:** >rxqcmeterstrcfg 1 0 8000 9000 10000 11000

```
-->rxqcmeterstrcfg 1 0 8000 9000 10000 11000
```

- To view receive qci filtering stream configurations

### rxqcifltrstrcfg port

rxqcifltrstrcfg : Receive port qci filtering stream configurations  
port : Port selection [1 - 8]

**Ex:** >rxqcifltrstrcfg 1

```
-->rxqcifltrstrcfg 1
QCI Filter Stream Configurations
QCIidx  MSduEn  MSdu  RPri  MtrEn  MtrID  GEn  GId  OSfrblk OSfr
0       dis   0      GIPV  dis   0      dis  0    dis   none
1       dis   0      GIPV  dis   0      dis  0    dis   none
2       dis   0      GIPV  dis   0      dis  0    dis   none
3       dis   0      GIPV  dis   0      dis  0    dis   none
```

- To configure receive qci filtering stream configurations

### rxqcifltrstrcfg port qciidx msdue msdusz rpri mtren mtrid gen gid osfb

rxqcifltrstrcfg : Receive port qci filtering stream configurations  
port : Port selection [1 - 8]  
qciidx : Qci index [0 - 7]  
msdue : max sdu enable [0 - 1] (0: SDU filter disable, 1: SDU filter enable)  
msdusz : max sdu size [0 - 65535]  
rpri : Remap Priority [0 - 1] (0: gate IPV, 1: Flow Meter)  
mtren : Meter enable [0 - 1] (0: disable, 1: enable)  
mtrid : Meter id [0 - 7]  
gen : Gate enable [0 - 1] (0: disable, 1: enable)  
gid : Gate id [0 - 7]  
osfb : Oversize frame stream block [0 - 1] (0: disable, 1: enable)  
osf : Reserved for backward compatibility

**Ex:** >rxqcifltrstrcfg 1 0 1 200 1 1 1 1 1 1 0

```
-->rxqcifltrstrcfg 1 0 1 200 1 1 1 1 1 1 0
```

- To view receive qci filtering stream frame statistics

### showrxqcifltrstrstats port qciidx

showrxqcifltrstrstats : Receive port qci filter stream statistics  
port : Port selection [1 - 8]  
qciidx : Qci index [0 - 7]

Ex: >showrxqcfiltrstrstats 1 0

```
-->showrxqcfiltrstrstats 1 0
QCIdx      :0
FMCnt      :0x00000000
FPGCnt     :0x00000000
FNPFCnt    :0x00000000
FPMSDUCnt  :0x00000000
FNPMSDUCnt :0x00000000
FDrdpCnt   :0x00000000
```

- To view receive gate control configurations

### rxgatectrlcfg port

rxgatectrlcfg : Receive port gate control configurations  
port : Port selection [1 - 8]

Ex: >rxgatectrlcfg 1

```
-->rxgatectrlcfg 1
QCIdx  CfgChange      Access  InvRxGCEn      InvRx  OExceGCEn      OExce
0       Prog          OGate   enabled        None   enabled        None
```

- To configure the receive gate control configurations

### rxgatectrlcfg port qciidx cfgchange access invrxgcloseen oexcegccloseen

rxgatectrlcfg : Receive port gate control configurations  
port : Port selection [1 - 8]  
qciidx : qci index [0]  
cfgchange : configure change indication [0 - 1] (0: done, 1: process)  
access : Shadow/Operation Gate list [0 - 1] (0: shadow, 1: Operational)  
invrxgcloseen : Invalid Rx gate close enable [0 - 1] (0: disable, 1: enable)  
invrx : Reserved for backward compatibility  
oexcegccloseen : Octect exceeded gate close en [0 - 1] (0: disable, 1: enable)  
oexce : Reserved for backward compatibility

Ex: >rxgatectrlcfg 1 0 1 1 1 1 1 0

```
-->rxgatectrlcfg 1 0 1 1 1 1 1 0
```

- To view receive gate control PTP config

### rxgptpctrlcfg port

rxgptpctrlcfg : Receive port gate control PTP configurations  
port : Port selection [1 - 8]

Ex: >rxgptpctrlcfg 1

```
-->rxgptpctrlcfg 1
QCIdx  CycSTimeNsec      CycSTimeSec      GCycCnt
0       0000001234      00000004321      00000005555
```

- To configure receive gate control PTP

### **rxgptpctrlcfg port qciidx cycstsec cycstnsec gcycnt**

rxgptpctrlcfg : Receive port gate control PTP configurations  
 port : Port selection [1 - 8]  
 qciidx : qci index [0]  
 cycstsec : Cycle start time sec [0 – 4294967296] or in hex  
 cycstnsec : Cycle start time nsec [0 - 1073741823] or in hex  
 gcycnt : Gate Cycle time [0 – 4294967296] or in hex

**Ex: >rxgptpctrlcfg 1 0 1234 4321 5555**

```
-->rxgptpctrlcfg 1 0 1234 4321 5555
```

- To view last gate control list index

### **rxgctrllastidx port**

rxgctrllastidx : Receive port last gate control configurations  
 port : Port selection [1 - 8]

**Ex: >rxgctrllastidx 1**

```
-->rxgctrllastidx 1
QCIIndex      GateLastIdx
0              15
```

- To configure last gate control list index

### **rxgctrllastidx port qciidx gctrllastidx**

rxgctrllastidx : Receive port last gate control configurations  
 port : Port selection [1 - 8]  
 qciidx : Qci index [0]  
 gctrllastidx : gate control last index [0 – 255]

**Ex: >rxgctrllastidx 1 0 15**

```
-->rxgctrllastidx 1 0 15
```

- To view receive gate control event configurations

### **rxgctrlevtcfg port qciidx**

rxgctrlevtcfg : Receive port gate event control configurations  
 port : Port selection [1 - 8]  
 qciidx : Qci index [0 – 7]

**Ex:** >rxgctrlevtcfg 1 0

```
-->rxgctrlevtcfg 1 0
EventIdx      IPUEn      IPU      Event      Time
0              No          0        Close      0x00000000
1              No          0        Close      0x00000000
2              No          0        Close      0x00000000
3              No          0        Close      0x00000000
4              No          0        Close      0x00000000
```

- To configure receive gate control event configurations

### **rxgctrlevtcfg port qciidx evtidx ipven ipv event cctime**

rxgctrlevtcfg : Receive port gate event control configurations  
 port : Port selection [1 - 8]  
 qciidx : Qci index [0 - 7]  
 evtidx : Gate control event index [0 - 255]  
 ipven : IPV null / IPV present [0 - 1] (0: IPV Null, 1: IPV present)  
 ipv : Internal priority value [0 - 7]  
 event : Scheduled event [0 - 1] (0: Close, 1: Open)  
 cctime : Cycle count time [0x00000000 - 0x07ffffff]

**Ex:** >rxgctrlevtcfg 1 0 0 1 1 1 0x2000

```
-->rxgctrlevtcfg 1 0 0 1 1 1 0x2000
```

- To view qci stream status

### **rxqcistrstatus port**

rxqcistrstatus : Receive port qci stream configurations and status  
 port : Port selection [1 - 8]  
 qciidx : Qci index [0 - 7]

**Ex:** >rxqcistrstatus 1 0

```
-->rxqcistrstatus 1 0
Stream counter overflowed Status:
Frame Match rolled over :No
Frame Pass gate rolled over :No
Frame not Pass gate rolled over :No
Frame Pass max sdu rolled over :No
Frame not Pass max sdu rolled over :No
Frame drop rolled over :No
```

- To clear qci stream status

### **rxqcistrstatus port clear**

rxqcistrstatus : Clear qci stream configurations and status  
 port : Port selection [1 - 8]  
 clear : Rolled over selection [0x00 - 0x3f]

**Ex:**     >rxqcistrstatus 1 0 0x3f

```
-->rxqcistrstatus 1 0 0x3f
```

- To view qci stream counter rollover interrupt configurations

### **rxqcistrcntint port**

rxqcistrcntint     : to view qci stream rollover interrupt config  
port               : Port selection                     [1 - 8]

**Ex:**     >rxqcistrcntint 1

```
-->rxqcistrcntint 1
Interrupt Status       : 0x00
Interrupt CFG mask     : 0x00
```

- To configure qci stream counter rollover interrupt configurations

### **rxqcistrcntint port intmask**

rxqcistrcntint     : to view qci stream rollover interrupt config  
port               : Port selection                     [1 - 8]  
intmask            : qci meter interrupt mask         [0x00 – 0xff]

**Ex:**     >rxqcistrcntint 1 0xff

```
-->rxqcistrcntint 1 0xff
```

- To view qci meter interrupt status

### **rxqcmeterredint port**

rxqcmeterredint: Receive port qci meter interrupt configurations and status  
port               : Port selection                     [1 - 8]

**Ex:**     >rxqcmeterredint 1

```
-->rxqcmeterredint 1
Interrupt Status       : 0x00
Interrupt CFG mask     : 0x0F
```

- To configure qci meter interrupt

### **rxqcmeterredint port intmask**

rxqcmeterredint: Receive port qci meter interrupt configurations and status  
port               : Port selection                     [1 - 8]  
intmask            : qci meter interrupt mask         [0x00 – 0xff]

**Ex:**     >rxqcmeterredint 1 0x00

```
-->rxqcmeterredint 1 0x00
```

- To view qci stream oversize frame interrupt status

### rxqcistrovrszint port

rxqcistrovrszint : Receive port qci stream interrupt configurations and status  
 port : Port selection [1 - 8]

Ex: >rxqcistrovrszint 1

```
-->rxqcistrovrszint 1
Interrupt Status      :0x00
Interrupt CFG mask    :0x0F
-->
```

- To configure qci stream oversize frame interrupt

### rxqcistrovrszint port intmask

rxqcistrovrszint : Receive port qci str interrupt configurations and status  
 port : Port selection [1 - 8]  
 intmask : qci stream interrupt mask [0x00 – 0xff]

Ex: >rxqcistrovrszint 1 0x00

```
-->rxqcistrovrszint 1 0x00
```

- To view qci gate interrupt status

### rxqcigint port

rxqcigint : Receive port qci gate interrupt configurations and status  
 port : Port selection [1 - 8]

Ex: >rxqcigint 1

```
-->rxqcigint 1
QCI Gate Invalid Rx      INT-Config  INT-Detected
QCI Gate Octets exceed   :Enabled     No
QCI Gate Config error    :Enabled     No
```

- To configure qci gate interrupt

### rxqcigint port rxinv octexcd cfgerr

rxqcigint : Receive port qci gate interrupt configurations and status  
 port : Port selection [1 - 8]  
 rxinv : Received invalid interrupt [0:Enabled, 1:Disabled]  
 octexcd : Octets exceed interrupt [0:Enabled, 1:Disabled]  
 cfgerr : Config error interrupt [0:Enabled, 1:Disabled]



Ex: >rxqcigint 1 1 1 1

```
-->rxqcigint 1 1 1 1
```

## 4.7 Switch Access Control List (ACL)

ACL is used to configure rules to forward / Deny /Inspect & Change the contents of the packet.

### 4.7.1 TCAM Data and Mask configurations

- To view acl entry from hardware

#### aclr port atype entry

aclr : To get acl tcam settings from hardware  
 port : Port selection [1 - 8]  
 atype : Access type selection [1 - 3] (1: Mask, 2: Data, 3: Both)  
 entry : TCAM entry [0 - 63]

Ex: >aclr 1 3 0

```
-->aclr 1 3 0
TCAM Mask:
           :0x12348765      0x12348765      0x98762345      0x98762345
           :0x00000000      0x00000000      0x00000000      0x00000000
           :0x00000000      0x00000000      0x00000000      0x00000000
TCAM Data:
           :0x12348765      0x12348765      0x98762345      0x98762345
           :0x00000000      0x00000000      0x00000000      0x00000000
           :0x00000000      0x00000000      0x00000000      0x00000000
Action:
Time Stamp : Disabled
Count Match : Disabled
Counter Sel : Counter0
QCI         : Disabled
Stream ID   : 0
Replace VID : Enabled
VID         : 0
Queue En    : Qos
QSEL        : 3
Remark Prio : Enabled
Priority     : 7
Map Mode    : OR
DST Port    : 0xF0
```

- To view current acl entry settings from RAM, before writing to hardware

#### aclw port atype

aclw : To get acl tcam settings from RAM and to set hardware  
 port : Port selection (dummy) [1 - 8]  
 atype : Access type selection [1 - 3] (1: Mask, 2: Data, 3: Both)

Ex: >aclw 1 3

```
-->aclw 1 3
TCAM Mask:
           :0x12348765      0x12348765      0x98762345      0x98762345
           :0x00000000      0x00000000      0x00000000      0x00000000
           :0x00000000      0x00000000      0x00000000      0x00000000
TCAM Data:
           :0x12348765      0x12348765      0x98762345      0x98762345
           :0x00000000      0x00000000      0x00000000      0x00000000
           :0x00000000      0x00000000      0x00000000      0x00000000
Action:
Time Stamp      : Enabled
Count Match     : Disabled
Counter Sel     : Counter1
QCI             : Enabled
Stream ID       : 2
Replace VID     : Disabled
VID             : 100
Queue En        : GQSEL
QSEL            : 3
Remark Prio     : Enabled
Priority         : 7
Map Mode        : OR
DST Port        : 0xF0
```

- To write current ACL entry settings to Hardware

### **aclw port atype entry pri rvld rshift nshift etype flush**

aclw	: To get acl tcam settings from RAM and to set hardware	
port	: Port selection	[1 - 8]
atype	: Access type select	[1 - 3] (1: Mask, 2: Data, 3: Both)
entry	: TCAM entry select	[0 - 63]
pri	: enable priority for entry	[0 - 1] (0: Disable, 1: Enable)
rvld	: row valid selection	[0x0 - 0xf]
rshift	: row address for shift operation	[0 - 63]
nshift	: Number of rows to be shifted	[0 - 3]
etype	: Entry addition type	[1 - 3] (1: Write, 2: Add, 3: Shift)
flush	: To reset the TCAM	[0-1] (0:None, 1: reset)

Ex: >aclw 1 3 0 0 0xf 0 0 1 0

```
-->aclw 1 3 0 0 0xf 0 0 1 0
```

- To write tcam data and mask settings to RAM before writing to hardware

### **acldatar atype length offset data0 data1 data2 .... data11**

acldatar : To write ACL data and mask settings to RAM  
 atype : Access type select [1 – 2] (1: Mask, 2: Data)  
 length : Data and mask length [1 – 12] (Multiple of 4 bytes)  
 offset : Offset to update [0 – 11]  
 data0 – data11 : data of 4bytes in hex [MSB- LSB] [0x00000000 – 0xFFFFFFFF]

#### **Mask:**

data0 (31 - 0)	data1 (63-64)	data2 (95 – 64)	data3 (127 – 64)
data4 (153 – 128)	data5 (191 – 154)	data6 (223 – 192)	data7 (255 – 224)
data8 (287 – 256)	data9 (319 – 288)	data10 (351 – 320)	data11 (352 – 383)

#### **Data:**

data0 (415 - 384)	data1 (447-416)	data2 (479 – 448)	data3 (511 – 480)
data4 (543 – 512)	data5 (575 – 544)	data6 (607 – 576)	data7 (639 – 608)
data8 (671 – 640)	data9 (703 – 672)	data10 (735 – 704)	data11 (767 – 736)

**Ex: >acldatar 2 4 0 0x012348765 0x12348765 0x98762345 0x98762345**

```
->acldatar 2 4 0 0x12348765 0x12348765 0x98762345 0x98762345
```

- To write tcam action to RAM before writing to hardware

### **aclaarw ts cnt cntsel stren strid rvtg vid qen qsel rp pri mm dport**

aclaarw : To write ACL action settings Ato RAM  
 port : Port selection [1 - 8]  
 ts : Time stamp frame [0 – 1] (0: Disabled, 1: Enable)  
 cnt : Count match frame select [0 – 1] (0: Disable, 1: Enable)  
 stren : QCI enable select [0 – 1] (0: Disable, 1: Enable)  
 strid : Stream ID [0 – 7]  
 rvtg : Replace VID select [0 – 1] (0: Disable, 1: Enable)  
 vid : Vlan ID and CFI [0x0000 - 0x1FFF] (13 bit for CFI)  
 qen : Priority mode select [0 - 3] (0: QOS, 1:GQUE, 2:LQUE, 3:QUE)  
 qsel : Queue select [0 – 7]  
 rp : Remark priority select [0 – 1] (0: Disable, 1: Enable)  
 pri : Remark priority value [0 – 7]  
 mm : Map mode select [0 – 3] (0: None, 1: OR, 2: AND, 3:REP)  
 dport : Destination port map [0x00 – 0xFF]

**Ex: >aclaarw 1 0 1 1 2 0 100 1 3 1 7 1 0xf0**

```
->aclaarw 1 0 1 1 2 0 100 1 3 1 7 1 0xf0
```

- To view acl entry write byte settings (Partial / Full acl data write select config)

### aclwbytecfg port atype

acldatar : To set or get ACL entry byte enable settings  
 port : Port selection [1 - 8]  
 atype : Access select [0 - 4] (0: Mask, 1: Data, 2: Action, 4: All)

Ex: >aclwbytecfg 1

```
-->aclwbytecfg 1
Mask[<32-1>,<48-33>] :0xFFFFFFFF 0xFFFF
Data[<32-1>,<48-33>] :0xFFFFFFFF 0xFFFF
Action[6-1] :0x3F
Parser-[X]RFR[<32-1>,<40-33>] :0xFFFFFFFF 0xFF
Parser-[X+1]RFR[<32-1>,<40-33>] :0xFFFFFFFF 0xFF
Parser-[X]KIVR[<32-1>,<48-33>] :0xFFFFFFFF 0xFFFF
Parser-[X+1]KIVR[<32-1>,<48-33>] :0xFFFFFFFF 0xFFFF
```

- To configure acl entry write byte settings (Partial / Full acl data write select config)

### aclwbytecfg port atype ben0 ben1

acldatar : To set or get ACL entry byte enable settings  
 port : Port selection [1 - 8]  
 atype : Access select [1 - 5] (1: Mask, 2: Data, 3: Action, 4: Parserx  
 5:Parserx+1)  
 ben0 : Byte Enable 0 [0x00000000 - 0xFFFFFFFF]  
 (Data/Mask/KVIR:32-1, RFR:32-1)  
 [0x00000000 - 0x00000003F]  
 (Action: 6-1)  
 ben1 : Byte Enable 1 [0x00000000 - 0x0000FFFF]  
 (Data/Mask/KVIR: 48-33)  
 [0x00000000 - 0x000000FF]  
 (RFR: 40-33)

Ex: >aclwbytecfg 1 1 0xFFFFFFFF 0xFFFF  
 >aclwbytecfg 1 2 0xFFFFFFFF 0xFFFF  
 >aclwbytecfg 3 2 0xff

```
-->aclwbytecfg 1 1 0xFFFFFFFF 0xFFFF
-->aclwbytecfg 1 2 0xFFFFFFFF 0xFFFF
-->aclwbytecfg 3 2 0xFF
```

## 4.7.2 TCAM RFR configurations

- To view ACL RFR settings from hardware

### aclrfr port parser rfridx cnt

acldatar : To get acl tcam rfr settings from hardware  
 port : Port selection [1 - 8]  
 parser : parser selection [0 - 5] (0-3: index, 4: parser 0&1, 5: parser 2&3)  
 rfridx : rfr start index [0 - 9]  
 cnt : Number of rfr to display [1 - 10]

Ex: **aclrfr 1 4 0 2**

```
-->aclrfr 1 4 0 2
Parser4:
RFR0 :Yes Yes Yes 0x0010 12 Key1
RFR1 :No No No 0x0000 0 Key0
Parser4:
RFR10 :Yes Yes Yes 0x0010 14 Key0
RFR11 :No No No 0x0000 0 Key0
```

- To view ACL RFR settings from RAM before writing to HW

### aclrfrw port

acldata : To get acl tcam rfr settings from RAM and to set hardware  
port : Port selection [1 - 8]

Ex: **aclrfrw 1**

```
-->aclrfrw 1
Parser X
RFR0 :Yes Yes Yes 0x0010 12
RFR1 :No No No 0x0000 0
RFR2 :No No No 0x0000 0
RFR3 :No No No 0x0000 0
RFR4 :No No No 0x0000 0
RFR5 :No No No 0x0000 0
RFR6 :No No No 0x0000 0
RFR7 :No No No 0x0000 0
RFR8 :No No No 0x0000 0
RFR9 :No No No 0x0000 0
Parser <X+1>
RFR10 :Yes Yes Yes 0x0010 14
RFR11 :No No No 0x0000 0
RFR12 :No No No 0x0000 0
RFR13 :No No No 0x0000 0
RFR14 :No No No 0x0000 0
RFR15 :No No No 0x0000 0
RFR16 :No No No 0x0000 0
RFR17 :No No No 0x0000 0
RFR18 :No No No 0x0000 0
RFR19 :No No No 0x0000 0
```

- To write ACL RFR settings from RAM to hardware

### aclrfrw port parser

acldata : To get acl tcam rfr settings from RAM and to set hardware  
port : Port selection [1 - 8]  
parser : parser selection [0 – 1] (0: parser 0&1, 1: parser 2&3)

Ex: **aclrfrw 1 0**

```
-->aclrfrw 1 0
```

- To write ACL RFR config to RAM

### **aclrfrdataw port parser rfridx l4 l3 l2 ofst len**

aclrfrdataw : To write ACL tcam rfr settings to RAM  
 parser : parser selection [0 – 1] (0: parserx, 1: parserx+1)  
 rfridx : RFR index [0 – 9]  
 l4 : L4 field selection [0 – 1] (0: No, 1: Yes)  
 l3 : L3 field selection [0 – 1] (0: No, 1: Yes)  
 l2 : L2 field selection [0 – 1] (0: No, 1: Yes)  
 ofst : offset to start [0x0000 – 0x3FFF] (in Hex)  
 len : length to be used [2 – 48]

**Ex:** >aclrfrdataw 0 0 1 1 1 10 12  
 >aclrfrdataw 1 0 1 1 1 10 14

```
-->aclrfrdataw 0 0 1 1 1 10 12
-->aclrfrdataw 1 0 1 1 1 10 14
```

## 4.7.3 TCAM KIVR configurations

- To view KIVR settings from hardware

### **aclkvirr port parser**

aclkvirr : To get acl tcam kvir settings from hardware  
 port : Port selection [1 - 8]  
 parser : parser selection [0 – 5] (0-3: parser index, 4: parser 0&1, 5: parser 2&3)

**Ex:** >aclkvirr 1 4

```
-->aclkvirr 1 4
Parser X
      :0x12345678      0x87654321      0x12345678      0x87654321
      :0x00000000      0x00000000      0x00000000      0x00000000
      :0x00000000      0x00000000      0x00000000      0x00000000
Parser (X+1)
      :0x12345678      0x87654321      0x12345678      0x87654321
      :0x00000000      0x00000000      0x00000000      0x00000000
      :0x00000000      0x00000000      0x00000000      0x00000000
```

- To view KIVR settings from RAM before writing to hardware

### **aclkvirw port**

aclkvirr : To get acl tcam kvir settings from RAM and to set hardware  
 port : Port selection [1 - 8]

**Ex:** >aclkivrw 1

```
-->aclkivrw 1
Parser X
      :0x12345678      0x87654321      0x12345678      0x87654321
      :0x00000000      0x00000000      0x00000000      0x00000000
      :0x00000000      0x00000000      0x00000000      0x00000000
Parser <X+1>
      :0x12345678      0x87654321      0x12345678      0x87654321
      :0x00000000      0x00000000      0x00000000      0x00000000
      :0x00000000      0x00000000      0x00000000      0x00000000
```

- To write KVIR settings from RAM to hardware

### aclkivrw port parser

aclkivrw : To get acl tcam kvir settings from RAM and to set hardware  
 port : Port selection [1 - 8]  
 parser : parser selection [0 – 1] (0: parser 0&1, 1: parser 2&3)

**Ex:** >aclkivrw 1 0

```
-->aclkivrw 1 0
```

- To write KVIR to RAM before writing to hardware

### aclkivrdaw port parser length offset data0 data1 data2 .... data11

aclkivrdaw : To write acl tcam KVIR settings to RAM  
 port : Port selection [1 - 8]  
 parser : Parser select [0 – 1] (0: parserx, 1: parserx+1)  
 length : Data and mask length [1 – 48]  
 offset : Offset to update [0 – 47]  
 data0 – data11 : data of 4bytes in hex [MSB- LSB] [0x00000000 – 0xFFFFFFFF]

#### Mask:

data0 (31 - 0)	data1 (63-64)	data2 (95 – 64)	data3 (127 – 64)
data4 (153 – 128)	data5 (191 – 154)	data6 (223 – 192)	data7 (255 – 224)
data8 (287 – 256)	data9 (319 – 288)	data10 (351 – 320)	data11 (352 – 383)

#### Data:

data0 (415 - 384)	data1 (447-416)	data2 (479 – 448)	data3 (511 – 480)
data4 (543 – 512)	data5 (575 – 544)	data6 (607 – 576)	data7 (639 – 608)
data8 (671 – 640)	data9 (703 – 672)	data10 (735 – 704)	data11 (767 – 736)

**Ex:** >aclkivrdaw 0 4 0 0x12345678 0x87654321 0x12345678 0x87654321  
 >aclkivrdaw 1 4 0 0x12345678 0x87654321 0x12345678 0x87654321

```
-->aclkivrdaw 0 4 0 0x12345678 0x87654321 0x12345678 0x87654321
-->
-->aclkivrdaw 1 4 0 0x12345678 0x87654321 0x12345678 0x87654321
```

## 4.7.4 TCAM Parser configurations

- To view parser control configurations

### acbpsrcfg port

acbpsrcfg : To set or get acl parser control configurations  
 port : Port selection [1 - 8]

Ex: >acbpsrcfg 1

```
-->acbpsrcfg 1
Parser Control Configurations:
Keyfmt :0x3
Key0 :Universal
Key1 :Universal
Key2 :Multiple
Key3 :Multiple
IPOpts0 :No
IPOpts1 :No
IPOpts2 :Yes
IPOpts3 :No
UTag0 :No
UTag1 :No
UTag2 :No
UTag3 :Yes
ABSOFF0 :Yes
ABSOFF1 :Yes
ABSOFF2 :Yes
ABSOFF3 :Yes
HSR0 :Yes
HSR1 :Yes
HSR2 :Yes
HSR3 :No
SNAP0 :Yes
SNAP1 :No
SNAP2 :Yes
SNAP3 :No
```

- To set parser control configurations

### acbpsrcfg port keyfmt keytype ipopt vtag abs hsr snap

acbpsrcfg : To set or get acl parser control configurations  
 port : Port selection [1 - 8]  
 keyfmt : Number of key formats [0x0 – 0xF]  
 keytype : Key type selections [0x0 – 0xF] (0'b-universal, 1'b-Multiple)  
 ipopt : IP option selection [0x0 – 0xF] (0'b-No, 1'b-Yes)  
 vtag : VLAN tag option selection [0x0 – 0xF] (0'b-No, 1'b-Yes)  
 abs : Offset selection [0x0 – 0xF] (0'b-No, 1'b-Yes)  
 hsr : HSR tag option selection [0x0 – 0xF] (0'b-No, 1'b-Yes)  
 snap : SNAP tag option selection [0x0 – 0xF] (0'b-No, 1'b-Yes)

Ex: >acbpsrcfg 1 0x3 0x3 0x2 0x1 0xf 0xe 0xa

```
-->acbpsrcfg 1 0x3 0x3 0x2 0x1 0xf 0xe 0xa
```



- To view ACL frame counters

### aclfrcnt port

aclpsrcfg : To clear or get acl frame counters  
 port : Port selection [1 - 8]

Ex: >aclfrcnt 1

```
-->aclfrcnt 1
Counter0: 0
Counter1: 0
Counter2: 0
Counter3: 0
```

- To clear ACL frame counters

### aclfrcnt port clear

aclpsrcfg : To set or get parser configurations  
 port : Port selection [1 - 8]  
 clear : Clear counters [0 - 4] (0-3: Counter Index, 4: All)

Ex: >aclfrcnt 1 0

```
-->aclfrcnt 1 0
```

- To view ACL negative rule match configurations

### aclnrmcfg port

aclnrmcfg : To set or get negative rule match settings  
 port : Port selection [1 - 8]

Ex: >aclnrmcfg 1

```
-->aclnrmcfg 1
TCAM Entry : <63-32> <31-0>
NMATCH : 0xAAAAAAAA 0xCCCCCCCC
```

- To configure ACL negative rule match settings

### aclnrmcfg port cfg0 cfg1

aclnrmcfg : To set or get negative rule match settings  
 port : Port selection [1 - 8]  
 cfg0 : To select TCAM entry [31 - 0] [0xFFFFFFFF - 0x00000000]  
 cfg1 : To select TCAM entry [63 - 32] [0xFFFFFFFF - 0x00000000]

Ex: >aclnrmcfg 1 0xAAAAAAAA 0xCCCCCCCC

```
-->aclnrmcfg 1 0xAAAAAAAA 0xCCCCCCCC
```

- To view ACL TCAM interrupt status

### aclint port

aclint : To get current acl tcam interrupt status  
 port : Port selection [1 - 8]

**Ex:** >aclint 1

```
-->aclint 1
TCAM Operation Done: No
Frame Counter 0 overflown: No
Frame Counter 1 overflown: No
Frame Counter 2 overflown: No
Frame Counter 3 overflown: No
```

- To view ACL TCAM interrupt configuration

### aclintcfg port

aclint : To get or set act tcam interrupt settings  
 port : Port selection [1 - 8]

**Ex:** >aclintcfg 1

```
-->aclintcfg 1
TCAM Operation Done Interrupt: Enabled
Counter 0 overflown Interrupt: Enabled
Counter 1 overflown Interrupt: Enabled
Counter 2 overflown Interrupt: Enabled
Counter 3 overflown Interrupt: Enabled
```

- To set ACL TCAM interrupt configuration

### aclintcfg port etop efrc0 efrc1 efrc2 efrc3

aclint	: To get or set act tcam interrupt settings	
port	: Port selection	[1 - 8]
etop	: To enable TCAM operation done interrupt	[0 - 1] (0: Disable, 1: Enable)
efrc0	: To enable frame count 0 rollover interrupt	[0 - 1] (0: Disable, 1: Enable)
efrc1	: To enable frame count 1 rollover interrupt	[0 - 1] (0: Disable, 1: Enable)
efrc2	: To enable frame count 2 rollover interrupt	[0 - 1] (0: Disable, 1: Enable)
efrc3	: To enable frame count 3 rollover interrupt	[0 - 1] (0: Disable, 1: Enable)

**Ex:** >aclintcfg 1 1 0 0 0 0

```
-->aclintcfg 1 1 0 0 0 0
```

### 3.7.5 TCAM BIST configurations

- To view BIST results

#### aclbistcfg port

aclbistcfg : To set or get BIST settings  
port : Port selection [1 - 8]

**Ex:** >aclbistcfg 1

```
-->aclbistcfg 1
TCAM Sel          :TCAM0
BIST Fail         :No
BIST Pass         :No
BIST Pause        :No
BIST SH0          :No
BIST SH1          :No
BIST Resume       :No
REIN En           :No
BIST Run          :No
BIST Reset        :No
Defect Addr       :0x00
Fail Seq          :0
Skip Err Cnt      :0
BIT Map <127:0>  :0x00000000 0x00000000 0x00000000 0x00000000
00
```

- To config BIST

#### aclbistcfg port tcam sho shi resume rtn run reset

aclbistcfg : To set or get BIST settings  
port : Port selection [1 - 8]  
tcam : TCAM selection [0 - 2] (0: TCAM0, 1: TCAM1, 2:TCAM2)  
sho : Shift out data select [0 - 1] (0: Yes, 1: No)  
shi : Shift in data select [0 - 1] (0: Yes, 1: No)  
resume : Retention enable select [0 - 1] (0: Yes, 1: No)  
run : BIST test run select [0 - 1] (0: Yes, 1: No)  
reset : BIST reset select [0 - 1] (0: Yes, 1: No)

**Ex:** >aclbistcfg 1 2 1 1 0 0 1 0

```
-->aclbistcfg 1 2 1 1 0 0 1 0
```

- To config BIST results params

#### aclbistcfgparam port deftaddr failseq skperrcnt map0 map1 map2 map3

aclbistcfg : To set or get BIST settings  
port : Port selection [1 - 8]  
defaddr : Defected address [0x00 - 0x7SF]  
failseq : Fail sequence [0 - 255]  
skperrcnt : Skip error count [0 - 31]  
map0 : Data Compression (31 - 0) [0x00000000 - 0xFFFFFFFF]  
map1 : Data Compression (63 - 32) [0x00000000 - 0xFFFFFFFF]  
map2 : Data Compression (95 - 64) [0x00000000 - 0xFFFFFFFF]  
map3 : Data Compression (127 - 96) [0x00000000 - 0xFFFFFFFF]

**Ex: >aclbistcfgparam 1 0x2 1 2 0x20 0x30 0x40 0x50**

```
->aclbistcfgparam 1 0x2 1 2 0x20 0x30 0x40 0x50
```

## ACL Rule Configuration Example

**To block all frames with Destination Address 00:00:00:00:51**

- Add the data to be filtered  
-->**acldataw 2 12 0 0x00000000 0x00510000 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0**
- Add the mask equivalent of the data  
-->**acldataw 1 12 0 0xffffffff 0xffae0000 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0**

The mask equivalent is the bit wise inverse of data

Note: Refer Datasheet (TCAM encoding section) to know more about TCAM Mask.

- Configure the action  
-->**aclaaw 0 1 0 0 0 0 0 0 0 0 0 3 0x00**

Port map is set to 0x00 to block the packets

- Set the write byte enable based on the no. of bytes to be updated into the TCAM  
-->**aclwbytecfg 1 1 0xffffffff 0xff**  
-->**aclwbytecfg 1 2 0xffffffff 0xff**  
-->**aclwbytecfg 1 3 0xf**
- Write current ACL entry setting to Hardware  
-->**aclw 1 3 0 0 0xf 0 0 1 0**
- Configure the Rule format register (RFR)  
-->**aclrfrdataw 0 0 0 0 0 0x0 6**
- Configure RFR entries to HW  
-->**aclrfrw 1 0**

RFR is configured to look for the data from the starting byte of the incoming frame (Offset is 0) up to 6 bytes (length is 6)

- Configure the Parser  
-->**aclpsrcfg 1 0x0 0x0 0x0 0x0 0x8 0x0 0x0**

Parser is configured to use universal key type and Absolute offset

- Enable ACL for the Ingress port, where the rule is applied  
-->**w 1803 04**

ACL is enabled for port 1

```

COM4 - Tera Term VT
File Edit Setup Control Window Help

-->acldataw 2 12 0 0x00000000 0x00510000 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
--> acldataw 1 12 0 0xffffffff 0xffae0000 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
--> aclaarw 0 1 0 0 0 0 0 0 0 0 3 0x00
--> aclubytecfg 1 1 0xffffffff 0xff
--> aclubytecfg 1 2 0xffffffff 0xff
--> aclubytecfg 1 3 0xff
--> aclu 1 3 0 0 0xf 0 0 1 0
--> aclrfrdataw 0 0 0 0 0 0x0 6
--> aclrfrw 1 0
--> aclrfr 1 0 0 2
      L4      L3      L2      Ofst  Len  REn  ROfst
Parser0:
RFR0      :No      No      No      0x0000 6      No      0x0000
RFR1      :No      No      No      0x0000 0      No      0x0000
--> aclpsrcfg 1 0x0 0x0 0x0 0x0 0x8 0x0 0x0

```

```

COM4 - Tera Term VT
File Edit Setup Control Window Help

--> u 1803 04
read reg 0x1803 = 0x04
--> 

```

## 4.8 PHY SQI

Following commands are used to get the PHY SQI status.

- To get the SQI of T1 PHY port

### physqi port

```

physqi      : To get phy sqi status
port        : T1 Phy port number

```

**Ex:**    > **physqi 1**  
           SQL: 0  
           Link: DOWN

```
--> physqi 1
SQL: 0
Link: DOWN
```

## 4.9 PHY CABLE DIAGS

Following commands are used to get the Cable Diags of T1 PHY

- To get the Cable Diags of T1 PHY port

### phycdiag port

phycdiag       : To get phy cable diags status  
 port           : T1 Phy port number

**Ex:**    > **phycdiag 1**  
           Cable Diag - : OPEN\_CIRCUITED

```
--> phycdiag 1
Cable Diag - : OPEN_CIRCUITED
```

## 4.10 TC10 Commands

Following commands are used to test the TC10 feature of T1 PHY and Partial networking.

For EVB LAN9370 with FreeRTOS, Please use the below mapping logical/AFE/Phy address.

LAN9370		
Logical port	AFE number	FreeRTOS Phy address
1	0	1
2	1	2
3	3	4
4	4	5

- To get the TC10 command help  
**Ex:**    > **tc10 h**

```

LAN937x_CLI> tc10 h
tc10 h
tc10 l phy_id
tc10 fg phy_id
tc10 fs phy_id wk(1/0) wup(1/0)
tc10 ng
tc10 ns bit_mask <0x00-0xFF>
tc10 pg port <1-8>
tc10 ps port <1-8> bit_mask <0x00-0xFF>
tc10 mg phy_id
tc10 ms phy_id 1/0 <0: slave, 1:master>
tc10 sg phy_id
tc10 ss phy_id 1/0 <0:sleep, 1: wake up>
-----Help
-----Get link status
-----Get wk auto-forward and wup auto-forward
-----Set wk auto-forward and wup auto-forward
-----get enable partial network
-----set enable partial network
-----Get switch port TC10 partial network
-----Set switch port TC10 partial network
-----Get master/slave
-----Set master/slave
-----Get wake/sleep
-----Set wake/sleep

```

- To get the a of T1 PHY link status

>tc10 l <port number>

Ex: > tc10 l 2

```

LAN937x_CLI> tc10 l 2
phy_id=2 link is up

```

- To get the a of T1 PHY wk and wup auto-forward setting

>tc10 fg <port number>

Ex: > tc10 fg 2

```

LAN937x_CLI> tc10 fg 2
phy_id=2: wk auto-forward disabled , wup auto-forward disabled

```

- To set the a of T1 PHY wk and wup auto-forward setting

>tc10 fs <port number> <wake in> <wake out>, where Wake in/Wake out: 1 – enable and 0 - disable

Ex: > tc10 fs 2 1 1

```

LAN937x_CLI> tc10 fs 2 1 1
Set phy_id=2 wk auto-forward enabled
Set phy_id=2 wup auto-forward enabled

```

- To get the Global switch partial network setting. Get the GLB\_PART\_NET register. Each bit corresponds to whether this phy participates in the partial network. Note that GLB\_PART\_NET register follows the AFE number for bit positions. Ie: bit 0 corresponds to AFE0 etc.

>tc10 ng

Ex: > tc10 ng

```

LAN937x_CLI> tc10 ng
partial network register =0x00

```

- To set the Global switch partial network setting. Set the GLB\_PART\_NET register. Each bit corresponds to whether this phy participates in the partial network. Note that GLB\_PART\_NET register follows the AFE number for bit positions. Ie: bit 0 corresponds to AFE0 etc.

>tc10 ns <register value>

Ex: > tc10 ns 3a

```

LAN937x_CLI> tc10 ns 3a

```

- To get the switch Port partial network setting. Get the PORT\_PART\_NET register. The value indicates which partial network this port belongs to.

Bit 0: Port belongs to partial network 0  
 Bit 1: Port belongs to partial network 1  
 Bit 2: Port belongs to partial network 2  
 Bit 3: Port belongs to partial network 3  
 Bit 4: Port belongs to partial network 4  
 Bit 5: Port belongs to partial network 5  
 Bit 6: Port belongs to partial network 6  
 Bit 7: Port belongs to partial network 7

>tc10 pg <port number>

**Ex:     > tc10 pg 2**

```
LAN937x_CLI> tc10 pg 2
port 2 Port Partial Network Register =0x00
```

- To set the switch Port partial network setting. Set the PORT\_PART\_NET register

>tc10 ps <port number> <value>

The value indicates which partial network this port belongs to.

Bit 0: Port belongs to partial network 0  
 Bit 1: Port belongs to partial network 1  
 Bit 2: Port belongs to partial network 2  
 Bit 3: Port belongs to partial network 3  
 Bit 4: Port belongs to partial network 4  
 Bit 5: Port belongs to partial network 5  
 Bit 6: Port belongs to partial network 6  
 Bit 7: Port belongs to partial network 7

**Ex:     > tc10 ps 2 ab**

```
LAN937x_CLI> tc10 ps 2 ab
```

- To get the T1 PHY master/slave status

>tc10 mg <port number>

**Ex:     > tc10 mg 2**

```
LAN937x_CLI> tc10 mg 2
The DUT(phy_id=2) is master
```

- To set the T1 PHY master/slave

>tc10 ms <port number> <value> , where 1 – master and 0 - slave

**Ex:     > tc10 ms 2 1**

```
LAN937x_CLI> tc10 ms 2 1
Set phy id= 2 to master
```

- To get the T1 PHY wake/sleep status



>tc10 sg <port number>

**Ex:**     > tc10 sg 2

```
LAN937x_CLI> tc10 sg 2  
the device<phy_id=2> is in sleep state
```

- To Set T1 PHY wake/sleep status

>tc10 ss <port number> <value>, where 1 – wake and 0 - sleep

**Ex:**     > tc10 ss 2 0

## 5 Boot config from SD card

There are few system configurations which can force/modify the system setting from SD card. This configuration will be read early in boot process and configurations are applied.

Create “**cfg.txt**” file in SD card and place your configuration in the file such as ip, mac, etc. to load during bootup.

### 5.1 Cfg.txt Script rules

There are few system configurations which can force/modify the system setting from SD card. This configuration will be read early in boot process and configurations are applied.

Create “**cfg.txt**” file in SD card and place your configuration in the file such as ip, mac, etc. to load during bootup. Please make sure sd card is formatted to FAT32 ([HP USB Disk Storage Format](#) Tool can be used)

#### Config Syntax:

**Parameter: [value] [value]**

Please follow the syntax below for each parameter.

# Change MAC address

mac: 00-11-22-33-44-55

# Change IP address

ip: 192.168.0.20

# Set LAN937x T1 PHY mode master/slave config

# port bit map to represent the port number, 1b: master 0b: slave

t1\_master: 0x3f

#Only for Dual T board

#phy\_addr\_1 is the PHY address to be used with the port 5 and phy\_addr\_2 is used with port 6.

#-1 means the PHY address is not being used, autodetected.

phy\_addr\_1: -1 3

phy\_addr\_2: 18 0

#xmii configurations for Dual T board

# xmii\_1 contains the register value programmed to 0x5300-5301.

# xmii\_2 contains the register value programmed to 0x6300-6301

# Using a value of 0 means the driver will not write the register

xmii\_1: 0x784d 0x0049

xmii\_2: 0x0246 0x780c

# T1S PHY configurations Dual T board

# The first number applied to the first T1S phy detected and the second setting for the next T1S phy

# The table specifies the registers affected

Setting	Register Address	Bit-Field	Comment / Register Name
PLCA Enable	0x1FCA01	Bit[15]	PLCA Control 0
Local Node ID	0x1FCA02	Bit[7:0]	PLCA Control 1
Node Count	0x1FCA02	Bit[15:8]	PLCA Control 1
Burst Timer	0x1FCA05	Bit[7:0]	PLCA Burst Mode
Max Burst Count	0x1FCA05	Bit[15:8]	PLCA Burst Mode

# The first number applied to the first T1S phy detected and the second setting for the next T1S phy

t1s\_node\_count: 8 8

t1s\_node\_id: 0 1

t1s\_plca\_enable: 1 1

t1s\_max\_burst\_count: 0 0

t1s\_burst\_timer: 128 128

# PTP configurations

ptp\_profile: 0

ptp\_mechanism: 2

ptp\_display: 0

ptp\_slave\_port: 1

# latency values adjustment in PTP operation

# t1\_tx means the T1-to-TX bridge board is used, t1\_end means the T1 endpoint (AIS18022 board) is used, which is used in the AVB demo.

#Parameter is port bitmap. 0 not used. Select 1 either of the setting if bridge board or T1 endpoint board

t1\_tx: 0

t1\_end: 0

## 5.2 Sample cfg.txt configuration for Dual T board

If you are using EVB-LAN9373 Dual-T board below configuration can be used. Note that on this board the phy addresses for T1S phys are as below.

Phy address: 18 – T1S connected to first LAN9373 switch.

Phy address: 3 – T1S connected to second LAN9373 switch.

# Change MAC address

mac: 00-11-22-33-44-55

# Change IP address

ip: 192.168.0.20

# Set LAN937x T1 PHY mode master/slave config

t1\_master: 0x3f

# T1S PHY configurations.

# First number is for lower T1S phy address. Second number is for next T1S phy address

t1s\_node\_count: 8 8

t1s\_node\_id: 0 1

t1s\_plca\_enable: 1 1

t1s\_max\_burst\_count: 0 0

t1s\_burst\_timer: 128 128

## 5.3 Sample Cfg.txt configuration for LAN9370 board

# Change MAC address

mac: 00-11-22-33-44-55

# Change IP address

ip: 192.168.0.20

# Set LAN937x T1 PHY mode master/slave config

t1\_master: 0x3f

## 6 Command script

The command “run” can be used from Switch CLI to execute a series of commands from the file.

**Syntax:** “run <filename>”

**Example:** run cmd.txt

**Limitations:**

- The scripting is intended for “set” commands, the “get/show” commands may affect scripting.
- The PTP task is delayed task, there could be some PTP related commands may fail at startup.
- The config file name must be very small, large file name may result in file unrecognized.

### 6.1 Boot time Configurations:

During system boot, a lookup for “**config.txt**” in SD card will be done, if found the series of command from “config.txt” will be executed sequentially. Please make sure sd card is formatted to FAT32 ([HP USB Disk Storage Format](#) Tool can be used). Note that cfg.txt and config.txt files co-exist. The cfg.txt will be executed first.

### 6.2 Selective Configurations:

Create a selective file say PTPE2E.txt file with series of commands and place the file in SD card. From the Switch CLI prompt use “run PTPE2E.txt” command to execute the commands sequentially.

### 6.3 Format of config file:

There are a set of distinct commands available which need to be specified in a proper format to be executed as script.

#### 6.3.1 Switch CLI Commands:

All the commands from Switch CLI can be used directly in script. No change is needed.

#### 6.3.2 System Commands:

All the system commands need to be added with prefix “**LAN93XX:** ” except for the following commands.

**Example:**

LAN93XX: phyread 1 0x01

**System command “portstat”:**

The prefix “**portstat:** “ must to be used for the **portstat** related commands.

**Example:**

portstat: L 1 0

**System command “ptpsvc”:**

The prefix “**ptpsvc:sw:** ” or “**ptpsvc:hw:** ” must be used for the **ptpsvc** related commands

**Example:**

ptpsvc:sw: mci

ptpsvc:hw: sd 1 1 1 1

**System command “sysfs”:**

The prefix “**sysfs:** ” must be used for the **sysfs** related commands.

**Example:**

```
sysfs: echo 1 > sw1/1_master
```

System command “ptpcfg”:

The **ptpcfg** need to be used carefully based on the desired configuration as follows.

**Command Syntax:** ptpcfg: ptptoption t1\_master t1\_tx t1\_end ptpttype\_slaveport avb\_fwd\_1 avb\_fwd\_2 avb\_fwd\_3 avb\_mirror avb\_mirror\_port

**Command Help:**

```
# ptptoption 0: No PTP, 1:1588, 2:gPTP, 3:AutogPTP
# ptpttype_slavePort 1:E2E 2:P2P or <SlavePort>
# Note: Configure the complete parameters for corresponding ptp type
#
```

**Example 1:**

```
# No PTP
# ptpcfg: ptptoption t1_master t1_tx t1_end
ptpcfg: 0 0x00 0x00 0x3f
```

**Example 2:**

```
# 1588 E2E
# ptpcfg: ptptoption t1_master t1_tx t1_end ptpttype_slaveport
ptpcfg: 1 0x00 0x00 0x3f 1
```

**Example 3:**

```
# 1588 P2P
# ptpcfg: ptptoption t1_master t1_tx t1_end ptpttype_slaveport
ptpcfg: 1 0x00 0x00 0x3f 2
```

**Example 3:**

```
# gPTP
# ptpcfg: ptptoption t1_master t1_tx t1_end
ptpcfg: 2 0x00 0x00 0x3f
```

**Example 4:**

```
# AutogPTP
# ptpcfg: ptptoption t1_master t1_tx t1_end ptpttype_slaveport avb_fwd_1 avb_fwd_2 avb_fwd_3
avb_mirror avb_mirror_port
ptpcfg: 3 0x00 0x00 0x3f 1 0x06 0x07 0x28 0x07 7
```

### 6.3.3 Example “config.txt”:

```
showmib
vlan 1 1 1 0x3 0x3 1 1 1
vlan 2 1 0 0xf 0xf 0 1 1
vlan 3 1 0 0xa 0x2 0 0 0
showmac
LAN93XX: date
LAN93XX: date 0601121023
LAN93XX: setbusmask spi
LAN93XX: getbusmask
LAN93XX: memstat
LAN93XX: phyread 1 0x01
LAN93XX: regread 0x01
portstat: L 1
portstat: L 1 0
```

```
portstat: L 1
portstat: L 1 1
portstat: L 1
portstat: l 1
ptpsvc:sw: mci
ptpsvc:sw: d
ptpsvc:sw: d 1
ptpsvc:sw: d
ptpsvc:sw: d 0
ptpsvc:sw: d
ptpsvc:hw: has
ptpsvc:hw: hda
ptpsvc:hw: gd 1
ptpsvc:hw: sd 1 1 1 1
ptpsvc:hw: gd 1
sysfs: cat sw1/1_master
sysfs: echo 0 > sw1/1_master
sysfs: cat sw1/1_master
sysfs: echo 1 > sw1/1_master
sysfs: cat sw1/1_master
ptpcfg: 3 0x00 0x00 0x3f 1 0x06 0x07 0x28 0x07 7
```

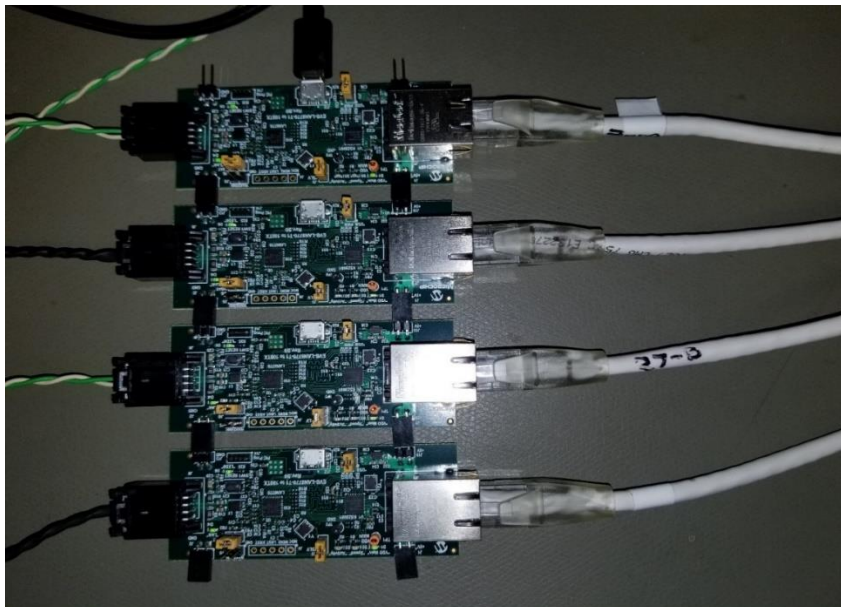
## 7 Appendix A – SAM E70 XPlained with EVB-LAN9370-LC (4 Port Switch Daughter card) + LAN8770 Bridge Boards

Note that Port numbers are 3, 2, 1, 4 as tagged below with their corresponding PTP Master/Slave and T1 PHY Master/Slave default settings. Since Auto crossover is not yet supported it is necessary to match up the wiring 1-1 in order to link.



Notice that the LAN8770 bridge board has the T1 PHY SLV (slave) jumpers in to match the T1 PHY Master default setting for the switch ports.

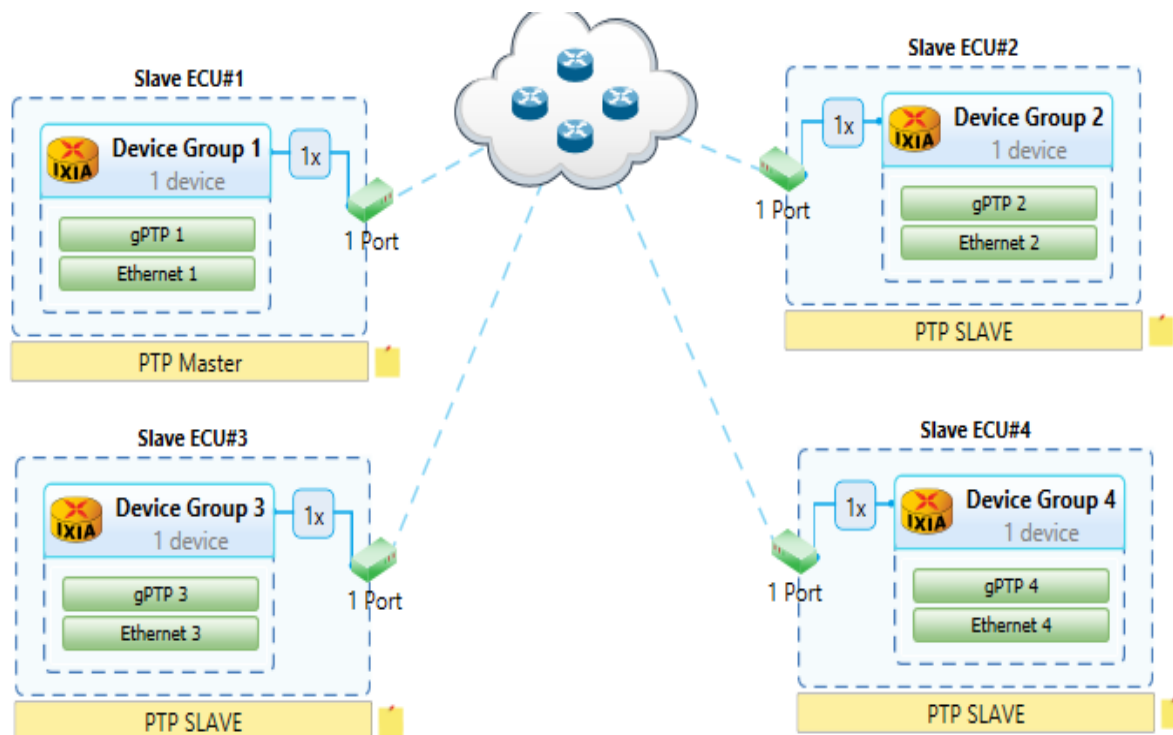
Remember, using bridge board will require setting PTP path delays using the `gd` command.





## 8 Appendix B – Testing LAN9370 gPTP with Ixia as GrandMaster

The Ixia XGSD is capable of emulating gPTP Master and gPTP Slave Endpoints. In below diagram, Slave ECU#1 is emulating GM and the Slave ECU#2-4 are emulating gPTP Slaves. All ports are connected directly with T1 PHY's. The LAN9370-LC board acts as a gPTP Boundary Clock by default. As a BC, our switch has one gPTP Slave port and remaining ports (2-4 with this board) are gPTP Master ports that send regenerated Sync messages out of the switch.



gPTP (IEEE 802.1AS) profile default settings

gPTP is not actually a 1588 profile, but 802.1AS, being based on IEEE 1588, is comparable to a 1588 profile.

transport: layer-2, multicast (unicast in WLANs), Pdelay\_Req interval 0, path delay measurement mechanism: only peer delay (p2p) two-step

The Live statistical view below shows that Eth1 is (Slave ECU#1) is sending Sync and FollowUp Messages and Eth2-Eth4 (Slave ECU#2-4) are receiving the Sync and FollowUp Messages. All Ports are exchanging PdelayRequest, PdelayResponse, and PdelayResponseFollowUp messages. Also, you can use WireShark to capture the messages coming out of the switch ports to verify correct PTP message intervals are following the 802.1as (gPTP) profile default settings

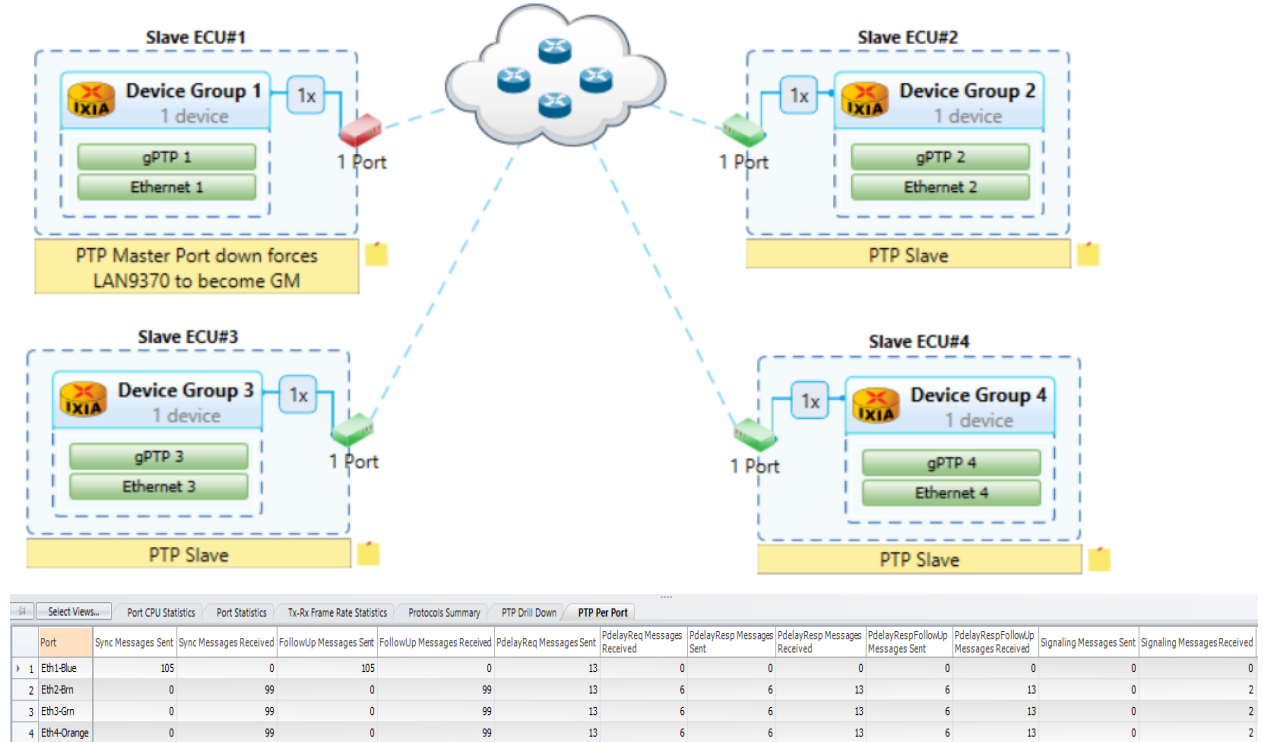
Protocols > PTP																	
Protocol Settings > PTP Global Settings > PTP																	
Filter in All Filter Text Reapply Clear																	
Grouping	Topology	Device Group	Device #	Status	Session Info	PTP State	Master Clock ID	Clock Role	Custom Clock ID	Clock Identity	Profile	One Way	Delay Mechanism	Communication Mode	Step Mode	Domain	Port Number
gPTP 1: 1 port	Slave ECU#1	Device Group 1	# 1	1 of 1 Up		Grandmaster	0x00:00:00:00:00:00:00	Master		0x00:00:00:00:00:00:01	IEEE 802.1AS		Peer Delay	Multicast	Two-Step	0	1
Eth1-Blue	Slave ECU#1	Device Group 1	# 1	Up							IEEE 802.1AS		Peer Delay	Multicast	Two-Step	0	1
gPTP 2: 1 port	Slave ECU#2	Device Group 2	# 1	1 of 1 Up		Slave	0x00:AB:CD:FF:FE:EF:71:60	Slave		0x00:00:00:01:00:00:00:01	IEEE 802.1AS		Peer Delay	Multicast	Two-Step	0	1
Eth2-Brn	Slave ECU#2	Device Group 2	# 1	Up							IEEE 802.1AS		Peer Delay	Multicast	Two-Step	0	1
gPTP 3: 1 port	Slave ECU#3	Device Group 3	# 1	1 of 1 Up		Slave	0x00:AB:CD:FF:FE:EF:71:60	Slave		0x00:00:00:02:00:00:00:01	IEEE 802.1AS		Peer Delay	Multicast	Two-Step	0	1
Eth3-Grn	Slave ECU#3	Device Group 3	# 1	Up							IEEE 802.1AS		Peer Delay	Multicast	Two-Step	0	1
gPTP 4: 1 port	Slave ECU#4	Device Group 4	# 1	1 of 1 Up		Slave	0x00:AB:CD:FF:FE:EF:71:60	Slave		0x00:00:00:03:00:00:00:01	IEEE 802.1AS		Peer Delay	Multicast	Two-Step	0	1
Eth4-Orange	Slave ECU#4	Device Group 4	# 1	Up							IEEE 802.1AS		Peer Delay	Multicast	Two-Step	0	1
All PTP Unicast Connection Unicast Advanced GS265.1 GS275.1 gPTP SMPTE C37.238 Advanced Simulate Negative Testing Debug																	
Select Views... Port CPU Statistics Port Statistics Tx-Rx Frame Rate Statistics Protocols Summary PTP Drill Down PTP Per Port																	
Port	Sync Messages Sent	Sync Messages Received	FollowUp Messages Sent	FollowUp Messages Received	PdelayReq Messages Sent	PdelayReq Messages Received	PdelayResp Messages Sent	PdelayResp Messages Received	PdelayRespFollowUp Messages Sent	PdelayRespFollowUp Messages Received	Signaling Messages Sent	Signaling Messages Received					
1 Eth1-Blue	75	0	75	0	9	0	0	0	0	0	0	0					
2 Eth2-Brn	0	71	0	71	9	4	4	9	4	9	0	2					
3 Eth3-Grn	0	71	0	71	9	4	4	9	4	9	0	2					
4 Eth4-Orange	0	71	0	71	9	4	4	9	4	9	0	2					

PTP Drill Down shows PTP State, Offset, and Path Delay values for the downstream Ixia Slave ports in real-time. To see these offset and path delay values for switch PTP slave port 1 you can go to the terminal interface for our switch as shown earlier in this document.

Select Views... Port CPU Statistics Port Statistics Tx-Rx Frame Rate Statistics Protocols Summary PTP Drill Down PTP Per Port																	
Back Per Session																	
Topology	Device Group	Port	Protocol	Device#	Status	Configured Role	PTP State	Offset [ns]	Max Offset [ns]	Min Offset [ns]	Avg Offset [ns]	Path Delay [ns]	Max Path Delay [ns]	Min Path Delay [ns]	Avg Path Delay [ns]		
1 Slave ECU#1	Device Group 1	Eth1-Blue	gPTP 1	1	Up	Master	Grandmaster	0	0	0	0	0	0	0	0		
2 Slave ECU#2	Device Group 2	Eth2-Brn	gPTP 2	1	Up	Slave	Slave	280	320	240	277	0	0	0	0		
3 Slave ECU#3	Device Group 3	Eth3-Grn	gPTP 3	1	Up	Slave	Slave	360	400	160	277	0	0	0	0		
4 Slave ECU#4	Device Group 4	Eth4-Orange	gPTP 4	1	Up	Slave	Slave	200	360	200	272	0	0	0	0		

## 6 Appendix C – Testing gPTP with LAN9370 as OC GrandMaster

With No Sync Messages Received on our PTP Slave port the LAN9370 is sending Sync and FollowUp Messages on downstream gPTP master ports as seen below in the Ixia statistical view.



## 7 Alternative Sync Partners (Oregano, LAN937x)

For those testing gPTP without an Ixia or Spirent chassis, you can use another switch or an endpoint device to Sync with. You can connect two LAN937x switch boards together and use the Console screen to see sync, offset, and path delay information is correct for the device that is configured to become Slave.