Test Plan for Ethernet

Test Plan for Ethernet

1 Outline

This document is for the Ethernet driver in Linux kernel of MVF TOWER BOARD (XTWR-VF600) with VF6XX SoC, and describes test plan for each API/feature of such unit.

2 Test Environment

Toolchain: The latest Linaro toolchain
Bootloader: u-boot 2011.12
Kernel: Freescale i.MX Linux 3.0.15 kernel
Rootfs: rootfs on initramfs/NFS

3 Target Module of the Test

Ethernet driver

4 Test Plan

Command tests by ethtool, ifconfig, ping, scp, telnet and iperf, and NFS mount test will be carried out.
For L2 Switch test, use 4PCs and 2 Ether HUBs. Connect 2 PCs to an Ether HUB and use it as a set. Then connect one set to PORT1 of Ether HUB on VF600 and another to PORT 2.
In this document, call the first set (PC 1&2 with Ether HUB 1) "segment 1", and the second set (PC 3&4 with Ether HUB 2) "segment 2".

5 Conditions

Tests to change MAC address and IP address will be done in intramfs environment.

Test plan for Ethernet

Datails

No.	Head	Item	Procedure	Points to be checked	Judge	Note
1	Driver		Message output at kernel boot.	Verify in the boot message. When multiple ether channels exist, all of them must be probed.		
2	Interrupt		Enter the following command in command prompt. # cat /proc/interrupts	Reasonable interrupt occurs for each channel according to packet receiving status. *The number of ping reply times 2 is considered to be proper number of interrupt.		
3	nfs	eth0	Build NFS server. Add "root=/dev/nfs" to kernel parameter and boot.	NFS is bootable as rootfs.		
4	Link speed, communication mode	10Mbps/half-duplex	Enter the following commands in command prompt. # ethtool -s eth0 autoneg off # ethtool -s eth0 speed 10 duplex half	The following message is shown on the console. eth0: link up (10M/half)		
5		10Mbps/full-duplex	Enter the following commands in command prompt. # ethtool -s eth0 autoneg off # ethtool -s eth0 speed 10 duplex full	The following message is shown on the console. eth0: link up (10M/full)		
6		100Mbps/half-duplex	Enter the following commands in command prompt. # ethtool -s eth0 autoneg off # ethtool -s eth0 speed 100 duplex	The following message is shown on the console. eth0: link up (100M/half)		
7		100Mbps/full-duplex	Enter the following commands in command prompt. # ethtool -s eth0 autoneg off # ethtool -s eth0 speed 100 duplex full	The following message is shown on the console. eth0: link up (100M/full)		
8		Automatic detection	Enter the following command in command prompt. # ethtool -s eth0 autoneg on	The following message is shown on the console. eth0: link up (xxxM/xxx) *Depends on the cable connecting status at the time.		
9	IP Address Setting		Enter the following commands in command prompt. # ifconfig eth0 <board_addr> # ifconfig eth0	inet addr: has the set value.		
10			Enter the following commands in command prompt. # ifconfig eth0 netmask <netmask> # ifconfig eth0	mask: has the set value.		

11			Enter the following commands in command prompt. # route add default gw <gateway_addr> # route -n	gateway: includes the set value.		
12			Enter the following command in command prompt. # ifconfig eth0	HWaddr indicates the MAC address.		
13			Enter the following commands in command prompt. # ifconfig eth0 hw ether <MAC_addr> # ifconfig -a	HWaddr indicates specified MAC address.		
14	Link lamp		Enter the following command in command prompt. # ping <IP_addr>	LED is on when ether is running and in link state.		
15	telnet		Enter the following commands in command prompt of target board. # telnet <server_addr> After login # touch abc # ls abc # rm abc	Connectable. File operation can be done. telnet terminates.		
16			Enter the following command in command prompt. # /sbin/telnetd & Connect to the target from test PC by telnet command.	Connectable. File operation can be done. telnet terminates.		
17	ping		Enter the following command in command prompt. # ping <ip_addr>	Ping command responds.		
18	scp		Connect to the target from PC by scp, and transfer a file of size around 2M. Procedures 1. Start /usr/sbin/dropbearon the target 2. Set a password for root user 3. Execute the following on the PC scp usr@<target_addr>:/<Directory>/<file1> <file2>	File on the target is copied to PC.		

19			Connect to the PC from target by scp, and transfer a file of size around 2M. 1. Set a password for root user 2. Execute the following on the target # scp usr@<host_addr>:/<Directory>/<file1> <file2>	File on the PC is copied to target.		
20	Network cable insertion-extraction		Disconnect network cable while nfs mounting.	nfs recovers by reconnecting cable.		
21			Disconnect network cable on the target while pinging.	Ping is possible by reconnecting cable.		
22			Disconnect network cable on the PC while pinging.	Ping is possible by reconnecting cable.		
23			Disconnect network cable on the target while pinging.	Ping is possible after reconnecting cable to different type of HUB (BUFFALO LSW10/100-8P)		
24	PHY		Connect to 1Gbase 100base HUB.	Connect by 100Mbit.		
25			Connect to 10base HUB.	Connect by 10Mbit.		
26		Autonegotiation	Switch over to 10base HUB while connecting to 1Gbase 100base HUB.	Change from 100Mbit to 10Mbit automatically.		
27			Switch over to 1Gbase 100base HUB while connecting to 10base HUB.	Change from 10Mbit to 100Mbit automatically.		
28	Aging		＜Host＞ Enter the following command in command prompt. # ./iperf -s -i 60 ＜Target＞ Enter the following commands in command prompt. # ifconfig eth0 <board_addr> # dmesg -n 8 # cat /proc/meminfo # ./iperf -c <host_addr> -d -t 43200 -i 60 # cat /proc/meminfo	iPerf completes without disconnecting communication for 12 hours.		
29			Enter the following command in command prompt. # ping <ip_addr>	After pining for about an hour, no system crash or communication error occurs. Run the same test for ping -s 10000 etc. and no error/problem occurs in the system.		
30	L2Switch	Send out broadcast frame	Enter the following command in command prompt. Ping from segment 1 to segment 2. # ping <segment2_ip_addr>	ARP packet is transferred from segment 1 to segment 2 by passing on VF600.		

31		Ping within a segment 1	Enter the following command in command prompt. Ping from segment 1 to segment 1. # ping <segment1_ip_addr>	No packet send-out to segment 2. *Packet can be sent if MAC source address is unknown within a segment		
32		Ping within a segment 2	Enter the following command in command prompt. Ping from segment 2 to segment 2. # ping <segment2_ip_addr>	No packet send-out to segment 1. *Packet can be sent if MAC source address is unknown within a segment		
33		Move PC within a segment	Ping after switching HUB connection of PC 1 and PC 2.	Ping properly.		
34		Move PC to another segment	Move PC 1 to segment 2, then ping from PC 2 to PC 1.	After aging, information of PC 1 in segment 1 is cleared and ping is possible from PC 2 to PC 1.		
35		Other	Execute other network commands.	No connection problem occurs according to the ping result above.		