TLS619 - PC Card (PCMCIA) device support for SCO OpenServer 5

Chapter 1
SCO OpenServer PC Card device support

This is a technology release of the PC Card (PCMCIA) software that SCO has acquired from LynnSoft, Inc. SCO is working with LynnSoft to create advanced PC Card support that will be included in future product releases.

This technology release has the following limitations:

+ This is an unsupported product. SCO support may attempt to help you but we cannot guarantee that it will work on any particular hardware configuration.

+ This preliminary release can only be installed on SCO OpenServer Release 5 platforms. Support for the UnixWare 7 platform is under development.

+ This preliminary release does not use standard SCO installation and removal mechanisms. It does not appear in listings of installed software and cannot be cleanly removed from the system after it is installed.

+ At this time, the PC Card software is not extensible. It provides support for a set of PCMCIA devices (listed in Chapter 3, ``Supported hardware'') but no API is provided to add support for additional devices.

+ Most laptop computers do not support shared interrupts or overlapping memory addresses; each device must have its own IRQ and I/O address assigned. Use the hw or hwconfig -h command to determine which IRQs and I/O addresses are available.

+ You must configure the PC Card TLS software in exactly the order described in this document. You may need to do some configuration for devices you are not using.

The SCO PC Card software contains PC Card socket services, card services, and client-enabled device drivers. For more complete information about the PC Card architecture, visit the PCMCIA web site (http://www.pc-card.com/).

See Chapter 3, ``Supported hardware'' for a complete list of supported laptop computers and peripheral devices.

Chapter 2
Installing the PC Card software

The PC Card software package is distributed in the UNIX tar(C) format. The tls619.tar file includes all the files for the supported PC Cards.

The files that are extracted include configuration scripts that are in the SCO mkdev(ADM) format. You need to download the file, extract the files contained in it, and then use the mkdev command to configure the drivers. Alternately, you can download the file to any SCO OpenServer system and cut floppy disks that you use to install the PC Card software. To install the PC Card software, you must configure the lsio driver and then configure the lspcmcia driver.

NOTE For this TLS, you must follow this procedure in order and may need to configure some device types that you are not using.

Downloading and installing PC Card TLS software

This TLS is available at

ftp://ftp.sco.com/TLS/tls619.tar

The steps to download and install the PC Card TLS software are:

1. Download the PC Card software to your local machine. Be sure that you download in binary mode. You can either download it directly to the /tmp directory on the laptop where it will be configured or you can download it to another SCO OpenServer system and create a floppy disk that you use to install the PC Card software.

   After downloading the file, run sum -r and verify that the output is 18136.

2. To create an installation floppy:

   - Download the tls619.tar file to any SCO OpenServer system.

   - Copy the file to a floppy:

     ```
     dd if=tls619.tar of=/dev/fd0 bs=18K
     ```

3. Log on as or su to root and change to the /tmp directory.

   ```
   su root
   cd /tmp
   ```

4. Extract the driver packages from the tls619.tar file. If you downloaded the tls619.tar file directly to the laptop, the command is:

   ```
   tar xvf tls619.tar
   ```

   If you created a floppy disk with the TLS image, insert the floppy into the laptop's floppy drive and issue the following command.

   ```
   tar xvf /dev/fd0
   ```

5. The following files should be extracted:

   ```
   /usr/lib/mkdev/lsio Fax/modem installation/removal script
   /tmp/lsio.o         Fax/modem driver object file
   /tmp/l0.lsio        Fax/modem copyright notice
   /usr/lib/mkdev/lspcmcia
                       Ethernet/SCSI installation/removal script
   /tmp/lspcmcia.o     PCMCIA kernel
   /tmp/e3e.o          3C589 Client Device Driver
   /tmp/ql.o           SCSI Device Driver
   /tmp/S95pccards     Daemon launcher
   /tmp/l0.pccards     Ethernet/SCSI copyright notice
   ```

Configuring the drivers

Each device type you are using must be configured with the mkdev(ADM) command and you may need to manually edit some system files as well. After configuring the device, the kernel must be relinked and the system rebooted for the device to be available. If you are configuring several devices, you can wait to relink the kernel and reboot the system until they are all configured.

Always be sure that the devices are installed in their slots when you boot the system or you may be unable to access the devices. Do not remove a card while I/O is occurring to or from the device; in some cases, this will cause a system panic.

Before beginning

Before beginning the PC Card configuration, do the following:

+ Run mkdev serial to disable the serial interface and to free up a serial port and associated IRQ. This is required even if you are not configuring a fax or modem device.

+ Edit the Devices(F) file:

  /usr/lib/uucp/Devices

  to create a line that matches the tty you selected. You can do this by copying the tty1a line and modifying it. For example, if you selected the COM3 device, you need to create a ttya3 line:

  Direct ttya3 - 19200 direct

  Note that, for PC Card devices, The ``a'' and the port number are reversed from what is in the file.

+ If you are configuring a PC Card Ethernet LAN driver, determine the base address and IRQ to be used for the device.

Configuring the lsio driver

The lsio driver contains software for fax and modem devices as well as some general PC Card software. It must be configured even if you are not configuring fax and modem devices.

1. Configure the lsio serial driver by typing the following command:

   mkdev lsio

   The menu driver screen will be displayed:

   LynnSoft PCMCIA Aware-Fax/Modem driver installation/removal script

   i)nstall the LynnSoft PCMCIA-Aware Fax/Modem Driver
   r)emove the LynnSoft PCMCIA-Aware Fax/Modem Driver
   q)uit

   Please enter your choice (i/r/q)>_

   Select 'i' to install the driver
   Select 'r' to remove the driver
   Select 'q' to quit

2. Select 'i' to install driver

3. The script to configure the COM port will be displayed:

   Configure the PCMCIA-Aware driver to be one of the
   following COM ports that is not already in use:

1.	COM1	(IOBase = 0x3f8)	IRQ4
2.	COM2	(IOBase = 0x2f8)	IRQ3
3.	COM3	(IOBase = 0x3e8)	IRQ10
4.	COM4	(IOBase = 0x2e8)	IRQ11
q.	Quit		

4. If you select q (Quit), it aborts the configuration process. You must select a COM port even if you are not configuring a fax or modem device.

   The following LynnSoft PCMCIA-Aware devices have been installed:

   ttya<x>

   The following device(s) access the same physical port as their lowercase counterpart, but have modem control properties:

   ttyA<x>

   Relink the kernel now (y/n): type 'n' not to relink.

   This display uses the ttya<x> and ttyA<x> strings. <x> will actually be the number 1 thru 4, depending on the COM port selected. Be sure that the Devices(F) file includes the appropriate line.

5. If you will not be configuring other PC Card devices, you can relink and reboot the system at this point. Be sure that the PC Card is inserted firmly in the slot when you reboot.

Configuring the lspcmcia driver

The lspcmcia driver is used for Ethernet LAN and SCSI devices.

1. Login as or su to root.

2. Type the following command:

   mkdev lspcmcia

   You should see the menu driven screen as follows:

   LynnSoft PCMCIA Software driver installation/removal script

   i)nstall the LynnSoft PCMCIA Card and Socket Service Driver
   r)emove the LynnSoft PCMCIA Card and Socket Service Driver
   q)uit

   Please enter your choice (i/r/q)>_

   Select 'i' to install the driver
   Select 'r' to remove the driver
   Select 'q' to quit

3. Select i to install the driver. If you select 'q' to quit, it aborts the procedure.

4. The following is displayed:

   Select the type of Ethernet adapter being used:

   1. NE2000 compatible (Accton or Socket Communications)
   2. 3COM 3C589 Etherlink III PCMCIA
   3. SMC 8020 Ethernet Card
   4. NONE

   Select type of card: (1, 2, 3, or 4)

5. If you are configuring an Ethernet LAN driver, select the number (1,

2, or 3) for the card that is installed, then supply the base address and IRQ when you are prompted. The prompts will list a suggested base address range and IRQs that may be available and show the default value in square brackets.

If you are not configuring an Ethernet LAN driver, select 4 (NONE).

6. Respond "y" in response to the prompt to relink the kernel.

7. If you installed the PC Card software from a floppy disk, remove the floppy disk before rebooting the system.

8. Physically plug the network adapter card into the system.

9. Reboot the system to allow the PCMCIA kernel driver to be activated.

Configuring the Ethernet LAN device

If you are configuring an Ethernet LAN device, you must install and configure the LAN adapter driver itself.

If you are not configuring an Ethernet LAN device, you may skip this procedure.

To configure an Ethernet LAN device:

1. Login as or su to root.

2. Insert the Ethernet LAN card into the appropriate slot.

3. Run scoadmin as root, and select Networks and then Network Configuration Manager. Select the card that matches what is plugged into your system and what was selected with mkdev.

4. The installation script of the PCMCIA kernel scans the system for the I/O port and IRQ configured by the netconfig utility.

   Most Laptop or portable computers have the following I/O port and IRQ available for LAN cards.

   ```
   I/O port            =    0x300      (Hexadecimal)
   IRQ                 =    3, 5, or 10
   ```

   WARNING If you select the I/O port and/or IRQ, make sure that the I/O port and/or IRQ you choose is not reserved. If the I/O port and/or IRQ is reserved, an error may occur. If an I/O port and/or IRQ error occurs, change to an unreserved I/O port and/or IRQ. Use the hw or hwconfig -h command to determine which I/O ports and IRQs are in use.

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5. Provide the IP address for the card. The Network Configuration Manager will fill in the remaining information.

6. Relink the kernel and reboot the system. If the Ethernet LAN connection is in place when the system comes up, networking should be working.

Configuring the SCSI card

To configure a SCSI card, follow this procedure. If you are not configuring a SCSI card, you can skip this procedure.

WARNING Do not configure an Ethernet LAN card after you configure a SCSI card; the Ethernet configuration will erase the SCSI installation.

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1. Login as or su to root.

2. The PC Card SCSI device expects to use IRQ 11. If your laptop reserves IRQ 11 for other purposes, you must select a different IRQ for your SCSI devices by editing two files:

   /etc/conf/pack.d/lscs/space.c
   Modify the scsiirq line to use an IRQ that is free. For example, to use IRQ 5, the line would be:

   ```
   int scsiirq=5
   ```

   Also, make sure that the I/O base address equals to the I/O base address you are using.

   /etc/conf/pack.d/smad/space.c
   Replace the {11} string in the aha_change smad_irq line. For example, to use IRQ 5:

   ```
   aha_change smad_irq[SCSI_NSMAD] = {1,5};
   ```

   The 1 indicates that you are changing the IRQ; the 5 is the new IRQ.

3. Run the appropriate mkdev commands:

   ```
   mkdev cdrom
   mkdev hd
   mkdev tape
   ```

4. Relink the kernel and reboot the system. Be sure all the configured hardware is in place when you reboot.

Deconfiguring the PC Card drivers

For this TLS of the SCO PC Card software, the software cannot be automatically removed from the system. To manually remove the PC Card software from the system:

1. Use the mkdev(ADM) command to deconfigure the lsio and lspcmcia drivers:

   ```
   mkdev lsio
   mkdev lspcmcia
   ```

   Select the remove (r) option for each to deconfigure the drivers, then relink the kernel. Do not run scripts that use the -r command line option.

2. Delete the files that were extracted from the tls619.tar file.

3. Edit any system files that you modified to restore them to their previous state.

Testing and troubleshooting the PC Card software

After the PC Card software has been installed, you can use the supported

PC Cards; see Chapter 3, ``Supported hardware'' for a full list of supported devices.

This section summarizes steps you can take to verify that the PC Card devices are functioning correctly and, if not, to resolve the problem. If these steps do not solve your problem, you can contact SCO technical support for assistance. Please note that this is an unsupported technology release and SCO Technical Support may be unable to resolve your problem.

SCO Technical Support: 1-800-SCO-UNIX
E-mail: support@sco.com

Testing the LAN card

To verify that the PC Card software is functional:

1. Insert a supported Ethernet LAN card into a PCMCIA slot.

2. Boot the system and verify that the lspcmcia and PC Card enabled driver start. For example, if you are using a 3COM 3c589 Etherlink III PCMCIA Network Adapter, the following banner will appear on the boot screen:

```
%cle3e        -      -   -   LynnSoft 3c589 EtherLink Client v2.0
```

3. To ping an IP address or server, issue the following command:

```
ping -n <IP address or Server>
```

Using the -n option avoids DNS lookups.

4. You will see a Response Status. If you get an error or Host Down message, check the routing table and arp table with the following commands:

```
netstat -rn
arp -an
```

5. To end the connection, press the <Del> key.

If you cannot ping any server, take the following steps:

1. Stop and restart the driver:

```
nd stop
nd start
```

2. Try to ping a nearby server. If there is still no response from the server, try stopping and restarting the driver again. You may need to repeat this step several times.

3. Use the following commands to get network connectivity statistics that may help you identify any problems:

```
ndstat -l
netstat -s
netstat -i
```

4. If this does not resolve the problem, eject the PCMCIA LAN card and insert it into a different PCMCIA slot. Stop and restart the driver.

Testing fax and modem cards

1. Insert a Fax/Modem card into a PCMCIA slot.

2. Boot the system and verify that the lsio driver starts. For example, if you selected COM2 during setup of lsio, the following banner will appear on the boot screen:

```
%lsio        0x2f8-0x2ff     3       unit=0 type=PCMCIA nport=1
```

3. To Configure the Modem Device, edit the /usr/lib/uucp/Devices file to look like the following:

```
Direct ttyax - 19200 direct
```

   x is a number in the 1-4 range that identifies the COM port that is selected.

4. Issue the following command:

```
cu -lttya<x>
```

   The system should respond with a Connected message.

5. Be sure that the modem echo is turned on by issuing the following commands: Use the following commands to be sure that the modem echo is turned on and that it is responding:

```
ATZ
ATE1
at
```

   The system should respond with an OK message.

6. To disconnect, type a tilde and period (~.) and <Enter>:

If the fax or modem is not responding, eject the fax or modem from the socket and insert it into a different PCMCIA slot. Repeat the steps above. The system should respond with an OK message.

Testing the SCSI host adapter

WARNING Always unmount a mounted device before removing the SCSI Host Adapter from a slot. Failure to do this could corrupt files.

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1. Insert the SCSI card into a PCMCIA slot.

2. Boot the system and verify that the SCSI client driver and the smad driver starts. The following banners will appear on the boot screen:

```
%cl1460          -          -   -   LynnSoft SlimSCSI Client v2.0
%adapter     0x340-0x35f    11   -   type=smad ha=0 id=0 fts=s
```

3. Issue the following commands to test the SCSI CD-ROM device:

```
mount -r /dev/cd0 /mnt
cd /mnt
ls
```

   This should list the files from that SCSI device.

   /mnt is the directory where the device is mounted. If it is mounted in a different directory, replace /mnt with the path and name of that specific directory.

Chapter 3
Supported hardware

The LynnSoft PC Card Software supports the following hardware.

NOTE At this time, the SCO PC Card Software is not extensible. A driver interface that allows IHVs to implement support for other device types is under development.

Socket Controllers

Currently, LynnSoft's Socket Service supports the following Socket Controllers:

Cirrus Logic	CL-PD6710/20/22/29/30, CL-PD6832
Intel PCIC	82365LS/A-step/B-step/DF
Vadem	VG-365/465/468/469
VLSI	82C146
IBM PCIC (Ricoh)	RL5C66
Texas Instruments (In PCIC mode only)	TI-1131,TI-1132, TI-1220, TI-1250, TI-1250A

Note: The version support most of the CardBus Controllers that support the PCIC legacy mode.

Fax/Modem cards

After the PC Card is inserted into a PCMCIA slot, a telephone line or cellular phone connection can be made and data can be transferred to another computer or a host system using the wire or wireless connection.

The following Fax/Modem cards are supported, as well as any Fax/Modem card that is PCMCIA Standard Compliant.

- U.S. Robotics 14.4 Fax/Modem
- U.S. Robotics 28.8 Courier Fax/Modem
- Cirrus Logic 14.4k Fax/Modem
- Rockwell 14.4k Fax/Modem
- Practical Peripherals PROCLASS 288 V.34 Data/Fax Modem with EZ-Port
- Hayes OPTIMA 288 V.34 +Fax for PCMCIA with EZjack
- Hayes OPTIMA 144 Data +Fax for PCMCIA
- BOCAMODEM 14.4k V.32bis Data/Fax
- PreMax 14.4k Fax/Modem
- Compaq Speedpaq 192 Data/Fax 19200 with Direct Cellular Connection
- Megahertz 14.4 PCMCIA Fax/Modem with XJack
- Megahertz 28.8 PCMCIA Fax/Modem with XJack
- 3com Megahertz 56K Global Modem
- 3com Megahertz 56K Cellular Modem
- Racal SafeDial v.34

LAN Ethernet cards

- Accton EN2212 Combo Ethernet Adapter Card

Accton UE2212 Combo Ethernet Adapter Card
Accton EN2216 Combo Ethernet Adapter Card

Old 3COM 3c589 family
3COM 3C589 Etherlink III PCMCIA Network Adapter
3COM 3C589B Etherlink III PCMCIA Network Adapter
3COM 3C589C Etherlink III PCMCIA Network Adapter
3COM 3C589D Etherlink III PCMCIA Network Adapter

New 3COM 3c589 family
3COM Megahertz LAN 3CXE589ET PC Card Network Adapter
3COM Megahertz LAN 3CXE589DT PC Card Network Adapter
3COM Megahertz LAN 3CCE589ET PC Card Network Adapter
3COM Megahertz LAN 3CCE589EC PC Card Network Adapter

Socket Comunications Socket EA
Socket Comunications Socket LP-E
Socket Comunications Socket LP-E+

EtherEZ (SMC 8020BT) Ethernet Adapter 10Base-T and 10Base-2 Card
Socket Communication (Socket EA+) NE2000 Compatible Ethernet Adapter
New Media (LiveWire)

Serial I/O cards

These PC Cards add a serial port to portable computers. They give access to serial devices such as fax/modems, digital cameras, portable sheet fed scanners, bar code scanners, stenography machines, data collection equipment, as well as mice, GPS or DGPS receivers, and label printers.

Hardware that contains any of the Socket Controllers listed here is supported by the LynnSoft PC Card Software. Note that you cannot run Merge or WABI with a PC Card serial I/O card.

Socket Communications Socket I/O Serial I/O Adapter with High-Speed 16550 UART

SCSI cards

Small Computer System Interface (SCSI) cards allow users to access SCSI Peripherals through a PCMCIA slot to view information contained on a CD-ROM device or send data to a backup tape device.

Adaptec 1460-A SlimSCSI PCMCIA Card
Future Domain SCSI2GO
IBM SCSI Adapter
New Media Bus Toaster SCSI Adapter

Laptop computers

Acer

Acer 950 P75
Acer AcerNote 750
Acer Anyware 486SC
Acer Anyware V386SL
Acer Anyware V486SL
Acernote 370PC Notebook
AcerNote Lite (model # 350PCX)

AMS

AMS Model 5300
AMS Travel-Pro

AST

AST Ascentia 910N
AST Ascentia P Series laptop
AST Bravo NB 4/25S
AST Bravo NB 4/45S
AST Escenti 910N
AST PowerExec 3/25C
AST PowerExec 4/25C
AST PowerExec 4/75
AST PowerExec 4/75

Compaq

Compaq Armada 7730MT
Compaq LTE 5300
Compaq LTE Elite 4/75 CX
COMPAQ LTE Elite Series
Compaq LTE-5100 notebook

DEC

DEC 325SL/SLC
DEC 425SL/SLC

Dell

Dell Latitude
Dell Latitude LM133

Digital

Digital Hinote VP567
Digital VP550 laptop
Digital VP575 Notebook

Gateway

Gateway 2000 Colorbook 486SX-25
Gateway 2000 Handbook 486SX-25
Gateway Solo2100

Halicon Halicon 486
Hewlett-Packard
Hewlett-Packard Omnibook 4000

Hitachi Hitachi E-series laptop

IBM

IBM 365XD laptop
IBM ThinkPad 350/C
IBM Thinkpad 380D
IBM ThinkPad 500
IBM ThinkPad 710
IBM ThinkPad 750/C
IBM ThinkPad 755-C
IBM ThinkPad 755-CX Pentium
IBM Thinkpad 755CX
IBM Thinkpad 760EL

Ki-System

Ki-System 4/100
Ki-System P/100

NCR

NCR Safari 3170
NCR Safari 3180

NEC

NEC Ultralite Versa 20
NEC Ultralite Versa 25
NEC Versa P75

NoteStar

NoteStar NP-743
NoteStar NP-743D
NoteStar NP-743T

Panasonic Panasonic CF-25

Siemans Nixdorf

SCENIC Mobile 320
SCENIC Mobile 501
SCENIC Mobile 510
SCENIC Mobile 710
SCENIC Mobile 800

Sharp

Sharp PC-3020 100Mhz 586
Sharp PT-9000

SunRex SunRex HyperBook 3200SLC/486

Tadpole Tadpole P1000

Texas Instruments
Texas Instruments 6050

Toshiba

Toshiba 3600CT
Toshiba 440 CDX Pentium P133
Toshiba 460cdt

Toshiba Laptop CD740t
Toshiba Portege 660CDT

Toshiba Satellite 220CS
Toshiba Satellite 310CDT

Toshiba Satellite Pro 440CDT
Toshiba Satellite Pro 460CDT
Toshiba Satellite Pro 470CDT
Toshiba Satellite Pro 480CDT

	Toshiba T1900 Satellite
	Toshiba T1900/T1900C
	Toshiba T2100CS laptop
	Toshiba T3400/T3400CT
	Toshiba T4500/T4500C
	Toshiba T4600/T4600C
	Toshiba T6600C
	Toshiba Tecra 520CDT
	Toshiba Tecra 530CDT
	Toshiba Tecra 540CDT
	Toshiba Tecra 720CDT
	Toshiba Tecra 730CDT
	Toshiba Tecra 740CDT
	Toshiba Tecra 740XCDT
	Toshiba Tecra 750CDT
Zenith	
	Zenith Z-Lite 320L
	Zenith Z-Lite 425SL Mod. 85
	Zenith Z-Star 433 VLD
Zero	Zero ColorNote 486