Linux PPP HOWTO

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This document contains a list the most Frequently Asked Questions (FAQ) about PPP for Linux (and their answers). It is really *not* a HOWTO, but is in 'classical' Question / Answer form. This is but one of the Linux HOWTO/FAQ documents. You can get the HOWTO's from `sunsite.unc.edu:/pub/Linux/doc/HOWTO` (this is the 'official' place) or via WWW from *the Linux Documentation home page* (`http://sunsite.unc.edu/mdw/linux.hmtl`). You cannot rely on the HOWTO's being posted to `comp.os.linux.answers`, as some news feeds have complained about their size.

1 Preface Please send any corrections to `longyear@netcom.com`.

Throughout this document, I have used the word 'remote' to mean 'the system at the other end of the modem link'. It is also called 'peer' in the PPP documentation. Another name for this is called the 'gateway' when the term is use for routing. Its IP address will show as the 'P-t-P' address if you use `ifconfig`.

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2 General information

2.1 What is PPP? A: PPP, or Point-to-Point Protocol, is a recognized 'official' internet protocol. It is a protocol used to exchange IP frames (and others) over a serial link. The current RFC for PPP is 1661. There are many related ones.

Contrary to what some people think, it does not mean "Peer to Peer Processing"; although you may do peer-peer communications using TCP/IP over a PPP link.

2.2 My university (company) does not support PPP. Can I use PPP? A: In general, no. A 'classical' PPP implementation requires that you make changes to the routes and network devices supported by the operating system. This may mean that you will have to rebuild the kernel for the remote computer.

This is not a job for a general user. If you can convince your administration people that PPP is a 'good thing' then you stand a chance of getting it implemented. If you can't, then you probably can't use PPP.

However, if you are using a system which is supported by the people who are marketing the "TIA" (The Internet Adapter) package, then there is hope. I do not have much information on this package, however, from what I have found, they plan to support PPP in "the next version". (My information may be old. Contact them directly. Information on TIA is available at `ftp.marketplace.com` in the `/pub/tia` directory.)

A Linux port is on their list.

If your system is not supported by TIA and you can't convince the admin group to support PPP then you should use the '`term`' package. Some service providers will object to you running '`term`'. They have many different reasons, however the most common is 'security concerns'.

2.3 Where is PPP? A: It is in two parts. The first part is in the kernel. In the kernels from 1.1.13, the driver is part of the network system drivers.

Do not replace the driver in the kernel with a version from the `pppd` package!!!

The second part is the 'daemon' process, `pppd`. This is a **required** process. The source to it is in the file `ppp-2.1.2b.tar.gz` located on `sunsite.unc.edu` in the `/pub/Linux/system/Networking/serial` directory.

It should also be somewhere on `ftp.funet.fi`.

For kernels before 1.1.13, the necessary driver is included in the daemon code.

2.4 I just obtained PPP. What do I do with it? A: Read The Fine Material available.

Start by reading the `README` file and then the `README.linux` file. The documentation sources are listed below.

2.5 Where are additional sources of information for PPP? (Where's the documentation? Is there a HOWTO?, etc.)

A: There are several sources of information for the PPP protocol as implemented under Linux.

- The `README` file in the source package.
- The `README.linux` file in the source package.
- The `Net-2-HOWTO` document.
- The Network Administration Guide.
- The `pppd` man page.
- The ppp FAQ document. (This is not it, by the way.)

The HOWTO file is stored in the usual place for the Linux HOWTOs. That is currently on `sunsite.unc.edu` in the directory `/pub/Linux/docs/HOWTO`.

The Network Administration Guide is available in the `docs/linux-doc-project/nag` directory on sunsite. It is published by O'Riellly and Associates. So, if you want a really professional document, then buy a copy from your local bookstore.

The '`man`' pages are included in the source package. You will probably have to move them to the normal man directory, `/usr/man/man8` before the `man` command may find them. Alternately, you may use `nroff` and `more` to view them directly.

The PPP faq document describes the PPP protocol itself and the various implementations. You will find the FAQ for the usenet news group, `comp.protocols.ppp`, archived on `rtfm.mit.edu` in the `/usenet` directory. It is in eight parts at the present time.

2.6 Where should I post questions about PPP? A: I would prefer that you post them to the `comp.protocols.ppp` group. That is its purpose. I recognize that most people tend to post things to the `comp.os.linux.*` groups first. You will usually get a response even if you use these wrong groups. However, it is better that you do ask in the proper group.

Very few questions are related directly to the Linux port. Most of the questions are general use of the ppp package and are exactly applicable to the remainder of the pppd users.

Please, if you *must* use usenet for PPP questions, use `comp.protocols.ppp`.

2.7 The PPP software doesn't work. HELP!!! A: This is one of the most sickening questions. I realize that this is a plea for help. However, it is practically useless to post this message with no other information. I, and most others, will only ignore it.

Please see the question regarding errors which normally occur at the modem's disconnection. They are not the cause of a problem, only a symptom. Posting a message with only those errors is also meaningless.

What is needed is the output of the system log (syslog) when you run the `pppd` program with the option '`debug`'. In addition, if you are using chat then please use the '`-v`' option to run the sequence with verbose output.

Please include the output from the kernel's startup. This shows the various kernel hardware information such as your UART type, PPP version, etc.

Please include all information that you can relating to the problem. However your system configuration, disk drive configuration, terminal type, mouse location and button status, etc. are irrelevant. What is important is the system to which your are trying to contact, the ppp (or terminal server) that they are using, the modem types and speed that you are using, etc.

Take care and go through the output. Remove the references to the telephone number, your account name, and the password. They are not important to analyzing the problem and would pose a security risk to you if you published them to usenet. Also discard the lines which neither come from the kernel nor pppd.

Do **NOT** run the pppd program with the option '`kdebug 7`' and post that!

If the problem warrants examining the data stream, then you will be contacted by email and asked to mail the trace. Usenet already costs too much for too many people.

Information is written to various levels. The debug information is written to the debug level. The informational messages are written to the info level. The errors are written to the error level. Please include all levels the the '`local2`' group which come from the `pppd` process.

In addition, please do not delete the time stamp information. It is important.

2.8 Can I use the same local IP address for all of the lines of my PPP server? A: Yes. The local address is not significant to the local system. You must have a unique `remote` IP address. The routing is performed based upon the remote IP address and not the local IP address.

3 Other implementations

3.1 Do you know of a implementation for PPP other than Linux? A: Check the PPP FAQ document mentioned above.

AIX is due to be supported in the 2.2 version of the pppd process. HP-UX is, to my knowledge, only supported by the Morning Star commercial package.

If you don't find one listed then post to the `comp.protocols.ppp` group and not the Linux group.

(Please don't mail me asking for "Do you know of a PPP package for ..."? These requests will now be 'appropriately' filed. `;-)`)

3.2 Did you know that there is a program called '`dp`'? A: Yes, we know. The `dp` package was considered very early in the development stage quite a few months back. It is nice. It supports 'demand dial'. It also only works with systems which support streams. This is primarily the SunOS (Solaris) operating systems.

Linux, at the present time, does not supports streams.

There are several other packages for PPP available on the 'net'. The 'portable ppp' package is very much like the TIA code. There is another package called simply 'ppp'. There is code for PPP in the KA9Q package.

Of all of the packages available, the pppd package was the closest to the requirements and functions of Linux to warrant the port.

(If you want more information about these other packages, ask in the `comp.protocols.ppp` group!)

3.3 What RFCs describe the PPP protocol?

A: The current implementation of PPP is a mixture of several. The major portion of the PPP code is written against the RFCs 1331 and 1332. These RFCs were later obsoleted. 1331 was replaced by 1548 and that, in turn, was obsoleted by 1661 six months later.

Most implementations of PPP will be happy to talk to the Linux PPP code.

A complete list is in the PPP faq.

[to quote the FAQ document]:

> All of 1134, 1171, and 1172 (and 1055, for that matter `:-)` have been obsoleted. They're interesting only if you want to debug a connection with an ancient PPP implementation, and you're wondering why (e.g.) it asked you for `IPCP` option 2 with a length of only 4, and Compression-Type `0x0037`. (There's a lot of that still running around - be careful out there.)

Linux PPP will not support this.

4 Compatibility

4.1 Can PPP talk to a SLIP interface? A: No. SLIP works with SLIP. PPP works with PPP.

Some vendors may offer products which work both as SLIP and PPP. However, they must be configured to run in one mode or the other. There is no present method to determine, based upon the protocol passed at the time of a connection, which combination of SLIP protocols or PPP is being requested.

5 Which is better?

5.1 Which is better? PPP or SLIP? A: IT DEPENDS UPON MANY FACTORS. The people who post this type of question have usually not read the `Net-2-HOWTO` document.

A good technical discussion is available at Morning Star's www server, `www.morningstar.com`.

5.2 Is CHAP or PAP better for authentication? A: If you have the choice, use CHAP. Failing that, PAP is better than nothing.

6 Authentication files

6.1 /etc/ppp/pap-secrets file

A: The PAP protocol is most often implemented as your user name and password. You need to include the name of the remote system, your account name, and the password. If the user on abbot wishes to call costello, the entry would be similar to the following.

```
#remote    account    password     IP address list
*          abbot      firstbase
```

6.2 /etc/ppp/chap-secrets file A: The most common problem is that people don't recognize that CHAP deals with a pair of secrets. Both computers involved in the link must have both secrets to work.

For example, if abbot wants to talk to `costello`, then `abbot`'s file would have:

```
#local      remote        secret       IP address list
abbot       costello      firstbase
costello    abbot         who
```

And costello's file would have:

```
#local      remote        secret       IP address list
abbot       costello      firstbase
costello    abbot         who
```

7 Construction problems

7.1 I get compile errors when I try to compile the kernel A: Did you edit the `ppp.c` file to reflect the settings for the kernel that you are using? There are two defines which must be set correctly if you are going to compile the code for PPP.

```
.---------------------.------------------.-------------------------.
|                     |                  |                         |
|  kernel version     |     NET02D       |     NEW_TTY_DRIVERS     |
|_____________________|__________________|_________________________|
|                     |                                            |
```

```
|  < 1.0.0            |              UPGRADE!!!                        |
|_____________________|_________________.______________________________|
|  1.0.0  - 1.0.*     |    defined      |    undefined                 |
|  1.1.0  - 1.1.3     |    defined      |    undefined                 |
|  1.1.4  - 1.1.12    |    undefined    |    undefined                 |
|_____________________|_________________|______________________________|
|                     |                                                |
|  1.1.13             |              UPGRADE!!!                        |
|_____________________|_________________.______________________________|
|                     |                 |                              |
|  1.1.14 - ... NOTE  |    undefined    |    defined                   |
|_____________________|_________________|______________________________|
```

The third define near the top of the file is called `OPTIMIZE_FLAG_TIME`. This may or may not be set with any version of the kernel which supports PPP.

Additional information is in the `ppp.c` file.

NOTE: For kernels from 1.1.14, do not replace the `ppp.c` file in the drivers/net directory nor the `ppp.h` file in the `/usr/include/linux` directory. The drivers and the include file are the proper values for your kernel.

So, from the above list, you will find that 1.1.8 kernel will need `NET02D` and `NEW_TTY_DRIVERS` both undefined. Likewise, the 1.1.18 kernel will already have things configured for it. Do nothing special.

8 Problems running pppd

8.1 `PPPD` won't run unless you are root

A: The pppd process needs to make changes to the networking system and this can only be done if you are the root user. If you wish to run `pppd` from other than the root user then the pppd program needs to be secured 'suid to root'.

```
chown root pppd
chmod 4755 pppd
```

If you wish to control the pppd access to a select group of people, then make the `pppd` process owned by the group and do not permit all others to run the program.

8.2 The `ppp-2.1.2b` package says it needs the 4.6 libraries A: Sorry, I goofed. You will have to forego the binaries and re-compile the code yourself. It is easy. Go to the pppd directory, delete the bad binary, and issue the command '`make`'. Go to the chat directory and do the same if you want a corrected chat program.

You must have the C language compiler and GNU make installed to rebuild the PPP software.

It turns out that when I compiled the `ppp-2.1.2b` package, while I used the proper definitions, I used the 4.6 libraries. One of these days, Al may finally get his act together . . . .

Or, you can get binaries from the `Slackware` 2.0.2 (or later) package. They are in the **ppp.tgz** file in the 'n' series of disks.

Please use the source in the `ppp-2.1.2b` to compile the code. The source has been corrected over the '`a`' package.

8.3 `unable to create pid file: no such file or directory` A: You need to create the directory `/var/run`. On earlier Slackware distributions, this was a symbolic link to the `/etc` directory.

This is a warning. The ppp software will work normally in spite of this message. However, the `ppp-off` script depends upon this file. It is a good idea to create the directory or make the link to the appropriate location.

The posix header, `paths.h`, defines the location for the pid file under the name "`_VAR_RUN`". If you wish to use a different directory for PPP and others, change the value for this define and rebuild the software.

8.4 `/etc/ppp/options: no such file or directory` A: You need to create the directory `/etc/ppp` and have a file called '`options`' in that directory. It needs to be readable by the `pppd` process (root).

The file may be empty. To make an empty file use the '`touch`' command.

See the `pppd` man page, `pppd.8`, for a description of this file.

8.5 `Could not determine local IP address` A: This happens with many configurations of the Telebit Netblazer. The problem is not the terminal server, but the site which has not configured the terminal server with a set of IP addresses.

The Netblazer does not have your IP address. You do not have your IP address. The link will not work unless both IP addresses are known.

You must have been given a piece of paper with both IP addresses written upon it. You must tell the Netblazer the IP addresses to be used. Use the local IP address and the remote IP address as a parameter to the pppd process.

Use the pppd option format of:

```
local_ip:remote_ip
```

(That is the local IP address, a colon, and the remote IP address.)

8.6 `Could not determine remote IP address.` A: See the previous question.

8.7 The magic number is always NAKed. It won't connect A: There is a one in over four billion chance that the two systems have chosen the same magic number. If you get a continual failure about the magic number, the chances that this is a fluke will geometrically reduce.

The two most common reasons for this failure are:

- The modem has disconnected immediately upon making the connection and logging you on to the remote. Most modems are configured to echo the data sent to them and you are seeing the local echo from the modem.
- The remote ppp software is not running when you think it is. Is the remote system configured to run PPP? Is the ppp process in the expected location? Is the privileges suitable so that you may run it? This would indicate that the shell is doing the local echo of the data.

In either case, the Linux system is sending data to the remote which is being fed immediately back into the serial receiver. This is not an acceptable condition. You have what is called a "`loop`".

8.8 `protocol reject for protocol fffb` A: This usually occurs when you are trying to connect to a Xyplex terminal server. Version 5.1 of the Xyplex terminal server software, according to Xyplex, has numerous problems with PPP. It is strongly recommended that you update the Xyplex software to at least version 5.3.

If you must use version 5.1, then use the pppd option "`vj-max-slots 3`" to limit the number of slots to three. The problem on the Xyplex server is that it will accept the request for the default 16 slots, but fail to operate beyond the third slot. It should have return a NAK frame with the limit, but it does not.

Alternately, you can disable the Van Jacobson header compression with the option "`-vj`".

8.9 The PPP software connects but just sends message after message and then finally disconnects. A: Examine the system log when you use the "`debug`" option. (You will need the system log data anyway if you are going to ask for help.) If the trace shows that it is sending the `LCP`-request frame over and over again and the id number is not incrementing then you are not exchanging frames with the remote PPP software.

Three common reasons for this are:

- You don't have the ppp software running on the other end. You are sending the PPP frames to some other program which is probably saying "What is this #$%^ ?" Please make sure that you have the ppp software started on the other end before you enter the ppp protocol sequence. Try to use a normal modem program and go through the logon sequence that you would normally do. Do you see the ppp frames being sent to you?

The ppp frames are fairly distinctive. They will be about 16 characters in length and contain several { characters. They should not have a carriage return character after them and are sent out in a burst with a pause between the bursts.

- The line is not "eight bit clean". This means that you need to have eight data bits, no parity, and one stop bit. The PPP link absolutely requires eight data bits. The pppd software will automatically put the line into eight data bits, no parity, and one stop bit. The remote must match this configuration or framing and parity errors may occur.

  PPP will escape characters. It is not possible for it to escape bits as kermit does. PPP will *not* work with a seven bit communications link.

  There is a compile option in the ppp.c driver (part of the kernel) called **CHECK_CHARACTERS** which will include additional code in the driver to provide additional checking on the input characters. It will be able to tell you if the parity was enabled or if the remote system always sent the characters as seven bits.

- The remote is configured to require authentication such as `PAP` or `CHAP`. You have not configured the local system to use this feature. Therefore, the remote is discarding all of your frames until it sees a valid authentication frame from you. Since you are not configured to generate the frames, the `IPCP` frames which you send are being ignored. In this case, either configure the remote to not expect authentication or configure the local system to do authentication and supply the proper secrets.

8.10 I can't connect to the merit network. A: Some users of the merit network have indicated that it needs PAP. Did you try PAP authentication?

9 DIP

9.1 DIP does not have support for PPP's mode A: The current version of dip-uri supports PPP in that it will execute the pppd process when you execute 'mode ppp'. However, there are many options which are needed for the proper operation of pppd. Since dip does not pass these to the program, they must be stored in the /etc/ppp/options file.

The dip program controls the establishment of the SLIP link. It controls the SLIP link with the aid of slattach, ifconfig, and route. These programs may be used to establish a SLIP link. They are not useful for the establishment of a PPP link.

The dip program may be used to dial the telephone and start the `ppp` software on the remote system. It is best used in this mode as the parameter to the '`connect`' option. However, you have the option to use dip to control the link. It is not important how pppd be executed to run the ppp link. It is only important that it be executed as it is a mandatory program for the PPP protocol.

10 Process termination

10.1 Is there a 'dip -k' for PPP? A: No. There is no 'dip -k'.

In the chat directory, there is a '`ppp-off`' script. This will stop the ppp link in the same manner as the '`dip -k`'.

I have included it below. (Cut it out. Store it in its own file. Make the file executable with chmod.)

```
#!/bin/sh
DEVICE=ppp0
#
# If the ppp0 pid file is present then the program is running. Stop it.
if [ -r /var/run/$DEVICE.pid ]; then
        kill -INT `cat /var/run/$DEVICE.pid`
#
# If the kill did not work then there is no process running for this
# pid. It may also mean that the lock file will be left. You may wish
# to delete the lock file at the same time.
        if [ ! "$?" = "0" ]; then
                rm -f /var/run/$DEVICE.pid
                echo "ERROR: Removed stale pid file"
                exit 1
        fi
#
# Success. Let pppd clean up its own junk.
        echo "PPP link to $DEVICE terminated."
        exit 0
fi
#
# The ppp process is not running for ppp0
echo "ERROR: PPP link is not active on $DEVICE"
exit 1
```

10.2 PPP does not hangup the modem when it terminates A: There are several reasons for this.

- Did you use the pppd '`modem`' parameter? This parameter controls whether or not the `pppd` process is to control and honor the signals reflecting the modem status. This parameter is explained in the man page for `pppd`.
- Do you have the modem presenting the DCD signal and honoring DTR? The Hayes sequence for this is usually "&C1". If you reset the modem during the connection sequence with "ATZ" then ensure that your modem is configured correctly. The DTR signal is generated by the computer and instructs

the modem to disconnect. Hayes sequence for this is usually "&D1" or "&D2" with "&D2" being the preferred setting for PPP. Many manufacturers will ignore the DTR condition in their 'factory defaults' setting.

- Did you use a cheap cable which does not pass the DCD signal? Macintosh 'classic' cables are notorious for this problem. That Macintosh does not use this signal.
- For dial-in connections, did you exec the pppd process properly?

  The pppd process should be 'exec'ed from the script rather than simply executed. If you attempt to simply run the pppd process then it will be the shell which will receive the SIGHUP hangup signal and not the pppd process. The 'shell' script should have a format similar to the following:

```
#!/bin/sh
exec pppd -detach modem ...
```

11 Data Transfer related issues

11.1 ftp transfers die when I do a 'put' but they work correctly if I 'get' a file. A: Do you have the flow control enabled? Flow control is set by the pppd option `crtscts` for RTS/CTS and `xonxoff` for XON/XOFF. If you don't enable the flow control then you will probably overrun the modem's buffers and this will prove to be disastrous with vj header compression.

11.2 How do I use XON/XOFF for flow control?

A: The better flow control is CTS/RTS. However, if you can not do the hardware flow control with the signals CTS and RTS, then use XON/XOFF. The following three steps need to be performed.

- You need to specify the pppd option `xonxoff`. This tells the pppd process to configure the serial device for XON/XOFF flow control and to load the two characters into the tty driver.
- You need to specify the XON and XOFF characters in the pppd parameter `asyncmap`. This tells the remote system that is should quote the XON and XOFF characters when it wishes to send them to you. It is normally specified as the pppd parameter '`asyncmap` **a0000**'.
- Of course, don't forget to tell the modem to use XON/XOFF flow control. My `ZyXEL` modem uses a sequence '&R1&H4' to do this.

11.3 Modem never seems to connect at a the high rate A: Put the desired rate as an option to the pppd process. If you don't put the rate, then pppd process will use whatever rate is set currently at the time. Not all programs will restore all of the parameters to the previous settings properly upon exit. This may lead to strange rates configured for the serial device.

11.4 The proxyarp function fails to find the hardware address. A: Use the `ppp-2.1.2b.tar.gz` package. The `pppd` process was erroneously compiled with the 1.1.8 kernel and it used `Net-3` rather than `Net-2` definitions.

Additionally, you should refer to the proxy-ARP mini-HOWTO about the requirements for using proxy-ARP.

11.5 "`ioctl(TIOCGETD): I/O error`" or "`ioctl(PPPIOCSINPSIG): I/O error`". A: Look at the boot messages when you boot the kernel. If it says "`PPP version 0.1.2`" then you have an old version of the `ppp.c` driver.

If it says "`PPP version 0.2.7`" then you have the current driver, however, it was not built with the same set of defines for the ioctl numbers. Ensure that you have only one file called "`ppp.h`". It should be located in the kernel's `include/linux` directory. Once you have done this, rebuild the kernel and the pppd process.

12 Routing and other problems

12.1 My route to the remote keeps disappearing! A: This is not a question for PPP.

Hint: **DON'T RUN `routed`!**

12.2 I can only reach the remote server. A: Did you forget the '`defaultroute`' parameter to pppd? This parameter adds a default route into your routing system so that frames to all other IP addresses will be sent to the PPP device.

The PPP software will not replace the default route if you have one already set when you run pppd. This is done to prevent people from destroying their default route to the ethernet routers by accident. A warning message is written to the system log if the defaultroute parameter is not performed for this reason.

12.3 I have defaultroute can only reach the remote server. A: The problem then is not with the local Linux system. It most likely is routing problem on the remote end.

The remote system is not configured for '`IP forwarding`'. It is an RFC requirement that this option **NOT** be enabled by default. You must enable the option. For Linux systems, you will need to build the kernel and specify that you want IP forwarding/gatewaying.

The remote computers need a route back to you just as you need a route to them. This may be accomplished by one of four methods. Each has advantages and limitations. You need to do one and only one of these.

- Use a host route. At each host on the remote system, add a host route to your Linux IP address with the gateway being the terminal server that you use for your local access. This will work if you have a small number of host systems and a simple network without bridges, routers, gateways, etc.
- Use a network route. Subdivide the remote IP addresses so that your local Linux IP address and the remote terminal server address and the remote terminal server's ethernet address is on the same IP domain. This will work if you have the IP addresses to spare. It will work very well if you have a Class-B IP domain and can afford to put the all of the remote addresses on the same IP domain. Then add a network route on each of the gateways and routers so that any address of the remote network is sent to the terminal server. Most configurations have many hosts but few routers. (At `sii.com`, we have over 300 active host systems with only 3 routers.)
- Use `gated` on all of the gateways and on the terminal server. This will cause the terminal server to broadcast to the gateways that it can accept the frames for your IP address. Since the hosts will have a default route to one of the gateways, the gateways will generate the ICMP re-direct frame and the specific host will automatically add its host route.
- Use proxy ARP on the terminal server. This will only work if your remote IP address is in the same IP domain as one of the domains for the network cards.

There is no clear solution. You must choose one of these.

12.4 I can not ping my local IP address A: You are not able to do this because you don't have a route to the address. This is the normal operating environment. Don't try to ping the local IP address.

If you wish to ping your own system then use the loopback address of 127.0.0.1.

You may be able to ping the remote address. However, some terminal servers may not allow this as the address may be 'phony' to them. It depends upon their environment.

In general, don't try to ping either address. Choose a third address which is well known to be available on the remote network such as the name server IP address.

13 Interactions with other PPP implementations

13.1 Trumpet (for MSDOS) and the connection simply terminates. A: Trumpet does not like any VJ header compression. Use the pppd option "-vj" to turn it off.

13.2 I am using dp-3.1.2 and can't do anything but ping and nslookup. A: There is a bug in the 3.1.2 version of dp. Please get the 3.1.2a or later file from the dp ftp home site harbor.ecn.purdue.ecu. Until you can put the patch into dp, disable the vj header compression.

13.3 I can not connect to/with my Windows NT code (a.k.a. 'Daytona') A: Microsoft has chosen to support a non-standard authentication protocol with Windows NT. That is their right to do so provided that they have registered the protocol number with the IANA. (They have.) If the 'accept only Microsoft encrypted authentication' check box is set in the phone book entry, the connection will not complete. This setting mandates that the Daytona system only exchange PPP authentication with another Microsoft PPP implementation.

Linux does not support this authentication protocol.

If you have the option of changing the settings on the Daytona system then go to the Daytona Phone Book settings, advanced, security settings and choose either 'Accept any authentication including clear text' to allow execution without authentication, or 'Use clear text terminal login only' for PAP authentication, or 'Accept only encrypted authentication' to allow CHAP authentication.

The Microsoft authentication sequence is a PAP style authentication with their encryption algorithm for the passwords. Normal PAP sends the passwords in clear text. This would violate their C2 security goals.

14 Other messages written to the system log

14.1 `Alarm` A: This is not a problem. It means that a timer has expired and timers are a necessary part of the protocol establishment phase.

14.2 `Unknown protocol (c025) received!.` A: The remote wishes to exchange Link Quality Reporting protocol with the Linux system. This protocol is presently not supported. This is not an error. It is merely saying that it has received the request and will tell the remote that "I can't do this now. Don't bother me with this!"

The Morning Star PPP package will always try to do LQR protocol. This is normal.

14.3 The connection fails with an `ioctl(TIOCSCTTY)` error. A: Use the `ppp-2.1.2b.tar.gz` package. This was a bug which was not caught before the 'a' package was released.

14.4 "`ioctl(PPPIOCGDEBUG): I/O error`", "`ioctl(TIOCSETD): I/O error`" and "`ioctl(TIOCNXCL): I/O error`" A: The remote system has disconnected the telephone. The tty drivers will re-establish the proper tty discipline and these errors are the result of the `pppd` process trying to do the same thing. These are to be expected.

14.5 My `ifconfig` has strange output for PPP. Usually the ifconfig program reports information similar to the following:

```
ppp0      Link encap UNSPEC  HWaddr 00-00-00-00-00-00-00 ...
          inet addr 192.76.32.2  P-t-P 129.67.1.65  Mask 255.255.255.0
          UP POINTOPOINT RUNNING  MTU 1500  Metric 1
```

A: The information is for display purposes only. If you are using a recent 1.1 kernel then update the nettools package with the current one on `sunacm.swan.ac.uk` in the directory `/pub/Linux/networking/nettools`.

14.6 The file `/proc/net/dev` seems to be empty

A: Did you just issue the command "`ls -l /proc/net`" and are wondering why the size is zero? If so, this is normal. Instead, issue the command:

```
cat /proc/net/dev
```

You should not find the file empty. The size is always shown as zero, but that is the 'proc' file system. Don't believe the size. Do the command.

15 Network routing issues (using PPP as a 'cheap' bridge)

15.1 `Slattach` and `ifconfig` don't work as they do with SLIP A: Do not use `slattach` and `ifconfig` with PPP. These are used for SLIP. The `pppd` process does these functions at the appropriate time. These must occur after the `LCP` and `IPCP` protocols have been exchanged.

You can not replace `pppd` with `slattach` and `ifconfig`. Most of the protocol support for PPP is in the `pppd` process. Only the IP (and `IPX` when it is completed) processing is in the kernel.

The host route to the remote system will be automatically added by pppd. There is no option to NOT add the route. The pppd process will terminate if the route could not be added.

The default route may or may not be added. This is controlled by the option '`defaultroute`'. If you have a default route, it will not be changed.

If you must do routing for an entire network, then put the route command into the `/etc/ppp/ip-up` script. The parameters to the script are:

```
$0 - name of the script (/etc/ppp/ip-up or /etc/ppp/ip-down)
$1 - name of the network device (such as ppp0)
$2 - name of the tty device (such as /dev/cua0)
$3 - speed of the tty device in Bits Per Second (such as 38400)
$4 - the local IP address in dotted decimal notation
$5 - the remote IP address in dotted decimal notation
```

15.2 I want the route to the network and not the route to the host. A: On `sunsite` there is a package called `devinfo.tar.gz`. It contains some useful little programs which will extract the data from the device and to do various things with the dotted IP addresses.

The documentation is in the man pages in the file.

For example, if you want to route the entire IP domain to the remote, the following may be used in `/etc/ppp/ip-up`.

Of course, if the values are not variable, then simply use the appropriate entry in the route command.

```
# Obtain the netmask for the ppp0 (or whatever) device
NETMASK = `devinfo -d $1 -t mask`

# Obtain the IP domain (without the host address by removing the extra bits)
DOMAIN = `netmath -a $5 $NETMASK`

# Do the network route now that the IP domain is known
route -net add $DOMAIN gw $5
```

16 Other features and protocols

16.1 What about support for 'demand dial' A: Use the diald package. This is on sunsite in the same directory as the ppp source, /pub/Linux/system/Network/serial.

16.2 What about 'filtering' A: There are no plans to put filtering into the PPP code. Run the ipfirewall code. It is on sunsite. Help the author debug that code. It will do the filtering that you want in a general solution.

The latest development kernels will include the patches to support filtering. (You will still need the ipfirewall code as the kernel only contains the patches which were in the ipfirewall code for the kernel.) Again, filtering is a network issue and not one specifically for PPP.

16.3 How about IPX? A: The addition of support for IPX is fairly straight forward. Work is underway to include the IPX protocol.

16.4 How about NETBIOS? A: There is a netbios PPP protocol. However, your better solution would be to use TCP/IP and the 'samba' code.

Microsoft and others have used Netbios PPP protocol. This is usually a proprietary mixture and one vendor is not guaranteed to work with another.

I'll leave the Netbios protocols for someone else. If a Microsoft employee wishes to donate to the public domain the specifications and the time to implement their Netbios over PPP, send the diffs to me. I'll make sure that they are put into the released product.

17 Extraneous

17.1 Do you have a PPP compatible mail reader? A: Huh? You have the wrong group if you want MSDOS. PPP has nothing to do with the mail user agent. All of the mail agents are compatible with PPP.

17.2 How about a news reader? A: See above.