magplip

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Contents

Chapter 1

magplip

1.1 magPLIP

                    magPLIP – SANA II device driver parallel IP – Written by Marius ←
                        Gröger.

   This software requires AmigaOS 2.0 (V37) or higher.

        Intro

                    Description
                    Why You need it!

                    Features
                    All in one glance

                    Requirements
                    What you need

        Getting started

                    Installation
                    What's needed to be done

                    Wiring
                    The hardware side

        Options

                    Configuration
                    Options offered by the configuration file

        Problems, Questions and Caveats

                    Caveats
                    Caution!

1.2   magPLIP - Description

Description

What is PLIP ?

PLIP means Parallel Line IP, and means to run an IP network over the
parallel port of a computer. However, IP is only the most popular sort
of network which PLIP may be used for. In fact, as all other SANA II
devices it is not bound to a particular protocol stack, and it is quite
imaginable to run an Internet protocol and, for instance, an Appletalk
protocol over the same line.

To avoid confusion with other PLIP releases which can be found on Aminet
I named my version magPLIP, referring to the initials of my name.

1994 saw the last release of the original Amiga PLIP device, which was
written by Oliver Wagner and Michael Balzer. I was not fully satisfied
with this last release, and so I was happy to have the source code and
started rewriting it. The deeper I creeped into the source, the more of
the original code was thrown out. However, magPLIP is compatible to the
original regarding the configuration and the cable wiring. It is not
compatible in the sense that it can communicate with machines that have
the old plip installed.

The original documentation of the plip.device published by Oliver Wagner
and Michael Balzer reads:

    "PLIP is a network device driver conforming to the SANA2 standard.
    It allows linking of two Amigas using their parallel ports. [...]
    The complete low level transfer protocol is integrated in the device
    driver, including port arbitration handshaking and interrupt driven
    reads. Although the transfer process itself is cpu intensive, the
    device needs no cpu resources when no transfer is in progress.

    PLIP is intended as a low-cost networking solution, since the

capabilities of the parallel hardware are somewhat limited. However,
it gives much better results than SLIP and leaves the serial port
free."

This gives a quick impression what PLIP and magPLIP are intended for.

Support for slow Amigas

My version of PLIP has been written also with a special eye on the
employment of slow, MC68000 based Amigas. (I believe I'm not the only
person who wants to blow again a bit of life in his old computer.) It
seems to me that the other PLIP releases had some difficulties in this
field, mainly arising out of badly chosen priorities.

Starting with release 37.2, the low-level transfer routines are written
in assembly language. This gains another 25% speed improvement. The
conversion to assembly was done by Jan Kratochvil and Martin Mares.

1.3   magPLIP - Feaures

Features

· Compatible with original wiring

·~Works fine also with 68000 based systems

· Slightly changed protocol, allowing to be more flexible and extensible

· Option to ommit CRC checks

· Much better configurable then the original

· Major code cleanup, including the removal of assembler fragments,
  globals, errors

· Several protocol stacks may use magPLIP simultaneously

·~Distributed as Freeware, complete source code is supplied

1.4   magPLIP - Requirements

Requirements

· AmigaOS Release 2.04 or better

·~A networking package such as AmiTCP/IP, Envoy, AS225R2

·~2 Amiga computers to be connected via magPLIP

1.5   magPLIP - Installer Script

```
    Actions taken by the Installer-script

    Copy the device code to the proper place:

        AmigaShell> copy DEVS/Networks/magplip.device AMITCP:DEVS/Networks/

    Then copy the configuration file to it's places:

        AmigaShell> copy ENV/Sana2/magPLIP.config ENVARC:Sana2/
        AmigaShell> copy ENV/Sana2/magPLIP.config ENV:Sana2/

    Finally, you may want to copy the documentation somewhere. Simply drag
    it's icon where you want to.
```

1.6 magPLIP - Installation

```
                    Installation

    Installing network drivers is really no fun, as you might already know.

    Rather than writing an installer script with artifical intelligence I
    decided to split the installation procedure into the installation of the
    binaries and a manual part.

    The first part is best done by the supplied installer script. If you
    still want to do the installation manually then follow the steps
    described
                    herein
                    .

    The second part must be done by hand. As I guess the only hands around
    currently are yours, follow these steps:

    I explain here what to do if you want integrate magPLIP in an AmiTCP/IP
    Release 4 based network. Other network packages and older AmiTCP/IP
    releases will require similar actions to be done. Please consult the
    according user manual to find out what you should do in such cases.

    On both systems you want to connect, load the file AMITCP:db/interfaces
    into you favorite text editor. Add the following lines:

        magplip0 DEV=AMITCP:DEVS/Networks/magplip.device UNIT=0 P2P NOARP ...
                                            WRITEREQ=32 IPREQ=32
        magplip1 DEV=AMITCP:DEVS/Networks/magplip.device UNIT=1 P2P NOARP ...
                                            WRITEREQ=32 IPREQ=32

    Don't type in the ellipsis, instead concatenate the lines to one.

    This tells AmiTCP/IP that there are two PLIP devices, only one of which
    you will actually use, however.

    To tell AmiTCP/IP which interface you want to use, load the file
    AMITCP:bin/startnet into you favorite text editor. Search the
    line where the default value for the parameter "IFACE" is set. It should
```

```
look like this:

    .def IFACE slip0

On one of your systems, change this line into

    .def IFACE magplip0

On the other system, change this line into

    .def IFACE magplip1
```

It is of absolutely no matter which one you assign which magplip unit.
The only really important thing is that you must use both units, if you
use the standard PLIP
                wiring
                as introduced by the orignal
authors, and which I recommend for compatibility reasons and safety.

It is possible that PLIP doesn't immediately work correctly ith your
system configuration. If this is the case, please read the

                Configuration
                section. There you will find a lot of items you may
use to adapt PLIP to your system.

1.7   magPLIP - Wiring

Wiring

In order to establish the physical connection between your Amigas, you
will have to create a special wire. Do this very carefully, as a little
fault may destroy your parallel port hardware.

On all Amiga models except the Amiga 1000 you need a male DB25
connector.

On an Amiga 1000 you need a female connector.

The cable length should not exceed 4 meters.

```
    System 1        System 2
    ---------------------------
    D0-D7           D0-D7
    BUSY            BUSY
    POUT            POUT
    GND             GND
    ACK             STROBE
    STROBE          ACK
```

 You can look up the pin assignment in your Amiga User Manual, Appendix A.
 Please note that this cable differs from ParNet! Double check before
 using!

You may also cross the BUSY and POUT lines, in this case you must use
the same magPLIP unit on both sides. However I don't recommend this. As
the codes must stay compatible to older PLIPs anyway you would gain
nothing by this except an identical software setup.

1.8   magPLIP - Configuration

Configuration of magPLIP

After being started, magPLIP reads it's configuration file located in
ENV:Sana2/magPLIP.config. This file should consist of a single line on
which the following standard AmigaDOS template is applied:

```
    TIMEOUT/K/N,PRIORITY=PRI/K/N,MTU/K/N,BPS/K/N,RETRIES/K/N,
        SENDCRC/S,CD=COLLISIONDELAY/K/N,AD=ARBITRATIONDELAY/K/N
```

TIMEOUT (optional keyword argument / number)
   PLIP polls the parallel port when transmitting each byte. A counter
   is decremented and when it becomes zero, this situation is considered
   as a time-out. As this behaviour is completely system dependent,
   multi-tasking offending and generally very nasty, you may waste a lot
   of time when tracking down network bugs and playing with this
   parameter. (Don't scream, send me a diff). A fast machine connected to
   a slower one will probably require a higher than the default value for
   this Parameter.
   Defaults to 300000.
   Maximum is 2^32-1.

PRI=PRIORITY (optional keyword argument / number)
   Priority of the PLIP server task. A high value will decrease response
   times for communication. On 68000 based systems this should be a
   higher value than 20, otherwise some intuition actions such as window
   movement could make the driver miss packets.
   Defaults to 0.
   Maximum is 127.

MTU (optional keyword argument / number)
   Max-Transfer Unit. Must be the same for boths ends! This value is the
   largest packet which may be transmitted.
   Defaults to 1024.
   Maximum is 8192.

BPS (optional keyword argument / number)
   A dummy Bit-Per-Second value reported to SANA-2 user when being asked
   for it.
   Defaults to 100000.
   Maximum is 2^32-1.

RETRIES (optional keyword argument / number)
   Number of repetitions when a arbitration error is detected.
   Defaults to 63.
   Maximum is 127.

SENDCRC (Switch)
   If you want to send the packets over the line with a CRC checksum,

you should set this flag on the side which's packets you want to
check. This may be only one both sides. I personally don't use the
CRC feature, as all the problems I got so far came due to timeouts,
if at all. Don't sending with CRC brings a little speed improvement.

CD=COLLISIONDELAY (optional keyword argument / number)
    If accidently both sides want start sending at the same time, this
    situation is considered as a collision. In such cases, both sides
    stop their attempts to obtain the line. Instead, they will wait a
    specific time and try again. This parameter lets the user tell the
    device how long this time should be, measured in micro-seconds. If
    you experience line errors, you may play a bit with this parameter
    in order to fix them.
    Defaults to 300000 $\mathrm{\mu}$s for unit 0, 450000 $\mathrm{\mu}$s for ←
        unit 1.
    Maximum is 999999 $\mathrm{\mu}$s.

AD=ARBITRATIONDELAY/K/N (optional keyword argument / number)
    The procedure of arbitration looks (simplified) like this:

        Does the other side request the line ?
          Yes: Stop arbitration.
        Else
          No: Signal our request
          Wait ARBITRATIONDELAYTIME micro seconds.
          Does the other side still not request the line ?
            Yes: we have the line.
          Else
            No: Reset our request line.
            No: Stop arbitration.

    In fact the arbitration leaves a small door for undetected, real
    collisision, as the request lines are used for handshake during the
    transmission process. The "No: Reset our request line." statement
    could be misinterpreted by the other side as the first handshake. Up
    to now I couldn't conceive a satisfying solution for this, so I
    introduced the ARBITRATIONDELAYTIME as an (hopefully) intermediate
    way to reduce the possibility of errors. If you experience line errors,
    you may play a bit with this parameter in order to fix them.
    Defaults to 500 $\mathrm{\mu}$s.
    Maximum is 999999 $\mathrm{\mu}$s.

1.9 magPLIP - Caveats

                Caveats

This section tries to address some known problems.

I will always try to give the user the necessary technical background to
understand the problem and, if possible, to include a work-around.

If any user has found a similar problem which is not mentioned in this
document, he or she should contact
              me
              in order to append it to this

section.

magPLIP and intuition

On slow, 68000 based systems the magPLIP server should run at a
higher priority than the input task. This way you loose a bit
intuition speed during transfers, but you don't get line errors when
just moving a window.

1.10   magPLIP - Troubleshooting

                    Troubleshooting

"The bloody thing doesn't work at all!"

     -> Check your
               wiring
                    .
     -> Did you use both units, magplip0 and magplip1 ?
     -> Did you update both systems ?

     See also :
                Installation

                Usage
                 "I get heavy line errors when dragging windows or screens!"

     See
             caveats
                .

"I get heavy line errors all the time!"

     There are a lot parameters which influence transmission timing.
     You find an explanation of the in the
                configuration
                section.

     Especially the TIMEOUT value's setting is likely to be the key to
     your problem.

     If you use the AmiTCP/IP package, you should use the ping command to
     track down the error:

        AmigaShell> ping [host]
     or
        AmigaShell> ping -f [host]

     The -f option means "flood" and generates as much packets as
     possible. Invoked simultaneously on both sides reveals almost any
     error.

1.11   magPLIP - Known Bugs

```
                Known Bugs

·~The arbitration is currently not as secure as it should be. If there
  is anyone interested in things like this, he/she is invited to
  get in touch with
                me
                in order to work it out.


If you know further bugs, contact
                me
                .
```

1.12   magPLIP - Future plans

```
                Future plans

Perhaps I will implement some more features:

· Complete interrupt driven transfer
    Probably this slows down the thing...

· Timeout controlled by timer.device
    What do you think?

· Online configuration tool
    What's up, you GUI/Ys out there?
    Nobody volounteering for this task?

If you have any suggestions, contact
               me
                .
```

1.13   magPLIP - History

```
Development history of magPLIP

Release 37.2

  ·~Performance has been significantly improved due to the transfer routines
    being rewritten in assembly language

  · internal code cleanups

Release 37.1

  ·~initial release

Technical history of magPLIP
```

For more technical details, please refer to the source code. In the
header section of each source file, you find the pseudo-keyword
$HISTORY: after which follows the complete revision history of this
file.

1.14   magPLIP - Copyright / Credits / Legal stuff / Contacting

Copyright and author information

magPLIP is

(C) Copyright 1993-1994 Oliver Wagner, Michael Balzer
(C) Copyright 1995 Jan Kratochvil & Martin Mares
(C) Copyright 1995 Marius Gröger
    All Rights Reserved.

Credits

Oliver Wagner and Michael Balzer have written the original PLIP device,
introducing it to the Amiga. At this point my thanks go to these guys
particularly for that they supplied the Amiga community with the source
code, too. Even though the current source magPLIP has nearly nothing in
common with the original, magPLIP would hardly exist without having been
able to peek at the original.

I also want to thank Jan Kratochvil and Martin Mares. They wrote the
low-level transfer routines from scratch in assembly language. This way
they could shorten magPLIP's round trip times by 25%.

Again, I ask everyone who has suggestions to magPLIP's implementation or
even modified versions of magPLIP to tell me, so that I can incorporate
them into the distribution.

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fileareas.

Contact

If you like this software, or have any suggestion how to improve it, or
just want to complain about it, feel free to contact me:

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