

```

CompareIO.c - Execute me to compile me with Lattice 5.10b
-cfstgq -v -y -j73 CompareIO.c
FROM LIB:c.o,CompareIO.o TO CompareIO LIBRARY
LIB:Amiga.lib,lib:debug.lib
/

CompareIO.c uses packet level I/O to copy the standard input channel to the */
standard output channel (as set up by the standard startup code, c.o). */
CompareIO uses both synchronous and asynchronous I/O to perform the copy */
reports the time it takes to do each. */

#include <exec/types.h>
#include <dos/dosextens.h>
#include <devices/timer.h>

#include <clib/dos_protos.h>
#include <clib/timer_protos.h>
#include <clib/exec_protos.h>
#include <clib/alib_protos.h>
#include <clib/alib_stdio_protos.h>

LATTICE
/* Disable Lattice CTRL/C handling */
#pragma abort(void) { return(0); }
#pragma abort(void) { return; }

#define BUFSIZE 8192

char *vers = "\0$VER: CompareIO 37.14 Nov-12-92";

void AsyncLoop(void);
void AsyncLoop(void);

struct Library *DOSBase;
Library *TimerBase;

MsgPort *myport;

FileHandle *in, *out;
int results, in_start, out_start;

DosPacket *sp_read, *sp_write;

char buffer[BUFSIZE*2];

timeval time_start, time_finish;
timerequest timer_io;

char *fprintfargs[2]; /* An array of pointers */

int main(void)
{
    DOSBase->lib_Version >= 37)

    (results = Open("", MODE_NEWFILE)) /* This is for printing the results. */
    /* Since the example is already using the */
    /* standard I/O channels for its own */
    /* purposes, there needs to be a separate */
    /* channel to output the results. */
    if (!OpenDevice(TIMERNAME, UNIT_MICROHZ, &timer_io, 0L))

    TimerBase = (struct Library *)timer_io.tr_node.io_Device;

    if (myport = CreateMsgPort())
    {
        in_start = Input(); /* Need to hold on to input and output so no one can */
        out_start = Output(); /* change them while this example is using them. */
        if (in = (struct FileHandle *)BADDR(in_start))
        {
            if (out = (struct FileHandle *)BADDR(out_start))
            {
                if (sp_read = AllocDosObject(DOS_STDPKT, NULL))
                {
                    if (sp_write = AllocDosObject(DOS_STDPKT, NULL))
                    {
                        /* When AllocDosObject() allocates a StandardPacket, it takes */

```

```

/* care of linking together the Message and DosPacket.
/* AllocDosObject() points the DosPacket's dp_Link field a
/* the StandardPacket's Message structure. It also point
/* the Message's mn_Node.ln_Name field at the DosPacket:
    sp_read->dp_Link = sp_Msg;
    sp_Msg->mn_Node.ln_Name = (STRPTR)sp_r

sp_read->dp_Type = ACTION_READ; /* Fill out ACTION_READ pack
sp_read->dp_Arg1 = in->fh_Arg1;

sp_write->dp_Type = ACTION_WRITE; /* Fill out ACTION_WRITE pac
sp_write->dp_Arg1 = out->fh_Arg1;

VFPrintf(results, "\n      Method      Seconds      Micros\n", NULL);
VFPrintf(results, "      -----      -----      -----\n", NULL);

GetSysTime(&time_start);
if (AsyncLoop())
{
    GetSysTime(&time_finish);
    SubTime(&time_finish, &time_start);
    vfprintfargs[0] = time_finish.tv_secs;
    vfprintfargs[1] = time_finish.tv_micro;
    VFPrintf(results,
        "      Asynchronous:   %3ld      %7ld\n", &vfprintfargs[0], &vfprintfargs[1]);
}

GetSysTime(&time_start);
if (SyncLoop())
{
    GetSysTime(&time_finish);
    SubTime(&time_finish, &time_start);
    vfprintfargs[0] = time_finish.tv_secs;
    vfprintfargs[1] = time_finish.tv_micro;
    VFPrintf(results,
        "      Synchronous:     %3ld      %7ld\n", &vfprintfargs[0], &vfprintfargs[1]);
}
else
    VFPrintf(results, "      ***** Stop *****\n", NULL);
}
else
    VFPrintf(results, "      ***** Stop *****\n", NULL);

FreeDosObject(DOS_STDPKT, sp_write);
FreeDosObject(DOS_STDPKT, sp_read);
}
}
}
DeleteMsgPort(myport);
CloseLibrary(TimerBase);
Close(results);
}
}
}

ULONG AsyncLoop()
{
    struct StandardPacket *mysp;
    UBYTE *buf;

    LONG amount_read;

    BOOL sp_read_busy = TRUE, /* Is the ACTION_READ packet busy */
        sp_write_busy = FALSE, /* Is the ACTION_WRITE packet busy */
        done = FALSE; /* Is the program finished? */
    ULONG ok = TRUE;

    if (!((out->fh_Arg1) && (in->fh_Arg1))) /* Don't bother if in or out uses N
        return(FALSE);
    sp_read->dp_Arg2 = (LONG)buffer; /* The buffer to fill in. */
    sp_read->dp_Arg3 = BUFSIZE; /* The size of the Arg2 buffer. */

    SendPkt(sp_read, in->fh_Type, myport); /* Send initial read request. */

```

```

sp_write->dp_Type = ACTION_WRITE; /* Fill out the ACTION_WRITE packet. */
sp_write->dp_Arg1 = out->fh_Arg1;
sp_write->dp_Arg2 = (LONG)&buffer[BUFSIZE]; /* Arg2 points to the buffer to write */
sp_write->dp_Arg3 = 0L; /* out. At first glance, it might */
sp_write->dp_Res1 = 0L; /* seem odd to bother setting Arg2 */

/* when the program hasn't read anything yet. */
/* This is to set up for the main loop. The */
/* main loop swaps the ACTION_READ buffer with */
/* the ACTION_WRITE buffer when it receives */
/* a completed read. Likewise, dp_Arg3 and */
/* dp_Res1 are set to make the ACTION_READ */
/* look like it has a valid return value so */
/* main loop won't fail the first time through */
/* the loop. */

/* main() has already taken care of sending the initial read to the */
/* handler. Because we need the data from that read before we can */
while (!done) /* do anything, the first thing to do is wait for its return. */
{
    do /* Wait for the ACTION_READ to return. */
    {
        WaitPort(myport);
        while (mysp = (struct StandardPacket *)GetMsg(myport)) /* ...empty the port. */
        {
            /* If this message is the ACTION_READ packet, mark it as */
            /* no longer busy so we can use it to start another read. */
            if (mysp->sp_Pkt.dp_Type == ACTION_READ) sp_read_busy = FALSE;

            /* If this message is instead the ACTION_WRITE packet, */
            /* mark it as not busy. We need to check for this because */
            /* the WRITE_PACKET from the previous iteration through */
            /* the loop might have come back before the ACTION_WRITE */
            /* from the previous iteration. */
            else if (mysp->sp_Pkt.dp_Type == ACTION_WRITE) sp_write_busy = FALSE;
        } while (sp_read_busy); /* End of "wait for ACTION_READ" loop. */

        /* Get ready to send the next ACTION_READ. */
        buf = (UBYTE *) (sp_read->dp_Arg2); /* Hold on to the important stuff from the */
        amount_read = sp_read->dp_Res1; /* ACTION_READ we just got back so we can */
        /* reuse the packet to start a new read */
        /* while processing the last read's data. */

        while (sp_write_busy) /* Because this example only uses two buffers and */
        { /* the ACTION_WRITE might be using one of them, */
            /* this example has to wait for an outstanding */
            /* ACTION_WRITE to return before reusing the */
            /* ACTION_WRITE packet's buffer. */

            WaitPort(myport);
            while (mysp = (struct StandardPacket *)GetMsg(myport))
            {
                if (mysp->sp_Pkt.dp_Type == ACTION_WRITE) sp_write_busy = FALSE;
            }

            if (SetSignal(0L, SIGBREAKF_CTRL_C) & SIGBREAKF_CTRL_C)
            {
                done = TRUE;
                ok = FALSE;
            }
            else
            {
                /* This tests the return values from the ACTION_READ and ACTION_WRITE */
                /* packets. The ACTION_READ packet returns the number of bytes it */
                /* read in dp_Res1, which was copied earlier into amount_read. If it */
                /* is 0, the read packet found the EOF. If it is negative, there was */
                /* an error. In the case of ACTION_WRITE, an error occurs if the */
                /* number of bytes that ACTION_WRITE was supposed to write (Arg3) */
                /* does not match the actual number it wrote, which ACTION_WRITE re- */
                /* turns in Res1. This test is the reason dp_Res1 and dp_Arg3 were */
                /* set to zero when the ACTION_WRITE packet was set up in main(). */
                if ((amount_read > 0) && (sp_write->dp_Res1 == sp_write->dp_Arg3))
                {
                    sp_read->dp_Arg2 = sp_write->dp_Arg2; /* ACTION_WRITE is finished with its */
                    /* buffer, use it in the next read. */

                    SendPkt(sp_read, in->fh_Type, myport); /* Send the next ACTION_READ and mark */
                    sp_read_busy = TRUE; /* the ACTION_READ as busy. */
                }
            }
        }
    }
}

```

```

/* Process Buffer. This example does */
/* last ACTION_READ, it just passes */

sp_write->dp_Arg2 = (LONG)buf;
sp_write->dp_Arg3 = amount_read;
SendPkt(sp_write, out->fh_Type, myport);
sp_write_busy = TRUE;
}
else /* A */
{
    done = TRUE;
    if ((amount_read < 0) || (sp_write->dp_Res1 != sp_write->dp_Arg3))
    {
        return(ok);
    }
}

ULONG SyncLoop()
{
    BOOL done = FALSE;
    ULONG ok = TRUE;
    BPTR lock;

    if (!((out->fh_Arg1) && (in->fh_Arg1)))
        return(FALSE);

    sp_read->dp_Arg2 = (LONG)buffer;
    sp_read->dp_Arg3 = BUFSIZE*2;
    sp_write->dp_Arg2 = (LONG)buffer;

    if (lock = DupLockFromFH(in_start))
    {
        UnLock(lock);
        Seek(in_start, 0, OFFSET_BEGINNING);
    }

    while (!done)
    {
        if (SetSignal(0L, SIGBREAKF_CTRL_C) & SIGBREAKF_CTRL_C)
        {
            done = TRUE;
            ok = FALSE;
        }
        else
        {
            SendPkt(sp_read, in->fh_Type, myport);
            WaitPort(myport);
            while (GetMsg(myport));
            if (sp_read->dp_Res1 > 0)
            {
                sp_write->dp_Arg3 = sp_read->dp_Res1;
                SendPkt(sp_write, out->fh_Type, myport);
                WaitPort(myport);
                while (GetMsg(myport));
                if (sp_write->dp_Res1 != sp_write->dp_Arg3)
                {
                    done = TRUE;
                    ok = FALSE;
                }
            }
            else
            {
                done = TRUE;
                if (sp_read->dp_Res1 < 0) ok = FALSE;
            }
        }
    }
    return(ok);
}

/* InOutCTRL-C.c - Execute me to compile me */
LC -b0 -cfistq -v -y -j73 InOutCTRL-C.c
Blink FROM LIB:c.o,InOutCTRL-C.o TO InOutCTRL-C.o
LIB:LC.lib,LIB:Amiga.lib,lib:debug.lib

```

Amiga Mail

```
/* This example doesn't do anything with the data from the */
/* AD, it just passes it on to the STDOUT handler. */

/* Set up the ACTION_WRITE packet. */
dp_Type = (LONG)buf;
dp_Arg1 = amount_read;
dp_Arg2 = out->fh_Type, myport); /* Send the next ACTION_WRITE and */
dp_Arg3 = TRUE; /* mark the ACTION_WRITE as busy. */

/* A packet returned with a failure, so quit. */
if (dp_Res1 != sp_write->dp_Arg3) ok = FALSE;

/* Don't bother if in or out uses NIL: */
if (in->fh_Arg1)

/* Make sure this is a filesystem and not */
/* a console. If this is a filesystem, */
/* go to the beginning of the file. */
if (SET_BEGINNING)

/* Make sure this is a filesystem and not */
/* a console. If this is a filesystem, */
/* go to the beginning of the file. */
if (SIGBREAKF_CTRL_C) & SIGBREAKF_CTRL_C)

/* Fill out the packet */
sp_read->dp_Type = ACTION_READ;
sp_read->dp_Arg1 = in->fh_Arg1;
sp_read->dp_Arg2 = (LONG)buf1;
sp_read->dp_Arg3 = BUFSIZE;

/* When AllocDosObject() allocates a StandardPacket, it takes */
/* care of linking together the Message structure. AllocDosObject() */
/* points the DosPacket's mn_Node.ln_Name field at the Message's */
/* mn_Node.ln_Name field. At first, sp_read->dp_Link = sp_read->mn_Node.ln_Name */
/* sp_Msg->mn_Node.ln_Name */

if (!((out->fh_Arg1) && (in->fh_Arg1)))
return;

SendPkt(sp_read, in->fh_Type, myport); /* Send the packet */

/* Fill out the packet */
sp_write->dp_Type = ACTION_WRITE;
sp_write->dp_Arg1 = out->fh_Arg1;
sp_write->dp_Arg2 = (LONG)buf2; /* Arg2 points to the buffer */
sp_write->dp_Arg3 = 0L; /* out. At first, sp_write->dp_Res1 = 0L; */
/* seem odd to k
```

AmigaDOS

Packet Level I/O under Release 2

Page II - 105

```
quit ;*/

/* InOutCTRL-C.c uses packets to copy the standard input channel */
/* standard output channel using asynchronous I/O. This example */
/* job checking for a user break than the accompanying example. */

#include <exec/types.h>
#include <dos/dosextens.h>

#include <clib/dos_protos.h>
#include <clib/exec_protos.h>
#include <clib/alib_protos.h>
#include <clib/alib_stdio_protos.h>

#ifdef LATTICE
int CXBRK(void) { return(0); } /* Disable Lattice */
void chkabort(void) { return; }
#endif

#define BUFSIZE 8192

UBYTE *vers = "\0$VER: InOutCTRL-C 37.9 Nov-12-92";

void MainLoop(void);

extern struct Library *DOSBase;

struct MsgPort *myport;
ULONG portsignal, signals, sigmask;

struct FileHandle *in, *out;
struct DosPacket *sp_read, *sp_write;

UBYTE buf1[BUFSIZE], buf2[BUFSIZE];

void main(void)
{
    if (DOSBase->lib_Version >= 37)
    {
        if (myport = CreateMsgPort())
        {
            if (in = (struct FileHandle *)BADDR(Input())) /* M */
            {
                if (out = (struct FileHandle *)BADDR(Output())) /* S */
                {
                    if (sp_read = AllocDosObject(DOS_STDPKT, NULL)) /* R */
                    {
                        if (sp_write = AllocDosObject(DOS_STDPKT, NULL)) /* W */
                        {
                            sp_read->dp_Type = ACTION_READ; /* Fill out the packet */
                            sp_read->dp_Arg1 = in->fh_Arg1;
                            sp_read->dp_Arg2 = (LONG)buf1; /* The buffer */
                            sp_read->dp_Arg3 = BUFSIZE; /* The size of the buffer */

                            /* When AllocDosObject() allocates a StandardPacket, it takes */
                            /* care of linking together the Message structure. AllocDosObject() */
                            /* points the DosPacket's mn_Node.ln_Name field at the Message's */
                            /* mn_Node.ln_Name field. At first, sp_read->dp_Link = sp_read->mn_Node.ln_Name */
                            /* sp_Msg->mn_Node.ln_Name */

                            if (!((out->fh_Arg1) && (in->fh_Arg1))) /* Do */
                                return; /* */

                            SendPkt(sp_read, in->fh_Type, myport); /* Send the packet */

                            portsignal = 1L<<myport->mp_SigBit; /* R */
                            sigmask = SIGBREAKF_CTRL_C | portsignal; /* W */

                            sp_write->dp_Type = ACTION_WRITE; /* Fill out the packet */
                            sp_write->dp_Arg1 = out->fh_Arg1;
                            sp_write->dp_Arg2 = (LONG)buf2; /* Arg2 points to the buffer */
                            sp_write->dp_Arg3 = 0L; /* out. At first, sp_write->dp_Res1 = 0L; */
                            /* seem odd to k
```

Amiga Mail

```

standard input channel to the      */
s I/O. This example does a better */
companioning example, CompareIO.c */

/* Disable Lattice CTRL/C handling */

/* 2.0 only */

put())) /* Need file handle to */
(Output())) /* get to Handler process */

TDPKT, NULL)) /* Allocate two */
S_STDPKT, NULL)) /* StandardPackets: one */
/* for reading, and one */
/* for writing. */

; /* Fill out the ACTION_READ packet. */

/* The buffer to fill in. */
/* The size of the Arg2 buffer. */

t() allocates a StandardPacket, it takes */
gether the Message and DosPacket. */
oints the DosPacket's dp_Link field at */
's Message structure. It also points */
ode.ln_Name field at the DosPacket: */
_read->dp_Link = sp_Msg; */
_Msg->mn_Node.ln_Name = (STRPTR)sp_read; */

h_Arg1))) /* Don't bother if in or */
/* out uses NIL: */

myport); /* Send initial read request. */

gBit; /* Record the signal bits */
| portsignal; /* for later use. */

TE; /* Fill out the ACTION_WRITE packet. */

; /* Arg2 points to the buffer to write */
/* out. At first glance, it might */
/* seem odd to bother setting Arg2 */

```

```

/* when the program hasn't read anything yet. */
/* This is to set up for the main loop. The */
/* main loop swaps the ACTION_READ buffer with */
/* the ACTION_WRITE buffer when it receives */
/* a completed read. Likewise, dp_Arg3 and */
/* dp_Res1 are set to make the ACTION_READ */
/* look like it has a valid return value so */
/* main loop won't fail the first time through */
/* the loop. */

MainLoop();
FreeDosObject(DOS_STDPKT, sp_write);
}
FreeDosObject(DOS_STDPKT, sp_read);
}
}
DeleteMsgPort(myport);
}

void MainLoop()
{
struct StandardPacket *mysp;
UBYTE *buf;

LONG amount_read;

BOOL sp_read_busy = TRUE, /* Is the ACTION_READ packet busy? */
sp_write_busy = FALSE, /* Is the ACTION_WRITE packet busy? */
done = FALSE; /* Is the program finished? */

/* main() has already taken care of sending the initial read to the */
/* handler. Because we need the data from that read before we can */
while (!done) /* do anything, the first thing to do is wait for its return. */
{
do /* Wait for the ACTION_READ to return. */
{
signals = Wait(sigmask); /* Wait for port signal or CTRL-C. */

if (signals & portsignal) /* If a message arrived at the port, ... */
{
while (mysp = (struct StandardPacket *)GetMsg(myport)) /* ...empty the port. */
{
/* If this message is the ACTION_READ packet, mark it as */
/* no longer busy so we can use it to start another read. */
if (mysp->sp_Pkt.dp_Type == ACTION_READ) sp_read_busy = FALSE;

/* If this message is instead the ACTION_WRITE packet, */
/* mark it as not busy. We need to check for this because */
/* the WRITE_PACKET from the previous iteration through */
/* the loop might have come back before the ACTION_WRITE */
/* from the previous iteration. */
else
if (mysp->sp_Pkt.dp_Type == ACTION_WRITE) sp_write_busy = FALSE;
}
}

if (signals & SIGBREAKF_CTRL_C) /* If someone hit CTRL-C, start to quit. */
{
done = TRUE; /* If the ACTION_READ is still out, try to */
if (sp_read_busy) /* abort it. As of V39, AbortPkt() does */
AbortPkt(in->fh_Type, sp_read); /* not do anything, so this function has */
/* no effect. Maybe a later release of the */
/* OS will support packet aborting. */
}

} while (sp_read_busy); /* End of "wait for ACTION_READ" loop. */

buf = (UBYTE *) (sp_read->dp_Arg2); /* Get ready to send the next ACTION_READ. */
amount_read = sp_read->dp_Res1; /* Hold on to the important stuff from the */
/* ACTION_READ we just got back so we can */
/* reuse the packet to start a new read */
/* while processing the last read's data. */

while (sp_write_busy) /* Because this example only uses two buffers and */
{ /* the ACTION_WRITE might be using one of them, */

```

```

/* this example has to wait for an outstanding
/* ACTION_WRITE to return before reusing the
/* ACTION_WRITE packet's buffer.

signals = Wait(sigmask);

if (signals & portsignal) /* If a message arrived at the port, ...
{
/* ... empty the port.
while (mysp = (struct StandardPacket *)GetMsg(myport))
if (mysp->sp_Pkt.dp_Type == ACTION_WRITE) sp_write_busy = FALSE;
}

if (signals & SIGBREAKF_CTRL_C) /* If someone hit CTRL-C, start to quit.
{
done = TRUE; /* If the ACTION_READ is still out, try to
if (sp_write_busy) AbortPkt(out->fh_Type, sp_write); /* abort it.
}
}

/* Make sure the user didn't hit CTRL-C. If the user hit CTRL-C dur-
if (!done) /* ing one of the "wait for packet" loops, done == TRUE. Notice that
{
/* this example does not actually break for the CTRL-C until after it
/* gets back both packets.

/* This tests the return values from the ACTION_READ and ACTION_WRITE
/* packets. The ACTION_READ packet returns the number of bytes it
/* read in dp_Res1, which was copied earlier into amount_read. If it
/* is 0, the read packet found the EOF. If it is negative, there was
/* an error. In the case of ACTION_WRITE, an error occurs if the
/* number of bytes that ACTION_WRITE was supposed to write (Arg3)
/* does not match the actual number it wrote, which ACTION_WRITE re-
/* turns in Res1. This test is the reason dp_Res1 and dp_Arg3 were
/* set to zero when the ACTION_WRITE packet was set up in main().
if ((amount_read > 0) && (sp_write->dp_Res1 == sp_write->dp_Arg3))
{
sp_read->dp_Arg2 = sp_write->dp_Arg2; /* ACTION_WRITE is finished with its
/* buffer, use it in the next read.

SendPkt(sp_read, in->fh_Type, myport); /* Send the next ACTION_READ and mark
sp_read_busy = TRUE; /* the ACTION_READ as busy.

/* Process Buffer. This example doesn't do anything with the data from the
/* last ACTION_READ, it just passes it on to the STDOUT handler.

sp_write->dp_Arg2 = (LONG)buf; /* Set up the ACTION_WRITE packet.
sp_write->dp_Arg3 = amount_read;
SendPkt(sp_write, out->fh_Type, myport); /* Send the next ACTION_WRITE and
sp_write_busy = TRUE; /* mark the ACTION_WRITE as busy.

```


--

--