

Amiga Mail

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A Shared Socket Library
Server and Client

Unix and Networking

```
/*
** Note.h - Some generic external references
*/
extern struct Library *IntuitionBase,
                    *SockBase;

/*
** Amiga System Includes
*/
#include <exec/types.h>
#include <exec/exec.h>
#include <dos/dos.h>
#include <dos/rdargs.h>
#include <dos/dostags.h>
#include <dos/dosextens.h>
#include <intuition/intuition.h>
#include <utility/tagitem.h>

/*
** Amiga System Prototypes
*/
#include <clib/exec_protos.h>
#include <clib/dos_protos.h>
#include <clib/intuition_protos.h>

/*
** socket.library Includes
*/
#include <sys/types.h>
#include <sys/socket.h>
#include <ss/socket.h>
/* make sure you rename <ss/socket_pragmas.sas|manx>
to <ss/socket_pragmas.h> */
#include <ss/socket_pragmas.h>
#include <netdb.h>

/*
** ...and some generic ANSI stuff
*/
#include <stdio.h>
#include <string.h>
#include <stddef.h>
#include <stdarg.h>
#include <stdlib.h>
#include <errno.h>

/*
** The definition of the structure which is the message packet passed
** between the client and server. This has been kept about as minimal
** as possible, but the buffers had to be designated that way to keep
** the code of the handler routines down in size.
**
** The #define's give the valid types that may be in the nn_Code field
** of the NetNote packet.
*/
struct NetNote
{
    int     nn_Code;
    int     nn_Retval;
    char    nn_Text[200],
           nn_Button[40];
};
```

```
#define NN_MSG 0
#define NN_ACK 1
#define NN_ERR 2

/*
** This definition is used in both the client and server as the name any
** entries in the INET:DB/SERVICES file will be under.
*/

#define APPNAME "notes"

#ifndef LATTICE
int CXBRK(void) { return(0); } /* Disable Lattice CTRL/C handling */
int chkabort(void) { return(0); }
#endif

/*
** End of note.h
*/
```

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```
/* shownote.c - Execute to compile with SAS 5.10b
LC -b0 -cfistq -v -y -j73 shownote.c
Blink FROM LIB:c.o shownote.o TO shownote LIBRARY LIB:LC.lib LIB:Amiga.lib
quit
*/

/*
** Our Application Prototypes (specific to noter.c file)
*/
void main( void );
void TG_Init( void );
int SS_Init( void );
int DoER( char *, char *, char * );
void AppPanic( char *, int );
void HandleMsg( int );

/*
** Application-specific defines and globals
*/
char Version[] = "\0$VER: ShowNote 1.2 (1.12.91)";

/*
** The library bases...we need em later...
*/
struct Library *IntuitionBase, *SockBase;

/*
** All other includes and protos are indexed off our catch-all file
** note.h which both the client (sendnote.c) and server (shownote.c) include.
*/
#include "note.h"

VOID main( VOID )
{
    int socket; /* The socket */

    fd_set sockmask, /* Mask of open sockets */
            mask; /* Return value of socketwait() */

    long umask; /* AmigaDOS signal mask */

    /*
    ** Call TG_Init to prepare the generic Amiga stuff for use...
    */
    TG_Init();

    /*
    ** ...and SS_Init for the socket-specific arrangements, keeping
    ** track of what it hands back.
    */
    socket = SS_Init();

    /*
    ** First, prepare the various masks for signal processing
    */
    FD_ZERO( &sockmask );
    FD_SET( socket, &sockmask );
```

```
/*
** And we enter the event loop itself
*/
while(1)
{
    /*
    ** Reset the mask values for another pass
    */
    mask = sockmask;
    umask = SIGBREAKF_CTRL_C;

    /*
    ** selectwait is a combo network and Amiga Wait() rolled into
    ** a single call. It allows the app to respond to both Amiga
    ** signals (CTRL-C in this case) and to network events.
    **
    ** Here, if the selectwait event is the SIGBREAK signal, we
    ** bail and AppPanic() but otherwise its a network event.
    ** This is a very crude way of handling the exit, but it
    ** is an effective one
    */

    if (selectwait( 2, &mask, NULL, NULL, NULL, &umask ) == -1 )
    {
        AppPanic("CTRL-C:\nProgram terminating!",0);
    }

    /*
    ** Since the contact between the client and server is so
    ** quick, an iterative server is adequate. For cases where
    ** extended connections or concurrent connections are needed,
    ** either a state-machine or concurrent server would be a
    ** better choice.
    */

    /*
    ** Here, we accept the pending connection (the only case
    ** possible with this mechanism) and dispatch to a routine
    ** which actually handles the client-server communication.
    */
    if (FD_ISSET( socket, &mask ))
    {
        HandleMsg( socket );
    }
    else
    {
        AppPanic("Network Signal Error!",0);
    }
}

/*
** AppPanic() - General Shutdown Routine
**
** This routine serves to provide both a nice GUI way of indicating error
** conditions to the user, and to handle all the aspects of shutting the
** server down. In a real-world application, you would probably separate
** the error condition shutdown from the normal shutdown. Since this is
** an example, it would add needless complexity to the code. Further,
** as far as this server is concerned, shutting down is an error state,
** since SIGBREAKF_CTRL_C is a process-specific warning of shutdown.
*/
```

```

VOID AppPanic( char *panictxt, int panicnum )
{
    char buffer[255];

    if (!panicnum)
    {
        DoER( APPNAME, panictxt, "OK" );
    }
    else
    {
        sprintf( (char *)&buffer, "%s\n\n%s", panictxt, strerror(panicnum));
        DoER( APPNAME, (char *)&buffer, "OK" );
    }
    if (SockBase)
    {
        cleanup_sockets();
        CloseLibrary(SockBase);
    }

    if (IntuitionBase)
    {
        CloseLibrary(IntuitionBase);
    }

    exit(RETURN_ERROR);
}

/*
** DoER() - Attempt at a "generic" wrapper for EasyRequest()
**
** Since EasyRequest(), though "easy", still requires some initialization
** before it can be used, this routine acts as a wrapper to EasyRequest.
** It also catches and provides a means to implement application-generic
** values for what gets handed to the EasyRequest routine, making coding
** just a wee bit easier.
*/
int DoER( char *titledtxt, char *msgtxt, char *btntxt )
{
    struct EasyStruct easy =
    {
        sizeof(struct EasyStruct),
        NULL,
        NULL,
        NULL,
        NULL
    };

    int retval = 0;

    if (IntuitionBase)
    {
        if (titledtxt)
        {
            easy.es_Title = titledtxt;
        }
        else
        {
            easy.es_Title = APPNAME;
        }

        if (msgtxt)
        {
            easy.es_TextFormat = msgtxt;
        }
        else
        {
            easy.es_TextFormat = "Null message text!\nIsnt it?";
        }
    }
}

```

```

    if (btntxt)
    {
        easy.es_GadgetFormat = btntxt;
    }
    else
    {
        easy.es_GadgetFormat = "Take off, eh!";
    }

    retval = EasyRequest( NULL, &easy, NULL, NULL );
    return (retval);
}

/*
** TG_Init() - Initializer of AOS/Intuition
**
** This routine just handles opening Intuition, but would be a good
** place to put any other initialization code which is specific to getting
** an application's Amiga environment properly set up.
*/
VOID TG_Init( VOID )
{
    IntuitionBase = OpenLibrary("intuition.library",36);
    if (!IntuitionBase)
        exit(RETURN_ERROR);
}

/*
** SS_Init() - Initializer of shared socket library
**
** SS_Init() handles the opening of socket.library, the formation of an
** application-specific socket environment, and the creation of the initial
** socket for the server. It returns an identifier to the socket it has
** prepared, which just happens to represent itself as an int.
*/
int SS_Init( VOID )
{
    struct sockaddr_in sockaddr;

    int snum, len = sizeof(sockaddr);

    /*
    ** Attempt to open socket library and initialize socket environ.
    ** If this fails, bail out to the non-returning AppPanic() routine.
    */

    /*
    ** The errno variable is a part of ANSI, and is defined in the c.o
    ** startup code. Essentially, its where ANSI functions put their
    ** error codes when they fail. For more information, consult a
    ** reference to ANSI C.
    */

    if (SockBase = OpenLibrary("inet:libs/socket.library",0L))
    {
        setup_sockets( 3, &errno );
    }
    else
    {
        AppPanic("Can't open socket.library!",0);
    }

    /*
    ** Open the initial socket on which incoming messages will queue for
    ** handling. While the server is iterative, I do it this way so that
    ** SIGBREAKF_CTRL_C will continue to function.
    */
}

```

```

if ((snum = socket( AF_INET, SOCK_STREAM, 0 )) == -1)
{
    AppPanic("Socket Creation:",errno);
}

/*
** Here we clear and prepare the information to give our socket
** a real address on the system.
*/
memset( &sockaddr, 0, len );
sockaddr.sin_family = AF_INET;

/*
** Following is commented out for ease of testing purposes!
**
** {
**     struct servent *servptr;
**     char *serv = APPNAME;
**
**     if ((servptr = getservbyname( serv, "tcp" )) == NULL)
**     {
**         AppPanic("Service not in inet:db/services list!",0);
**     }
**     sockaddr.sin_port = servptr->s_port;
** }
*/

sockaddr.sin_port = 8769;

sockaddr.sin_addr.s_addr = INADDR_ANY;

/*
** Having everything set up, we now attempt to allocate the port number
** for our socket. If this fails, we bail.
*/

if ( bind( snum, (struct sockaddr *)&sockaddr, len ) < 0 )
{
    AppPanic("Socket Binding:",errno);
}

/*
** Okay, the socket is as ready as it gets. Now all we need to do is to
** tell the system that the socket is open for business. In an ideal
** world, this needs to be checked for errors, but for the scope of the
** example, it isnt necessary. By the way, the '5' in the listen() call
** indicates the "queue size" for number of outstanding requests.
*/

listen( snum, 5 );

/*
** And last, we pass the socket number back to the main routine.
*/

return snum;
}

/*
** HandleMsg() - Handles client connection and message display
**
** This is where 90% of the "function" of the program occurs. This routine
** connects the server to the client socket, gets the incoming message pkt,
** acknowledges it, displays it, then terminates the client connection.
** For doing all that, its small, a testament to how easily the actual work
** can be done.
*/
void HandleMsg( int sock )

```

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```

{
    struct NetNote in;          /* Buffer for incoming packets */

    struct sockaddr_in saddr;   /* Socket address from accept() */
    struct in_addr sad;        /* Internet address component */

    struct hostent *hent;      /* Internet host information */

    int nsock,                 /* New socket from accept() */
        len,                   /* Length of addr from accept() */
        retv;                   /* Return value from DoER call */

    char rname[80],            /* Buffer for titlebar string */
        *hname,                /* Ptr to the hostname */
        *dd_addr;              /* Ptr to the dotted-decimal address */

    /*
    ** We accept() the attempted connection on socket 'sock'
    ** which also yields the addr of the remote machine. Then we
    ** attempt to convert the name to something meaningful.
    ** First, we clear the stuff...
    */

    bzero( (char *)&rname, 80);
    bzero( (char *)&saddr, sizeof(struct sockaddr_in) );
    bzero( (char *)&sad, sizeof(struct in_addr) );
    len = sizeof(struct sockaddr_in);

    /*
    ** Then we accept the connection on the socket
    */

    if (!(nsock = accept( sock, (struct sockaddr *)&saddr, &len )))
    {
        AppPanic("Accept:",errno);
    }

    /*
    ** Break the internet address out of the sockaddr_in structure and then
    ** create a dotted-decimal format string from it, for later use
    */

    sad = saddr.sin_addr;
    dd_addr = inet_ntoa(sad.s_addr);

    /*
    ** Use the internet address to find out the machine's name
    */

    if ( !(hent =
        gethostbyaddr( (char *)&sad.s_addr,
            sizeof(struct in_addr),
            AF_INET )))
    {
        AppPanic("Client resolution:\nAddress not in hosts db!", 0 );
    }
    hname = hent->h_name;

    /*
    ** Form the string which goes into the title bar using name & address
    */

    sprintf( rname, "FROM: %s (%s)", hname, dd_addr );
}

```

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```

/*
** Okay, now the waiting packet needs to be removed from the connected
** socket that accept() gave back to us. Verify its of type NN_MSG and
** if not, set return type to NN_ERR. If it is, then display it and
** return an NN_ACK message.
*/

recv( nsock, (char *)&in, sizeof(struct NetNote), 0 );
if (in.nn_Code == NN_MSG)
{
    DisplayBeep(NULL);
    DisplayBeep(NULL);
    retv = DoER( rname, (char *)&in.nn_Text, (char *)&in.nn_Button );
    in.nn_Code = NN_ACK;
    in.nn_Retval = Retv;
}
else
{
    in.nn_Code = NN_ERR;
}

/*
** Having dealt with the message one way or the other, send the message
** back at the remote, then disconnect from the remote and return.
*/

send( nsock, (char *)&in, sizeof(struct NetNote), 0 );
s_close( nsock );

```

```

/* sendnote.c - Execute to compile with SAS 5.10b
LC -b0 -cfastq -v -y -j73 sendnote.c
Blink FROM LIB:c.o sendnote.o TO sendnote LIBRARY LIB:LC.lib LIB:Amiga.lib
quit
*/

/*
** Our Application Prototypes (specific to notes.c file)
*/

void main( int, char ** );
void FinalExit( int );

/*
** Application-specific defines and globals
*/

char Version[] = "\$VER: SendNote 1.2 (1.12.91)";

#define TEMPLATE "Host/A,Text,Button"
#define OPT_HOST 0
#define OPT_TEXT 1
#define OPT_BUTTON 2
#define OPT_COUNT 3

/*
** The library bases...we need em later...
*/

struct Library *IntuitionBase, *SockBase;

/*
** All other includes and protos are indexed off our catch-all file
** note.h which both the client (sendnote.c) and server (shownote.c)
** include.
*/

#include "note.h"

void main(int argc, char **argv)
{
    struct RDArgs *rdargs; /* ReadArgs() return information */
    struct sockaddr_in serv; /* Server's Internet Address */
    struct hostent *host; /* The located host info */
    struct NetNote out; /* Message packet for send/recv */
    long opts[OPT_COUNT] = {
        0L,
        (long)"== PING! ==",
        (long)"OK"
    };

    int sock; /* The working socket */

    char *hostnam, /* Arg of hostname */
        *text, /* Arg of text to be sent */
        *button; /* Arg of button text */

    /*
    ** Process arguments using new (2.0) dos calls.
    */

    rdargs = (struct RDArgs *)ReadArgs( (UBYTE *)TEMPLATE, opts, NULL );
    if(rdargs == NULL)

```

```

{
    puts("Command line not accepted!");
    FinalExit( RETURN_ERROR );
}

hostnam = (char *)opts[OPT_HOST];
text = (char *)opts[OPT_TEXT];
button = (char *)opts[OPT_BUTTON];

/*
** Open socket.library and initialize socket space
*/

if (SockBase = OpenLibrary("inet:libs/socket.library", 0L))
{
    setup_sockets( 1, &errno );
}
else
{
    puts("Can't open socket.library!");
    FinalExit( RETURN_ERROR );
}

/*
** First we need to try and resolve the host machine as a
** normal IP/Internet address. If that fails, fall back to searching
** the hosts file for it. Before anything, we need to clear out
** the buffer (serv) where the information will be placed, using
** the bzero() call (actually a macro in sys/types.h).
*/

bzero( &serv, sizeof(struct sockaddr_in) );
if ( (serv.sin_addr.s_addr = inet_addr(hostnam)) == INADDR_NONE )
{
    /*
    ** Okay, the program wasn't handed a dotted decimal address,
    ** so we check and see if it was handed a machine name.
    **
    ** NOTE: Grab the information you need before you use the
    ** gethostbyname() call again. Subsequent calls
    ** will overwrite the buffer it hands back.
    */

    if ( (host = gethostbyname(hostnam)) == NULL )
    {
        printf("Host not found: %s\n",host);
        FinalExit( RETURN_ERROR );
    }

    /*
    ** It does indeed have a name, so copy the addr field from the
    ** hostent structure into the sockaddr structure.
    */

    bcopy( host->h_addr, (char *)&serv.sin_addr, host->h_length );
}

/*
** Following is commented out for ease of testing purposes! Normally, apps
** should obtain server numbers using this type of code and a matching entry
** in the inet:db/services file.
**
** {
**     struct servent *servptr;
**     char *servnam = APPNAME;
**
**     *
**     ** Open the INET:DB/SERVICES file and locate the server info
**     ** by matching the name and service.

```

```

**     *
**     ** if ((servptr = getservbyname( servnam, "tcp" )) == NULL)
**     {
**         printf("%s not in inet:db/services list!",servnam);
**         FinalExit( RETURN_ERROR );
**     }
**     serv.sin_port = servptr->s_port;
** }
**
**
/*
** If you used the above code, you would remove this line:
*/

serv.sin_port = 8769;

/*
** This tells the system the socket in question is an Internet socket
*/

serv.sin_family = AF_INET;

/*
** Initialize the socket
*/

if ( (sock = socket( AF_INET, SOCK_STREAM, 0 )) < 0 )
{
    printf("socket gen: %s\n", strerror(errno));
    FinalExit( RETURN_ERROR );
}

/*
** Connect the socket to the remote socket, which belongs to the
** server, and which will "wake up" the server.
*/

if ( connect( sock,
              (struct sockaddr *)&serv,
              sizeof(struct sockaddr) ) < 0 )
{
    printf("connect: %s\n", strerror(errno));
    s_close( sock );
    FinalExit( RETURN_ERROR );
}

/*
** Compose the message packet for transmission
*/

out.nn_Code = NN_MSG;
strcpy( (char *)&out.nn_Text, text );
strcpy( (char *)&out.nn_Button, button );

/*
** Send the packet to the remote system
*/

send( sock, (char *)&out, sizeof(struct NetNote), 0 );

printf("\nMessage sent to %s...waiting for answer...\n", hostnam );

/*
** Wait for either acknowledge or error. This is a potential hang
** location if the server is mortally wounded.
*/

```

```
recv( sock, (char *)&out, sizeof(struct NetNote), 0 );

/*
** Evaluate the packet returned to us
*/

if (out.nn_Code == NN_ACK)
{
    printf("Response:  Button %ld pressed.\n\n", out.nn_Retval );
}
else
{
    puts("Error during message send...please try again later!");
    FinalExit( RETURN_ERROR );
}

/*
** Since ReadArgs() was called inside the main() function, the pointer
** to the buffer it created needs to be deallocated inside main().
*/

if (rdargs)
{
    FreeArgs( rdargs );
}

FinalExit( RETURN_OK );
}

/*
** FinalExit() - Non-returning routine which handles exits and cleanups.
**
**
**
*/
void    FinalExit( int retcode )
{
    /*
    ** If SockBase is non-null, it means that socket.library was opened,
    ** and a socket environment was initialized.  Remove the environment
    ** and close the library.
    */

    if (SockBase)
    {
        cleanup_sockets();
        CloseLibrary(SockBase);
    }

    /*
    ** Terminate program, handing return code out to the shell handler
    */

    exit( retcode );
}
```

