```
                        Sign On


User  .  .  .  .  .  .  .  .  .  USING
Password . . .  .  .  .  .  .  .
Program/procedure  .  .  .  .  SNADS
Menu  .  .  .  .  .  .  .  .  .  OVER
Current library .  .  .  .  .  TCP/IP
```

# A Quick Guide to Setting up SNADS on the AS/400

# SNADS over TCP/IP

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## 1. Acknowledgements

## 2. Introduction

This guide will show you how to set up and use SNADS over TCP/IP on the AS/400. SNADS, or Systems Network Architecture Distribution System, is an IBM protocol for exchanging objects over networks. As SNADS developed over the decades, the documentation became buried in old manuals. Even experts may no longer remember every detail. This guide draws on the IBM sources, both on-line and printed, and brings them together into a coherent outline.

Section 3 will be a brief overview of SNADS. Section 4 will show you how to plan and set up SNADS over TCP/IP by describing a simple scenario: adding an AS/400 to an existing corporate network. Section 5 will describe the most commonly used commands: sending messages, sending output, and exchanging files. Section 6 will cover troubleshooting common problems.

This guide assumes you already have TCP/IP working, and that you are more familiar with the IP utilities, such as ftp and telnet, than the SNA commands, such as STRPASTHR and SNDNETF. Accordingly, you will find a glossary of SNA terms and acronyms in Section 7.

For further details, please see the resources listed in Section 8.

Finally, any comments or corrections you may have would be welcomed. To submit feedback, please see Section 9

- Conventions

This icon will indicate commands that require special authority.

In the screenprints, **bold green** will indicate what you will enter.

## 3. Overview

### 3.1. SNA

In the 1960's and 1970's, the typical corporate computer network was a mainframe controlling communications between many devices. IBM's proprietary Systems Network Architecture, or SNA, was designed to manage any sort of communications errors. It implemented a robust level of confirmation, error handling, and messaging.

Since a printer could only handle certain types of commands, and a terminal could handle different types of command, all devices on the network had a type of Logical Unit, or LU. Each LU type was a package of parameters that defined what commands or data could be sent or received.  For example, LU1 and LU3 were printers. LU2 was a terminal.

At the central control point, the mainframe kept a table listing all devices attached to it, whether locally or over phone lines, as well as routing tables to manage sending data within the network. Within the entire network communicating with the mainframe, every device had to have a unique logical unit name, or LUNAME.

### 3.2. APPC

In the 1980's, more intelligent devices were added to the network. The mainframe was no longer the only device that could run programs or need to communicate to other devices running programs. Midrange servers, such as System/36 and System/38, could do essentially the same functions. To a lesser degree, so could early PC's.

All these devices were peers on the network, capable of program to program communications. LU 6 was defined to address them. After some revisions that became LU 6.2. This protocol is Advanced Program to Program Communication, or APPC. APPC controller descriptions and device descriptions define the physical configuration over which SNA communications take place.

### 3.3. APPN

In 1988, the first AS/400 was introduced. An AS/400 might be the sole server on a network, or networked with several other AS/400's, or connected to a corporate network controlled by a mainframe. Also APPC was point-to-point, it did not provide routing. In order to handle this more decentralized network, the AS/400 implemented a routable extension of APPC called Advanced Peer to Peer Networking, or APPN.

While the mainframe commanded one vast network, AS/400's can be grouped within networks. Each network has a network ID, usually referred to a NETID. Within each network, every device has a unique LUNAME. Devices with the same LUNAME can coexist, even when networks of AS/400's are interconnected. In that case, every device is identifed by a combination address of NETID.LUNAME.

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The AS/400 stores a table of all users on the network in the system distribution directory. It stores networking information in the routing table. Just as reports are sent to a printer one after another via output queues, requests for SNA distributions are served by distribution queues. Each distribution queue is attached to an APPC device, which defines how to send the data over the physical lines.

## 3.4. ANYNET

Finally, in the 1990's, IBM created ANYNET. ANYNET encapsulates the various functions of SNA, APPC, and APPN within the IP packet. To the TCP/IP network, these SNA packets are treated like any other data packet. To the AS/400's, the SNA distributions are treated as if they were being sent to APPC devices. ANYNET maps the SNA addresses to IP addresses using naming conventions in the APPC configuration.

## 3.5. An example of an SNA distribution

IP communication is sessionless. A packet is sent to a destination with no provison for recovery if it fails. SNA communications, however, happen within a session, in which a connection is established and maintained throughout the exchange. Therefore, when a program on a device wishes to communicate with another, it must establish a session first. Once the session is established, they can exchange objects such as messages, data files, and printouts.

For example, suppose a user submits a request to send a file to a user on another system. First the source system verifies that the sender is in its system distribution directory, and therefore authorized to send objects. Then the source system looks up the target system in its system distribution directory. The target system's directory entry points to the routing table. The target system's routing table entry will list its distribution queue. Once the source system puts the sender's file into the distribution queue, the attached APPC device will send the SNA distribution to the target system.

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## 4. Setup

This scenario assumes you are the administrator on your home AS/400, and you need to connect it to a target system that is already using SNADS over TCP/IP.

### 4.1. Collect information

Before you begin, you will need to collect key setup information: IP addresses, the system value of QAUTOCFG, and network attributes.

You may use CFGTCP to determine the IP addresses, and DSPSYSVAL to look up the value of QAUTOCFG.

To view the Network Attributes, on each system, on the command line type

DSPNETA

Press <Enter>.  You will see something like this:

```
                    Display Network Attributes
                                                  System:   SOURCE
Current system name  . . . . . . . . . . . . . :  SOURCE
  Pending system name  . . . . . . . . . . . :
Local network ID . . . . . . . . . . . . . . :  APPN
Local control point name . . . . . . . . . . :  SOURCE
Default local location . . . . . . . . . . . :  SOURCE
Default mode . . . . . . . . . . . . . . . . :  BLANK
APPN node type . . . . . . . . . . . . . . . :  *ENDNODE
Data compression . . . . . . . . . . . . . . :  *NONE
Intermediate data compression  . . . . . . . :  *NONE
Maximum number of intermediate sessions  . . . :  200
Route addition resistance  . . . . . . . . . :  128
Server network ID/control point name . . . . . :  *LCLNETID   *ANY
                                                   More...
```

**Figure 1. Display Network Attributes - first screen**

The attributes that you need to record are in yellow.

Page down twice to view the end screen. You will see something like this:

```
                    Display Network Attributes
                                                  System:   SOURCE
Maximum hop count  . . . . . . . . . . . . . . :  16
DDM request access . . . . . . . . . . . . . . :  *OBJAUT
Client request access  . . . . . . . . . . . . :  *OBJAUT
Default ISDN network type  . . . . . . . . . . :
Default ISDN connection list . . . . . . . . . :  QDCCNNLANY
Allow AnyNet support . . . . . . . . . . . . . :  *NO
Network server domain  . . . . . . . . . . . . :  SOURCE
Allow add to cluster . . . . . . . . . . . . . :  *NONE
Modem country or region ID . . . . . . . . . . :
                                                   Bottom
```

**Figure 2. Display Network Attributes - last screen**

# SNADS over TCP/IP

Record the key attributes in Table 1. Setup Information. The labels in *italics* indicate how these attributes will be referred to in the instructions.

| Parameter | Source | Source system | Target system |
|---|---|---|---|
| IP Address | CFGTCP | | |
| QAUTOCFG | DSPSYSVAL | | |
| Current system name | DSPNETA | *local* | *remote* |
| Default Local Location | DSPNETA | *source* | *target* |
| Network ID | DSPNETA | *srcnetid* | *tgtnetid* |
| Default Mode | DSPNETA | | |
| Allow ANYNET Support | DSPNETA | | |

**Table 1. Setup Information**

## 4.2. Configure ANYNET

If ALWANYNET is *NO, you must change it. If it is *YES, go on to Step 4.2.2. Add an ANYNET entry to the TCP/IP host table.

### 4.2.1.    Change ALWANYNET from *NO to *YES

You will need *IOSYSCFG authority to make this change.

This change tells the system it can find APPN LU Names in the TCP/IP host table. It takes effect immediately.

On the command line type,

    CHGNETA ALWANYNET(*YES)

Press <Enter>.

### 4.2.2.  Add an ANYNET entry to the TCP/IP host table

Note: If you are using a remote name server for DNS lookup, have your DNS administrator add a secondary name as described below to your target's IP address.

# SNADS over TCP/IP

On the command line type,

CFGTCP

Press <Enter>.

Select Option 10. Work with TCP/IP Host Table Entries. You will see the host table.

```
                 Work with TCP/IP Host Table Entries
 Type options, press Enter.
   5=Display


      Internet          Host
 Opt  Address           Name


   _   127.0.0.1         LOOPBACK
                         LOCALHOST
   _   192.168.0.100     SOURCE
   2   192.168.0.200     TARGET
```

Figure 3. Work with TCP/IP Host Table Entries

Find your target system. If necessary, add it using your standard conventions for TCP/IP hostnames.

Put a **2** put to the target TCP/IP hostname. Press <Enter>. You will see something like this:

```
              Change TCP/IP Host Table Entry (CHGTCPHTE)

 Type choices, press Enter.

 Internet address . . . . . . . . > '192.168.0.200'
 Host names:
   Name . . . . . . . . . . . . .     'TARGET'


                + for more values +
 Text 'description' . . . . . . .    *SAME
```

Figure 4. Changing a host Table entry

Next "+ for more values" enter **+**. Press <Enter>. You will see something like this:

# SNADS over TCP/IP

```
              Specify More Values for Parameter HOSTNAME

Type choices, press Enter.


Host names:
  Name . . . . . . . . . . . . .    'TARGET'


  Name . . . . . . . . . . . . .    target.tgtnetid.SNA.IBM.COM



```

**Figure 5. Adding a secondary name**

Add a secondary name of the format

*target.tgtnetid*.SNA.IBM.COM

(*target* and *tgtnetid* are the values recorded in Table 1. Setup Information.)

Press <Enter>.

## 4.3. Configure APPC

Next you will create an APPC controller. On the command line type,

CRTCTLAPPC

Press <Enter>. You will see:

```
               Create Ctl Desc (APPC) (CRTCTLAPPC)

Type choices, press Enter.

Controller description . . . . .   TARGET        Name
Link type  . . . . . . . . . .    *ANYNW         *ANYNW, *FAX, *FR,
*ILAN...
```

**Figure 6. CRTCTLAPPC  initial screen**

In Controller description, enter *target*

In Link Type, enter *ANYNW.

Press <Enter>.

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You will see:

```
                Create Ctl Desc (APPC) (CRTCTLAPPC)

Type choices, press Enter.

Controller description . . . . . >  TARGET        Name
Link type  . . . . . . . . . . . >  *ANYNW        *ANYNW, *FAX, *FR,
*ILAN...
Online at IPL  . . . . . . . . .    *YES          *YES, *NO
Remote network identifier  . . .    tgtnetid      Name, *NETATR, *NONE,
*ANY
Remote control point . . . . . .    ANYNET        Name, *ANY
APPN/HPR capable . . . . . . . .    *YES          *YES, *NO
```

**Figure 7. CRTCTLAPPC detail screen**

In Remote network identifier, enter *tgtnetid*

In Remote control point, enter ANYNET.[1]

(*target* and *tgtnetid* are the values recorded in Table 1. Setup Information.)

Press <Enter>.

Make the controller available. On the command line type,

VRYCFG *target* *CTL STATUS(*ON)

Press <Enter>.

## 4.4. Configure APPN

You will need *IOSYSCFG authority.

The APPN networking information is stored in the configuration list. On the command line type,

WRKCFGL

Press <Enter>.

---

[1] The true Remote Control Point Name is the Local Location Name in the target system's Network Attributes. However, if the target system is part of an SNA network, the true RMTCPNAME is already in use. Using the true RMTCPNAME in an ANYNET configuration could cause a networking topology storm and significant CPU utilization. Unless you are sure there is no existing SNA network, you should use a generic RMTCPNAME, such as ANYNET or TCPIP.

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You will see something like this. Note you will probably not have any configuration lists.

```
                    Work with Configuration Lists
                                                    System:    SOURCE
Position to  . . . . .  _____          Starting characters

Type options, press Enter.
  1=Create    2=Change    3=Copy    4=Delete    5=Display    6=Print
  7=Rename       8=Work with entries


Opt   List        Type        Text
 1    _____

   (No configuration lists selected)
```

**Figure 8. Work with Configuration Lists**

Put a 1 under Opt. Press <Enter>. You will see:

```
                 Create Configuration List (CRTCFGL)

Type choices, press Enter.

Configuration list type  . . . .   *APPNRMT        *APPNDIR, *APPNLCL...
```

**Figure 9. Create Configuration List**

In Configuration list type, type *APPNRMT . Press <Enter>. You will see:

```
                 Create Configuration List (CRTCFGL)

Type choices, press Enter.

Configuration list type  . . . . >  *APPNRMT        *APPNDIR, *APPNLCL...
Text 'description' . . . . . . .    Remote APPN configuration list
```

**Figure 10. Configuration List Description**

Type in a description. Press <Enter>.

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You will see:

```
                          Create Configuration List

Configuration list  . . :    QAPPNRMT
Configuration list type :    *APPNRMT
Text  . . . . . . . . . :    Remote APPN configuration list


Type information, press Enter.


--------------------------APPN Remote Locations---------------------
          Remote                    Remote    Control
Remote    Network    Local          Control   Point     Location        Secure
Location  ID         Location        Point     Net ID    Password         Loc
TARGET    tgtnetid   SOURCE         ANYNET    tgtnetid                    *NO
          *NETATR    *NETATR                  *NETATR                     *NO
          *NETATR    *NETATR                  *NETATR                     *NO
          *NETATR    *NETATR                  *NETATR                     *NO
          *NETATR    *NETATR                  *NETATR                     *NO
```

**Figure 11. Remote Configuration List**

On the first blank line, enter *target*, *tgtnetid*, and *source* as recorded in Table 1. Setup Information. For Remote Control Point, enter ANYNET. Press <ENTER>.

## 4.5. Test the configuration with STRPASTHR (Start Pass-through)

Once you have completed the initial setup, start a pass-through session with STRPASTHR. Since STRPASTHR uses APPN (Advanced Peer-to-Peer Networking) to find a route, a successful pass-through confirms that you have your networking configuration set up correctly.

If QAUTOCFG is *ON, a successful STRPASTHR will automatically create an APPC device with all the correct matching parameters under the APPC controller created in Step 4.3 Configure APPC. If QAUTOCFG is *OFF, the simplest course is to change it to *ON temporarily, execute the STRPASTHR, and then change it to *OFF. If you cannot change QAUTOCFG, see Section 6.1.2 Make sure the APPC device was created for information about manually creating the APPC device.

On the command line, type

STRPASTHR *target*

(where *target* represents represent the value recorded in Table 1. Setup Information.)

Press <Enter>.

When the signon screen appears, sign on with the username and password for the target system.

To end your pass-through session, on the command line, type

ENDPASTHR

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Press <Enter>.

This will sign you off, end your pass-through session, and return you to your home system.

If you cannot start a pass-through, review the setup steps so far. See also in Troubleshooting 6.1 Problem: You cannot do pass-through.

## 4.6. Configure Distribution Services

Now that you have confirmed that you have a working SNA network, you can configure Distribution Services.

### 4.6.1. Add Local User(s) to the Distribution Directory

You will need *SECADM authority to work with the full distribution directory.

Each user profile on your system will need an individual entry. On the command line, type

ADDDIRE

Press <F4>. You will see something like this:

```
                    Add Directory Entry (ADDDIRE)

Type choices, press Enter.


User identifier:
  User ID  . . . . . . . . . . . > USERNAME       Character value
  Address  . . . . . . . . . . . > LOCAL          Character value
User description . . . . . . . . > Description of user

User profile . . . . . . . . . . > USERNAME       Name, *NONE
```

**Figure 12. Individual directory entry**

In User ID, enter the user profile.[2]

In Address enter *local*

(where *local* represents the value recorded in Table 1. Setup Information.)

In User description, enter the appropriate description.

In User profile, enter the actual user profile.

Press <Enter>.

---

[2] This is the ID that identifies the user to SNADS. Note that it is only eight characters long, though a user profile can be ten characters.

### 4.6.2. Add a remote entry to the Distribution Directory

Each user profile on your system will need an individual entry. On the command line, type

ADDDIRE

Press <F4>. You will see something like this:

```
                     Add Directory Entry (ADDDIRE)

Type choices, press Enter.


User identifier:
  User ID  . . . . . . . . . . . >  *ALL         Character value
  Address  . . . . . . . . . . . >  REMOTE       Character value
User description . . . . . . . . >  Group entry for all users on remote
User profile . . . . . . . . . .                 Name, *NONE
System name:
  System name  . . . . . . . . .    REMOTE       Character value, *LCL,
  System group . . . . . . . . .                 Character value
Network user ID  . . . . . . . .    *USRID
```

**Figure 13. Group directory entry**

In User ID, enter *ALL.

In Address enter *remote.*

In User description, enter the appropriate description.

In System name, enter *remote.*

(where *remote* represents the value recorded in Table 1. Setup Information.)

Press <Enter>. You may receive a message that the system name and group were not found. Ignore it.

### 4.6.3. Distribution Queues

On the command line, type

CFGDSTSRV

Press <Enter>. You will see:

```
                  Configure Distribution Services

Type choice, press Enter.


  Type of distribution services
    information to configure  . . .    1        1=Distribution queues
                                                2=Routing table
                                                3=Secondary system name
                                                   table
```

**Figure 14. Configure Distribution Services**

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For Type of distribution services, enter **1**. Press <Enter>. You will see something like this:

```
                    Configure Distribution Queues

 Position to . . . . .


 Type options, press Enter.
   2=Change  4=Remove  5=Display details


                                    Remote                   Remote
 Opt  Queue Name         Queue Type   Location Name  Mode Name  Net ID
      QSMTPQ                *RPDS       TCPIPLOC       *NETATR   *LOC
                                                                Bottom

F3=Exit      F5=Refresh         F6=Add distribution queue
F10=Work with distribution queues                        F12=Cancel
```

**Figure 15. Configure Distribution Queues**

To add a queue, press <F6>. You will see something like this:

```
                    Add Distribution Queue

Type choices, press Enter.

  Queue  . . . . . . . . . . .   TARGET          Name
  Queue type . . . . . . . . .   *SNADS          *SNADS, *RPDS,
*SVDS, *DLS
  Remote location name . . . .   TARGET          Name
  Mode . . . . . . . . . . . .   *NETATR         Name, *NETATR
  Remote net ID  . . . . . . .   TGTNETID        Name, *LOC, *NONE
  Local location name  . . . .   SOURCE          Name, *LOC
```

**Figure 16. Adding a Distribution Queue**

In Queue, enter *target*.

In Queue type, enter *SNADS.

In Remote Location name, enter *target*.

In Mode, enter *NETATR.

In Remote Network ID, enter *tgtnetid*.

In Local Location name, enter *source*.

(*target*, *tgtnetid,* and *source* represent the values recorded in Table 1. Setup Information.)

Press <Enter>.

## 4.6.4. Routing Table

You will return to the Configure Distribution Services screen (see Figure 14. Configure Distribution Services), For Type of distribution services, enter **2**. Press <Enter>. You will see something like this:

```
                    Configure Routing Table

Type options, press Enter.
   2=Change   4=Remove   5=Display details


       ------System------
Opt   Name       Group     Description
      TCPIP                TCP/IP Routing



                                                   Bottom

F3=Exit       F5=Refresh          F6=Add routing table entry
F12=Cancel
```

**Figure 17. Configuring the Routing Table**

To add a routing table entry, press <F6>. You will see something like this:

```
                    Add Routing Table Entry

Type choices, press Enter. (At least one queue name is required.)

  System name/Group  . .    REMOTE
  Description  . . . . .    Remote AS/400
  Service level:
    Fast:
      Queue name . . . .    TARGET          Distribution queue name
      Maximum hops . . .    *DFT            Number of hops, *DFT
    Status:
      Queue name . . . .    TARGET
      Maximum hops . . .    *DFT
    Data high:
      Queue name . . . .    TARGET
      Maximum hops . . .    *DFT
    Data low:
      Queue name . . . .    TARGET
      Maximum hops . . .    *DFT
```

**Figure 18. Adding a Routing Table Entry**

In System Name, enter *remote*.

Leave Group blank.

In Description, enter an appropriate description.

In Queue Name under the Fast Service level, enter *target*.

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In Queue Name under the Status Service level, enter *target*.

In Queue Name under the Data high Service level, enter *target*.

In Queue Name under the Data low Service level, enter *target*.

Make sure you enter all four queues.

(*remote* and *target* represent the values recorded in Table 1. Setup Information.)

Press <Enter>.

## 4.7. Start the SNADS subsystem

Now that the setup is complate, you may start the subsystem QSNADS. On the command line, type

    STRSBS QSNADS

Press <Enter>.

In order to make sure SNADS is always running, add the following command to your system startup progarm.

    QSYS/STRSBS SBSD(QSNADS)

# 5. Common uses

## 5.1. Sending Messages

SNADS can be used to send text messages to users on other AS/400's. The recepient will receive the message as an informational message on their message queue. You cannot send break messages or program messages.

On the command line, type

    SNDNETMSG

Press <F4>. You will see something like this:

```
                    Send Network Message (SNDNETMSG)

Type choices, press Enter.

Message text . . . . . . . . . .    Greetings



User ID:
  User ID  . . . . . . . . . .     RECEIVER      Character value
  Address  . . . . . . . . . .     TARGET        Character value
            + for more values
```

**Figure 19. Sending a Network Message**

In Message text, enter your message.

In User ID, enter the recepient's username.

In Address, enter *target*.

Press <Enter>.

Once your message has been sent, you will receive a confirmation message. If the distribution fails, you will receive an error message. For troubleshooting this error, see Section 6.3 Problem: Distribution (message, spool file, save file) not sent.

## 5.2. Sending Spool Files

SNADS can be used to send spool files to user on other systems. When a spool file reaches the target system, it is placed on the default output queue defined in the recepient's user profile. If the recepient has no default output queue, it will be placed on the system default output queue (specified in the system value QPRTDEV). If the destination output queue is attached to a printer, the spool file will print exactly as it would have on the source system.

For example, to view all the spool files waiting to print on PRT01, on the command line, type

    WRKOUTQ PRT01

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Press <Enter>. You will see something like this:

```
                    Work with Output Queue

Queue:   PRT01          Library:   QUSRSYS          Status:   RLS

Type options, press Enter.
  1=Send    2=Change   3=Hold    4=Delete    5=Display    6=Release
  7=Messages  8=Attributes       9=Work with printing status

Opt  File        User       User Data    Sts   Pages    Copies Form Type
 1   QPRINT      QSYS                     RDY      1        1    *STD
     QPRINT      QSYS                     RDY      1        1    *STD
```

**Figure 20. Work with Output Queue**

Put a 1 next to the file you wish to send. Press <Enter>. You will see something like this:

```
              Send Network Spooled File (SNDNETSPLF)

 Type choices, press Enter.

 Spooled file . . . . . . . . . . >  QPRINT         Name
 User ID:
   User ID  . . . . . . . . . . .   RECEIVER       Character value
   Address  . . . . . . . . . . .   TARGET         Character value
```

**Figure 21. Sending a Network Spooled File**

This will open a SNDNETSPLF screen, with the parameters describing the spool file to be sent already filled in.

In User ID, enter the recepient's username.

In Address, enter *target*.

Press <Enter>.

To send more than one file, from the Work with Output Queue screen, put a **1** next to all the spool files you wish to send. On the command line, type

TOUSRID ((*username target*))

Press <Enter>.

When the spool file arrives on the target system, both you and the recepient will receive a notification message. If the distribution fails, only you will receive the error message. For troubleshooting this error, see Section 6.3 Problem: Distribution (message, spool file, save file) not sent.

# SNADS over TCP/IP

## 5.3. Sending and Receiving Files

SNADS can be used to send files between systems. This includes not just data or source files, but also save files which can package entire libraries to be distributed.

For example, say you want to send the contents of a library called WRKLIB.

On the command line, type

    CRTSAVF PACKAGE

Press <Enter>.

On the command line, type

    SAVOBJ WRKLIB/*ALL *SAVF(PACKAGE)

Press <Enter>.

When the save operation has completed, on the command line, type

    SNDNETF PACKAGE

Press <F4>. You will see:

```
                    Send Network File (SNDNETF)

Type choices, press Enter.

File . . . . . . . . . . . . .   PACKAGE      Name
  Library  . . . . . . . . . .     *LIBL      Name, *LIBL, *CURLIB
User ID:
  User ID  . . . . . . . . . .   RECEIVER     Character value
  Address  . . . . . . . . . .     TARGET     Character value
              + for more values
Member . . . . . . . . . . . .   *FIRST       Name, *FIRST
```

**Figure 22. Send Network File**

In File, enter PACKAGE.

In User ID, enter the recepient's username.

In Address, enter *target*.

Press <Enter>.

When the file arrives on the target system, a notification message is sent to both the sender and receiver. If the distribution fails, only the sender will receive a message. For troubleshooting this error, see Section 6.3 Problem: Distribution (message, spool file, save file) not sent.

To receive the distribution, you must first create an empty save file.

On the command line, type

    CRTSAVF PACKAGE

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Press <Enter>.

On the command line, type

    WRKNETF

Press <Enter>. You will see something like this:

```
                    Work with Network Files

User . . . . . . . . . . . . :      RECEIVER
User ID/Address  . . . . . . :      RECEIVER  TARGET


Type options, press Enter.
  1=Receive network file   3=Submit job   4=Delete network file
  5=Display physical file member

                          File    -------From-------  ----Arrival----
Opt  File        Member   Number User ID  Address     Date      Time
 1   PACKAGE     *FIRST      1    SENDER   SOURCE      12/25/04  00:01
```

**Figure 23. Work with Network Files**

This will list all file distributions you have been sent. Put a 1 next to the PACKAGE file. Press <Enter>. You will see:

```
                 Receive Network File (RCVNETF)

 Type choices, press Enter.

 From file  . . . . . . . . . .    PACKAGE        Character value
 To file  . . . . . . . . . . .    PACKAGE        Name, *FROMFILE
   Library  . . . . . . . . . .     *LIBL         Name, *LIBL, *CURLIB
 Member to be received  . . . . .  *ONLY          Character value, *ONLY
 To member  . . . . . . . . . .    *FROMMBR       Name, *FROMMBR, *FIRST
```

**Figure 24. Receive Network File**

In To file, enter PACKAGE. Enter the library if necessary. Press <Enter>.

On the command line, type

    RSTOBJ *ALL *SAVF(PACKAGE) RSTLIB(WRKLIB)

Press <Enter>.

Once the restore operation has completed, you will have a full copy of the WRKLIB library with all the objects in it.

# 6. Troubleshooting

## 6.1. Problem: You cannot do pass-through

### 6.1.1. Review setup

Most SNADS problems are due to configuration errors. Review Section 4. Setup.

### 6.1.2. Make sure the APPC device was created

The most likely cause of the APPC device not being created is that QAUTOCFG is *OFF. If you must create the device manually, on the command line, type

    CRTDEVAPPC

Press <ENTER>. You will see:

```
                Create Device Desc (APPC) (CRTDEVAPPC)

Type choices, press Enter.

Device description . . . . . . .   TARGET        Name
Remote location  . . . . . . . .   TARGET        Name
Online at IPL  . . . . . . . . .   *YES          *YES, *NO
Local location . . . . . . . . .   *NETATR       Name, *NETATR
Remote network identifier  . . .   tgtnetid      Name, *NETATR, *NONE
Attached controller  . . . . . .   TARGET        Name
Mode . . . . . . . . . . . . . .   *NETATR       Name, *NETATR
              + for more values
```

**Figure 25. Manually creating an APPC device**

In Device description, enter *target.*

In Remote location, enter *target.*

In Remote network identifier, enter *tgtnetid*

In Device description, enter *target.*

Press <ENTER>.

Make the device available. On the command line type,

    VRYCFG *target* *DEV STATUS(*ON)

Press <Enter>.

### 6.1.3. Route not found.

If STRPASTHR fails with a "Route not found" message, check the routing. The DSPAPPNINF command will show valid routing information.

## 6.2. Problem: You receive a "User not authorized" message

Add the user to the system distribution directory. See 4.6.1 Add Local User(s) to the Distribution Directory.

## 6.3. Problem: Distribution (message, spool file, save file) not sent.

Follow the steps below to make sure all the SNA components are active.

### 6.3.1. Make sure SNADS is running

Use WRKACTJOB to view active jobs on the system.

You should see the subsystem QSNADS as *ACTIVE. If it is not, on the command line type,

   STRSBS QSNADS

Press <Enter>.

### 6.3.2. Make sure MSF is running

After OS/400 V4.5, SNADS uses the Mail Server Function for its distributions.

Use WRKACTJOB to view active jobs on the system. You should see the subsystem QSYSWRK as *ACTIVE. If it is not, on the command line type,

   STRSBS QSYSWRK

Press <Enter>.

Once QSYSWRK is active, you should see the MSF job under it as *ACTIVE. If it is not, on the command line type

   STRMSF

Press <Enter>.

Note: The MSF job should automatically start with QSYSWRK. If it does not, check the configuration of the IP host servers. See the *TCP/IP Configuration and Reference* for more information (listed in Section 8.1 IBM resources).

### 6.3.3. Make sure ANYNET is active

Use WRKACTJOB to view active jobs on the system. Under the subsystem QSYSWRK, you should see at least one QAPPCTCP job as *ACTIVE.

Vary on the APPC controller.

On the command line type,

   NETSTAT *CNN

Press <Enter>.

There should be two ports named APPCove, one with a status of *UDP, the other with LISTEN.

### 6.3.4. Check Distribution queues

Make sure the distribution queue is released. On the command line, type

   WRKDSTQ

Press <Enter>.

Find the distribution queue assigned to the target system. Its status should be "Released", or "Active". If it is "Held", put a 6 next to it and press <Enter>.

### 6.3.5.  Check the APPC device

Make sure the APPC device and its controller are available. On the command line, type

WRKCFGSTS *DEV *APPC

Press <Enter>.

Find the device attached to the distribution queue.

It should be VARY ON PENDING. If it is VARIED OFF, put a 1 next to it to vary it on, and press <Enter>.

### 6.3.6.  Check Disk Storage

If the disk storage is filled over the threshhold (typically 90%), SNADS will not function.

## 6.4. Configuration issues

If you find you need to make changes to the configuration, end and restart QSNADS to make sure they take effect. On the command line type

ENDSBS QSNADS

Press <Enter>. Once the subsystem has ended, on the command line type

STRSBS QSNADS

Press <Enter>.

## 6.5. Cannot send distributions through firewall

If you are trying to send distributions through a firewall, check with your Network administrator to make sure that port 397 is open. This port is used by  the Anynet service, APPCoverTCP.

## 6.6. General Troubleshooting

All SNA distributions are logged in the QSNADS journal, or distribution services log. To view it, on the command line type

DSPDSTLOG

Press <Enter>.

The log entries will help you find the point of failure.

The most common causes of problem are configuration errors, QSNADS or MSF not running, or ASP threshhold.

## 7. Glossary

| | |
|---|---|
| APPC | Advanced Program to Program Communications |
| APPN | Advanced Peer to Peer Networking |
| Control point | Combined with the Network ID, identifies the system as a unique host on the network. Typically the same as the system name. |
| LU Name | Logical Unit Name. A unique identifier on an APPN network |
| LU 6.2 | Logical Unit Type 6 Revision 2. Any device that can support APPC, from a PC to a mainframe. |
| Mode | Communications mode for APPC devices. Typically "BLANK". |
| Network ID | Network name used to group systems. Typically "APPN". |
| SNA | Systems Network Architecture |
| SNADS | Systems Network Architecture Distribution System |
| Spool file | File streamed or spooled to an output queue, where it may be served by a printer. |

# 8. Resources

## 8.1. IBM resources

- On-line resources

    IBM eServer iSeries Support: Software Knowledge Base

    <http://www-912.ibm.com/s_dir/slkbase.nsf/>

    A searchable, indexed database of articles about technical issues for the AS/400. (iSeries is the current official name for the AS/400.)

- Manuals

    All manuals are available on-line at the AS/400 Online Library.

    <http://publib.boulder.ibm.com/pubs/html/as400/online/homeeng1.htm>

    These document the older APPN network protocol, which supports SNADS.

    *APPN Support V4R2.* 1998. Rochester, MN: IBM.

    *OS/400 APPC Programming Manual V4R1*. 1997. Rochester, MN: IBM.

    *OS/400 Communications Configuration V4R1*. 1997. Rochester, MN: IBM.

    This documents TCP/IP, but does not address APPN or SNA

    *OS/400 TCP/IP Configuration and Reference*. 1997. Rochester, MN: IBM.

    This documents SNADS, but assumes you have APPN working and does not address TCP/IP.

    *OS/400 SNA Distribution Services V4R4*. 1999. Rochester, MN: IBM.

- Redbooks

    The "Redbooks" are case studies published in red covers. The two listed below examine running SNA over TCP/IP in more detail.

    All Redbooks are available on-line at the AS/400 Online Library.

    <http://publib.boulder.ibm.com/pubs/html/as400/online/homeeng1.htm>

    Buzcak, Jerzy, Karl Wozabal, Antonio Luca, Castrichella, Heikki Lehikoinen, Maria Christina Madureira, and Tsutomu Masaoka. *SNA and TCP/IP Integration*. 1999. Research Triangle Park, NC: IBM International Technical Support Organization.

    Byrd, John. *Anynet: SNA over TCP/IP Installation and Interoperability*. 1995. Research Triangle Park, NC: IBM International Technical Support Organization.

## 8.2. User Groups

Midrange-L

<http://www.midrange.com/lists>

A mailing list focussed on the AS/400. The posters' experience is invaluable. Some of the regulars work for IBM, or are long-standing experts. Searchable list archives are at <http://archive.midrange.com/midrange-l/index.htm>.

comp.sys.ibm.as400.misc

AS/400 newsgroup. Though less active than Midrange-L, this is another source of information.

## 8.3. Other services

www.timeshare400.com

Provides shared access over the Internet to a current model AS/400 for development.

## 9. Where to send feedback

Comments, questions, and corrections are welcomed. You may contact me via email at Pam_Phillips@comcast.net, or visit my homepage at Pam_Phillips.home.comcast.net.