IPv6/VSE
IPv4

Users Guide

Current Build

Table of Contents

Preface

About this Publication

This is the **IPv6/VSE IPv4 Users Guide**. The manual will introduce you to the various IPv6/VSE applications and provide you with the information necessary to use these applications.

Trademarks

The following are lists of the trademark and products referenced in this manual. Symbols for trademarks and registered trademarks do not appear in subsequent references.

Barnard Software, Inc.

IPv6/VSE is a registered trademark of Barnard Software, Inc.
IPv6/VSE is a registered trademark of Barnard Software, Inc.

International Business Machines Corporation

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at **www.ibm.com/legal/copytrade.shtml**.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.
Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.
UNIX is a registered trademark of The Open Group in the United States and other countries.

Copyrights

This software and documentation is covered by the following copyright:

Technical Support

IBM Customers

IBM IPv6/VSE customers should contact IBM for support.

BSI Customers

Technical Support is available from Barnard Software, Inc. by phone, mail or email:

Barnard Software, Inc.
806 Silk Oak Terrace
Lake Mary, FL 32746

Phone: 1-407-323-4773

Support: bsiopti@bsiopti.com

Sales: bsisales@bsiopti.com

Support is available from 9:00 a.m. through 5:00 p.m. EST, Monday through Friday.

If a TSR (Technical Support Representative) is not available at the time of your call, please leave a message and a TSR will return your call as soon as possible. Please provide the following information: name, company, phone number, product name, product release level, and a short description of the problem.

BSIUsers Announcement List Server

When new releases of IPv6/VSE are available BSI will post an announcement on its BSIUsers announcement list.

To subscribe to the BSIUsers announcement list send an email to this email address

BSIUsers-subscribe@yahoogroups.com

To unsubscribe to the BSIUsers announcement list send an email to this email address

BSIUsers-unsubscribe@yahoogroups.com

Problem Determination

If you have a problem using a IPv6/VSE application always check the SYSLST output for additional information and messages. Most messages are written to SYSLST and not to the VSE/ESA system console.

When contacting BSI for technical support always have the applications JCL/commands, console and SYSLST output available for problem determination. The SYSLST output is very important.

While a IPv6/VSE application is running, you can issue the **AR CANCEL XX,PARTDUMP** command to terminate IPv6/VSE application and dump the partition to SYSLST. Using the VSE/POWER Flush (F) command cancels the IPv6/VSE application partition without a dump.

If the IPv6/VSE application partition stops responding to its console interface, use the **AR DUMP XX** command to obtain a dump of the partition.

Chapter 1

Commands

All commands must be in upper case and start in column one (1). Parameters specified by the command may be in upper or lower case as needed. Parameters for the FTP client USER and PASS commands are commonly specified in lower case. Any command with an asterisk (*) on column one is treated as a comment.

ASA

```
ASA ON|OFF
```

The ASA command is used with ASCII (TYPE A) transfers to/from the VSE/POWER LST Queue. This command enables (ON) or disables (OFF) setting/adding the ASA carriage control character as the first character of each print line. The default is ON.

APPLID

```
APPLID xxxxxxxx
```

The APPLID command is used with the TN3270E server to create an application task. Once this command is issued any OPEN done to a VTAM ACB the specifies this applid will be intercepted and processed by the TN3270E server.

ATTACH

```
ATTACH TN3270E
```

The ATTACH command is used with the TN3270E server to attach and activate the TN3270E server task. The TN3270E server task is a multi-threaded communication processing task than handles the communication with TN3270(E) clients and CICS. This should be the last command in the TN3270E server startup command list.

BLKSZ

```
BLKSZ nnnnn
```

The BLKSZ command is used by the FTP Client to tell the FTP Server the block size of the file about to be transferred from the FTP Client to the FTP Server. This command is issued via the SITE command.

COMPANY

```
COMPANY company-name
```

The COMPANY command identifies the name of the company holding the license to the product. The company name specified in this command is passed to the LICENSE command during verification code processing.

CPUID

```
CPUID nnnnnn MODEL nnnn
```

The CPUID command identifies the CPU serial number and model number. The serial number must be six (6) digits and the model number must be four (4) digits in length. The CPU serial number and model number specified in this command is passed to the LICENSE command during verification code processing.

Note: When running under PR/SM or VM, only the low order five (5) digits of the six (6) digit CPU serial number are actually used by verification code processing routines. However, all six (6) digits must be correctly specified on the CPUID command statement.

The CPUID command must be present in the startup commands if the letter C is included in the feature codes contained on the LICENSE command provided by Barnard Software, Inc. After is running, you can reissue the CPUID command through the console interface, if necessary.

CRLF

```
CRLF ON|OFF
```

The CRLF command is used with ASCII (TYPE A) transfers. This command, combined with the NL command, determines if a <CRLF>, <NL> or no characters mark end-of-line. The default is CRLF ON, NL OFF. Setting CRLF OFF and NL OFF results in no end-of-line characters. Setting CRLF ON and NL ON is invalid and will cause data transfer errors.

DBCS

```
DBCS name EBCDIC 300 ASCII 301
```

The DBCS command is used by the FTP client and FTP server to identify the name of the Double Byte Character Set translation table to be used. There is no default table. This command is issued to the FTP server using a SITE command.

```
Table EBDCIC ASCII
JAPAN     300    301  941 941C
CHINA 835    837  927  947 1380 1385 4933
KOREA 834    951 1362 4930
```

FNO

```
FNO value
```

The FNO command is used as a SITE command to the FTP server to set the VSE/POWER form value. The default is spaces.

GZIP

```
GZIP ON|OFF
```

The GZIP command in the batch FTP client (BSTTFTPC) and FTP server (BSTTFTPS) has been dropped. Please use the batch GZIP utility instead (BSTTGZIP).

HTML

```
HTML ON|OFF
```

The HTML command is used to indicate the library transfer should use a special variable length string mode for storing HTML data in a library member. This command is used by the FTP Client to inform the BSI FTP Server that this special mode is ON or OFF. The default is OFF. When using the BSI batch FTP Client refer to the EXIT BSTTPLAM section.

IBM

```
IBM ON|OFF
```

The IBM command is used by the BSTTLPRC to indicate IBM mode. IBM mode passes variable length BINARY (EBCDIC) records of the format llllccddddddddd… to the LPD. The default is IBM OFF. This command should be specified before the INPUT command.

IBMRDW

```
IBMRDW ON|OFF
```

The IBMRDW command enables or disables IBM format Record Descriptor Words. This command causes the FTP client or FTP server to add a fullword record length before each record. This mode is useful when transferring BINARY records from one VSE system to another. It is similar to STRUcture Record mode. The fullword record length is actually a halfword length of the record plus 4 bytes for the RDW followed by a halfword of zeroes.

ID

```
ID nn
```

The ID command identifies the TCP/IP partition to be used during socket processing. The default is 00. The ID command must specify a two digit decimal number. This must be the first command read from SYSIPT and must be placed before any OPEN commands.

INPUT

```
INPUT NULL
INPUT POWER queue name number class userid password segment
INPUT LIBRARY lib sublib member type mode DATA
INPUT VSAM dlbl
INPUT XRDS dlbl
INPUT SLT tlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB|VB option
INPUT NLT tlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB|VB option
INPUT SAM dlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB|VB
INPUT SAM dlbl EPIC
INPUT EXIT phase
INPUT EXIT BSTTPZIO
INPUT EXIT BSTTVTIO
INPUT SYSIPT
```

The INPUT command is used to inform the FTP client of the location and access method to be used to access the data to be stored on the FTP server. Examples of each type of INPUT are available in the Examples chapter.

Keyword	Description
queue	VSE/POWER Queue Id (RDR, LST, PUN)
name	VSE/POWER Queue Member Name
number	VSE/POWER Queue Member Number (or zero)
class	VSE/POWER Queue Class
userid	VSE/POWER Queue Userid
password	VSE/POWER Queue Password
lib	VSE Library Name
sublib	VSE Sublibrary Name
member	VSE Library Member Name
type	VSE Library Member Type
mode	VSE Library Access Mode (Fixed or String)
option	UNLOAD (default), NOREW, REWIND
segment	VSE/Power segment number
DATA	Literal present indicates .PROC SYSIPT data
phase	Phase Name of the User Exit Program

JSEP

```
JSEP ON|OFF
```

The JSEP command is used to tell the BSTTFTPC, BSTTMPTC BSTTLPRC programs to use VSE/POWER separators. This command must precede the INPUT/OUTPUT command to be effective. JSEP OFF is the default.

KILL

```
KILL luname
```

The KILL command is used to terminate a TN3270E session. The KILL command will simulate a lost connection condition releasing both the VTAM session connection and the TCP/IP TN3270E connection with the TN3270E client.

LICENSE

```
LICENSE IPv6/VSE A expdate vcode
```

The LICENSE command's parameters are combined with the COMPANY command's parameters to validate the verification code. If an error is detected in processing, an error message is issued and the product continues to initialize. However, unless the verification code is validated, IPv6/VSE or IPv6/VSE cannot be enabled by the IPv6/VSE ENABLE command.

Enter the product expiration date in the expdate field in full-year Julian format (for example, 1994365). IPv6/VSE and IPv6/VSE begin issuing messages warning of product expiration 45 days prior to actual expiration date.

Enter the verification code in the vcode field as seven numeric digits (for example, 1234567).

LINES

```
LINES nn
```

The LINES command is used to tell the ASA conversion of VSE/POWER LST data where to automatically insert ASA Channel 1 skips. The default is 0 (disabled).

LF

```
LF ON | OFF

LF ON is equivalent to:
CRLF OFF
NL ON
TRANSLATE ASCII 10 21
TRANSLATE EBCDIC 21 10

LF OFF is equivalent to:
CRLF ON
NL OFF
TRANSLATE ASCII 10 37
TRANSLATE EBCDIC 21 133
```

The LF command is used to enable (ON) or disable UNIX LineFeed mode in the FTP client and server.

LOOKUP

```
LOOKUP ON | OFF
```

The LOOKUP ON | OFF command enables or disables the dynamic DNS lookup for the network names of DIRECT and LPR printers session in BSTTVNET. The default is OFF.

LSTRU

```
LSTRU R|F
```

The LSTRU command tells the FTP client to operate locally in STRUcture Record (STRU R) or STRUcture File (STRU F) mode. STRU R mode is useful when transferring BINARY record from one VSE system to another.

LMODE

```
LMODE STRING
LMODE FIXED
```

The LMODE command tells the FTP server that the I/O mode is STRING or FIXED. The default I/O mode is the same mode as the existing member. This command is used to specify a mode for new members.

METER

```
METER nnn
```

The METER command specifies the maximum transfer rate for the BSTTFTPS FTP server. The default is 0 (METER disabled).**MPWD**

```
MPWD xxxxxxxx
```

The MPWD command defines the VSE/POWER Master Password to the FTP Client and Server.

NL

```
NL ON|OFF
```

The NL command is used with ASCII (TYPE A) transfers. This command, combined with the CRLF command, determines if a <CRLF>, <NL> or no characters mark end-of-line. The default is CRLF ON, NL OFF. Setting CRLF OFF and NL OFF results in no end-of-line characters. Setting CRLF ON and NL ON is invalid and will cause data transfer errors.

NOPASV

```
NOPASV
```

Passive FTP transfers became the default in Build 249. Usually this is better than using active transfers due to firewall issues. The NOPASV command disables the automatic use of PASV (passive) transfers.

OPEN

```
OPEN ipaddr|name port
```

The OPEN command opens a connection on the specified host on the specified port. The IP address can be specified in standard dotted decimal notation or can be specified as a character name. If a name is specified, the name will be used in a GETHOSTBYNAME call to TCP/IP. The name specified must be defined to TCP/IP using the HOST command (or, if you are using the CSI/IBM TCP/IP for VSE product, the DEFINE NAME,NAME=name,IPADDR=ipaddr command. The default port address for FTP is 21. The default port address for SNTP is 123.

OUTPUT

```
OUTPUT NULL
OUTPUT POWER queue name number class disp form dest
OUTPUT LIBRARY lib sublib member type mode
OUTPUT KSDS dlbl RECSZ nnnnn NORESET|* password KEYOS nnnn
OUTPUT ESDS dlbl RECSZ nnnnn NORESET|* password|* V
OUTPUT XRDS dlbl RECSZ nnnnn NORESET|* password|*
OUTPUT SLT tlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB|VB
OUTPUT NLT tlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB|VB
OUTPUT SAM dlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB|VB
OUTPUT EXIT phase
OUTPUT EXIT BSTTPZIO srclib.sublib phase.PHASE dstlib.sublib
OUTPUT EXIT BSTTVTIO
OUTPUT SYSLST
OUTPUT SYSPCH
```

The OUTPUT command is used to inform the FTP client of the location and access method to be used to access the data to be retrieved from the FTP server. Examples of each type of OUTPUT are available in the Examples chapter.

Keyword	Description
queue	VSE/POWER Queue Id (RDR, LST, PUN)
name	VSE/POWER Queue Member Name
number	VSE/POWER Queue Member Number (or zero)
class	VSE/POWER Queue Class
tlbl	VSE TLBL Name
dlbl	VSE DLBL Name
NORESET	Do not reset VSAM cluster
disp	VSE/POWER Disposition
dest	VSE/POWER Destination Node Name
form	VSE/POWER Form Id
lib	VSE Library Name
sublib	VSE Sublibrary Name
member	VSE Library Member Name
type	VSE Library Member Type
mode	VSE Library Access Mode (Fixed or String)
Password	The password for the VSAM file
phase	Phase Name of the User Exit Program

KEYOS	KSDS Key OffSet (used with NORESET to delete existing records when new records are loaded into a file)
V	Variable length

PAD

```
PAD ON | OFF
```

The PAD command is used to enable or disable padding of output data records. Variable length ASCII input records can be padded to fixed length using this command. The PAD command can be used in the BSTTFTPC (Batch FTP) and as a SITE command with the BSTTFTPS (FTP server).

PADCHAR

```
PADCHAR nnn
```

The PADCHAR command is used to define the pad character value. This value is specified as a decimal number. PADCHAR 64 would define a pad character of a space.

PEOJ

```
PEOJ nn
```

The PEOJ command is used to indicate the Printer End-Of-Job status. The default is 10 second delay.

QUERY

```
QUERY *
QUERY luname
```

The QUERY command is used to check the status of a TN3270E server resource. QUERY * will display information about all active TN3270E connections. QUERY *luname* will display information about the specified TN3270E connection.

PROGRESS

```
PROGRESS
```

The PROGRESS command is used to check on the progress of an Batch FTP Client transfer. This command can only be used via the console interface. Use the command by entering ‘MSG xx,DATA=PROGRESS’. The output of this command will show the number of bytes transferred, transfer duration and transfer rate.

RDW

```
RDW ON|OFF
```

The RDW command enables or disables Record Descriptor Words. This command causes the FTP client or FTP server to

add a halfword record length before each record. This mode is useful when transferring BINARY records from one VSE system to another. It is similar to STRUcture Record mode.

RECSZ

```
RECSZ nnnnn
```

The RECSZ command is used by the FTP Client to tell the FTP Server the record size of the file about to be transferred from the FTP Client to the FTP Server. This command is issued via the SITE command.

REACTIVATE

```
REACTIVATE luname
REACT luname
INACT luname
```

The REACTIVATE command is used to tell the BSTTVNET TN3270E server to activate or re-activate lost VTAM logical units. The name of the logical unit is *luname*. The INACT version of this command inactivates an luname within the TN3270E server. The inactivated luname is no longer available for use. The REACT command must be used to reactivate the luname.

RESET

```
RESET ON|OFF
```

The RESET command is used by the FTP client to tell the FTP server to reset the VSAM file about to be transferred. The default is ON.

SBCS

```
SBCS name
```

The SBCS command is used by the FTP client and FTP server to identify the name of the Single Byte Character Set translation table to be used. The default table is US_ENG_03. This command is issued to the FTP server using a SITE command.

```
US_ENG_01  - US English          EBCDIC  037 ASCII  437
US_ENG_02  - US English          EBCDIC  037 ASCII  850
US_ENG_03  - US English          EBCDIC  037 ASCII 1252
UK_ENG_01  - UK English          EBCDIC  285 ASCII  437
UK_ENG_02  - UK English          EBCDIC  285 ASCII  850
UK_ENG_03  - UK English          EBCDIC  285 ASCII 1252
GERMAN_01  - Germany/Austria     EBCDIC  273 ASCII  437
GERMAN_02  - Germany/Austria     EBCDIC  273 ASCII  850
GERMAN_03  - Germany/Austria     EBCDIC  273 ASCII 1252
FRANCE_01  - France              EBCDIC  297 ASCII  437
FRANCE_02  - France              EBCDIC  297 ASCII  850
FRANCE_03  - France              EBCDIC  297 ASCII 1252
ITALY_01   - Italy               EBCDIC  280 ASCII  437
ITALY_02   - Italy               EBCDIC  280 ASCII  850
SPAIN_01   - Spain/Latin America EBCDIC  284 ASCII  437
SPAIN_02   - Spain/Latin America EBCDIC  284 ASCII  850
SPAIN_03   - Spain/Latin America EBCDIC  284 ASCII 1252
DN_01      - Denmark/Norway      EBCDIC  277 ASCII  437
DN_02      - Denmark/Norway      EBCDIC  277 ASCII  850
DN_03      - Denmark/Norway      EBCDIC  277 ASCII 1252
FS_01      - Finland/Sweden      EBCDIC  278 ASCII  437
FS_02      - Finland/Sweden      EBCDIC  278 ASCII  850
FS_03      - Finland/Sweden      EBCDIC  278 ASCII 1252
BELGIUM_01 - Multilingual        EBCDIC  500 ASCII  437
INTER_01   - Multilingual        EBCDIC  500 ASCII  850
INTER_02   - Multilingual        EBCDIC  500 ASCII 1252
OS_01      - Multilingual        EBCDIC 1047 ASCII 1252
OS_02      - Multilingual        EBCDIC 1047 ASCII 1252
OS_03      - Multilingual        EBCDIC 1047 ASCII  437
OS_04      - Multilingual        EBCDIC 1047 ASCII  437
OS_05      - Multilingual        EBCDIC 1047 ASCII  850
```

SETIME

```
SETIME
```

The SETIME command instructs the BSTTNTPC SNTP client application to issue the VSE/ESA TIME command to set the date and time on the system. We recommend that time features only be used just prior to a system shutdown and re-ipl. It is possible to set the system date and time earlier than the current date and time. This command is effect only for z/VSE images running with a single processor in basic or LPAR mode. Running under z/VM or in MP mode the command is not supported.

SITE

```
SITE INPUT …
SITE OUTPUT …
```

The SITE command is used by an FTP Client to pass an INPUT or OUTPUT command to the FTP Server. When using the MS-DOS FTP Client you can issue SITE commands by using the QUOTE command.

SMNT

```
SMNT LIBRARY lib
SMNT POWER
SMNT VSAM catalog.name
SMNT SAM
SMTN NULL
```

The SMNT (Structure Mount) command is used by the FTP Client to tell the FTP Server to mount a file system. The Librarian, VSE/POWER and VSAM file systems are currently supported. Once mounted the FTP Client can browse the directories of these file systems. The SMNT command can also be issue as a SITE command 'SITE SMNT …'.

SOSI

```
SOSI NONE
SOSI KEEP
SOSI XLATE
SOSI CONVERT
SOSI BLANK
```

The SOSI command specifies how to handle DBCS Shift-In (SI) and Shift-Out (SO) characters. The SOSI command is passed to the FTP server as a SITE command.

SOSI CONVERT
This specification (the default) indicates that the data stream will be
converted and that SO/SI characters will be added or removed as appropriate.

SOSI KEEP
SO/SI characters will be retained as place-holders in the ASCII stream.

SOSI XLATE
SO/SI characters will be retained as place-holders in the ASCII stream but will be translated to their ASCII equivalents.

SOSI BLANK
SO/SI characters will be retained as place holders in the ASCII

stream but will be translated to ASCII spaces.

SOSI NONE
No SO/SI characters are expected. Instead the complete data stream is expected to be pure DBCS only.

STATS

```
STATS *
STATS luname
```

The STATS command is used to check the statistics of a TN3270E server resource. STATS * will display information about all active TN3270E connections. STATS *luname* will display information about the specified TN3270E connection.

STATUS

```
STATUS
```

The STATUS command of the BSTTFTPS FTP Server is used to display current session activity. The name, status, userid and IP-address of each connected user is shown.

IPv6/VSE

```
IPv6/VSE ENABLE
```

The IPv6/VSE command enables processing. This command must be the last command in the BSTTPARM.A member.

TIMEOUT

```
TIMEOUT nnn
```

The TIMEOUT command specifies the FTP server and TN3270E server inactivity timeout value. The default is 0 seconds. Specify a value of 0 (zero) to disable the inactivity timeout feature. If a value is specified it should not be less than 180 seconds (3 minutes).

TITLE

```
TITLE string
```

The TITLE command specifies a title string for the TN3270E server menu. This command is used the by the BSTTVNET TN3270E server application.

TERMINATE

```
TERMINATE
```

The TERMINATE command terminates processing. This command can be issued at anytime during the transfer process and the application will terminate its processing and go to end-of-job. If an FTP client transfer hangs you can use this command to terminate the job.

TRANSLATE

```
TRANSLATE ASCII xxx yyy
TRANSLATE EBCDIC xxx yyy
```

The TRANSLATE command is used to modify the default ASCII to EBCDIC or ECBDIC to ASCII translate table. The TRANSLATE ASCII command translates an ASCII decimal xxx to EBCDIC decimal yyy. The TRANSLATE EBCDIC command translates an EBCDIC decimal xxx to ASCII decimal yyy. xxx and yyy must be specified in decimal and in the range 0 to 255.

TRCMD

```
TRCMD ON|OFF
```

The TRCMD command is used to tell the FTP client or server to translate ASA printer control code to ASCII. This allows better viewing of VSE/POWER LST output by word processors.

UINF

```
UINF <string>
```

The UINF command is used to tell the FTP server the information to use in the VSE/POWER user information field. This is the same as specifying USER='sting' on an * $$ JOB/* $$ LST/* $$ PUN card. This is specified as an FTP server site command. Embedded blanks in the string must be specified as a plus (+) sign.

Chapter 2

FTP COMMANDS

ACCESS CONTROL COMMANDS

The following commands specify access control identifiers (command codes are shown in parentheses).

USER NAME (USER)

The argument field is a Telnet string identifying the user. The user identification is that which is required by the server for access to its file system. This command will normally be the first command transmitted by the user after the control connections are made (some servers may require this). Additional identification information in the form of a password and/or an account command may also be required by some servers.

PASSWORD (PASS)

The argument field is a Telnet string specifying the user's password. This command must be immediately preceded by the user name command, and, for some sites, completes the user's identification for access control.

ACCOUNT (ACCT)

The argument field is a Telnet string identifying the user's account. The command is not necessarily related to the USER command, as some sites may require an account for login and others only for specific access, such as storing files. In the latter case the command may arrive at any time.

CHANGE WORKING DIRECTORY (CWD)

This command allows the user to work with a different directory or dataset for file storage or retrieval without altering his login or accounting information. Transfer parameters are similarly unchanged. The argument is a pathname specifying a directory or other system dependent file group designator.

CHANGE TO PARENT DIRECTORY (CDUP)

This command is a special case of CWD, and is included to simplify the implementation of programs for transferring directory trees between operating systems having different syntaxes for naming the parent directory.

STRUCTURE MOUNT (SMNT)

This command allows the user to mount a different file system data structure without altering his login or accounting information. Transfer parameters are similarly unchanged. The argument is a pathname specifying a directory or other system dependent file group designator.

REINITIALIZE (REIN)

This command terminates a USER, flushing all I/O and account information, except to allow any transfer in progress to be completed. All parameters are reset to the default settings and the control connection is left open. This is identical to the state in which a user finds himself immediately after the control connection is opened. A USER command may be expected to follow.

LOGOUT (QUIT)

This command terminates a USER and if file transfer is not in progress, the server closes the control connection. If file transfer is in progress, the connection will remain open for result response and the server will then close it. If the user-process is transferring files for several USERs but does not wish to close and then reopen connections for each, then the REIN command should be used instead of QUIT.

TRANSFER PARAMETER COMMANDS

All data transfer parameters have default values, and the commands specifying data transfer parameters are required only if the default parameter values are to be changed. The default value is the last specified value, or if no value has been specified, the standard default value is as stated here. This implies that the server must "remember" the applicable default values. The commands may be in any order except that they must precede the FTP service request. The following commands specify data transfer parameters:

DATA PORT (PORT)

The argument is a HOST-PORT specification for the data port to be used in data connection. There are defaults for both the user and server data ports, and under normal circumstances this command and its reply are not needed. If this command is used, the argument is the concatenation of a 32-bit internet host address and a 16-bit TCP port address. This address information is broken into 8-bit fields and the value of each field is transmitted as a decimal number (in character string representation). The fields are separated by commas. A port command would be: PORT h1,h2,h3,h4,p1,p2 where h1 is the high order 8 bits of the internet host address.

PASSIVE (PASV)

This command requests the server-DTP to "listen" on a data port (which is not its default data port) and to wait for a connection rather than initiate one upon receipt of a transfer command. The response to this command includes the host and port address this server is listening on.

REPRESENTATION TYPE (TYPE)

The argument specifies the representation type. The parameter is denoted by a single Telnet character.

- `A - ASCII (Default)`
- `E - EBCDIC`
- `I - IMAGE (Binary)`

FILE STRUCTURE (STRU)

The argument is a single Telnet character code specifying file structure described in the Section on Data Representation and Storage. The following codes are assigned for structure:

- `F - File (no record structure) (Default)`
- `R - Record structure`
- `P - Page structure`

TRANSFER MODE (MODE)

The argument is a single Telnet character code specifying the data transfer mode. The following codes are assigned for transfer modes:

- `S - Stream (Default)`
- `B - Block`
- `C - Compressed`

FTP SERVICE COMMANDS

The FTP service commands define the file transfer or the file system function requested by the user. The argument of an FTP service command will normally be a pathname. The syntax of pathnames must conform to server site conventions (with standard defaults applicable), and the language conventions of the control connection. The suggested default handling is to use the last specified device, directory or file name, or the standard default defined for local users. The commands may be in any order except that a "rename from" command must be followed by a "rename to" command and the restart command must be followed by the interrupted service command (e.g., STOR or RETR). The data, when transferred in response to FTP service commands, shall always be sent over the data connection, except for certain informative replies. The following commands specify FTP service requests:

RETRIEVE (RETR)

This command causes the server-DTP to transfer a copy of the file, specified in the pathname, to the server- or user-DTP at the other end of the data connection. The status and contents of the file at the server site shall be unaffected.

STORE (STOR)

This command causes the server-DTP to accept the data transferred via the data connection and to store the data as a file at the server site. If the file specified in the pathname exists at the server site, then its contents shall be replaced by the data being transferred. A new file is created at the server site if the file specified in the pathname does not already exist.

STORE UNIQUE (STOU)

This command behaves like STOR except that the resultant file is to be created in the current directory under a name unique to that directory. The 250 Transfer Started response must include the name generated.

APPEND (with create) (APPE)

This command causes the server-DTP to accept the data transferred via the data connection and to store the data in a file at the server site. If the file specified in the pathname exists at the server site, then the data shall be appended to that file; otherwise the file specified in the pathname shall be created at the server site.

ALLOCATE (ALLO)

This command may be required by some servers to reserve sufficient storage to accommodate the new file to be transferred. The argument shall be a decimal integer representing the number of bytes (using the logical byte size) of storage to be reserved for the file. For files sent with record or page structure a maximum record or page size (in logical bytes) might also be necessary; this is indicated by a decimal integer in a second argument field of the command. This second argument is optional, but when present should be separated from the first by the three Telnet characters <SP> R <SP>. This command shall be followed by a STORe or APPEnd command. The ALLO command should be treated as a NOOP (no operation) by those servers which do not require that the maximum size of the file be declared beforehand, and those servers interested in only the maximum record or page size should accept a dummy value in the first argument and ignore it.

RESTART (REST)

The argument field represents the server marker at which file transfer is to be restarted. This command does not cause file transfer but skips over the file to the specified data checkpoint. This command shall be immediately followed by the appropriate FTP service command which shall cause file transfer to resume.

RENAME FROM (RNFR)

This command specifies the old pathname of the file which is to be renamed. This command must be immediately followed by a "rename to" command specifying the new file pathname.

RENAME TO (RNTO)

This command specifies the new pathname of the file specified in the immediately preceding "rename from"command. Together the two commands cause a file to be renamed.

ABORT (ABOR)

This command tells the server to abort the previous FTP service command and any associated transfer of data.

DELETE (DELE)

This command causes the file specified in the pathname to be deleted at the server site. If an extra level of protection is desired (such as the query, "Do you really wish to delete?"), it should be provided by the user-FTP process.

REMOVE DIRECTORY (RMD)

This command causes the directory specified in the pathname to be removed as a directory (if the pathname is absolute) or as a subdirectory of the current working directory (if the pathname is relative).

MAKE DIRECTORY (MKD)

This command causes the directory specified in the pathname to be created as a directory (if the pathname is absolute) or as a subdirectory of the current working directory (if the pathname is relative).

PRINT WORKING DIRECTORY (PWD)

This command causes the name of the current working directory to be returned in the reply.

LIST (LIST)

This command causes a list to be sent from the server to the passive DTP. If the pathname specifies a directory or other group of files, the server should transfer a list of files in the specified directory. If the pathname specifies a file then the server should send current information on the file. A null argument implies the user's current working or default directory. The data transfer is over the data connection in type ASCII or type EBCDIC.

NAME LIST (NLST)

This command causes a directory listing to be sent from server to user site. The pathname should specify a directory or other system-specific file group descriptor; a null argument implies the current directory. The server will return a stream of names of files and no other information. The data will be transferred in ASCII or EBCDIC type over the data connection as valid pathname strings separated by <CRLF> or <NL>. (Again the user must ensure that the TYPE is correct.) This command is intended to return information that can be used by a program to further process the files automatically. For

example, in the implementation of a "multiple get" function.

SITE PARAMETERS (SITE)

This command is used by the server to provide services specific to his system that are essential to file transfer but not sufficiently universal to be included as commands in the protocol. The nature of these services and the specification of their syntax can be stated in a reply to the HELP SITE command.

SYSTEM (SYST)

This command is used to find out the type of operating system at the server. The reply shall have as its first word one of the system names listed in the current version of the Assigned Numbers document [4].

STATUS (STAT)

This command shall cause a status response to be sent over the control connection in the form of a reply. The command may be sent during a file transfer (along with the Telnet IP and Synch signals--see the Section on FTP Commands) in which case the server will respond with the status of the operation in progress, or it may be sent between file transfers. In the latter case, the command may have an argument field. If the argument is a pathname, the command is analogous to the "list" command except that data shall be transferred over the control connection. If a partial pathname is given, the server may respond with a list of file names or attributes associated with that specification. If no argument is given, the server should return general status information about the server FTP process. This should include current values of all transfer parameters and the status of connections.

HELP (HELP)

This command shall cause the server to send helpful information regarding its implementation status over the control connection to the user. The command may take an argument (e.g., any command name) and return more specific information as a response. The reply is type 211 or 214. It is suggested that HELP be allowed before entering a USER command. The server may use this reply to specify site-dependent parameters, e.g., in response to HELP SITE.

NOOP (NOOP)

This command does not affect any parameters or previously entered commands. It specifies no action other than that the server send an OK reply.

Chapter 3

Examples of FTP Transfers

Examples of all INPUT and OUTPUT types can be found in this chapter.

ttlib.sublib is the installation library and sublibrary.
iplib.sublib is the TCP/IP library and sublibrary.

Null Transfers

The NULL device is useful for testing and other reasons. When used in the OUTPUT command data is discarded. When used in the INPUT command data consists of 99999 80 byte card images. The first 5 characters of the card image contains the record number.

```
INPUT NULL
OUTPUT NULL
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT NULL
TYPE I
STOR NULFILE.TXT
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT NULL
TYPE I
RETR NULFILE.TXT
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.

BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I NULL     OPENED INPUT  RC=00000000

BSTT010I TYPE I

BSTT033I 200 TYPE set to IMAGE (binary)

BSTT034I TYPE SET TO I

BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4224

BSTT010I PORT 192,9,51,1,16,128

BSTT033I 200 PORT Command OK
```

```
BSTT010I STOR NULFILE.TXT

BSTT033I 150 Opening BINARY mode data connection for NULFILE.TXT.

BSTT018I PORT  4224 OPENED RC=     0

BSTT022I NULL     CLOSED INPUT  RC=00000000

BSTT018I PORT  4224 CLOSED RC=     0

BSTT023I  7812K BYTES IN  55.9 SECONDS. RATE  139K BYTES/SECOND
BSTT033I 226 Transfer complete - file NULFILE.TXT received
successfully
BSTT022I NULL     OPENED OUTPUT RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4225
BSTT010I PORT 192,9,51,1,16,129
BSTT033I 200 PORT Command OK
BSTT010I RETR NULFILE.TXT
BSTT033I 150 Opening BINARY mode data connection for NULFILE.TXT
BSTT018I PORT  4225 OPENED RC=     0
BSTT022I NULL     CLOSED OUTPUT RC=00000000
BSTT018I PORT  4225 CLOSED RC=     4
BSTT023I  7812K BYTES IN  66.5 SECONDS. RATE  117K BYTES/SECOND
BSTT033I 226 Transfer complete - file NULFILE.TXT sent successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

User Exit Transfers

The INPUT EXIT or OUTPUT EXIT command is used to read or write data via a user exit routine. The sample user exit routine BSTTSAMP.A is provided in the installation installation library. The INPUT or OUTPUT command is passed to the user exit during open call processing. This provides a method of passing extra parameter data to the routine.

```
INPUT EXIT phase <exit parameters>
OUTPUT EXIT phase <exit parameters>
```

phase is the phase name of the user exit routine.

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// ASSGN SYS000,DISK,TEMP,VOL=BSI001,SHR
// DLBL SAMDTFI,'BSI.DTFSD.FILE',0,SD
// EXTENT SYS000,BSI001,,,02415,00150
// DLBL SAMDTFO,'BSI.DTFSD.FILE',0,SD
// EXTENT SYS000,BSI001,,,02415,00150
// EXEC BSTTFTPC,SIZE=(BSTTFTPC,512K)
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT EXIT BSTTSAMP
TYPE I
STOR SAMPFIL.DAT
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT EXIT BSTTSAMP
TYPE I
RETR BSTTFIL.DAT
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT014I BSTTSAMP LOADED A=0043B180 L=000005B8
BSTT022I BSTTSAMP OPENED INPUT  RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4110
BSTT010I PORT 192,9,51,1,16,14
BSTT033I 200 PORT Command OK
BSTT010I STOR SAMPFIL.DAT
BSTT033I 150 Opening BINARY mode data connection for SAMPFIL.DAT.
BSTT018I PORT  4110 OPENED RC=     0
BSTT022I BSTTSAMP CLOSED INPUT  RC=00000000
BSTT018I PORT  4110 CLOSED RC=     0
BSTT023I  1599K BYTES IN  57.77 SECONDS. RATE  28349 BYTES/SECOND
```

```
BSTT033I 226 Transfer complete - file SAMPFIL.DAT received
successfully
BSTT014I BSTTSAMP LOADED A=0043B180 L=000005B8
BSTT022I BSTTSAMP OPENED OUTPUT RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4111
BSTT010I PORT 192,9,51,1,16,15
BSTT033I 200 PORT Command OK
BSTT010I RETR SAMPFIL.DAT
BSTT033I 150 Opening BINARY mode data connection for SAMPFIL.DAT
BSTT018I PORT  4111 OPENED RC=     0
BSTT022I BSTTSAMP CLOSED OUTPUT RC=00000000
BSTT018I PORT  4111 CLOSED RC=     4
BSTT023I  1599K BYTES IN  29.81 SECONDS. RATE  54938 BYTES/SECOND
BSTT033I 226 Transfer complete - file SAMPFIL.DAT sent successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

HTML Transfers

The INPUT EXIT BSTTPLAM or OUTPUT EXIT BSTTPLAM command is used to read or write data via the BSTTPLAM user exit routine. The HTML user exit stores HTML data in VSE library member using a special variable length string mode.

The BSTTPLAM exit is used to take html text created on a PC and move it to a z/VSE library member for use with IPServer (Data21 product). The z/VSE library member is a string mode (binary) member with a variable length structure.

```
INPUT EXIT BSTTPLAM lib sublib member type
OUTPUT EXIT BSTTPLAM lib sublib member type
```

lib is the VSE library name.
sublib is the VSE sublibrary name.
member is the VSE member name.
type is the VSE member type.

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT EXIT BSTTPLAM BSILIB INSTALL DOWNLOAD HTML

STOR DOWNLOAD.HTML
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT EXIT BSTTPLAM BSILIB INSTALL INDEX HTML
RETR INDEX.HTML
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.

BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT010I OUTPUT EXIT BSTTPLAM BSILIB INSTALL DOWNLOAD HTML
BSTT014I BSTTPLAM LOADED A=0056B000 L=00003EA5
BSTT004I CB=LBUF A=0056F000 L=00010000
BSTT022I BSTTPLAM OPENED OUTPUT RC=00000000

BSTT010I RETR DOWNLOAD.HTM
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4113
BSTT010I PORT 192,9,51,1,16,17
BSTT033I 200 PORT Command OK
BSTT010I RETR DOWNLOAD.HTM
BSTT033I 150 Opening ASCII mode data connection for DOWNLOAD.HTM (22
BSTT018I PORT  4113 OPENED RC=     0
BSTT022I BSTTPLAM CLOSED OUTPUT RC=00000000
```

```
BSTT018I PORT  4113 CLOSED RC=     0
BSTT023I   2234 BYTES IN  1.124 SECS. RATE   1987/SEC           REC
BSTT048I TCP  I/O WAIT TIME 0.019 SECONDS. RATE  114K BYTES/SECOND
BSTT048I FILE I/O WAIT TIME 1.000 SECONDS. RATE  2234 BYTES/SECOND
BSTT033I 226 Transfer complete - file DOWNLOAD.HTM sent successfully

BSTT018I PORT    21 CLOSED RC=     0

BSTT001I TERMINATED BSTTXFCC

BSTT001I TERMINATED BSTTFTPC
```

Phase Transfers

The INPUT EXIT BSTTPZIO command is used to read a phase from a VSE library and store the phase as a binary file on the FTP server. This binary file can then be transferred to the VSE/POWER reader queue of the target system. The job stream in the reader queue will run in BG and LNKEDT the phase into the specified destination library.

Note: When using the OUTPUT EXIT BSTTPZIO command, the // EXEC BSTTFTPC must specify SIZE=(BSTTFTPC,512K) instead of SIZE=BSTTFTPC.

```
INPUT EXIT BSTTPZIO srclib.sublib phase.PHASE dstlib.sublib
```

srclib.sublib is the source library and sublibrary of the phase.
phase.PHASE is the phase member name and type.
dstlib.sublib is the destination library and sublibrary (Where to catalog the phase).

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// EXEC BSTTFTPC,SIZE=(BSTTFTPC,512K)
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT EXIT BSTTPZIO BSILIB.TTDEV BSTTFTPC.PHASE BSILIB.INSTALL

TYPE I
STOR BSTTFTPC.PHZ
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT POWER RDR BSTTFTPC 0 A

TYPE I
RETR BSTTFTPC.PHZ
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I BSTTPZIO OPENED INPUT  RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4229
BSTT010I PORT 192,9,51,1,16,133
BSTT033I 200 PORT Command OK
BSTT010I STOR BSTTFTPC.JOB
BSTT033I 150 Opening BINARY mode data connection for BSTTFTPC.JOB.
BSTT018I PORT  4229 OPENED RC=     0
BSTT022I EXIT     CLOSED INPUT  RC=00000000
BSTT018I PORT  4229 CLOSED RC=     0
BSTT023I   140K BYTES IN  2.025 SECONDS. RATE  70992 BYTES/SECOND
BSTT033I 226 Transfer complete - file BSTTFTPC.JOB received
```

```
successfully
BSTT022I RDR      OPENED OUTPUT RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4230
BSTT010I PORT 192,9,51,1,16,134
BSTT033I 200 PORT Command OK
BSTT010I RETR BSTTFTPC.JOB
BSTT033I 150 Opening BINARY mode data connection for BSTTFTPC.JOB
BSTT018I PORT  4230 OPENED RC=     0
BSTT022I POWER    CLOSED OUTPUT RC=00000000
BSTT018I PORT  4230 CLOSED RC=     4
BSTT023I   140K BYTES IN  3.745 SECONDS. RATE  38387 BYTES/SECOND
BSTT033I 226 Transfer complete - file BSTTFTPC.JOB sent successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Tape Image Transfers

The INPUT/OUTPUT EXIT BSTTVTIO command is used to read a tape volume or write to the tape volume assigned to SYS000. The INPUT EXIT BSTTVTIO reads the tape volume and stores a binary compressed tape image file on the FTP server. The OUTPUT EXIT BSTTVTIO reads the compressed tape image file and writes decompressed tape data to the tape volume assigned to SYS000. This file transfer is the same as a DITTO tape-to-tape copy until end-of-volume (double tape marks) is detected.

The BSTTVTIO routine uses a VSE port of INFO-ZIP to compress and decompress the tape data. This compression is compatible with gzip and usually results in 70%-90% compression rates.

```
INPUT EXIT BSTTVTIO
OUTPUT EXIT BSTTVTIO
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// ASSGN SYS000,cuu
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT EXIT BSTTVTIO
TYPE I
STOR TAPEDATA.DAT
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT EXIT BSTTVTIO
TYPE I
RETR TAPEDATA.DAT
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I BSTTVTIO OPENED INPUT  RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4236
BSTT010I PORT 192,9,51,1,16,140
BSTT033I 200 PORT Command OK
BSTT010I STOR TAPEDATA.DAT
BSTT033I 150 Opening BINARY mode data connection for TAPEDATA.DAT.
BSTT018I PORT  4236 OPENED RC=     0
BSTT038I FILES     4 BLOCKS   999 BYTES 15723K COMPR  4667K    70%
BSTT022I BSTTVTIO CLOSED INPUT  RC=00000000
BSTT018I PORT  4236 CLOSED RC=     0
BSTT023I  4677K BYTES IN  333.2 SECONDS. RATE  14372 BYTES/SECOND
```

```
BSTT033I 226 Transfer complete - file TAPEDATA.DAT received
successfully
BSTT022I BSTTVTIO OPENED OUTPUT RC=00000000
BSTT010I TYPE I

BSTT033I 200 TYPE set to IMAGE (binary)

BSTT034I TYPE SET TO I

BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4238

BSTT010I PORT 192,9,51,1,16,142
BSTT033I 200 PORT Command OK

BSTT010I RETR TAPEDATA.DAT

BSTT033I 150 Opening BINARY mode data connection for TAPEDATA.DAT
BSTT018I PORT  4238 OPENED RC=     0

BSTT038I FILES     4 BLOCKS   999 BYTES  4667K COMPR 15723K   236%

BSTT022I BSTTVTIO CLOSED OUTPUT RC=00000000

BSTT018I PORT  4238 CLOSED RC=     4

BSTT023I  4677K BYTES IN  240.8 SECONDS. RATE  19890 BYTES/SECOND

BSTT033I 226 Transfer complete - file TAPEDATA.DAT sent successfully

BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Library Member Transfers

The INPUT/OUTPUT LIB command is used to read and write data to and from VSE library member. Library members can be accessed in fixed (F) or string (S) mode. String mode access is generally used for library members containing binary data.

```
INPUT LIBRARY lib sublib member type mode
OUTPUT LIBRARY lib sublib member type mode
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT LIBRARY BSILIB TTDEV BSTTPARM A FIXED
TYPE A
STOR BSTTPARM.A
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT LIBRARY BSILIB INSTALL BSTTPARM A FIXED
TYPE A
RETR BSTTPARM.A
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I BSILIB   OPENED INPUT  RC=00000000

BSTT010I TYPE A

BSTT033I 200 TYPE set to ASCII

BSTT034I TYPE SET TO A

BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4241

BSTT010I PORT 192,9,51,1,16,145

BSTT033I 200 PORT Command OK
```

```
BSTT010I STOR BSTTPARM.A

BSTT033I 150 Opening ASCII mode data connection for BSTTPARM.A.

BSTT018I PORT  4241 OPENED RC=     0

BSTT022I BSILIB   CLOSED INPUT  RC=00000000

BSTT018I PORT  4241 CLOSED RC=     0

BSTT023I    902 BYTES IN  0.206 SECONDS. RATE   4378 BYTES/SECOND

BSTT033I 226 Transfer complete - file BSTTPRMA.A received
successfully                                          BSTT022I BSILIB
OPENED OUTPUT RC=00000000
BSTT010I TYPE A
BSTT033I 200 TYPE set to ASCII
BSTT034I TYPE SET TO A
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4244
BSTT010I PORT 192,9,51,1,16,148
BSTT033I 200 PORT Command OK
BSTT010I RETR BSTTPARM.A
BSTT033I 150 Opening ASCII mode data connection for BSTTPRMA.A
BSTT018I PORT  4244 OPENED RC=     0
BSTT022I BSILIB   CLOSED OUTPUT RC=00000000
BSTT018I PORT  4244 CLOSED RC=     4
BSTT023I    902 BYTES IN  1.054 SECONDS. RATE    855 BYTES/SECOND
BSTT033I 226 Transfer complete - file BSTTPARM.A sent successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Sequential (SAM) Transfers

The INPUT/OUTPUT SAM command is used to read and write data to and from VSE sequential disk files. SAM files can have fixed unblocked or fixed blocked records.

```
INPUT SAM dlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB
OUTPUT SAM dlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// ASSGN SYS000,DISK,TEMP,VOL=BSI001,SHR
// DLBL DISKFIL,'BSI.DTFSD.FILE',0,SD
// EXTENT SYS000,BSI001,,,02415,00150
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT SAM DISKFIL BLKSZ 4000 RECSZ 400 RECFM FB
TYPE I
STOR DISKFIL.DAT
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT SAM DISKFIL BLKSZ 4000 RECSZ 400 RECFM FB
TYPE I
RETR DISKFIL.DAT
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I DISKFIL  OPENED INPUT  RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4246
BSTT010I PORT 192,9,51,1,16,150
BSTT033I 200 PORT Command OK
BSTT010I STOR DISKFIL.DAT
BSTT033I 150 Opening BINARY mode data connection for DISKFIL.DAT.
BSTT018I PORT  4246 OPENED RC=     0
BSTT022I DISKFIL  CLOSED INPUT  RC=00000000
BSTT018I PORT  4246 CLOSED RC=     0
BSTT023I  1599K BYTES IN  25.78 SECONDS. RATE  63522 BYTES/SECOND
BSTT033I 226 Transfer complete - file DISKFIL.DAT received
```

```
successfully
BSTT022I DISKFIL  OPENED OUTPUT RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4247
BSTT010I PORT 192,9,51,1,16,151
BSTT033I 200 PORT Command OK
BSTT010I RETR DISKFIL.DAT
BSTT033I 150 Opening BINARY mode data connection for DISKFIL.DAT
BSTT018I PORT  4247 OPENED RC=     0
BSTT022I DISKFIL  CLOSED OUTPUT RC=00000000
BSTT018I PORT  4247 CLOSED RC=     4
BSTT023I  1599K BYTES IN  30.73 SECONDS. RATE  53289 BYTES/SECOND
BSTT033I 226 Transfer complete - file DISKFIL.DAT sent successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Standard Label Tape (SLT) Transfers

The INPUT/OUTPUT SLT command is used to read and write data to and from VSE standard label tape files. SLT files can have fixed unblocked or fixed blocked records.

```
INPUT SLT tlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB
OUTPUT SLT tlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// ASSGN SYS000,cuu
// TLBL TAPEFIL,'TAPE.FILE',
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID 00
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT SLT TAPEFIL BLKSZ 21600 RECSZ 800 RECFM FB
TYPE I
STOR TAPEFIL.DAT
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT SLT TAPEFIL BLKSZ 21600 RECSZ 800 RECFM FB
TYPE I
RETR TAPEFIL.DAT
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I TAPEFIL  OPENED INPUT  RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4251
BSTT010I PORT 192,9,51,1,16,155
BSTT033I 200 PORT Command OK
BSTT010I STOR S000004.SLT
BSTT033I 150 Opening BINARY mode data connection for S000004.SLT.
BSTT018I PORT  4251 OPENED RC=     0
BSTT022I TAPEFIL  CLOSED INPUT  RC=00000000
BSTT018I PORT  4251 CLOSED RC=     0
BSTT023I  3199K BYTES IN  41.28 SECONDS. RATE  79354 BYTES/SECOND
BSTT033I 226 Transfer complete - file S000004.SLT received
```

```
successfully
BSTT022I TAPEFIL  OPENED OUTPUT RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4253
BSTT010I PORT 192,9,51,1,16,157
BSTT033I 200 PORT Command OK
BSTT010I RETR S000004.SLT
BSTT033I 150 Opening BINARY mode data connection for S000004.SLT (3
BSTT018I PORT  4253 OPENED RC=     0
BSTT022I TAPEFIL  CLOSED OUTPUT RC=00000000
BSTT018I PORT  4253 CLOSED RC=     4
BSTT023I  3199K BYTES IN  108.6 SECONDS. RATE  30164 BYTES/SECOND
BSTT033I 226 Transfer complete - file S000004.SLT sent successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Non-Labeled Tape (NLT) Transfers

The INPUT/OUTPUT NLT command is used to read and write data to and from VSE Non-labeled tape files. NLT files can have fixed unblocked or fixed blocked records.

The *tlbl* specification in the INPUT/OUTPUT command for NLT files is ignored. It must be specified and can have any value.

```
INPUT NLT tlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB
OUTPUT NLT tlbl BLKSZ nnnnn RECSZ nnnnn RECFM F|FB
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// ASSGN SYS000,cuu
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID 00
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT NLT TAPEFIL BLKSZ 21600 RECSZ 800 RECFM FB
TYPE I
STOR TAPEFIL.DAT
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT NLT TAPEFIL BLKSZ 21600 RECSZ 800 RECFM FB
TYPE I
RETR TAPEFIL.DAT
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I TAPEFIL  OPENED INPUT  RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4251
BSTT010I PORT 192,9,51,1,16,155
BSTT033I 200 PORT Command OK
BSTT010I STOR S000004.NLT
BSTT033I 150 Opening BINARY mode data connection for S000004.NLT.
BSTT018I PORT  4251 OPENED RC=     0
BSTT022I TAPEFIL  CLOSED INPUT  RC=00000000
BSTT018I PORT  4251 CLOSED RC=     0
BSTT023I  3199K BYTES IN  41.28 SECONDS. RATE  79354 BYTES/SECOND
BSTT033I 226 Transfer complete - file S000004.NLT received
```

```
successfully
BSTT022I TAPEFIL  OPENED OUTPUT RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4253
BSTT010I PORT 192,9,51,1,16,157
BSTT033I 200 PORT Command OK
BSTT010I RETR S000004.NLT
BSTT033I 150 Opening BINARY mode data connection for S000004.NLT (3
BSTT018I PORT  4253 OPENED RC=     0
BSTT022I TAPEFIL  CLOSED OUTPUT RC=00000000
BSTT018I PORT  4253 CLOSED RC=     4
BSTT023I  3199K BYTES IN  108.6 SECONDS. RATE  30164 BYTES/SECOND
BSTT033I 226 Transfer complete - file S000004.SLT sent successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

VSAM Transfers

The INPUT VSAM command is used to read data from KSDS or ESDS VSAM datasets. The INPUT XRDS command is used to read data from RRDS or VRDS VSAM datasets. The OUTPUT KSDS/ESDS/XRDS command is used to write data to VSAM KSDS, ESDS, RRDS/VRDS datasets. The OUTPUT command opens the VSAM dataset with the *reset, out* ACB options. If the VSAM dataset is reuseable the *reset* option will reset the dataset to an empty condition. Specify *NORESET* only if you do ***not*** want the default *reset* option.

INPUT VSAM datasets have no restrictions on record length. Actual record length is determined when the record is read. OUTPUT VSAM datasets detect the <CR/LF> or <NL> end-of-line character and use this to calculate the record length during ASCII transfers. OUTPUT VSAM datasets using IMAGE transfers must specify the RECSZ parameter and are limited to fixed length records.

```
INPUT VSAM dlbl
OUTPUT KSDS|ESDS dlbl RECSZ nnnnn NORESET
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// DLBL BSOCACB,'BSI.TEST.FILE',,VSAM,CAT=BSICAT
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT VSAM BSOCACB
TYPE I
STOR VSAMFIL.DAT
*
*  Define OUTPUT and Retrieve the file from the FTP Server
*
OUTPUT KSDS BSOCACB RECSZ 4089
TYPE I
RETR VSAMFIL.DAT
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I BSOCACB  OPENED INPUT  RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4256
BSTT010I PORT 192,9,51,1,16,160
BSTT033I 200 PORT Command OK
BSTT010I STOR VSAMFIL.DAT
BSTT033I 150 Opening BINARY mode data connection for VSAMFIL.DAT.
BSTT018I PORT  4256 OPENED RC=     0
BSTT022I BSOCACB  CLOSED INPUT  RC=00000000
BSTT018I PORT  4256 CLOSED RC=     0
BSTT023I  3194K BYTES IN  60.76 SECONDS. RATE  53831 BYTES/SECOND
BSTT033I 226 Transfer complete - file VSAMFIL.DAT received
```

```
successfully
BSTT022I BSOCACB  OPENED OUTPUT RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4257
BSTT010I PORT 192,9,51,1,16,161
BSTT033I 200 PORT Command OK
BSTT010I RETR VSAMFIL.DAT
BSTT033I 150 Opening BINARY mode data connection for VSAMFIL.DAT

BSTT018I PORT  4257 OPENED RC=     0
BSTT022I BSOCACB  CLOSED OUTPUT RC=00000000
BSTT018I PORT  4257 CLOSED RC=     4
BSTT023I  3194K BYTES IN  62.27 SECONDS. RATE  52531 BYTES/SECOND
BSTT033I 226 Transfer complete - file VSAMFIL.DAT sent successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

SYSLST Transfers

The OUTPUT SYSLST command is used to retrieve a file from the FTP Server and print it on SYSLST. The ASA option indicates the first character of the print line is ASA carriage control. When used with ASCII type files, the <CR> or <NL> character denotes end-of-line. For IMAGE transfers, a record length of 120 is used without the ASA option or 121 is used with the ASA option.

```
OUTPUT SYSLST ASA
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// DLBL BSOCACB,'BSI.TEST.FILE',,VSAM,CAT=BSICAT
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.4 21
USER BARNARD
PASS JEFF
SYST
*
*  Define INPUT and Store the file on the FTP Server
*
OUTPUT SYSLST ASA
TYPE A
RETR BSTTTST1.LISTING
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     4 PORT    21
BSTT004I CB=CBUF A=00445400 L=0000FFFF
BSTT004I CB=DBUF A=00455400 L=0000FFFF
BSTT004I CB=IBUF A=00465400 L=00100000
BSTT018I PORT    21 OPENED RC=     0
BSTT033I 220-FTPSERVE IBM VM V2R3 at SYS1, 11:35:36 EST THURSDAY
BSTT033I 220 Connection will close if idle for more than 5 minutes.
BSTT010I USER BARNARD
BSTT033I 331 Send password please.
BSTT010I PASS JEFF
BSTT033I 230 BARNARD logged in; working directory = BARNARD 191
BSTT010I SYST
BSTT033I 215 VM is the operating system of this server.
BSTT022I ASA      OPENED OUTPUT RC=00000000
BSTT010I TYPE A
BSTT033I 200 Representation type is ASCII.
BSTT034I TYPE SET TO A
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4261
BSTT010I PORT 192,9,51,1,16,165
BSTT033I 200 Port request OK.
BSTT010I RETR BSTTTST1.LISTING
BSTT018I PORT  4261 OPENED RC=     0
BSTT022I ASA      CLOSED OUTPUT RC=00000000
BSTT018I PORT  4261 CLOSED RC=     4
BSTT023I   259K BYTES IN  4.444 SECONDS. RATE  59780 BYTES/SECOND
BSTT033I 250 Transfer completed successfully.

BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

SYSPCH Transfers

The OUTPUT SYSPCH command is used to retrieve a file from the FTP Server and punch it to SYSPCH. When used with ASCII type files, the <CR> or <NL> character denotes end-of-line. For IMAGE transfers, a record length of 80 is used.

```
OUTPUT SYSPCH
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// DLBL BSOCACB,'BSI.TEST.FILE',,VSAM,CAT=BSICAT
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.4 21
USER BARNARD
PASS JEFF
SYST
*
*  Define INPUT and Store the file on the FTP Server
*
OUTPUT SYSPCH
TYPE I
RETR BSTTTST4.ASSEMBLE
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     4 PORT    21
BSTT004I CB=CBUF A=00445400 L=0000FFFF
BSTT004I CB=DBUF A=00455400 L=0000FFFF
BSTT004I CB=IBUF A=00465400 L=00100000
BSTT018I PORT    21 OPENED RC=     0
BSTT033I 220-FTPSERVE IBM VM V2R3 at SYS1, 11:35:36 EST THURSDAY
BSTT033I 220 Connection will close if idle for more than 5 minutes.
BSTT010I USER BARNARD
BSTT033I 331 Send password please.
BSTT010I PASS JEFF
BSTT033I 230 BARNARD logged in; working directory = BARNARD 191
BSTT010I SYST
BSTT033I 215 VM is the operating system of this server.
BSTT022I SYSPCH   OPENED OUTPUT RC=00000000
BSTT010I TYPE A
BSTT033I 200 Representation type is ASCII.
BSTT034I TYPE SET TO A
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4261
BSTT010I PORT 192,9,51,1,16,165
BSTT033I 200 Port request OK.
BSTT010I RETR BSTTTST4.ASSEMBLE
BSTT018I PORT  4261 OPENED RC=     0
BSTT022I SYSPCH   CLOSED OUTPUT RC=00000000
BSTT018I PORT  4261 CLOSED RC=     4
BSTT023I   259K BYTES IN  4.444 SECONDS. RATE  59780 BYTES/SECOND
BSTT033I 250 Transfer completed successfully.

BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Users Guide

SYSIPT Transfers

The INPUT SYSIPT command is used to read a card deck from SYSIPT and store it on the FTP Server. For ASCII transfers a <CR LF> is added to each 80 character line. For IMAGE transfers a record length of 80 is used.

```
INPUT SYSIPT
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// DLBL BSOCACB,'BSI.TEST.FILE',,VSAM,CAT=BSICAT
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT SYSIPT
TYPE A
STOR SYSIPT.TXT
*
QUIT
/*
This is SYSIPT Data
And so is this.
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I SYSIPT   OPENED INPUT  RC=00000000

BSTT010I TYPE A

BSTT033I 200 TYPE set to ASCII

BSTT034I TYPE SET TO A

BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4266

BSTT010I PORT 192,9,51,1,16,170

BSTT033I 200 PORT Command OK
```

```
BSTT010I STOR SYSIPT.TXT

BSTT033I 150 Opening ASCII mode data connection for SYSIPT.TXT.

BSTT018I PORT  4266 OPENED RC=     0

BSTT022I SYSIPT   CLOSED INPUT  RC=00000000

BSTT018I PORT  4266 CLOSED RC=     0

BSTT023I  34522 BYTES IN  0.687 SECONDS. RATE  50250 BYTES/SECOND

BSTT033I 226 Transfer complete - file SYSIPT.TXT received
successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

VSE/POWER RDR Transfers

The OUTPUT POWER RDR command is used to read a file from the FTP Server and transfer it to the VSE/POWER RDR Queue to be processed by VSE/POWER. For ASCII transfers a <CR> or <NL> denotes end-of-line. For IMAGE transfers a record length of 80 is used.

When retrieving data (via INPUT command) from VSE/POWER queues you must specify the name, number and class. If only one member exists with the specified name, the number may be specified as zero (0). If multiple members exist with the specified name, using a number of zero will always retrieve the first member. The class defaults to A. If a userid has been specified on the * $$ JOB card it must also be specified correctly to retrieve the member. The default userid is SYS and this userid is used if no userid was used when the job was submitted to VSE/POWER.

Storing data (via the OUTPUT command) into VSE/POWER queues requires the name and class be specified. The number should be zero (0). Optionally, the disp and form id can be specified. Disp default to D and from to blanks. Transferring data into the VSE/POWER reader queue (submitting a job) is a special case. In this case the number, class, etc., may be omitted because they are contained on the * $$ JOB card.

```
INPUT POWER RDR name number class userid password
OUTPUT POWER RDR name number class disp form
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// DLBL BSOCACB,'BSI.TEST.FILE',,VSAM,CAT=BSICAT
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
OUTPUT POWER RDR DUMMY
TYPE A
RETR DUMMY.JOB
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I RDR      OPENED OUTPUT RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4268
BSTT010I PORT 192,9,51,1,16,172
BSTT033I 200 PORT Command OK
BSTT010I RETR DUMMY.JOB
BSTT033I 150 Opening BINARY mode data connection for DUMMY.JOB
BSTT018I PORT  4268 OPENED RC=     0
BSTT022I RDR      CLOSED OUTPUT RC=00000000
BSTT018I PORT  4268 CLOSED RC=     4
BSTT023I    720 BYTES IN  1.084 SECONDS. RATE    664 BYTES/SECOND
BSTT033I 226 Transfer complete - file DUMMY.JOB sent successfully
```

```
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

VSE/POWER LST Transfers

The INPUT POWER LST command is used to read a VSE/POWER LST queue member and transfer it to the FTP Server. For ASCII transfers a <CR LF> is added to the end of each line. For IMAGE transfers the record length is variable. ASCII transfers, optionally, first character of each line is converted to an ASA character.

When retrieving data (via INPUT command) from VSE/POWER queues you must specify the name, number and class. If only one member exists with the specified name, the number may be specified as zero (0). If multiple members exist with the specified name, using a number of zero will always retrieve the first member. The class defaults to A. If a userid has been specified on the * $$ JOB card it must also be specified correctly to retrieve the member. The default userid is SYS and this userid is used if no userid was used when the job was submitted to VSE/POWER.

Storing data (via the OUTPUT command) into VSE/POWER queues requires the name and class be specified. The number should be zero (0). Optionally, the disp and form id can be specified. Disp default to D and from to blanks. Transferring data into the VSE/POWER reader queue (submitting a job) is a special case. In this case the number, class, etc., may be omitted because they are contained on the * $$ JOB card.

```
INPUT POWER LST name number class userid password
OUTPUT POWER LST name number class disp form dest
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// DLBL BSOCACB,'BSI.TEST.FILE',,VSAM,CAT=BSICAT
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT POWER LST IDCAMS 0 B BARNARD
TYPE A
STOR IDCAMS.LST
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I LST      OPENED INPUT  RC=00000000
BSTT010I TYPE A
BSTT033I 200 TYPE set to ASCII
BSTT034I TYPE SET TO A
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4272
BSTT010I PORT 192,9,51,1,16,176
BSTT033I 200 PORT Command OK
BSTT010I STOR IDCAMS.LST

BSTT033I 150 Opening ASCII mode data connection for IDCAMS.LST.

BSTT018I PORT  4272 OPENED RC=     0
BSTT022I LST      CLOSED INPUT  RC=00000000
BSTT018I PORT  4272 CLOSED RC=     0
```

```
BSTT023I   232K BYTES IN  2.731 SECONDS. RATE  87351 BYTES/SECOND
BSTT033I 226 Transfer complete - file IDCAMS.LST received
successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

VSE/POWER PUN Transfers

The INPUT POWER PUN command is used to read a VSE/POWER PUN queue member and transfer it to the FTP Server. For ASCII transfers a <CR LF> is added to the end of each line. For IMAGE transfers a record length of 80 is used.

When retrieving data (via INPUT command) from VSE/POWER queues you must specify the name, number and class. If only one member exists with the specified name, the number may be specified as zero (0). If multiple members exist with the specified name, using a number of zero will always retrieve the first member. The class defaults to A. If a userid has been specified on the * $$ JOB card it must also be specified correctly to retrieve the member. The default userid is SYS and this userid is used if no userid was used when the job was submitted to VSE/POWER.

Storing data (via the OUTPUT command) into VSE/POWER queues requires the name and class be specified. The number should be zero (0). Optionally, the disp and form id can be specified. Disp default to D and from to blanks. Transferring data into the VSE/POWER reader queue (submitting a job) is a special case. In this case the number, class, etc., may be omitted because they are contained on the * $$ JOB card.

```
INPUT POWER PUN name number class userid password
OUTPUT POWER PUN name number class disp form
```

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// DLBL BSOCACB,'BSI.TEST.FILE',,VSAM,CAT=BSICAT
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT POWER PUN FTPCTEST 0 B

TYPE I
STOR FTPCTEST.PUN
*
QUIT
/*
```

Sample Output

```
BSTT002I IPv6/VSE VERSION 1.00
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT019I VSE 6.11 MODE 31-BIT

BSTT000I INITIATED  BSTTXFCC Ver 1.00 03/07/98 21.55    EP=0043F180

BSTT027I LICENSED TO BARNARD SOFTWARE, INC.

BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21

BSTT018I PORT    21 OPENED RC=     0

BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...

BSTT010I USER JCB

BSTT033I 331 User name OK, send password

BSTT010I PASS JCB

BSTT033I 230 User JCB logged in

BSTT010I SYST

BSTT033I 215 UNIX Type: L8

BSTT010I CWD \TEMP

BSTT033I 250 Directory changed to /c:/TEMP

BSTT022I PUN      OPENED INPUT  RC=00000000
BSTT010I TYPE I
BSTT033I 200 TYPE set to IMAGE (binary)
BSTT034I TYPE SET TO I
BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  4274
BSTT010I PORT 192,9,51,1,16,178
BSTT033I 200 PORT Command OK
BSTT010I STOR BSTTFTPD.JOB
BSTT033I 150 Opening BINARY mode data connection for BSTTFTPD.JOB.
BSTT018I PORT  4274 OPENED RC=     0
BSTT022I PUN      CLOSED INPUT  RC=00000000
BSTT018I PORT  4274 CLOSED RC=     0
BSTT023I   139K BYTES IN  1.917 SECONDS. RATE  74741 BYTES/SECOND
BSTT033I 226 Transfer complete - file BSTTFTPD.JOB received
```

```
successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Transferring Variable Length Binary Data

When transferring binary data the length of each record must be known. The FTP process provides a method for handling this requirement. Use the MODE B command.

PC based FTP servers do not support MODE B. MODE B is generally only supported by IBM mainframe FTP servers. E.g., z/VSE, z/VM and z/OS FTP servers.

The following example shows a transfer for a variable blocked SAM file from z/VSE to z/OS.

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(parmlib.slib,ttlib.sublib)
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN ...
USER ...
PASS ...
// EXEC BSTTFTPC,SIZE=BSTTFTPC
ID ..
OPEN ...
USER ...
PASS ...
*
INPUT SAM dlbl BLKSZ 32760 RECSZ 32760 RECFM VB
TYPE I
MODE B
STOR zos.file.name.spec
*
QUIT
/*
```

Double Byte Character Set Transfers

The DBCS command is used to enter DBCS mode. Three DBCS character translate tables are provided by BSI. These tables (JAPAN, KOREA and CHINA) are the same as the IBM/CSI tables. The DBCS command specifies the name of the table and the EBCDIC and ASCII code pages to be used.

The DBCS command must be preceeded by an SBCS command. The SBCS command identifies the Single Byte Character Set table to be used with the DBCS table.

The SOSI command is used to control the type of double byte seperators to be used during the translation. See the SOSI command for more information about this commands options.

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(parmlib.slib,ttlib.sublib)
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID nn
OPEN 192.45.25.1
USER JCB
PASS JCB
SYST
CWD \TEMP
*
*  Define INPUT and Store the file on the FTP Server
*
INPUT POWER PUN FTPCTEST 0 B

TYPE A
SBCS JAPAN_01
DBCS JAPAN EBCDIC 300 ASCII 301
SOSI NONE
STOR FTPCTEST.PUN
*
QUIT
/*
```

Sample Output

```
BSTT000I INITIATED  BSTTFTPC Ver 1.59 06/25/99 12.29    EP=00420078
BSTT003I COPYRIGHT (C) 1998-1999 BARNARD SOFTWARE, INC.
BSTT002I IPv6/VSE VERSION 1.60
BSTT004I CB=TTLA A=00440000 L=0000087C
BSTT019I VSE 6.30 MODE 31-BIT
BSTT000I INITIATED  BSTTXFCC Ver 1.56 06/14/99 15.20    EP=00469880
BSTT020I CPU VIRTUAL ID=000001 MODEL=7490 PART=P1
BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
BSTT028I IPv6/VSE ENABLED
BSTT045I TCP/IP ID SET TO 00
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21
BSTT018I PORT    21 OPENED RC=     0
BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...
BSTT010I USER JCB
BSTT033I 331 User name OK, send password
BSTT010I PASS JCB
BSTT033I 230 User JCB logged in
BSTT010I SYST
BSTT033I 215 UNIX Type: L8
BSTT046I SBCS     SET JAPAN_01
BSTT080I 12037 CODE POINTS PROCESSED
BSTT046I DBCS     SET JAPAN
BSTT046I SOSI     SET NONE

… data transfer occurs here …

BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Invoking BSTTFTPC from REXX

Using REXX to invoke a batch FTP provides a method of adjusting a batch FTP 'on-the-fly'. The parameters used by the BSTTFTPC program can be generated at runtime instead of using hard coded values.

Before invoking BSTTFTPC from REXX be sure to update the ARXEOJTB to add the phase BSTTFTPC. This will allow REXX to invoke BSTTFTPC and handle the EOJ macro (SVC 14) used to terminate the program.

The CATCHLST program written by Martin should allow you get 'catch' the SYSLST output produced by BSTTFTPC. http://www.pi-sysprog.de/smw/catchlst.htm

Sample REXX EXEC

```
/* Sample REXX EXEC to Invoke BSTTFTPC */
INP.0 = 9
INP.1 = 'OPEN …'
INP.2 = 'USER …'
INP.3 = 'PASS …'
INP.4 = 'SYST'
INP.5 = 'CWD \PDF\MISCFTP\DUKE'
INP.6 = 'INPUT VSAM FEEDBCK'
INP.7 = 'TYPE A'
INP.8 = 'STOR CCI_FEEDBACK_'||date('S')||'.DAT'
INP.9 = 'QUIT'
address jcl
call rexxipt inp.
"// OPTION LOG"
"// LIBDEF PHASE,SEARCH=VENDLIB.IPTOOLS"
"// LIBDEF SOURCE,SEARCH=(VENDLIB.IPCONFIG,VENDLIB.IPTOOLS)"
"// DLBL FEEDBCK,'DMS013.DUKE.FEEDBACK.FILE',,VSAM,CAT=CNVRSN"
 address link “CATCHLST START”
 address link "BSTTFTPC"
 address link “CATCHLST SETLST/lines.”
 say 'output from ftp...'
 do i = 1 to lines.0
   say lines.i
 end
return rc

*  Sample JCL
// OPTION LOG
// EXEC REXX=procname,SIZE=1M
```

Automatic FTP

IPv6/VSE uses a VSE/ESA REXX to handle Auto-FTP requirements. The BSTTAFTP.PROC is a sample VSE/ESA REXX exec that provides this function. The BSTTAFTP.PROC REXX exec scans the VSE/POWER LST queue for class X entries. When an entry is found the entry is changed to class Y and a BSTTFTPC batch FTP is submitted to VSE/POWER to FTP the entry to an FTP server. Since the entire process is REXX based it is simple and very powerful.

FTP Support for BIM-EDIT™

(BIM-EDIT™ is a trademark of CSI International.)

Both the FTP batch client (BSTTFTPC) and the FTP server (BSTTFTPS) include support for BIM-EDIT™ member transfers into and out of a BIM-EDIT™ library. This is accomplished via an access method driver program (BSTTBEAM) provided by Dave L. Clark of WinWholesale Group Services out of Dayton, Ohio. This program takes advantage of the BIM-EDIT™ API interface.

Please note that Barnard Software cannot provide any defect support for the BSTTBEAM access method driver program. This is because Barnard Software is not licensed to use the BIM-EDIT™ product and does not even have that product installed. BSTTBEAM source code is provided for your use. The BSTTBEAM driver is available via a special download using this URL http://www.bsiopti.com/ftp/bsttbeam.zip

The FTP batch client supports simple BIM-EDIT™ I/O via the exit routine format of the INPUT and OUTPUT statements. The FTP server includes rich FTP support for BIM-EDIT™, via the SMNT statement, by providing for directory listings, creation and deletion of libraries, rename and delete of members, and remote execution of other BIM-EDIT™ commands and procedures. This, of course, is in addition to simple member I/O (with the potential for creating new members during OUTPUT processing). Security is based on normal BIM-EDIT™ LOGON processing.

To use the BSTTBEAM access method driver program, perform the following installation steps:

1. Insure that the BIM-EDIT™ API module (BIUAPMD) is SVA-resident.
2. Load the following two members from your installation sublibrary into your BIM-EDIT™ library using the following two BIM-EDIT™ commands: (Note that these two members ***must*** reside in the indicated BIM-EDIT™ sublibrary and ***must*** be named as indicated in the following commands.)
   - `LOADD bsi.sublib.BSTTLIBL.BIMPROC $SIT.PROC.BSTTLIBL PROC`
   - `LOADD bsi.sublib.BSTTMEML.BIMPROC $SIT.PROC.BSTTMEML PROC`
3. After loading those two members into your BIM-EDIT™ library, you may use the following two commands to add descriptions to those members:
   - `ALTER $SIT.PROC.BSTTLIBL TITLE='SPECIAL LIBRARY LISTING FOR FTP ACCESS'`
   - `ALTER $SIT.PROC.BSTTMEML TITLE='SPECIAL MEMBER LISTING FOR FTP ACCESS'`
4. At this point, the installation is complete. However, you may wish to add FTP security entries to your BSTTSCTY security table.

   FTP-ACCESS ALLOW userid BSTTBEAM *

BIMEDIT™ FTP Client Support

The INPUT EXIT BSTTBEAM command is used to specify the FTP source as a BIM-EDIT™ member whose records are to be transferred to an FTP server. The OUTPUT EXIT BSTTBEAM command is used to specify the FTP target as a BIM-EDIT™ member to receive records transferred from an FTP server. Note that BIM-EDIT™ member replacement during OUTPUT processing is ***not*** supported by the BSTTBEAM access method program. Also, currently, all transfers of BIM-EDIT™ members ***must*** be performed as ASCII transfers with CRLF enabled. BIM-EDIT™ member records may be up to 253

characters in length (not including the CRLF on the end of each record).

```
INPUT EXIT BSTTBEAM applid bimusr bimpwd library member
OUTPUT EXIT BSTTBEAM applid bimusr bimpwd library member type
```

Where:

applid is the BIM-EDIT™ application id and may be specified as an asterisk (“*”) if the standard installation default (“BIMEDIT”) is used by the desired target BIM-EDIT™ application.

bimusr
bimpwd are the BIM-EDIT™-defined user and password information for LOGON processing.

library is the desired BIM-EDIT™ sublibrary name (which may be segmented) where the member is located and may be specified as an asterisk (“*”) if the desired member is located in the user’s “HOME” library.

member is the desired BIM-EDIT™ member name.

type only applies to OUTPUT processing and specifies the BIM-EDIT™ member type to be applied to the new member. If omitted, or specified as an asterisk (“*”), then a default member type of “TEXT” is used.

Sample JCL

```
// LIBDEF *,SEARCH=(PRD2.CONFIG,ttlib.sublib),TEMP
// EXEC   PGM=BSTTFTPC,SIZE=(BSTTFTPC,512K)
ID   nn
OPEN server
USER ftpusr
PASS ftppwd
SYST
CWD  \folder\subfolder\
TYPE A
CRLF ON
*
* Define BIM-EDIT™ INPUT and Store data at the FTP Server
*
INPUT EXIT BSTTBEAM applid bimusr bimpwd library member
STOR filename.ext
*
* Define BIM-EDIT™ OUTPUT and Retrieve data via the FTP Server
*
OUTPUT EXIT BSTTBEAM applid bimusr bimpwd library member type
RETR filename.ext
*
QUIT
/* EOD
```

Sample Output

```
21 BSTT000I INITIATED  BSTTFTPC Ver 2.37 08/16/04 22.55    EP=00500078
21 BSTT003I COPYRIGHT (C) 1998-2005 BARNARD SOFTWARE, INC.
21 BSTT002I IPv6/VSE BUILD 2.39
21 BSTT004I CB=TTLA A=005C3000 L=000013FC
21 BSTT019I VSE 6.30 MODE 31-BIT
21 BSTT004I CB=TTST A=0060BA00 L=00010250
8A BSTT000I INITIATED  BSTTXFCC Ver 2.39 11/07/05 14.23    EP=005ED880
8A BSTT027I LICENSED TO DAPSCO
8A BSTT028I IPv6/VSE ENABLED
8A BSTT045I TCP/IP ID SET TO 00
8A BSTT015I CONNECTING TO    10.    10.     0.   199 PORT    21
8A BSTT018I PORT    21 OPENED RC=     0
8A BSTT033I 220 server Microsoft FTP Service (Version 5.0).
8A BSTT010I USER ftpusr
8A BSTT033I 331 Password required for ftpusr.
8A BSTT010I PASS
8A BSTT033I 230-Dapsco Network to Mainframe FTP
8A BSTT033I 230 User ftpusr logged in.
8A BSTT010I SYST
8A BSTT033I 215 Windows_NT version 5.0
8A BSTT010I CWD  \CODATA\MFDOWNLOADS\
8A BSTT033I 250 CWD command successful.
8A BSTT010I TYPE A
8A BSTT033I 200 Type set to A.
8A BSTT034I TYPE SET TO A
8A BSTT046I CRLF     SET ON
8A BSTT014I BSTTBEAM LOADED A=005FD680 L=00001554
   BIM-EDIT API OPENED
=> LOGON bimusr,bimpwd
=> SET PPDCOND 2
   ## VARIABLE HAS BEEN SET ##
=> ATTACH ,HOME
   ## ATTACHED TO LIBRARY "lib.sublib" ##
=> SEND DAPTEST
8A BSTT661I BSTTBEAM OPENED INPUT  RC=00000000 RS=00000000
8A BSTT010I INPUT EXIT BSTTBEAM * bimusr bimpwd * DAPTEST
8A BSTT010I STOR DAPTEST.CBL2
8A BSTT015I CONNECTING TO    10.     1.    21.     2 PORT  5106
8A BSTT010I PORT 10,1,21,2,19,242
8A BSTT033I 200 PORT command successful.
8A BSTT010I STOR DAPTEST.CBL2
8A BSTT033I 150 Opening ASCII mode data connection for DAPTEST.CBL2.
8A BSTT018I PORT  5106 OPENED RC=     0
   LOADING INPUT BUFFER...
   *EOF* STATUS RECEIVED
   -- END OF INPUT --
=> LOGOFF
   ## LOGOFF COMPLETE:  TERM=$APL, DATE=12/13/2005, TIME=16:54:45 ##
   BIM-EDIT API CLOSED
8A BSTT022I BSTTBEAM CLOSED INPUT  RC=00000000
8A BSTT018I PORT  5106 CLOSED RC=     0
8A BSTT023I    533 BYTES IN  0.002 SECS. RATE   266K/SEC            RECS
8A BSTT668I BYTES H= 0000000000000215 DH=                  DL=              533
8A BSTT048I TCP  I/O WAIT TIME 0.001 SECONDS. RATE  533K BYTES/SECOND
8A BSTT033I 226 Transfer complete.
8A BSTT014I BSTTBEAM LOADED A=005FD680 L=00001554
   BIM-EDIT API OPENED
=> LOGON bimusr,bimpwd
=> SET PPDCOND 2
   ## VARIABLE HAS BEEN SET ##
```

```
=> ATTACH ,HOME
   ## ATTACHED TO LIBRARY "lib.sublib" ##
=> DEFINE DAPTEST_FTP,COBOLII,"CREATED VIA FTP"
   ## MEMBER "lib.sublib.DAPTEST_FTP" DEFINED ##
=> EDIT
=> INSERTF
8A BSTT661I BSTTBEAM OPENED OUTPUT RC=00000000 RS=00000000
8A BSTT010I OUTPUT EXIT BSTTBEAM * bimusr bimpwd * DAPTEST_FTP COBOLII
8A BSTT010I RETR DAPTEST.CBL2
8A BSTT015I CONNECTING TO    10.     1.    21.     2 PORT  5107
8A BSTT010I PORT 10,1,21,2,19,243
8A BSTT033I 200 PORT command successful.
8A BSTT010I RETR DAPTEST.CBL2
8A BSTT033I 150 Opening ASCII mode data connection for DAPTEST.CBL2(533 bytes).
8A BSTT018I PORT  5107 OPENED RC=     0
   EXTRACTING OUTPUT BUFFER...
   -- END OF OUTPUT --
=> QUIT
=> LOGOFF
   ## LOGOFF COMPLETE:  TERM=$APL, DATE=12/13/2005, TIME=16:54:46 ##
   BIM-EDIT API CLOSED
8A BSTT022I BSTTBEAM CLOSED OUTPUT RC=00000000
8A BSTT018I PORT  5107 CLOSED RC=     0
8A BSTT023I    533 BYTES IN  0.001 SECS. RATE   533K/SEC            RECS
8A BSTT668I BYTES H= 0000000000000215 DH=                  DL=              533
8A BSTT050I RECEIVE  COUNT     3 AVG SIZE   177
8A BSTT048I TCP  I/O WAIT TIME 0.001 SECONDS. RATE  533K BYTES/SECOND
8A BSTT033I 226 Transfer complete.
8A BSTT010I QUIT
8A BSTT033I 221
8A BSTT018I PORT    21 CLOSED RC=     0
8A BSTT001I TERMINATED BSTTXFCC
21 BSTT001I TERMINATED BSTTFTPC
```

Chapter 4

Using the Mail Transport Protocol Client

The BSTTMTPC program is used to send an email from a VSE/ESA batch partition and optionally attach any type of file. The BSTTMTPC program reads its input from SYSIPT. The DATA command is used to read the text of your email message from SYSIPT. You can also use the FTP INPUT, TYPE and ASA commands to define an input file. Due to SMTP requirements CRLF ON and NL OFF is forced by the BSTTMTPC program. The INCLUDE command is used to insert an attached file in the output stream.

BSTTMTPC commands

ID is your stack ID

OPEN specifies the IP address of the SMTP server

HELO specifies your domain name

MAIL specifies the From: email address E.g., user@domain.com

RCPT specifies the TO: email address E.g., user@domain.com
specifies the CC: email address E.g., user@domain.com
specifies the BCC: email address E.g., user@domain.com

A space after the To: or CC: literals is required.

RPTO specifies the Reply-To email address (OPTIONAL)

SUBJ is the Subject:
(This command is not optional)
SUB2 is the Subject: extension
SUBJ is the 1st 75 characters
SUB2 is the next 75 characters
(This command is optional and defaults to blanks)

ORGA is the Organization: (company name)
(This command is not optional)

SUBJ and **ORGA** must be specified.

CONTENT PLAIN|HTML
CONTENT PLAIN is the default unless CONTENT HTML is specified.

CHARSET ASCII|ISO-name
CHARSET ASCII is the default unless CHARSET ISO..... is specified.
And, the CHARSET name must begin with the letters ISO.

DATA indicates to read SYSIPT for the text of the email.

INPUT identifies the INPUT file (OPTIONAL)

INCLUDE specifies the file name of the attached file

QUIT terminates the utility

DISP INLINE|ATTACH determines if attachments are inline.

PRTY n is the message priority 1 - 5. The default is 3 (normal).

The **DISP, PRTY, CONTENT and CHARSET** commands must be placed prior to the **DATA** command.

EHLO is the extended HELO command. If this command is used instead of the HELO command, the AUTH LOGIN command must follow it.

AUTH LOGIN userid password is the authorized login command.

If the EHLO command is used instead of the HELO command. The HELO command is replaced with 2 commands, EHLO followed by the AUTH LOGIN command.

E.g.,

EHLO bsiopti.com
AUTH LOGIN bsitest testpswd

Sample JCL

ttlib.sublib is the installation library and sublibrary.
iplib.sublib is the TCP/IP library and sublibrary.

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// EXEC BSTTMTPC,SIZE=BSTTMTPC
ID 00
OPEN SERVER
*
HELO bsi.mail
MAIL From: bsiopti@bsiopti.com
RCPT To: bsisales@bsiopti.com
SUBJ Subject: Batch Email Client for VSE/ESA
ORGA Organization: Barnard Software, Inc.
*
DATA
*
INPUT VSAM FILEIN
TYPE I
INCLUDE WORKFIL.DAT
*
INPUT POWER LST BSAURSCN 00743 Y HP4L
TYPE A
INCLUDE BSAURSCN.LST
*
QUIT
/* End of BSTTMTPC commands
Teri,
You requested that BSI look into writing a batch email client
with file attachment facilities. I am happy to report that this
has been done.

In fact this email was sent by the BSI batch email client program
running in a VSE/ESA partition. Any type of file can be attached.
VSAM KSDS/ESDS/RRDS, VSAM SAM, SAM, Tape, VSE/POWER, or library members
can be attached to an email.

By way of example I have attached two small files to this email.
The first is a binary attachment and the second is a ASCII text
attachment.

Regards,
Jeff
/* End of Email DATA
```

Sample Email

```
      Subject: Batch Email Client for VSE/ESA
         Date: 6 Jun 99 20:00:47
         From: Jeffrey Barnard bsiopti@bsiopti.com
 Organization: Barnard Software, Inc.
           To: Teri Barnard <bsisales@bsiopti.com>

Teri,
You requested that BSI look into writing a batch email client
with file attachment facilities. I am happy to report that this
has been done.

In fact, this email was sent by the BSI batch email client program
running in a VSE/ESA partition. Any type of file can be attached.
VSAM KSDS/ESDS/RRDS, VSAM SAM, SAM, Tape, VSE/POWER, or library members
can be attached to an email.

By way of example I have attached two small files to this email.
The first is a binary attachment and the second is a ASCII text
attachment.

Regards,
Jeff

This email was sent from a VSE/ESA batch partition using the
BSTTMTPC (Mail Transport Protocol Client) program.

-------------------------------------------------------------------------

SYSIPT.DAT
    Name: SYSIPT.DAT
    Type: unspecified type (application/octet-stream)
Encoding: base64

-------------------------------------------------------------------------

Test text line 1
Test text line 2
Test text line 3
Test text line 4
Test text line 5
```

Generating PDF Output

The BSTTTPDF application provided by BSI can be used to create basic PDF documents. The BSTTTPDF application is based on the Open Source text2pdf.c source created by Phil Smith in 1996.

BSTTTPDF is a C/VSE utility that reads input EBCDIC text with optional form feeds (FF), line feeds (LF) and carriage return (CR) characters. The output of BSTTTPDF is an EBCDIC PDF file. When the output EBCDIC PDF file is transferred to another platform it is converted to ASCII by the FTP or Email process.

```
BSTTTPDF [options] ifilename ofilename

  BSTTTPDF makes a 7-bit clean PDF file (version 1.1) from the input file.
  It reads from ifilename and writes the PDF to ofilename

  There are various options as follows:

  -h         show this message
  -f<font>   use PostScript <font> (must be in standard 14, default: Courier)
  -I         useISOLatin1Encoding
  -s<size>   use font at given pointsize (default 10)
  -v<dist>   use given line spacing (default 12 points)
  -l<lines>  lines per page (default 60, determined automatically if unspecified)
  -c<chars>  maximum characters per line (default 80)
  -t<spaces> spaces per tab character (default 8)
  -F         ignore formfeed characters
  -A4        use A4 paper (default Letter)
  -A3        use A3 paper (default Letter)
  -x<width>  independent paper width in points
  -y<height> independent paper height in points
  -2         format in 2 columns
  -L         landscape mode
```

The default options used by the BSTTPDFC.PROC to create a PDF document is
-L -c132 -l66 -v10 -s8
Landscape, 132 columns, 66 lines, 10 spacing, 8 pointsize

Installation

The BSTTPDFC.PROC uses the BSIREXXC.PROC. BSIREXXC.PROC is documented in the IPv6/VSE Migration Guide. You must perform the installation step for BSIREXXC.PROC in order to use the BSTTPDFC.PROC.

ARXEOJTB

When performing the installation of the BSIREXXC.PROC you will need to update the REXX ARXEOJTB.PHASE. This is done to add the BSI phases BSTTFTPC, BSTTMTPC, etc. to the table. When updating the ARXEOJTB table also add BSTTTPDF.PHASE.

Creation of PDF output using BSTTTPDF is a 3-step process.

1. Use BSTTFTPC to connect to BSTTFTPS and copy the text file to a library member.
2. Use BSTTTPDF to convert the text member to a PDF member
3. Use BSTTFTPC or BSTTMTPC to transfer the PDF member to a destination.

To make the creation of basic PDF documents easier BSI provide a REXX EXEC to combine the 3 steps into a single BSTTFTPC-*like* or BSTTMTPC-*like* step.

Warning: The PDF generation process is designed to take SYSLST output created by a z/VSE application running within z/VSE, spooled by VSE/Power and create a basic PDF output file. Uploading ASCII text data to the VSE/Power LST queue will not work for creating PDF files.

Passing Options

Options can be passed to the BSTTTPDF application on the // EXEC card.

```
// LIBDEF PHASE,SEARCH=bsilib.slib
// LIBDEF PROC.SEARCH=bsilib.slib
// EXEC REXX=BSTTPDFC,PARM='CLIENT options'

// EXEC REXX=BSTTPDFC,PARM='BSTTFTPC -L -A4'
// EXEC REXX=BSTTPDFC,PARM='BSTTMTPC -L -c132 -l66 -v10 -s8'
```

BSTTPDFC.PROC

The BSTTPDFC.PROC is used to simplify the PDF creation process. Using a single REXX EXEC you can FTP or Email a PDF file to a desired destination.

Using BSTTFTPC

```
// LIBDEF PHASE,SEARCH=(bsilib.slib)
// LIBDEF PROC,SEARCH=(PRD2.CONFIG,bsilib.slib)
// EXEC REXX=BSTTPDFC,PARM='BSTTFTPC'
ID ..
OPEN ............
USER ...
PASS ...
*
CWD ....
TYPE A
CRLF OFF
SBCS RACOON
TRANSLATE EBCDIC 21 10
*
INPUT POWER LST name number class userid
STOR file.name
*
QUIT
/*
```

Note 1: Items highlighted in **BOLD** must not be changed. They are required.

The SBCS command can specify any Single Byte Character Set translate table provided the brace {, } and bracket characters [,] are correctly translated from EBCDIC to ASCII.

Note 2: Items highlighted in *Italics* can be changed/customized by you.

Note 3: The INPUT card can be any type of file, SAM, VSAM, etc. provided it is an EBCDIC text file.

Using BSTTMTPC

```
// LIBDEF PHASE,SEARCH=(bsilib.slib)
// LIBDEF PROC,SEARCH=(PRD2.CONFIG,bsilib.slib)
// EXEC REXX=BSTTPDFC,PARM='BSTTMTPC'
ID ..
OPEN ...
*
HELO ...
MAIL From: jeff@bsiopti.com
RCPT To: bsiopti@bsiopti.com
SUBJ Subject: BSTTTPDF Text Email
ORGA Organization: Barnard Software, Inc.
*
DATA
*
INPUT POWER LST name number class userid
DISP ATTACH
TYPE A
CRLF OFF
SBCS RACOON (see Note 1)
TRANSLATE EBCDIC 21 10
INCLUDE filename.pdf
*
QUIT
/?
This is a PDF created by the BSTTTPDF utility
and sent by the BSTTMTPC batch Email facilty.

Regards,
Jeff
/*
```

Note 1: Items highlighted in **BOLD** must not be changed. They are required.

The SBCS command can specify any Single Byte Character Set translate table provided the brace {, } and bracket characters [,] are correctly translated from EBCDIC to ASCII. And, the SMTP mail server @ character is translated correctly.

Note 2: Items highlighted in *Italics* can be changed/customized by you.

Note 3: The INPUT card can be any type of file, SAM, VSAM, etc. provided it is an EBCDIC text file.

Chapter 5

Using the FTP Server

An FTP Server is provided that runs completely outside of the TCP/IP partition. Up to 4 ATTACH commands can be used in each FTP Server partition to attach FTP Server subtasks. The FTP server partition must be 24MB or larger in size. Any number of FTP Server partitions can be run with up to 4 FTP Server subtasks in each partition.

When running BSTTFTPS under VSE/ESA 1.4, only 3 FTP server tasks can be attached. Run BSTTFTPS in the largest possible partition with no 31-bit storage.

The OPEN command specifies the TCP/IP defined name or IP address of the VSE system and the port number to be used. The default port number is 21. If you are running multiple FTP Server you may wish to change the default port to be used.

While a single BSTTFTPS FTP Server partition can run up to 4 FTP server tasks, there are 2 options for running additional FTP server tasks. First, you can run multiple BSTTFTPS partitions with each BSTTFTPS partition listening on a different port. Users can connect to one of these BSTTFTPS partitions based on the port number used. Second, in addition to the first option you can also run our BSTTPRXY Proxy Server to listen for FTP connections on a standard port and automatically proxy the connection to the multiple BSTTFTPS partitions running on the system. Users connect to the FTP server using the selected standard port and the BSTTPRXY server selects an available FTP server partition. This configuration allows for up to 32 FTP server tasks per z/VSE image.

The FTP server uses the SMNT command (Structure MouNT) to mount file systems. By default VSE/POWER is mounted. The default can be changed as a startup command.

```
SMNT POWER                      (mounts VSE/POWER)
SMNT SAM                       (mounts SAM file system)
SMNT VSAM <catalog.name>        (mounts a VSAM catalog)
SMNT LIBRARY <libname>          (mounts a library)
SMNT NULL                       (mounts a null filesystem)
```

There can be only one (1) SMNT command in the BSTTFTPS startup. This SMNT command defines the default-filesystem mounted when a FTP client connects to the FTP server. After a connection has been made another filesystem can be mounted by the FTP client if desired.

```
SITE INPUT SAM dlbl ...         (define SAM input file)
SITE OUTPUT SAM dlbl ...        (define SAM output file)
```

Pretty simple. We recommend WS-FTP as a GUI FTP client. WS-FTP LE is included in the IPv6/VSE download. With WS-FTP you can define 'Profiles'. Setup several, 'VSE POWER', 'VSE IJSYSUC' and so on. Makes it pretty simple to select the file system you want.

The VSE/POWER File System

VSE/POWER files are transferred in a c.nnnnn.name format. Where c is the VSE/POWER class, nnnnn is the VSE/POWER job number and name is the VSE/POWER Queue file name. Files retrieved from VSE/POWER will have this format on the client system. Client files to be stored in VSE/POWER's queues must also have this format.

The VSAM File System

Files must defined in a VSAM catalog before they can be accessed. The BSTTFTPS FTP server will not automatically define a VSAM ESDS/KSDS/xRDS cluster.

The LIBRARY File System

The library file system uses the library member BSTTLTYP.T to define the transfer mode of library members. The BSTTLTYP.T member specifies various library member types (TXT, HTML, JPG, etc) and the transfer mode to be used with each type. Transfer types include FIXED, STRING or HTML mode.

The NULL File System

The NULL file system is a method by which you can tell the BSTTFTPS FTP server to mount no (or a NULL) file system when an FTP Client connects. When the NULL file system is active, data transferred will be directed to the NULL file.

Accessing Files using BSTTFTPS

The user can see whatever they are authorized to see and they can mount the file system they want in a number of different ways. File systems are SAM, VSAM, POWER, LIBRARY, etc. You basically mount one at a time except for the User Defined SAM file system which can combine SAM and VSAM file in a single image view.

#1, The single SMNT command in the BSTTFTPS startup specifies the default file system for anyone that does not override it. Usually this is POWER.

#2, The BSTTSCTY.T security member FTP-USER command specifies valid userid and passwords ***and*** optionally the default file system for the user.

E.g.,

FTP-USER TONY .... SMNT-LIBRARY-BSILIB/TTDEV
FTP-USER PWRTEST .... SMNT-POWER/LST

#3, the user can mount a file system at any time.

quote smnt power
cd smnt-vsam-vsam.catalog.name

Note the dashes used when the smnt command is embedded in a cd command.

#4, They can specify a specific file using INPUT/OUTPUT commands

quote INPUT VSAM dlbl
quote INPUT SAM dlbl BLKSZ ... RECSZ .... RECFM ...

#5, There is a user defined file system. quote smnt sam

See the IPv6/VSE Migration Guide BSTTFTPS FTP Server and the section "Creating a User Defined SAM File System".

The user defined file system can have any mix of SAM and VSAM files in it. This is the only file system that combines SAM and VSAM.

SAM File System

The SAM file system is defined in a VSE library member called BSTTSFSD.T. The BSTTSFSD.T member specifies the DLBL/BLKSZ/RECSZ/RECFM of each file to be included in the file system. The DLBL name must be 7 character padded on the right with blanks.

```
CATALOG BSTTSFSD.T        EOD=/%          REPLACE=YES
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                         *
*        SAM FILE SYSTEM DEFINITIONS                                      *
*                                                                         *
*  1 ENTRY PER LINE                                                       *
*  MUST START IN COLUMN 1                                                 *
*                                                                         *
*  DLBL BLKSZ NNNNN RECSZ NNNNN RECFM XX                                  *
*                                                                         *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*
FTP1TST BLKSZ 8000 RECSZ   80 RECFM FB
/%
```

Sample BSTTFTPS JCL

```
// LIBDEF PHASE,SEARCH(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH(ttlib.sublib)
// EXEC BSTTFTPS,SIZE=BSTTFTPS,OS390
ID 00
*
OPEN ip-address 21
*
* Define the default file system to use …
SMNT POWER
*
ATTACH SERVER-1
ATTACH SERVER-2
ATTACH SERVER-3
/*
```

FTP Server SITE Commands

The BSTTFTPS FTP server supports a number of SITE commands. The commands have the form SITE command options.

FTP Server SITE Command	Description
SITE PAD ON|OFF	Set record padding on or off
SITE PADCHAR nnn	Set the value of the pad character (decimal)
SITE BLKSZ nnn	Set the block size value
SITE RECSZ nnn	Set the record size value
SITE RESET ON|OFF	Set VSAM reset-to-empty-on-open flag
SITE LMODE F|S	Set library mode to fixed or string
SITE SBCS ON|OFF	Set SBCS on or off
SITE DBCS …	Set DBCS information
SITE SOSI ON|OFF	Set DBCS SOSI on or off
SITE CONVERT ON|OFF	Set DBCS CONVERT on or off
SITE KEEP ON|OFF	Set DBCS KEEP on or off
SITE XLATE ON|OFF	Set DBCS XLATE on or off
SITE BLANK ON|OFF	Set DBCS BLANK on or off
SITE NONE ON|OFF	Set DBCS NONE on or off
SITE CRLF ON|OFF	Set CRLF on or off
SITE NL ON|OFF	Set New Line on or off
SITE LF ON|OFF	Set Line Feed on or off
SITE ASA ON|OFF	Set VSE/POWER ASA on or off
SITE LINES nnn	Set VSE/POWER auto skip line count
SITE TRCMD ON|OFF	Set VSE/POWER translate commands on or off
SITE HTML ON|OFF	Set library member to HTML mode
SITE PSWD value	Set VSAM password
SITE FNO value	Set VSE/POWER form
SITE NODE value	Set VSE/POWER destination node name
SITE USER value	Set VSE/POWER destination node userid
SITE JSEP n	Set VSE/POWER JSEP value
SITE UPJS ON|OFF	Set Use VSE/POWER Job Separators
SITE DISP x	Set VSE/POWER DISP value

SITE VALIDATE ON|OFF	Set VSE/POWER character validation on/off
SITE PWRCMD <command>	Send VSE/POWER a command
SITE WTO	Write message to console
SITE AUXDIR ON|OFF	Use alternate directory format (VSE/POWER)
SITE DLBL ON|OFF	Show DLBL name in SAM directory display
SITE UINF <string>	Set VSE/POWER USER='string' value
SITE EXPHRS nn	Set VSE/POWER Expiration Hours
SITE EXPDAYS nnn	Set VSE/POWER Expiration Days

Using the FTP Server with WS-FTP

WS-FTP is a popular graphical FTP Client that runs under Windows 95/98 and Windows NT. The BSI FTP Server was designed with this FTP Client in mind.

In the *General* tab of WS-FTP set the Host Name/Address to the VSE host name or IP address. The Host Type can be set to Automatic detect. Set the User ID and Password to the correct values. Passwords are required even if you are using default (no) security.

In the *Advanced* tab of WS-FTP change the Remote Port from 21 to the port you have selected for the BSI FTP Server to use. The default port is 21.

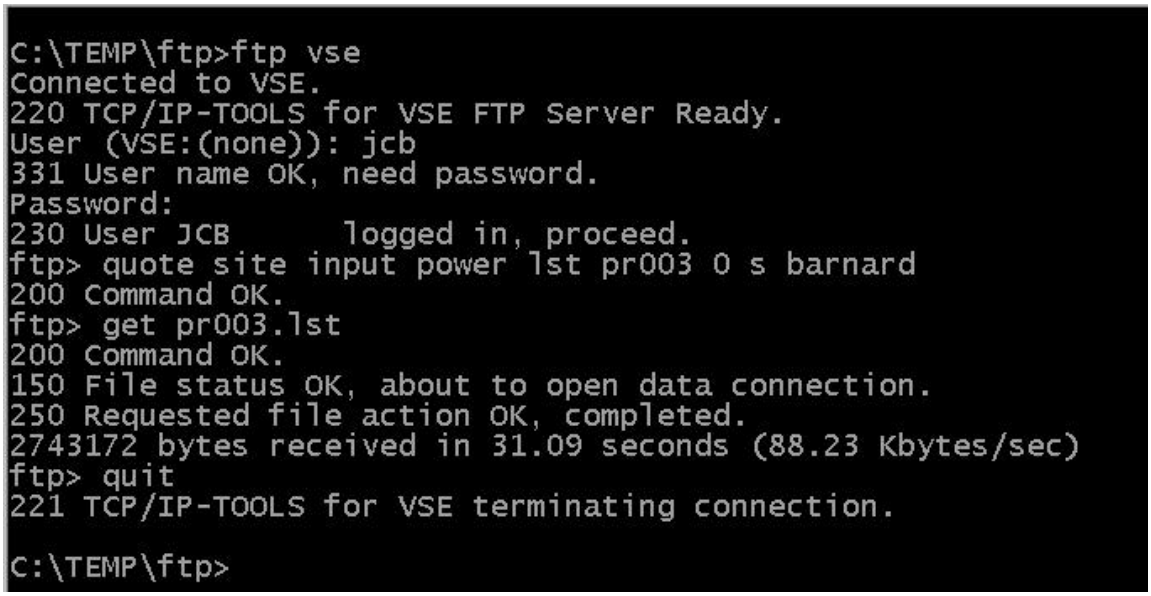
In the *Startup* tab set the Initial Local Directory. Use the Initialize Command field to issue a SMNT (Structure Mount) command to mount a file system. Valid file systems include SMNT POWER, SMNT VSAM catalog.name and SMNT LIBRARY lib.

Click Apply and OK.

The following screen should appear.

Using the FTP Server with MS-DOS FTP

MS-DOS FTP command is a command line FTP Client that comes with Windows 95/98 and Windows NT.



FTP Server Security

FTP Server Security is defined in a library member. The BSTTSCTY.T library member should be placed in the same library you have the BSTTPARM.A verification code library member. The lib.slib used for these members should not be the same as the installation library. This is because each time you upgrade IPv6/VSE sample BSTTSCTY.T and BSTTPARM.A members are cataloged into the installation lib.slib. We recommend that these members be kept in PRD2.CONFIG or your own configuration lib.slib. The BSTTSCTY.T table can be reloaded while the FTP server is active by using the MSG xx,D=RELOAD command. Comments are within the BSTTSCTY.T member are only support on a line with an asterisk (*) in column one (1).

FTP security command are processed from the first rule to the last rule for each type of rule. If access is allowed by an early rule, later rules are not processed. And, if no rule is found to allow access, access will be denied by default.

FTP server security is defined in the BSTTSCTY.T library member. This library member contains FTP server security commands.

- FTP-LUSER is used to require the LUSER and LPASS commands

  ```
  FTP-LUSER REQUIRED
  FTP-LUSER OPTIONAL
  ```

  OPTIONAL is the default if this command is omitted.

  FTP-LUSER REQUIRED indicates that the BSTTFTPC (batch FTP) and BSTTMTPC (batch Email) application must have LUSER/LPASS commands proceeding the OPEN command. This command has nothing to do with FTP server security. The FTP server always requires a valid userid and password to login. If you specify FTP-LUSER REQUIRED and do not have LUSER/LPASS commands in your BSTTFTPC/BSTTMTPC job stream you will get a 'BSTT013E ACCESS ERROR R15=00000040' message and the job will fail.

- FTP-IP is used to allow or deny access by IP addresses

  ```
  FTP-IP ALLOW SUBNET-ADDRESS SUBNET-MASK
  FTP-IP DENY SUBNET-ADDRESS SUBNET-MASK
  ```

- FTP-USER is used to define a userid and password

  ```
  FTP-USER USERID PASSWORD <initial-directory-string>

  Note: USERIDs and PASSWORDs are limited to 8 characters.
  The initial-directory-string is used to specify an initial directory for the
  userid. The format of the string is the same as used in a CWD command to mount
  a file system and set the directory.

  FTP-USER userid password SMNT-POWER
  FTP-USER userid password SMNT-LIBRARY-PRD2/CONFIG
  FTP-USER userid password SMNT-VSAM-VSESP.USER.CATALOG
  ```

- FTP-ACCESS is used to define access rights

```
FTP-ACCESS ALLOW USERID POWER QUEUE CLASSES PREFIX READ|WRITE
FTP-ACCESS DENY  USERID POWER QUEUE CLASSES PREFIX READ|WRITE
FTP-ACCESS ALLOW USERID LIBRARY LIB SLIB MEMBER TYPE READ|WRITE
FTP-ACCESS DENY  USERID LIBRARY LIB SLIB MEMBER TYPE READ|WRITE
FTP-ACCESS ALLOW USERID VSAM CATALOG DATASET READ|WRITE
FTP-ACCESS DENY  USERID VSAM CATALOG DATASET READ|WRITE
FTP-ACCESS ALLOW USERID SAM FILE.NAME READ|WRITE
FTP-ACCESS DENY  USERID SAM FILE.NAME READ|WRITE
FTP-ACCESS ALLOW USERID DLBL dlbl READ|WRITE
FTP-ACCESS DENY  USERID DLBL dlbl READ|WRITE


Note: Unless READ is specified, WRITE is assumed. WRITE is the default. This is
required for compatibility with earlier releases of the FTP server.
```

Security definition lines in the BSTTSCTY.T library member can be continued. An X in column 72 indicates continuation. Only one continuation line is supported. When continuation is used the 2 80 character lines are placed together in storage and the continuation character X is replaced by a blank before processing the security command.

Default BSTTSCTY.T Member

```
*
* FTP-IP ALLOW SUBNET-ADDRESS SUBNET-MASK
* FTP-IP DENY SUBNET-ADDRESS SUBNET-MASK
*
FTP-IP ALLOW 0.0.0.0 0.0.0.0
*
* FTP-USER USERID PASSWORD
*
FTP-USER *   *
*
*  FTP-ACCESS ALLOW USERID POWER QUEUE CLASSES PREFIX
*  FTP-ACCESS DENY  USERID POWER QUEUE CLASSES PREFIX
*  FTP-ACCESS ALLOW USERID LIBRARY LIB SLIB MEMBER TYPE
*  FTP-ACCESS DENY  USERID LIBRARY LIB SLIB MEMBER TYPE
*  FTP-ACCESS ALLOW USERID VSAM CATALOG DATASET
*  FTP-ACCESS DENY  USERID VSAM CATALOG DATASET
*  FTP-ACCESS ALLOW USERID SAM FILE.NAME
*  FTP-ACCESS DENY  USERID SAM FILE.NAME
*  FTP-ACCESS ALLOW USERID DLBL DLBL
*  FTP-ACCESS DENY  USERID DLBL DLBL
*
FTP-ACCESS ALLOW * * * * * *
```

The FTP-IP command defines IP/SUBNET address allowed to access the FTP server. IP addresses are specified in standard dotted decimal notation. The default FTP-IP command accepts connections from any IP address.

The FTP-USER command defines a userid and password. Either or both of these values may be specified as an asterisk (*). The asterisk indicates any value is valid. Specify an asterisk for the userid and any value with be accepted. Specify an asterisk for the password and any value will be accepted. The default FTP-USER command accepts any userid with any password.

The FTP-ACCESS command defines access rules. Access may be allowed or denied to any file system (VSE/POWER, LIBRARY or VSAM). Within each file system other access restrictions are permitted.

The FTP-ACCESS command allows you to restrict access to the VSE/POWER file system based on queue, member prefix and class. Valid queues are RDR, LST, PUN, XMT and CMD. The CMD queue is used to validate VSE/POWER commands sent from an FTP client via the SITE PWRCMD facility. When using the CMD queue you can specify the VSE/POWER command to ALLOW or DENY in the member prefix field.

The FTP-ACCESS command allows you to restrict access to the LIBRARY file system based on library, sublibrary, member name and member type.

The FTP-ACCESS command allows you to restrict access to the VSAM file system based on catalog name and dataset (cluster) name.

Using the IBM BSSTISX Security Phase

IBM provides a security exit routine called BSSTISX. The BSI FTP server security exit routine BSTTFTS1.PHASE calls the IBM security exit to verify userid and password. All other security is controlled using the standard BSTTSCTY.T member.

To enable the BSTTFTS1.PHASE security exit

- Copy the BSTTFTS1.PHASE to a configuration lib.slib as BSTTFTSX.PHASE
- LIBDEF the configuration lib.slib first in the BSTTFTPS PHASE,SEARCH chain
- Add the following BSSTISX command to your BSTTFTPS startup commands

```
BSSTISX
```

The BSSTISX command define the require initialization data for the IBM BSSTISX routine.

Sample BSTTSCTY.T Member

```
*
*
* FTP-IP ALLOW SUBNET-ADDRESS SUBNET-MASK
* FTP-IP DENY SUBNET-ADDRESS SUBNET-MASK
*
FTP-IP ALLOW 192.45.25.0 255.255.255.0
FTP-IP ALLOW 192.9.51.0 255.255.255.0
FTP-IP DENY 0.0.0.0 0.0.0.0
*
* FTP-USER USERID PASSWORD
*
FTP-USER JCB JCB SMNT-POWER/RDR
FTP-USER TJB TJB
FTP-USER BSI BSI
*

*  FTP-ACCESS ALLOW USERID POWER QUEUE CLASSES PREFIX
*  FTP-ACCESS DENY  USERID POWER QUEUE CLASSES PREFIX
*  FTP-ACCESS ALLOW USERID LIBRARY LIB SLIB MEMBER TYPE
*  FTP-ACCESS DENY  USERID LIBRARY LIB SLIB MEMBER TYPE
*  FTP-ACCESS ALLOW USERID VSAM CATALOG DATASET
*  FTP-ACCESS DENY  USERID VSAM CATALOG DATASET
*  FTP-ACCESS ALLOW USERID SAM FILE.NAME
*  FTP-ACCESS DENY  USERID SAM FILE.NAME
*
FTP-ACCESS ALLOW JCB * * * * *
*
FTP-ACCESS ALLOW TJB POWER RDR * *
FTP-ACCESS DENY  TJB * * * * *
*
FTP-ACCESS ALLOW BSI VSAM    BSI.USER.CATALOG *
FTP-ACCESS ALLOW BSI LIBRARY BSILIB * * *
FTP-ACCESS ALLOW BSI POWER   LST * *
FTP-ACCESS ALOOW BSI SAM     TEST. READ
FTP-ACCESS DENY  BSI * * * * *
*
FTP-ACCESS DENY  * * * * * * * *
```

In this sample BSTTSCTY.T member FTP IP access is restricted to IP address in the 192.45.25 and 192.9.51 address ranges. Three users are defined using the FTP-USER command. The userid JCB is permitted access to any resource. The userid TJB is permitted on VSE/POWER RDR queue access. The userid BSI is permitted access to VSAM datasets in the BSI.USER.CATALOG, LIBRARY member of any type in the BSILIB library and VSE/POWER LST queue members.

BIM-EDIT™ FTP Server Support

The SMNT BSTTBEAM command is used to specify the BIM-EDIT™ access method structure for FTP Server support.

```
SMNT BSTTBEAM applid bimusr bimpwd
```

Where:

applid is the BIM-EDIT™ application id and may be specified as an asterisk (“*”) if the standard installation default (“BIMEDIT”) is used by the desired target BIM-EDIT™ application.

Bimusr bimpwd are the BIM-EDIT™-defined user and password information for LOGON processing.

The following FTP commands are supported by the BIM-EDIT™ access method program:

CWD specifies a working directory.

CDUP removes the working directory specification.

LIST produces a library listing, with statistics, if no working directory is specified. It produces a member listing, with statistics, once a working directory is specified. (A qualified listing is requested via an argument to this command.)

NLST is the name-only version of the LIST command.

PWD prints the name of the current working directory specification. If no working directory is currently specified, “BIMEDIT” is always returned as the top library name.

RMD removes (deletes) an existing BIM-EDIT™ sublibrary. It must be empty.

MKD makes (creates) a new BIM-EDIT™ sublibrary.

RNFR specifies an existing BIM-EDIT™ member to be renamed.

RNTO specifies a new BIM-EDIT™ member name for the member rename process.

DELE deletes an existing BIM-EDIT™ member..

RETR specifies a member name to retrieve from the current BIM-EDIT™ sublibrary.

STOR specifies a member name to store (create) in the current BIM-EDIT™ sublibrary.

In addition to the above, the following SITE command is supported for the purpose of remote execution of other BIM-EDIT™ commands and procedures:

```
SITE BIM command parm1 parm2 parm3 parm4 parm5 parm6 ...
```

Where:

command is the command or procedure to send to BIM-EDIT™ for execution.

Parm*n* are the command parameters. The total length of the command name and parameters (including spaces, delimiters, and any punctuation) may not exceed 68 characters in length.

Chapter 6

Using the GZIP Feature

A GZIP compression application is provided. The GZIP code was ported to VSE using the INFOZIP ZLIB compression package. INFOZIP is a public domain zip compatible compression facility. This feature can dramatically reduce the amount of data actually transmitted during an FTP transfer. BSTTGZIP uses the gzip file format and is not compatible with the patented pkzip file format.

Sample JCL

```
// DLBL IJSYSUC,'SAM.USER.CATALOG',,VSAM
// DLBL DISKIN,'TEST.UZIP.OUTPUT',0,VSAM,DISP=(OLD,DELETE)
// DLBL DISKOUT,'TEST.GZIP.OUTPUT',0,VSAM,
               RECSIZE=20000,DISP=(NEW,KEEP),RECORDS=100
// EXEC BSTTGZIP,SIZE=BSTTGZIP
INPUT  SAM DISKIN  BLKSZ 8000  RECSZ 80    RECFM FB
OUTPUT SAM DISKOUT BLKSZ 20000 RECSZ 20000 RECFM F
TYPE A
COMPRESS SYSIPT.TXT
QUIT
/*
*  STEP 3, FTP THE GZIP FILE BACK TO THE PC
// DLBL IJSYSUC,'SAM.USER.CATALOG',,VSAM
// DLBL DISKFIL,'TEST.GZIP.OUTPUT',0,VSAM,DISP=(OLD,DELETE)
// EXEC BSTTFTPC,SIZE=BSTTFTPC,OS390
ID 10
OPEN JCB
USER JCB
PASS JCB
CWD C:\TEMP\GZIP
*
INPUT SAM DISKFIL BLKSZ 20000 RECSZ 20000 RECFM F
TYPE I
STOR SYSIPT.GZ
*
QUIT
/*
```

Chapter 7

Using the BSTTGZIP Program

IPv6/VSE includes a program that creates GZIP format data. The BSTTGZIP program allows input from any source to be compressed and stored in a VSE/ESA library member, SAM or VSAM ESDS file. This GZIP data file can be transferred to another system and decompressed using any GZIP utility. The BSTTGZIP phase will also decompress input from a VSE/ESA library member, SAM or VSAM ESDS file and write the data to any destination. The source and destination of GZIP data can be almost any type of file within VSE/ESA. VSAM (KSDS, ESDS, RRDS and VRDS), sequential work file, library members, tape and VSE/POWER are some of the available locations for data input and output. When using the SAM or VSAM ESDS files to output compressed data use 26K (26624) fixed unblocked records.

The BSTTGZIP program requires a minimum 5MB partition.

The library member BSTTGZIP.ZIP contains an MS-DOS GZIP/GUNZIP utility. To use these free GZIP/GUNZIP utilities transfer the BSTTGZIP.ZIP file to any Windows PC and PKUNZIP the file. Use the README file for installation instructions.

IBM IPv6/VSE customers must download and install the BSTTZLIB phase from Barnard Software, Inc. from this link http://www.bsitcpip.com/ftp/instzlib.zip

If the BSTTZLIB.PHASE is not installed correctly then the following error may be received.

```
BSTT013E ZLIBLOAD ERROR R15=0000000C R0=00000000 R1=00000000
```

Compressing Data Using BSTTGZIP

The BSTTGZIP program will compress data in GZIP format. Input can be from any source.

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(cflib.slib,ttlib.sublib)
// EXEC BSTTGZIP,SIZE=BSTTGZIP
INPUT POWER LST PR003 0 S BARNARD
OUTPUT LIBRARY BSILIB INSTALL PR003 GZ S
TYPE A
COMPRESS PR003.TXT
QUIT
/*
// EXEC BSTTFTPC,SIZE=BSTTFTPC
ID nn
OPEN …
USER …
PASS …
CWD …
*
INPUT LIBRARY BSILIB INSTALL PR003 GZ S
TYPE I
STOR PR003.GZ
*
QUIT
/*
```

Sample Output

```
BSTT000I INITIATED  BSTTGZIP Ver 1.61 08/05/99 22.55    EP=00420078
BSTT003I COPYRIGHT (C) 1998-1999 BARNARD SOFTWARE, INC.
BSTT002I IPv6/VSE VERSION 1.61
BSTT004I CB=TTLA A=0043E000 L=0000087C
BSTT019I VSE 6.30 MODE 31-BIT
BSTT000I INITIATED  BSTTXGZC Ver 1.61 08/09/99 15.06    EP=00484000
BSTT020I CPU VIRTUAL ID=000001 MODEL=7490 PART=M2
BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
BSTT028I IPv6/VSE ENABLED
BSTT010I INPUT POWER LST PR003 0 S BARNARD
BSTT022I LST      OPENED INPUT  RC=00000000
BSTT010I OUTPUT LIBRARY BSILIB INSTALL PR003 GZ S
BSTT022I BSILIB   OPENED OUTPUT RC=00000000
BSTT034I TYPE SET TO A
BSTT046I CRLF     SET ON
BSTT046I ASA      SET ON
BSTT010I COMPRESS PR003
BSTT079I GZIP INPUT 2742K OUTPUT  505K RATIO 18.42% CRC-32 3EF569BC
BSTT022I LST      CLOSED INPUT  RC=00000000
BSTT047I      32887 RECORDS PROCESSED
BSTT022I BSILIB   CLOSED OUTPUT RC=00000000
BSTT001I TERMINATED BSTTXGZC
BSTT001I TERMINATED BSTTGZIP
```

Decompressing Data Using BSTTGZIP

The BSTTGZIP program will decompress data in GZIP format.

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(cflib.slib,ttlib.sublib)
// EXEC BSTTGZIP,SIZE=BSTTGZIP
INPUT LIBRARY BSILIB INSTALL PR003 GZ S
OUTPUT LIBRARY BSILIB INSTALL PR003 TXT S
TYPE A
CRLF ON
ASA ON
DECOMPRESS
QUIT
/*
```

Sample Output

```
BSTT000I INITIATED  BSTTGZIP Ver 1.61 08/05/99 22.55    EP=00420078
BSTT003I COPYRIGHT (C) 1998-1999 BARNARD SOFTWARE, INC.
BSTT002I IPv6/VSE VERSION 1.61
BSTT004I CB=TTLA A=0043E000 L=0000087C
BSTT019I VSE 6.30 MODE 31-BIT
BSTT000I INITIATED  BSTTXGZC Ver 1.61 08/09/99 15.06    EP=00484000
BSTT020I CPU VIRTUAL ID=000001 MODEL=7490 PART=M2
BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
BSTT028I IPv6/VSE ENABLED
BSTT010I INPUT LIBRARY BSILIB INSTALL PR003 GZ S
BSTT022I BSILIB   OPENED INPUT  RC=00000000
BSTT010I OUTPUT LIBRARY BSILIB INSTALL PR003 TXT S
BSTT022I BSILIB   OPENED OUTPUT RC=00000000
BSTT034I TYPE SET TO A
BSTT046I CRLF     SET ON
BSTT046I ASA      SET ON
BSTT004I CB=IBUF A=004CC000 L=00100000
BSTT004I CB=ZBUF A=005CC000 L=00100000
BSTT010I DECOMPRESS
BSTT079I GZIP INPUT  505K OUTPUT 2742K RATIO 542.7% CRC-32 3EF569BC
BSTT022I BSILIB   CLOSED INPUT  RC=00000000
BSTT022I BSILIB   CLOSED OUTPUT RC=00000000
BSTT001I TERMINATED BSTTXGZC
BSTT001I TERMINATED BSTTGZIP
```

Chapter 8

Using the SNTP Client and Server

The SNTP client and server programs BSTTNTPC and BSTTNTPS can be used to syncronize system clocks on your network.

SNTP Client BSTTNTPC

The SNTP client will extract the UTC clock from an external source and optionally, using the VSE/ESA TIME command, set the date, timeand zone on the host system. This application should be used carefully because the NTP client may have to set the date and time backward from its current setting. The system clock on S/390 mainframe servers is quite good. It should only be necessary to set its clock a few times per year or after VSE/POWER on resets. It is recommended that the NTP client be used to set the clock just before a IPL is performed.

The ID command shown in the sample JCL is required. The SETIME command causes the VSE/ESA TIME command to be issued. Without the SETIME command the system TOD clock is not changed. This command is effective only for z/VSE images running with a single processor in basic or LPAR mode. Running under z/VM or in MP mode the command is not supported.

Warning: We recommend that a BSTTNTPC job be run *without a SETIME command* before a second BSTTNTPC job with a SETIME command. This allows you to verify the time setting before the change is actually made. Always verify the system date and time after using BSTTNTPC to set the system time. The BSTTNTPC jobs should be run just prior to a z/VSE system IPL. Verify the date and time again after IPL.

ttlib.sublib is the IPv6/VSE library and sublibrary.
iplib.sublib is the TCP/IP library and sublibrary.

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// EXEC BSTTNTPC,SIZE=BSTTNTPC
ID 00
*  NS.ARC.NASA.GOV is the NASA SNTP Server
OPEN 128.102.16.2
SETIME
/*
```

Sample Output

```
BSTT000I INITIATED  BSTTNTPC Ver 1.01 03/19/98 19.59    EP=00420078
BSTT002I IPv6/VSE VERSION 1.01
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT004I CB=TTLA A=0043C000 L=000005CA
BSTT019I VSE 6.11 MODE 31-BIT
BSTT000I INITIATED  BSTTXNCC Ver 1.01 03/20/98 14.42    EP=0043F180
BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     2 PORT   123
BSTT004I CB=CBUF A=00442000 L=0000FFFF
BSTT018I PORT   123 OPENED RC=     0
BSTT010I TIME DATE=03/20/98,CLOCK=20/04/24,ZONE=WEST/05/00
BSTT018I PORT   123 CLOSED RC=     0
BSTT001I TERMINATED BSTTXNCC
BSTT001I TERMINATED BSTTNTPC
```

SNTP Server BSTTNTPS

The SNTP server will allow SNTP client application on the network to synchronize their clocks. The BSTTNTPS SNTP server can be terminated by using the MSG XX,DATA=TERMINATE command. The ID command shown in the sample JCL is required. The OPEN command specifies the IP address of the TCP/IP stack specified by the ID statement.

ttlib.sublib is the IPv6/VSE library and sublibrary.
iplib.sublib is the TCP/IP library and sublibrary.

Sample JCL

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// EXEC BSTTNTPS,SIZE=BSTTNTPS
ID 00
OPEN 192.9.51.1 123
/*
```

Sample Output

```
BSTT000I INITIATED  BSTTNTPS Ver 1.01 03/19/98 19.59    EP=00420078
BSTT002I IPv6/VSE VERSION 1.01
BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
BSTT004I CB=TTLA A=0043C000 L=000005CA
BSTT019I VSE 6.11 MODE 31-BIT
BSTT000I INITIATED  BSTTXNSC Ver 1.01 03/20/98 14.42    EP=0043F180
BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
BSTT028I IPv6/VSE ENABLED
BSTT015I CONNECTING TO   192.    45.    25.     2 PORT   123
BSTT004I CB=CBUF A=00442000 L=0000FFFF
BSTT018I PORT   123 OPENED RC=     0
* <== MSG xx,DATA=TERMINATE issued.

BSTT018I PORT   123 CLOSED RC=     0
BSTT001I TERMINATED BSTTXNSC
BSTT001I TERMINATED BSTTNTPS
```

Chapter 9

Using the TN3270E Server

BSTTVNET VTAM Server

The BSTTVNET TN3270E Server allows a TN3270 or TN3270E client to create a session with any VTAM application (CICS for example) using VTAM. Multiple TN3270E servers can be run on a single VSE/ESA system. For example, you may wish to run a TN3270E server in F4 accepting connections on port 23 and connecting to the APPLID PRODCICS (Production CICS) and at the same time run a TN3270E server in F5 accepting connections on port 1023 connecting to other CICS partitions and VTAM applications.

When a TN3270(E) client connects to the TN3270E server, the TN3270E server will display a menu of available applications. The user can select an application by placing the cursor under the application name and pressing enter.

TN3270(E) TERMINAL sessions are non-SNA. SNA TERMINAL sessions are not supported. TN3270E PRINTER sessions can be non-SNA or SNA.

CICS printers must be defined and cannot be auto-installed. We strongly recommend that printers be defined via RDO. The CICS TYPETERM must be VSEDSCP. BSTTVNET printer definitions are always SPECIFIC so the TN3270E client session definition must specify a printer LUNAME (or Resource Name). The printer definition in the BSTTVNET startup should define the default application as BSTTVNET. This will allow the TN3270E client to connect and wait for a host application to acquire it. This setup allows printers to be shared. The TN3270E printer client session must also specify AUTO-RECONNECT. Remember to increase your CICS AMAX value by the number of printers you are going to use (if you are going to use CICS RCF).

SNA LU1 SCS printers are also supported. The CICS TYPETERM must be VSESCSPA and the VTAM LOGMODE must be SPSCSPRT. SPSCSPRT is part of the IESINCLM table. SNA terminal sessions are not supported.

The CICS AUTINST SIT parameter should specify AUTINST=(***999***,name,***0***,***0***). Under CICS TS change the AIEXIT, AILDELAY, AIQMAX, and AIRDELAY system initialization parameters.

The CICS OPNDLIM parameter should specify OPNDLIM=999. This parameter is not used by CICS TS.

For performance reasons we recommend the CICS SIT RAMAX value be set to 8096. If you are running the ITAM facility set RAPOOL=50,RAMAX=8096 for CICS TS, for CICS/VSE 2.3 use RAPOOL=8,RAMAX=8096.

CICS printers generally use an active task. Adjust your CICS SIT AMAX value so that you do not run out of available active tasks. E.g., Set AMAX to 99 + 1 for each printer defined. See the MXT SIT parm.

Warning: 3270 data stream compression products ***must*** be disabled for BSTTVNET printers (all

types).

Partition Storage Requirements

VSE/ESA 2.1 and higher

16MB + 64K per session defined

The BSTTVNET TN3270E server allocates both 24-bit and 31-bit partition storage. 24-bit storage is used for control blocks and task thread storage and 31-bit storage is used for send/receive buffer space. 64K of storage is required for each TN3270(E) session. To calculate the correct partition size, multiply the number of TN3270(E) sessions required by 64K and add this to the amount 16MB. For example, to support 250 TN3270(E) sessions, allocate a 250*64K=16000K (16M) + 16MB or 32MB partition. Do not allocate more than 2000 sessions per server. Multiple BSTTVNET TN3270E server partitions can be used if more than 2000 sessions are needed. Each TN3270E server must use a different port.

VSE/ESA 1.4

When the BSTTVNET TN3270E server is running under VSE/ESA 1.4 it is limited to 100 sessions per server. Multiple BSTTVNET TN3270E servers can be run, each server running in a separate partition.

BSTTVNET running under VSE/ESA 1.4 is limited to 24-bit storage. Allocate the largest partition possible with no 31-bit storage. This limitation is due to VTAM.

COUPED

```
COUPLED ON|OFF
```

The COUPLED command tells the BSTTVNET TN3270(E) server that the stack defined with the ID command is an IPv6/VSE BSTT6NET TCP/IP stack and this stack is coupled to an IPv6/VSE BSTTINET IPv4 stack. In the case, BSTTVNET will listen for connections on both stacks at the same time. The default is OFF.

OPEN

```
OPEN ip_address|name port
```

The OPEN command can be specified up to 16 times allowing BSTTVNET to listen for connections on up to 16 different port numbers. The default *port* is 23. The ip_address should be the primary IP address specified in the BSTTINET/BSTT6NET stack startup or the *name* assigned to the primary IP address in the BSTTINE/BSTT6NET stack startup.

TERMINAL

```
TERMINAL luname SPECIFIC applid DEDICATE
TERMINAL luname SPECIFIC applid DEDICATE IP subnet mask
TERMINAL luname GENERIC  applid DEDICATE
TERMINAL luname GENERIC  applid DEDICATE POOL poolid
TERMINAL luname GENERIC  applid DEDICATE PORT nnnnn
```

The TERMINAL command is used to define a terminal luname to the VTAM TN3270E server (BSTTVNET). All terminals are part of a specific or generic resource pool. GENERIC or SPECIFIC must be specified. SPECIFIC terminal definitions are used by TN3270E client software to select specific lunames. Applid is the primary application id for the terminal and DEDICATE indicates the terminal is dedicated to this application. This command can be issued from the console after startup to define new terminals or update existing terminal definitions. POOL and *poolid* are optional for generic terminal definitions. Applid and DEDICATE can be replaced as asterisk (*) if placeholders are needed in a generic TERMINAL command. The IP parameter is used to associate a SPECIFIC luname with a specific IP address or subnet ip address. The default mask is 255.255.255.255.

LUNAME Allocation

When a session is created an LUNAME is allocated to the session.

This is done in one of five ways ...

GENERIC, LUNAME allocated first come, first served. One big pool of names.
E.g., `TERMINAL T001 GENERIC applid DEDICATE`

GENERIC by POOL id (this is a special form of SPECIFIC)
E.g., `TERMINAL T001 GENERIC applid DEDICATE POOL id`
in this case, the TN3270E client is requesting an LUNAME based on a POOL id.

SPECIFIC, LUNAME is requested by the TN3270E client
E.g., `TERMINAL T001 SPECIFIC applid DEDICATE`

SPECIFIC by IP address, LUNAME is allocated based on a specific IP address
E.g., `TERMINAL T001 SPECIFIC applid DEDICATE IP subnet mask`

GENERIC by port, a pool of names for a specific port.
E.g., `TERMINAL T001 GENERIC applid DEDICATE PORT nnnn`

TN3270E

```
TN3270E luname SPECIFIC applid DEDICATE
```

The TN3270E command is the same as a SPECIFIC TERMINAL command except it will define a full TN3270E terminal session and pass psuedo-SNA Bind/Unbind commands to the TN3270E client.

The TN3270E command *must* specify SPECIFIC.

The TN3270E command sessions *must* use the BSI USSTAB menu system. The BSTTUSST applid and the keyword DEDICATE *must* be coded.

Warning: TN3270E sessions have higher overhead than normal TERMINAL sessions and not all TN3270E client software supports the psuedo-SNA Bind/Unbind processing.

PRINTER

```
PRINTER luname applid <SCS>|* * IP subnet mask
```

The PRINTER command is used to define a printer luname to the VTAM TN3270E server (BSTTVNET). All printers are part of a specific printer resource pool and must be specifically selected by the TN3270E client software. The applid is the application identifier the printer is to be associated with. This command can be issued from the console after startup to define new printers or update existing printer definitions. The 4th parameter SCS should only be specified if the printer is an SNA LU1 SCS printer.

TN3270

```
TN3270 ON|OFF
```

The BSTTVNET TN3270E server can be downgraded to a TN3270 server by using the TN3270 ON command is the BSTTVNET startup commands.

NEWNAME

```
NEWNAME luname dns_lookup_name
```

The NEWNAME command is used to modify the IP address or DNS lookup name for a specified luname.

REACTIVATE

```
REACTIVATE luname
REACT luname
INACT luname
```

The REACTIVATE command is used to tell the BSTTVNET TN3270E server to activate or re-activate lost VTAM logical units. The name of the logical unit is *luname*. The INACT version of this command inactivates an luname within the TN3270E server. The inactivated luname is no longer available for use. The REACT command must be used to reactivate the luname.

TN3270E Printer Session Setup

TN3270E printers are easy to setup.

Under CICS define a printer (E.g., P001) using the TYPETERM VSEDSCP
This is a 3270P (3270 Printer) local non-SNA definition

The VSEDSCP typeterm should have these properties

```
OPERATIONAL PROPERTIES
  AUTOConnect    : No
  ATi            : Yes
  TTi            : Yes
  CReatesess     : Yes
  RELreq         : Yes
  DIscreq        : Yes
  Nepclass       : 000
  SIgnoff        : Yes
```

The CICS printer definition for the CICS REPORT controller uses these parameters

```
OPERATOR DEFAULTS
 OPERId          :
 OPERPriority    : 000                0-255
 OPERRsl         : 1-24
 OPERSecurity    : 1-64
 Userid          :
 NAtlang         :

PRINTER DATA
 SPOOLDest       : HP4L
 SPOOLPRTRsl     : Public             0-24 | Public
 SPOOLPRTTo      : 00                 0-59
 PRINTEDmsg      : No                 No | Yes
 PRINTImmed      : No                 No | Yes
```

The SPOOLDest equates to the VSE/POWER * $$ LST DEST=(,HP4L) parameter

Next, copy the phase BSTTZNEP.PHASE (CICS 2.3) or BSTTZNTS.PHASE (CICS TS) from the IPv6/VSE lib.slib to PRD2.CONFIG as DFHZNEP.PHASE. This is a special DFHZNEP program that keeps the CREate flag set on printers when they disconnect from CICS.

Define the printer to VTAM in a .B book.
Use the sample .B book in the manual to do this.

Define the printer to the BSTTVNET TN3270E server

PRINTER P001 BSTTVNET

Using a TN3270E client on a PC startup a printer session. Printer sessions are defined as IBM-3287-1

devices. In the LUNAME or Resource Name field specify the VTAM LUNAME of the session. This value is P001 in our example. Make sure the TN3270E session has 'Auto-Reconnect' enabled.

Connect to the TN3270E server.

Print from CICS using the CICS Report Controller.
CICS will automatically acquire the printer session as needed.

Printing without using a TN3270E Client

The BSTTVNET TN3270E server supports printing from a VTAM application (E.g., CICS) without using a TN3270E client running on a PC. Direct, LPR, IPP and FTP protocols can be used to print directly to a printer or daemon running on a server (E.g. an LPD).

When using one of the direct print drivers a temporary/work lib.slib should be specified in the BSTTVNET SOURCE SEARCH LIBDEF chain. This lib.slib will be used for temporary/work print spool members.

```
// LIBDEF SOURCE,SEARCH=(templib.slib,PRD2.CONFIG,TOOLLIB.SLIB)
```

The following table shows the types of protocols and the format of the printer definitions supported for printing directly to printers bypassing the need for running a TN3270E client.

```
DIRECT luname applid ip-address port inserts line-len
LPR    luname applid ip-address 515  inserts queue_name line-len
NOTR
IPP    luname applid ip-address 631  inserts ipp_name Line-len
FTP    luname applid ip-address 21   inserts userid password line-
len
FTPP   luname applid ip-address 21   inserts userid password line-
len
```

The LPR (Line Print Requester) driver should not be used to print directly to an LPD running in a printer. Instead the LPR driver should be used to print to an LPD running on a server (Windows, Unix, Linux). The LPD running on the server can then print to the printer using standard Windows/Unix/Linux print drivers. The value of queue_name defaults to the luname. LPR printer definitions require 24-bit partition GETVIS. This limits the number of LPR printers to 128 per BSTTVNET partition.

The DIRECT protocol can be used to send print output direct to a printer using TCP/IP. Many printers support this protocol for printing output. Check your printer manuals or the vendors support web site to determine the correct port number to use. The port number varies from printer to printer. E.g., the EPSON Color 980N uses port 9100 for direct printing. Direct printing has the lowest overhead and highest speed.
Printers connected via JetDirect support 1 to 3 printers using ports 9100, 9101 and 9102.

IPP is Internet Print Protocol and is a fairly recent development. This protocol is supported by Windows 2000. This print driver is still under development by BSI.

FTP is File Transfer Protocol printing. When the VTAM application prints to the local non-SNA TN3270E printer, the data is stored in a library member until printing has completed. Once printing has completed an FTP session is started with the printer and the data stored in the library member is sent to the printer. This print method can also be used to send data to an FTP server. The filename used for the STOR FTP command is date.time.luname (yyyymmdd.hhmmss.luname or 20020320.151505.P102).

FTPP is the same as an FTP printer except the FTP data transfer process uses passive data transfers.

The PEOJ command controls the end-of-print detection timeout. The default PEOJ timeout is 10 seconds. When no print data has been sent for 10 seconds end-of-print is detected and the spooled data is processed and/or the connection is closed.

Line-len is the maximum line length. The default is 132.

The character plus sign '+' is translated to a space when used within the queue_name.

Note: The INSERTS members used by the BSTTVNET TN3270E server are the same format as those used by the BSTTLPRC program. BSTTVNET INSERTS use ASCII decimal byte values.

The NOTRAN option of the LPR command indicates the LPR data file should be sent as EBCDIC.

Printing to CICS Printers

When moving to TCP/IP controlled printers from channel or coax attached printers it is very useful to be able to send printer escape sequences to the printer as part of the report.

If the escape sequences are always the same for a specific printer then using an inserts member is a simple and easy way to handle this requirement. The inserts member is specified on the DIRECT or LPR command and read during BSTTVNET startup. Changing the inserts member requires recycling the BSTTVNET partition for the change to take effect.

However, when a printer is used for various different fonts (etc.) or graphics needs to be inserted into a report then sending escape sequences from a CICS transaction is necessary. There are 2 easy methods of handling this requirement.

First, the 'Escape to Binary' SNA printer command is supported by BSTTVNET DIRECT and LPR print drivers. This means that the SNA 'Escape to Binary' command can be sent to BSTTVNET Non-SNA printer sessions.

The 'Escape to Binary' command has the format x'35'LLPPPPPP...

Where the x'35' is the Escape to Binary command

LL is the length of the data (PPPPPP...).

PPPPPP... is the binary (usually ASCII data).

The second method is just as easy. Select an unassigned EBCDIC character, x'41' for example, and use this in your applications as an escape character. Then change the Single Byte Character Set translation table to translate the x'41' EBCDIC character into a x'1B' ASCII escape character.

```
... Original code

 01  WCF-CAB.
     03 WCF-RESET-IMP        PIC X(005) VALUE SPACES.
     03 FILLER               PIC X(008) VALUE
     '&%1B(12U'.
     03 FILLER               PIC X(020) VALUE
     '&%1B(s0p15h10v0s3b0T'.
     03 WCF-TAM-PAG          PIC X(009) VALUE SPACES.

... Modified code

 01  WCF-CAB.
     03 WCF-RESET-IMP        PIC X(005) VALUE SPACES.
     03 FILLER               PIC X(001) VALUE X'41'.
     03 FILLER               PIC X(004) VALUE
```

```
    '(12U'.
    03 FILLER               PIC X(001) VALUE X'41'.
    03 FILLER               PIC X(016) VALUE
    '(s0p15h10v0s3b0T'.
    03 WCF-TAM-PAG          PIC X(009) VALUE SPACES.
```

After changing the application remember to change the SBCS table you are using. The default SBCS table is US_ENG_03.

```
US_ENG_03
X'000102039C09867F978D8E0B0C0D0E0F'
X'101112139D8508871819928F1C1D1E1F'
X'80818283840A171B88898A8B8C050607'
X'909116939495960498999A9B14159E1A'
X'20A0E2E4E0E1E3E5E7F1A22E3C282B7C'

Change the last line shown here to

X'201BE2E4E0E1E3E5E7F1A22E3C282B7C'
```

The SBCS tables are located in the BSTTSBCS.T member of the IPv6/VSE lib.slib. Do not modify the table provided with IPv6/VSE. Instead copy the standard BSTTSBCS.T member to PRD2.CONFIG and modify the member in PRD2.CONFIG. BSTTVNET reads the BSTTSBCS.T member using the LIBDEF SOURCE,SEARCH chain. After making the modification change the BSTTVNET LIBDEF to search PRD2.CONFIG before the IPv6/VSE lib.slib. Updating the SBCS tables is also discussed in the IPv6/VSE Migration Guide.

After changing your application and recycling BSTTVNET to load the new SBCS table you are ready to print.

VTAM Definitions

The following VNETAPPL.B is an example if the VTAM definition required for the BSTTVNET TN3270E server.

Sample VNETAPPL.B Book

```
// EXEC LIBR,SIZE=256K,PARM='MSHP'
ACCESS S=PRD2.CONFIG
CATALOG VNETAPPL.B   REPLACE=YES
VNETAPPL VBUILD TYPE=APPL
BSTTVNET APPL
BSTTUSST APPL  AUTH=(PASS,ACQ)
VNETTRM  GROUP MODETAB=IESINCLM,DLOGMOD=SP3272QN
T001     APPL  AUTH=(ACQ),EAS=1
T002     APPL  AUTH=(ACQ),EAS=1
T003     APPL  AUTH=(ACQ),EAS=1
T004     APPL  AUTH=(ACQ),EAS=1
T005     APPL  AUTH=(ACQ),EAS=1
T006     APPL  AUTH=(ACQ),EAS=1
T007     APPL  AUTH=(ACQ),EAS=1
T008     APPL  AUTH=(ACQ),EAS=1
T009     APPL  AUTH=(ACQ),EAS=1
T010     APPL  AUTH=(ACQ),EAS=1
VNETPRT  GROUP MODETAB=IESINCLM,DLOGMOD=SPDSCPRT
P001     APPL  AUTH=(ACQ),EAS=1
P002     APPL  AUTH=(ACQ),EAS=1
P003     APPL  AUTH=(ACQ),EAS=1,DLOGMOD=SPSCSPRT

P004     APPL  AUTH=(ACQ),EAS=1
P005     APPL  AUTH=(ACQ),EAS=1
P006     APPL  AUTH=(ACQ),EAS=1
P007     APPL  AUTH=(ACQ),EAS=1
P008     APPL  AUTH=(ACQ),EAS=1
P009     APPL  AUTH=(ACQ),EAS=1
P010     APPL  AUTH=(ACQ),EAS=1
/+
/*
```

Partition Priority

The TN3270E server partition should be just below the TCP/IP partition in priority.

ttlib.sublib is the IPv6/VSE library and sublibrary.
iplib.sublib is the TCP/IP library and sublibrary.

Sample JCL

In the following sample JCL please change the *ip-addr* to be the IP address of your VSE/ESA system. The default port number is 23. If you already have a TN3270 server on your system you may wish to use a different port address (1023 for example).

DSPACE=3M is REQUIRED and the VTAM lib.slib (normally PRD1.BASE) must also be included in the PHASE library search chain. If the VTAM lib.slib is already defined in your PERM PHASE search chain it may be omitted from the TEMP PHASE search chain defined in your JCL.

```
// LIBDEF PHASE,SEARCH=(ttlib.sublib,iplib.sublib)
// LIBDEF SOURCE,SEARCH=(ttlib.sublib)
// EXEC IESWAITT,SIZE=IESWAITT   (Wait for VTAM)
// OPTION SYSPARM='nn'
// EXEC BSTTWAIT,SIZE=BSTTWAIT   (Wait for BSTTINET)
/*
// EXEC BSTTVNET,SIZE=BSTTVNET,DSPACE=3M,OS390
ID nn
OPEN ip-addr port
*
APPLID V21CICS  VSE/ESA CICS and ICCF
APPLID V21VTAM2 OPTI-AUDIT VTAM Console Interface
APPLID BSTTUSST VTAM USS Table Emulation
APPLID BSTTVNET Printer Sharing Application (Required, must be last)

*
TITLE <your title line goes here>
*
TERMINAL T001 GENERIC
TERMINAL T002 GENERIC
TERMINAL T003 GENERIC
TERMINAL T004 GENERIC * * POOL GP1
TERMINAL T005 GENERIC * * POOL GP1
TERMINAL T006 SPECIFIC DBDCCICS
TERMINAL T007 SPECIFIC DBDCCICS DEDICATE
TERMINAL T008 SPECIFIC BSTTUSST DEDICATE
TERMINAL T009 SPECIFIC *        *         IP 192.168.1.1
TERMINAL T010 SPECIFIC
*
PRINTER P001 BSTTVNET
PRINTER P002 BSTTVNET
PRINTER P003 BSTTVNET SCS
PRINTER P004 BSTTVNET
PRINTER P005 BSTTVNET
PRINTER P006 BSTTVNET
PRINTER P007 BSTTVNET
PRINTER P008 BSTTVNET
PRINTER P009 BSTTVNET
PRINTER P010 BSTTVNET
*
USSTAB <usstab phase name>
ATTACH BSTTUSST
*
ATTACH TN3270E
/*
```

Sample Output

```
F4 0004 // JOB TN3270E
   DATE 09/10/1998, CLOCK 20/13/28
F4 0004 BSTT000I INITIATED  BSTTVNET Ver 1.27 09/09/98 10.48
F4 0004 BSTT003I COPYRIGHT (C) 1998 BARNARD SOFTWARE, INC.
F4 0004 BSTT002I IPv6/VSE VERSION 1.27
F4 0004 BSTT004I CB=TTLA A=0041E000 L=00000734
F4 0004 BSTT019I VSE 6.30 MODE 31-BIT
F4 0004 BSTT004I CB=COMR A=00004160 L=00000108
F4 0096 BSTT000I INITIATED  BSTTXTNC Ver 1.27 09/09/98 15.51
F4 0096 BSTT015I CONNECTING TO   192.     9.    51.     1 PORT  1023
F4 0110 BSTT000I INITIATED  BSTTTSRV Ver 1.27 09/06/98 15.05
F4 0096 BSTT042I ATTACH OF TN3270E  COMPLETED
F4 0110 BSTT014I BSTTEXIT LOADED A=002C5000 L=00000FF8
F4 0110 BSTT014I BSTTAMIR LOADED A=002C5628 L=00000FF8
F4 0110 BSTT014I BSTTAXPR LOADED A=002C5DA0 L=00000FF8
F4 0110 BSTT065I T0000001 CB=TTCB A=00465800 L=00000A74
F4 0110 BSTT056I BSAUVCON ACTIVE TTAB=00458A80
F4 0110 BSTT056I V21TEST  ACTIVE TTAB=00458300
F4 0110 BSTT056I V21PROD  ACTIVE TTAB=00457B80
F4 0110 BSTT056I DBDCCICS ACTIVE TTAB=00457400
F4 0110 BSTT059I DBDCCICS OPENED BY F2 CICSICCF DFHSIP
F4 0110 BSTT064I T0000001 PORT  1023 OPENED RC=     0
F4 0110 BSTT061I T0000001 CONNECTED: PORT  4960 IP 192.45.25.1
F4 0110 BSTT065I T0000002 CB=TTCB A=00466280 L=00000A74
F4 0110 BSTT063E T0000001 RECEIVE  ERROR R15=00000004 R0=00000004
F4 0110 BSTT064I T0000001 PORT  1023 CLOSED RC=     4
F4 0110 BSTT062I T0000001 DISCONNECTED: PORT  4960 IP 192.45.25.1
F4 0110 BSTT064I T0000002 PORT  1023 OPENED RC=     0
F4 0110 BSTT061I T0000002 CONNECTED: PORT  1089 IP 192.45.25.1
F4 0110 BSTT065I T0000003 CB=TTCB A=00465800 L=00000A74
F4 0110 BSTT063E T0000002 RECEIVE  ERROR R15=00000004 R0=00000008
F4 0110 BSTT064I T0000002 PORT  1023 CLOSED RC=     4
F4 0110 BSTT062I T0000002 DISCONNECTED: PORT  1089 IP 192.45.25.1
F4 0110 BSTT064I T0000003 PORT  1023 OPENED RC=     0
F4 0110 BSTT061I T0000003 CONNECTED: PORT  1094 IP 192.45.25.1
F4 0110 BSTT065I T0000004 CB=TTCB A=00466280 L=00000A74
F4 0110 BSTT063E T0000003 RECEIVE  ERROR R15=00000004 R0=00000004
F4 0110 BSTT064I T0000003 PORT  1023 CLOSED RC=     4
F4 0110 BSTT062I T0000003 DISCONNECTED: PORT  1094 IP 192.45.25.1
```

The Logon Process

The TN3270E servers use APPLID commands to create a logon menu. The first APPLID on the menu screen is the last APPLID defined to the server with an APPLID command. The TN3270E servers automatically select the first APPLID (last APPLID defined with an APPLID command) when a connection is accepted and the first APPLID is active and ready for logons.

Initially, it is recommended that you define an unused (but valid) VTAM application as the last APPLID command. This application will appear first on the APPLID menu. Doing this will cause the TN3270E server to always display the logon menu.

For dedicated TN3270E access specify only one APPLID command. TN3270(E) clients connecting to this server will not see a menu unless the application is not available for logons.

The PRINTER command is used to direct TN3270E printer clients to a specific application.

Sample Logon Menu

```
IPv6/VSE TN3270-E Server Version V1.43     Host:192.9.51.1      03/22/1999
Application Selection Menu                   Client:192.45.25.1       09:49:07
Name     Status    Description
BSTTVNET Inactive  PRINTER SHARING APPLICATION
V21VTAM2 Active    OPTI-AUDIT VTAM CONSOLE INTERFACE
V21CICS  Ready     VSE/ESA CICS AND ICCF









Copyright (c) 1998-1999 by Barnard Software, Inc.              LU Name=T008
```

Application Status

Ready indicates that the application is active and ready to accept logons.

Active indicates that the application is active but is not currently accepting logons.

Inactive indicates that the application is not active.

VTAM USSTAB Emulation

The BSTTUSST VTAM application provided with IPv6/VSE provides VTAM USS table emulation for those users that want to retain the same menu system they used with VTAM.

The VTAM USS table phase must be assembled using the latest USSTAB macros. Only non-SNA USS tables are supported. Old format USS tables are not supported (FORMAT=DYNAMIC must be specified on the USSTAB macro). Single word logon commands (menu letters or words) and 'long form' LOGON commands are supported. To disable the writing of the USSMSG MSG=1 screen use the BSTTVNET startup command WRITECA OFF.

```
LOGON APPLID(applid) LOGMODE(logmode) DATA(data)
LOGON APPLID(applid) DATA(data) logmode(logmode)
```

USSTAB Configuration

The USSTAB command specifies the name of the VTAM USS table phase and the VTAM APPLID to be used by the BSTTUSST application. The USSTAB command must be in the BSTTVNET startup commands prior to the ATTACH BSTTUSST command. The default USS table name is VTMUSSTB. This table is provided with VSE/ESA and resides in IJSYSRS. The default VTAM APPLID is BSTTUSST.

```
USSTAB phase applid
```

Using the ATTACH BSTTUSST command activates the BSTTUSST application. This ATTACH command must be placed prior to the ATTACH TN3270E command in the BSTTVNET startup commands.

```
ATTACH BSTTUSST
```

The APPLID defined in the USSTAB command (used by the BSTTUSST application) must be defined to VTAM. Each TN3270E server using the BSTTUSST application must have its own APPLID definition.

```
BSTTUSST APPL AUTH=(PASS,ACQ)
```

The APPLID defined in the USSTAB command (used by the BSTTUSST application) must be defined as the default application for each LU defined by a TERMINAL command. The DEDICATE parameter can also be used to force the terminal to the BSTTUSST application on each connection by a TN3270E client.

```
TERMINAL T001 SPECIFIC BSTTUSST DEDICATE
TERMINAL T002 GENERIC  BSTTUSST DEDICATE
```

Using Multiple USSTAB Menus

Each BSTTVNET TN3270E server can have multiple USSTAB menus active. The following example shows 3 BSTTVNET TN3270E server3, each configured with a different USSTAB menu.

The USSTAB command must always be paired with an ATTACH BSTTUSST command.

VTAM .B Book Definitions

```
BSTTUSS1 APPL AUTH=(PASS,ACQ)
BSTTUSS2 APPL AUTH=(PASS,ACQ)
BSTTUSS3 APPL AUTH=(PASS,ACQ)
```

Sample BSTTVNET JCL

```
// EXEC BSTTVNET,SIZE=BSTTVNET,DSPACE=3M,OS390
ID nn
OPEN ip-address port1
*
APPLID BSTTUSS1 USSTAB Menu System #1
APPLID BSTTUSS2 USSTAB Menu System #2
APPLID BSTTUSS3 USSTAB Menu System #3
APPLID BSTTVNET Required Printer Sharing APPLID (must be last APPLID)
*
TERMINAL T101 SPECIFIC BSTTUSS1 DEDICATE
...
TERMINAL T201 SPECIFIC BSTTUSS2 DEDICATE
...
TERMINAL T301 SPECIFIC BSTTUSS3 DEDICATE
...
*
USSTAB phase BSTTUSS1
ATTACH BSTTUSST
USSTAB phase BSTTUSS2
ATTACH BSTTUSST
USSTAB phase BSTTUSS3
ATTACH BSTTUSST
*
ATTACH TN3270E
/*
```

Sample VTAM USSTAB

The following is a sample VTAM USSTAB for use with the BSTTUSST application. Note that the longest CMD= parameters must be first in the table and each USSTAB entry *must* have the format shown in the sample. The order of the parameters must be P1/APPLID, P2/LOGMODE and P3/DATA. Only USSMSG MSG=10 is supported and processed by the BSTTUSST menu application.

```
TCPUSST  USSTAB  FORMAT=DYNAMIC,TABLE=STDTRANS
*
CICS2    USSCMD  CMD=CICS2,REP=LOGON,FORMAT=BAL
         USSPARM PARM=P1,REP=APPLID,DEFAULT=DBDCCICS
         USSPARM PARM=P2,REP=LOGMODE,DEFAULT=SP3272QN
         USSPARM PARM=P3,REP=DATA,DEFAULT=TEST
*
CICS     USSCMD  CMD=CICS,REP=LOGON,FORMAT=BAL
         USSPARM PARM=P1,REP=APPLID,DEFAULT=DBDCCICS
         USSPARM PARM=P2,REP=LOGMODE
         USSPARM PARM=P3,REP=DATA
*
PROD     USSCMD  CMD=PROD,REP=LOGON,FORMAT=BAL
         USSPARM PARM=P1,REP=APPLID,DEFAULT=CICSPROD
         USSPARM PARM=P2,REP=LOGMODE
         USSPARM PARM=P3,REP=DATA
*
MESSAGES USSMSG  MSG=0,TEXT='COMMAND ACCEPTED'
         USSMSG  MSG=1,BUFFER=M1
         USSMSG  MSG=2,BUFFER=M1
         USSMSG  MSG=3,TEXT='ERROR IN VTMUSSTR. PRESS ENTER'
         USSMSG  MSG=4,TEXT='APPLICATION NOT ACTIVATED. PRESS ENTER'
         USSMSG  MSG=5,BUFFER=M1
         USSMSG  MSG=6,TEXT='LOGON ALREADY PENDING'
         USSMSG  MSG=7,TEXT='UNABLE TO ESTABLISH SESSION'
         USSMSG  MSG=8,TEXT='INSUFFICIENT STORAGE'
         USSMSG  MSG=9,TEXT='MAGNETIC CARD DATA ERROR'
         USSMSG  MSG=10,BUFFER=M1
         USSMSG  MSG=12,TEXT='REQUIRED PARAMETER OMITTED'
         USSMSG  MSG=13,TEXT='IBMECHO%'
*
M1       DC      AL2(M1E-M1S)
M1S      DC      X'F5C7'
         DC      X'114040'
         DC      X'1DF8'
         DC      C'   ENTER AN APPLID'
         DC      X'11C2E3'
         DC      X'1D4013'
         DC      X'11D661'
         DC      X'1DF8'
         DC      X'1DF8'
M1E      EQU     *
*
STDTRANS DC      X'000102030405060708090A0B0C0D0E0F'
         DC      X'101112131415161718191A1B1C1D1E1F'
         DC      X'202122232425262728292A2B2C2D2E2F'
         DC      X'303132333435363738393A3B3C3D3E3F'
         DC      X'404142434445464748494A4B4C4D4E4F'
         DC      X'505152535455565758595A5B5C5D5E5F'
         DC      X'606162636465666768696A6B6C6D6E6F'
         DC      X'707172737475767778797A7B7C7D7E7F'
         DC      X'80C1C2C3C4C5C6C7C8C98A8B8C8D8E8F'
         DC      X'90D1D2D3D4D5D6D7D8D99A9B9C9D9E9F'
         DC      X'A0A1E2E3E4E5E6E7E8E9AAABACADAEAF'
```

```
         DC      X'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'
         DC      X'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'
         DC      X'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'
         DC      X'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'
         DC      X'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'
END      USSEND
         END   ,              END OF ASSEMBLY
```

BSTTVNET Security Exit

The BSTTVNET TN3270(E) server has a security exit. The security exit, BSTTTNSX, can be used to validate the IP address of the incoming connection, LUNAME selected or Application selected.

The default BSTTTNSX.PHASE simply returns a return code of zero for any validation. The source code to the BSTTTNSX.PHASE is provided in the IPv6/VSE installation lib.slib.

Another security exit is provided, named BSTTTNS1.PHASE. This security exit permits only connections made through the loopback interface to connect to BSTTVNET server. This exit is useful if you want only SSL/TLS connections accepted. Clear text connections made directly to BSTTVNET will be denied.

Using the BSTTTNS1 Exit

1. Copy BSTTTNS1.PHASE to a different lib.slib
2. Rename the copied BSTTTNS1.PHASE to BSTTTNSX.PHASE
3. LIBDEF the different lib.slib 1st in the LIBDEF PHASE,SEARCH chain

Messages

If the BSTTTNSX security exit denies access for any reason, a message will appear in the BSTTVNET SYSLST log output.

```
BSTT741E BSTTTNSX Security check failed, RS=     1 RC=00000004
```

RS Reason codes:

1. IP address check failed
2. LUNAME check failed
3. APPLID check failed

The RC (Return Code) displayed is normally 4 (denied) but could vary if a customer has modified this routine to use other return codes.

Chapter 10

Using the BSTTLPRC LPR Program

The BSTTLPRC program provides Line Print Requestor facilities. The BSTTLPRC is an external batch LPR client program that reads VSE/POWER LST queue data and transmits it to a Line Print Daemon (server) on the network. The LPD might be an IP addressable printer or another host system running an LPD application.

VSE/POWER JECL

The BSTTLPRC uses several VSE/POWER JECL fields to define the destination LPD. The * $$ LST card must specify the DEST, USER and UCS parameters.

The DEST=(,queue) specifies the destination queue name on the LPD.

The USER='aaa.bbb.ccc.ddd' specifies the IP address of the destination LPD. The aaa.bbb.ccc.ddd can be replaced by a name if the name has been defined to the TCP/IP stack. If you are using the BSI TCP/IP stack defining a name is done using the HOST command. If you are using the IBM/CSI TCP/IP stack defining a name to the TCP/IP stack is done using the DEFINE NAME,NAME=SERVER,IPADDR=aaa.bbb.ccc.ddd command. This command appears in the IPINITxx.L member for the TCP/IP stack.

The UCS=(name) specifies the name of a member in the source search chain that defines the INSERTS header and trailer data for the report. If a member with the name specified in the UCS parameter is not found in the source search chain the BSTTLPRC will attempt to load a phase from the PHASE SEARCH chain. The format of this phase is the same as CSI's INSERTS phases.

VSE/POWER JECL Example

The following example shows the JCL/JECL required to setup report output to be printed by the BSTTLPRC application.

```
* $$ JOB JNM=LISTC,CLASS=P
* $$ LST CLASS=L,DEST=(,HP600),USER='192.45.25.1',UCS=(HP600L)
// JOB IDCAMS
// EXEC IDCAMS,SIZE=IDCAMS
   LISTC ALL CAT(VSAM.MASTER.CATALOG)
/*
/&
* $$ EOJ
```

INSERTS Members

The BSTTLPRC will process the member named in the UCS=(xxxxxxxx) field of the VSE/POWER JECL. These members have a member type of I. For example, if UCS=(TEST) is specified then the member TEST.I will be processed from the source library search chain.

For compatibility reasons if the source member TEST.I is not found then the BSTTLPRC program will attempt to CDLOAD the phase TEST. The TEST.PHASE must have the same format as the CSI INSERTS phases.

INSERTS Member Contents

The following example shows the contents of an INSERTS member. The HEADER command is used to define data to be inserted in the data stream before the report. The TRAILER command is used to define data to be inserted in the data stream after the report.

INSERTS data should be specified as 3 digit decimal numbers equating to the ASCII values you want sent to the printer.

Lines within the INSERTS member that begin with an asterisk (*) are treated as comments.

```
* ****************************************************************
*   HEADER - SETS PRINTER TO PROPER MODE FOR PRINTING THIS REPORT
*
*  027 069                          RESET PRINTER FIRST
*
*  027 038 108 048 079              PORTRATE MODE
*  027 038 108 049 083              DUPLEX PRINTING (LONG-EDGE BIND)
*  027 040 115 049 051 072          PITCH OF 13 CHARACTERS PER INCH
*  027 040 115 048 066              MEDIUM STROKE WEIGHT
*  027 040 115 052 048 057 057 084  COURIER TYPE (NON-PROPORTIONAL)
*  027 038 108 054 068              VERTICAL LINE SPACING - 6 LPI
*
* ****************************************************************
*
*  TRAILER - RESET THE PRINTER
*  027 069                          RESET PRINTER LAST
* ****************************************************************
HEADER  027 038 108 048 079
HEADER  027 038 108 049 083
HEADER  027 040 115 049 051 072
HEADER  027 040 115 048 066
HEADER  027 040 115 052 048 057 057 084
HEADER  027 038 108 054 068
TRAILER 027 069
```

BSTTLPRC Sample JCL

The following JCL shows sample JCL for running the BSTTLPRC programs. The BSTTLPRC programs creates a temporary library menber in the first lib.slib in the source chain. The library member has a name of TnnnLPR.DATA exists only long enough to send the data to the destination LPD.

```
// LIBDEF PHASE,SEARCH=(ttlib.slib,tcplib.slib)
// LIBDEF SOURCE,SEARCH=(wklib.slib,cfglib.slib,ttlib.slib)
// EXEC BSTTLPRC,SIZE=BSTTLPRC
ID nn
*
USERFLD ON|OFF
UFNR ON|OFF
*
INPUT POWER LST name number class destination
*
USER name
HOST description
*
INSERTS member
QUEUE qname
*
INSERTS optional-inserts-name
SEND
*
QUIT
/*
```

ttlib.slib is the IPv6/VSE lib.slib

tcplib.slib is the TCP/IP lib.slib

wklib.slib is a work lib.slib used to create a temporary member

cfglib.slib is the lib.slib where the BSTTPARM.A member is stored

nn is the ID of the TCP/IP partition to be used

The USERFLD ON|OFF command determines if the USER='a.b.c.d' field in the VSE/POWER JECL is used as the printer's name/ip-address. If USERFLD OFF is specified, the DEST=(,…) queue name value is used as the printer name. The qname is resolved to an IP-address using a DNS lookup.

The UFNR command indicates Unique File Name Required. The default is OFF. Use UFNR ON only if necessary.

USER name specifies a user name for the report. This command is required.

HOST description specifies a host name for the report. This command is required.

The command BANNER <string> can be used to tell the LPD to generate a banner page. BSTTLPRC has NO control over the format or type of banner products.

The INSERTS command specifies the INSERTS member to use. The member specified in this command overrides the UCS= value in the VSE/POWER JECL.

The QUEUE command specifies the LPD queue name to be used. The name specified in the queue command overrides the DEST=(,qname) value specified in the VSE/POWER JECL. The character plus sign '+' is translated to a space when used within the queue name.

Using the AUTO-LPR REXX Procedure

The BSTTALPR.PROC can be used to monitor the VSE/POWER LST queue and automatically submit BSTTLPRC jobs to LPR reports. The BSTTALPR.PROC can be customized by you to support any type of report selection features. The provided sample REXX procedure uses 2 VSE/POWER LST classes to control LPR printing. LST members entering the queue in class L are scanned. Once found, the class L members are changed to class M and the BSTTLPRC programs submitted to LPR the report to the specified LPD. Once the LPR process has completed the member is changed from DISP=K to DISP=L.

Sample BSTTALPR JCL

The following the sample JCL required to run the Auto-LPR REXX application.

```
// LIBDEF PROC,SEARCH=ttlib.slib
// EXEC REXX=BSTTALPR
/*
```

ttlib.slib is the IPv6/VSE lib.slib

Chapter 11

Using the Transparent FTP Facility

IPv6/VSE has a Transparent FTP feature. This feature allows any application to open a VSAM file for sequential input or output and transparently invoke the BSTTFTPC batch FTP client to read or write the data. When an application using Transparent FTP opens a sequential VSAM file for input (or output) the IPv6/VSE Open/Close Vendor Exit intercepts the open and attaches the BSTTFTPC (FTP Client) as a subtask. In turn, the BSTTFTPC program reads the FTP control file specified by the // DLBL and starts the data transfer operation. The Transparent FTP feature allows you to combine the creation and transfer of a flat file into a single step. To invoke the Transparent FTP feature a special // DLBL is used.

Restriction: Only one Transparent FTP file can be used per program execution.

Special // DLBL format

The file-name specified in the // DLBL as the following special format.

```
// DLBL name,'FTP:lib.slib.member.type',,VSAM
*
*  Examples
*
// DLBL DISKIN,'FTP:BSILIB.TEST.DISKIN.FTP',,VSAM
// DLBL DISKOUT,'FTP:BSILIB.TEST.DISKOUT.FTP',,VSAM
```

The 'FTP:' at the start of the filename indicates that this is a Transparent FTP and the lib.slib.member.type specifies the library location of the Transparent FTP control file.

PHASE and SOURCE LIBDEF SEARCH Chains

The Transparent FTP facility is started as a subtask of the application opening the VSAM file. This means that PHASE and SOURCE search chain must be adjusted to allow the BSTTFTPC program to run.

Partition Sizing

The BSTTFTPC program will use about 5MB of partition GETVIS. Check the size of the partition where the Transparent FTP will run to ensure 5MB of partition GETVIS is available.

Sample FTP Control File

Refer to the BSTTFTPC program information in this manual for more information about the various FTP Client commands. The INPUT EXIT BSTTTFIO command is used for a program writing a VSAM sequential output file to the specified FTP server. Input to the BSTTTFIO exit is the output from the application using the Transparent FTP facility. The OUTPUT EXIT BSTTTFIO is used for a program reading a sequential VSAM input file from the specified FTP server. Output from the BSTTTFIO is the input to the application program using the Transparent FTP facility.

The TYPE of transfer can be either A (ASCII) or I (IMAGE/BINARY). The CRLF and NL commands can be used to select the type of end-of-line characters needed. The default is CRLF ON and NL OFF.

```
CATALOG BSTTOFL.FTP EOD=/% REPLACE=YES
ID nn
*
OPEN ip-address
USER userid
PASS password
*
CWD directory-specification
INPUT EXIT BSTTTFIO
TYPE A
STOR filename.ext
*
QUIT
/%
```

Enabling the Transparent FTP Open/Close Vendor Exit

The BSTTVENA program defines and enables the Transparent FTP Open/Close Vendor Exit. This program is normally run at IPL time in the $0JCLxx IPL procedure. This program must be run prior to the first usage of the Transparent FTP facility.

```
// LIBDEF PHASE,SEARCH=(ttlib.slib)
// EXEC BSTTVENA,SIZE=BSTTVENA
/*
```

Disabling the TFTP Open/Close Vendor Exit

The BSTTVDIS program deletes and disables the Transparent FTP Open/Close Vendor Exit.

```
// LIBDEF PHASE,SEARCH=(ttlib.slib)
// EXEC BSTTVDIS,SIZE=BSTTVDIS
/*
```

Sample Execution JCL

The following sample JCL executes 2 sample programs.

The BSTTOFTP program opens the BSTTOFL file for output and writes a flat file. The open is intercepted and the BSTTFTPC program is invoked using the control file specified in the // DLBL filename.

The BSTTIFTP program opens the BSTTIFL file for input and reads a flat file. The open is intercepted and the BSTTFTPC program is invoked using the control file specified in the // DLBL filename.

The BSTTOFL.FTP and BSTTIFL.FTP Transparent FTP control files are in the IPv6/VSE installation library.

```
// LIBDEF PHASE,SEARCH=(ttlib.slib,iplib.slib)
// LIBDEF SOURCE,SEARCH=(cfglib.slib,ttlib.slib)
*  TEST BSTTOFTP
// DLBL BSTTOFL,'FTP:BSILIB.TTDEV.BSTTOFL.FTP',,VSAM
// EXEC BSTTOFTP,SIZE=BSTTOFTP
/*
*  TEST BSTTIFTP
// DLBL BSTTIFL,'FTP:BSILIB.TTDEV.BSTTIFL.FTP',,VSAM
// EXEC BSTTIFTP,SIZE=BSTTIFTP
/*
```

Sample Execution Output

```
*  TEST BSTTOFTP
// DLBL BSTTOFL,'FTP:BSILIB.TTDEV.BSTTOFL.FTP',,VSAM
// EXEC BSTTOFTP,SIZE=BSTTOFTP
BSTT000I INITIATED  BSTTFTPC Ver 1.60 07/27/99 15.21    EP=00426780
BSTT003I COPYRIGHT (C) 1998-1999 BARNARD SOFTWARE, INC.
BSTT002I IPv6/VSE VERSION 1.72
BSTT004I CB=TTLA A=00444000 L=0000087C
BSTT019I VSE 6.30 MODE 31-BIT
BSTT000I INITIATED  BSTTXFCC Ver 1.68 11/17/99 14.23    EP=0046D880
BSTT020I CPU VIRTUAL ID=000001 MODEL=7490 PART=P1
BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
BSTT028I IPv6/VSE ENABLED
BSTT045I TCP/IP ID SET TO 00
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21
BSTT018I PORT    21 OPENED RC=     0
BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...
BSTT010I USER JCB
BSTT033I 331 User name OK, send password
BSTT010I PASS
BSTT033I 230 User JCB logged in
BSTT010I CWD C:\TEMP\FTP
BSTT033I 250 Directory changed to /C:/TEMP/FTP
BSTT010I INPUT EXIT BSTTTFIO
BSTT014I BSTTTFIO LOADED A=00443380 L=000003EC
BSTT022I BSTTTFIO OPENED INPUT  RC=00000000
BSTT010I TYPE A
BSTT033I 200 TYPE set to ASCII
BSTT034I TYPE SET TO A
BSTT010I STOR BSTTOFL.TXT
BSTT015I CONNECTING TO   192.    45.    25.    10 PORT  4136
BSTT010I PORT 192,45,25,10,16,40
BSTT033I 200 PORT Command OK
BSTT010I STOR BSTTOFL.TXT
BSTT033I 150 Opening ASCII mode data connection for BSTTOFL.TXT.
BSTT018I PORT  4136 OPENED RC=     0
BSTT022I BSTTTFIO CLOSED INPUT  RC=00000000
BSTT018I PORT  4136 CLOSED RC=     0
BSTT023I  1601K BYTES IN  9.235 SECS. RATE   173K/SEC            RECS
BSTT048I TCP  I/O WAIT TIME 6.024 SECONDS. RATE  265K BYTES/SECOND
BSTT048I FILE I/O WAIT TIME 5.129 SECONDS. RATE  312K BYTES/SECOND
BSTT033I 226 Transfer complete - file BSTTOFL.TXT received successfully
BSTT018I PORT    21 CLOSED RC=     0
BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
1S55I  LAST RETURN CODE WAS 0000
```

```
*  TEST BSTTIFTP
// DLBL BSTTIFL,'FTP:BSILIB.TTDEV.BSTTIFL.FTP',,VSAM
// EXEC BSTTIFTP,SIZE=BSTTIFTP
BSTT000I INITIATED  BSTTFTPC Ver 1.60 07/27/99 15.21    EP=00426780
BSTT003I COPYRIGHT (C) 1998-1999 BARNARD SOFTWARE, INC.
BSTT002I IPv6/VSE VERSION 1.72
BSTT004I CB=TTLA A=00444000 L=0000087C
BSTT019I VSE 6.30 MODE 31-BIT
BSTT000I INITIATED  BSTTXFCC Ver 1.68 11/17/99 14.23    EP=0046D880
BSTT020I CPU VIRTUAL ID=000001 MODEL=7490 PART=P1
BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
BSTT028I IPv6/VSE ENABLED
BSTT045I TCP/IP ID SET TO 00
BSTT015I CONNECTING TO   192.    45.    25.     1 PORT    21
BSTT018I PORT    21 OPENED RC=     0
BSTT033I 220 Serv-U FTP-Server v2.3b for WinSock ready...
BSTT010I USER JCB
BSTT033I 331 User name OK, send password
BSTT010I PASS
BSTT033I 230 User JCB logged in
BSTT010I CWD C:\TEMP\FTP
BSTT033I 250 Directory changed to /C:/TEMP/FTP
BSTT010I OUTPUT EXIT BSTTTFIO
BSTT014I BSTTTFIO LOADED A=00443380 L=000003EC
BSTT022I BSTTTFIO OPENED OUTPUT RC=00000000                                  BSTT010I
TYPE A                                                          BSTT033I 200 TYPE set
to ASCII                                                 BSTT034I TYPE SET TO A
BSTT010I RETR BSTTOFL.TXT                                                   BSTT015I
CONNECTING TO   192.    45.    25.    10 PORT  4138                 BSTT010I PORT
192,45,25,10,16,42                                            BSTT033I 200 PORT Command
OK                                                  BSTT010I RETR BSTTOFL.TXT
BSTT033I 150 Opening ASCII mode data connection for BSTTOFL.TXT
BSTT018I PORT  4138 OPENED RC=     0                                        BSTT022I
BSTTTFIO CLOSED OUTPUT RC=00000000                                BSTT018I PORT  4138
CLOSED RC=     0                                      BSTT023I  1601K BYTES IN  7.601
SECS. RATE   210K/SEC            RECS          BSTT050I RECEIVE  COUNT    30 AVG SIZE 54666
BSTT048I TCP  I/O WAIT TIME 7.204 SECONDS. RATE  222K BYTES/SECOND             BSTT048I
FILE I/O WAIT TIME 3.426 SECONDS. RATE  467K BYTES/SECOND             BSTT033I 226 Transfer
complete - file BSTTOFL.TXT sent successfully            BSTT018I PORT    21 CLOSED RC=
0                                        BSTT001I TERMINATED BSTTXFCC
BSTT001I TERMINATED BSTTFTPC
```

Chapter 12

Remote EXEC Client

IPv6/VSE has a remote execution facility. The BSTTREXC is a Remote Execution Client application. The BSTTREXC facility logs into a Unix/Linux/Windows NT system and executes a single command or shell script. Standard output and error are returned to the BSTTREXC program. The output is parsed for a specific output string and the VSE/ESA return code is set to 0 if the string is found. If the string in not found the VSE/ESA return code is set to 8. The BSTTREXC facility allows you to run a job under VSE/ESA that, in turn, runs a job under Unix/Linux/NT. Once the job running on the remote system is done the BSTTREXC program sets the VSE/ESA return code. BSTTREXC also sets the VSE/ESA return code to 4 if the OPEN command fails to establish a connection.

BSTTREXC uses the CODE command to specify the string to be scanned for in the output of the remote command. If the CODE command is not specified or is specified as CODE * then any output is accepted as good completion. Otherwise the CODE command specifies a string to search for in the remote command output. If the string is found the return code is set to 0 otherwise the return code is set to 8. If the CODE string must include embedded blanks the blanks must be specified as plus sign (+) characters. The length of the CODE string is limited to 24 characters.

The TIMEOUT command can be used to set a timeout value for the script being executed. TIMEOUT nnn (in seconds) can be specified. The default value is zero (0) and indicates no timeout value. When a timeout limit is exceeded the BSTTREXC job will terminate with a RECEIVE ERROR RC=96 results in a VSE Return Code of 8.

The BSTTREXC EXE2 command can be used to continue an EXEC statement. The trick is EXE2 must precede the EXEC command. The text from the EXE2 command is appended to the text from the EXEC command (including any spaces at the end of the EXEC command out to column 80).

```
EXE2 The continuation line is here
EXEC This is the first line going out to column 80
```

Sample BSTTREXC Execution JCL

The following sample JCL shows how to use the BSTTREXC Remote Execution client. Note the use of mixed and lower case characters. On remote systems character case can be very important.

The example BSTTREXC shown here open a connection to the system *192.45.25.8* and identifies itself as user *jcb*. The command executed is a Linux shell script called *testsh*. The return code is set to 0 if the string *core* is found in the resulting output.

```
// LIBDEF PHASE,SEARCH=(BSILIB.TTDEV,PRD1.BASE)
// LIBDEF SOURCE,SEARCH=(BSILIB.WORK,PRD2.CONFIG,BSILIB.TTDEV)
// EXEC BSTTREXC,SIZE=BSTTREXC
ID 00
*
OPEN 192.45.25.8
*
USER jcb
PASS abc
CODE core
*
EXEC sh testsh
*
QUIT
/*
```

```
// LIBDEF PHASE,SEARCH=(BSILIB.TTDEV,PRD1.BASE)
// LIBDEF SOURCE,SEARCH=(BSILIB.WORK,PRD2.CONFIG,BSILIB.TTDEV)
// EXEC BSTTREXC,SIZE=BSTTREXC
BSTT000I INITIATED  BSTTREXC Ver 1.74 01/07/00 09.56    EP=00420078
BSTT003I COPYRIGHT (C) 1998-2000 BARNARD SOFTWARE, INC.
BSTT002I IPv6/VSE BUILD 1.74
BSTT004I CB=TTLA A=00440000 L=00000AB0
BSTT019I VSE 6.30 MODE 31-BIT
BSTT000I INITIATED  BSTTXRXC Ver 1.74 01/07/00 09.56    EP=0046B000
BSTT020I CPU VIRTUAL ID=000001 MODEL=7490 PART=P1
BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
BSTT028I IPv6/VSE ENABLED
BSTT045I TCP/IP ID SET TO 00
BSTT015I CONNECTING TO   192.    45.    25.     8 PORT   512
BSTT018I PORT   512 OPENED RC=     0
BSTT010I USER jcb
BSTT010I PASS
BSTT010I CODE core
BSTT010I EXEC sh testsh

+ cd /
+ pwd
/
+ ls -l
ls: linux.c: Input/output error
total 2301
-rw-r--r--   1 root     root       219739 Aug 18 17:00 System.map
-rw-r--r--   1 root     root       223369 Jul 17 16:35 System.old
drwxr-xr-x   2 root     root         2048 Oct  8 15:15 bin
drwxr-xr-x   2 root     root         1024 Aug 18 17:00 boot
drwxr-xr-x   2 root     root         1024 Oct  8 15:15 bru
drwxr-xr-x   2 root     root         1024 Jul 17 01:21 cdrom
drwxr-xr-x   9 root     root        34816 Jan  9 04:03 dev
drwxr-xr-x   9 root     root        34816 Jan  9 04:03 dev
drwxr-xr-x  36 root     root         3072 Jan  6 08:57 etc
drwxrwxrwx   9 jcb      root         1024 Oct  9 17:19 fba
drwxrwxr-x   3 root     root         1024 Jul 17 13:08 fstools
drwxr-xr-x   6 root     root         1024 Jul 17 16:25 home
drwxr-xr-x   1 root     root          512 Jan  1  1970 jcb.c
drwxr-xr-x   1 root     root          512 Jan  1  1970 jcb.d
drwxr-xr-x   4 root     root         3072 Jun 21  1999 lib
drwxr-xr-x   2 root     root        12288 Jun 21  1999 lost+found
drwxr-xr-x   4 root     root         1024 Jun 21  1999 mnt
-rw-r--r--   1 root     root       411686 Jul 16 11:52 msgmgr.o
dr-xr-xr-x   2 root     root          512 Jan  6 08:57 net
dr-xr-xr-x 354 root     root            0 Jan  6 03:51 proc
drwxr-x---  19 root     root         1024 Jan 12 08:01 root
drwxrwxrwx   2 root     root         1024 Jul 17 12:29 sambastor
drwxr-xr-x   3 root     root         3072 Jun 21  1999 sbin
drwxr-xr-x   1 root     root          512 Jan  1  1970 server.c
drwxr-xr-x   1 root     root          512 Jan  1  1970 server.d
drwxr-xr-x   1 root     root          512 Jan  1  1970 server.e
drwxr-xr-x   1 root     root          512 Jan  1  1970 tjb.c
drwxrwxrwt  11 root     root         2048 Jan 12 04:03 tmp
drwxr-xr-x  24 root     root         1024 Sep  3 10:12 usr
drwxr-xr-x  22 root     root         1024 Jul 16 16:55 var
drwxr-xr-x   4 root     root         1024 Jul 16 16:29 vmesa
-rw-rw-r--   1 root     root       698927 Aug 18 17:00 vmlinuz
-rw-rw-r--   1 root     root       709121 Jul 17 16:35 vmlinuz.old
```

```
+ cd /usr
+ pwd
/usr
+ ls -l
total 100
drwxr-xr-x   8 root     root         1024 Jun 21  1999 X11R6
drwxr-xr-x   6 root     root        31744 Jun 21  1999 bin
drwxr-xr-x   2 root     root         1024 Jun 21  1999 cgi-bin
drwxr-xr-x   2 root     root         1024 Jun 21  1999 dict
drwxr-xr-x 283 root     root         7168 Jun 21  1999 doc
drwxr-xr-x 283 root     root         7168 Jun 21  1999 doc
drwxr-xr-x   2 root     root         1024 Jun 21  1999 etc
drwxr-xr-x   2 root     root         1024 Jun 21  1999 games
drwxr-xr-x   5 root     root         1024 Jun 21  1999 i386-glibc20-linux
drwxr-xr-x   4 root     root         1024 Jun 21  1999 i386-redhat-linux
drwxr-xr-x   3 root     root         1024 Jun 21  1999 i486-linux-libc5
drwxr-xr-x  70 root     root        10240 Jun 21  1999 include
drwxr-xr-x   2 root     root         9216 Jun 21  1999 info
drwx------  14 jcb      adm          1024 Jun 21  1999 jcb
drwxr-xr-x  75 root     root        20480 Jun 21  1999 lib
drwxr-xr-x   5 root     root         1024 Jun 21  1999 libexec
drwxr-xr-x  12 root     root         1024 Aug  4 13:18 local
drwxr-xr-x  15 root     root         1024 Jun 24  1999 man
drwxr-xr-x  23 open370  open370      1024 Jul 16 21:30 open370
drwx------   4 jcb      adm          1024 Nov 15 21:07 rc5
drwxr-xr-x   2 root     root         4096 Jun 21  1999 sbin
drwxr-xr-x  68 root     root         2048 Jun 21  1999 share
drwxr-xr-x   5 root     root         1024 Jul 16 10:16 src
lrwxrwxrwx   1 root     root           10 Jun 21  1999 tmp -> ../var/tmp
+ cd /usr/jcb
+ pwd
/usr/jcb
+ ls -l
total 7570
drwxr-xr-x   5 jcb      adm          1024 Jun 21  1999 Desktop
-rw-------   1 jcb      adm        696320 Jul 17 17:31 core
-rw-r--r--   1 jcb      adm       6947760 Aug  4 13:05 ippatch.ptf
drwx------   2 jcb      adm          1024 Jul 27 18:29 nsmail
-rwxr-xr-x   1 root     root        58472 Dec 13 15:33 rsh.rpm
-rw-r--r--   1 root     root        10839 Jul 27 18:24 smb.conf
-rw-rw-r--   1 jcb      adm            65 Jan 10 20:03 testsh

BSTT018I PORT   512 CLOSED RC=     4
BSTT001I TERMINATED BSTTXRXC
BSTT001I TERMINATED BSTTREXC
```

Chapter 13

Batch PING Utility

IPv6/VSE has a batch PING utility. This utility uses the IP address passed in the // EXEC PARM field to send ping packets. If the ping packets are answered the return code is set to 0 otherwise the return code is set to 8.

Warning: The BSTTPING application uses the RAW sockets interface to the IPv6/VSE TCP/IP stack. Using this application with any other vendors TCP/IP stack will cause unpredictable results to occur.

Sample BSTTPING Execution JCL

The following sample JCL shows how to use the BSTTPING utility. Note the use of mixed and lower case characters. On remote systems character case can be very important.

The example BSTTREXC shown here open a connection to the system *192.45.25.8* and identifies itself as user *jcb*. The command executed is a Linux shell script called *testsh*. The return code is set to 0 if the string *core* is found in the resulting output.

```
// LIBDEF PHASE,SEARCH=(bsilib.slib)
// LIBDEF SOURCE,SEARCH=(PRD2.CONFIG,bsilib.slib)
// EXEC BSTTPING,SIZE=BSTTPING,PARM='192.168.1.100'
/*
```

If you receive the following error:

```
BSTT013E SOCKET  ERROR R15=FFFFFFFF R0=FFFFFFFF R1=0000045A
```

It is likely that you are running the TCP/IP for VSE (IBM or CSI) and IPv6/VSE on the same system. All IBM IPv6/VSE customers are in this group. In this case you need to generate a Multiplexor Control Table (See the Installation Guide) or add the following statement to your JCL.

```
// SETPARM EZA$PHA='BSTTIPS1'
```

Batch Telnet Utility

IPv6/VSE has a batch telnet utility. This utility can be used to establish a connection with a remote host telnet daemon and send basic commands.

While the BSTTTELN utility is useful we strongly recommend using the BSTTREXC Remote EXEC Client utility instead of BSTTTELN. The BSTTREXC utility will wait until a command has completed and set the z/VSE return code based upon the completion. The BSTTTELN utility does not do this.

At this time the BSTTTELN utility has been tested with the Linux and IBM AIX telnet daemons.

Sample BSTTTELN Execution JCL

The following sample JCL shows how to use the BSTTTELN utility. Note the use of mixed and lower case characters. On remote systems character case can be very important.

```
// EXEC BSTTTELN,SIZE=BSTTTELN
ID 00
OPEN 192.168.1.60 23
SBCS RACOON
*
USER jcb
PASS ...
*
CMD pwd
CMD ls -ltr
CMD sh cifs.mounts &
*
SEND
*
QUIT
/*
```

Once the BSTTTELN application starts and completes the telnet login procedure the command defined with the CMD command are sent to the remote host. Output received from the remote host is printed on SYSLST. In the example above, one of the commands contains a trailing & character. This tells the telnet shell on the remote host to begin the command and to run the command is the background without waiting for the command to complete.

Sample BSTTTELN Output

```
// EXEC BSTTTELN,SIZE=BSTTTELN
29-Nov-2012 18:44:55 0034 BSTT000I INITIATED  BSTTTELN Build253 11/29/12 18.27
29-Nov-2012 18:44:55 0034 BSTT003I COPYRIGHT (C) 1998-2012 BARNARD SOFTWARE, INC.
29-Nov-2012 18:44:55 0034 BSTT004I CB=TTLA A=00567000 L=000013FC
29-Nov-2012 18:44:55 0034 BSTT019I VSE 9.10 MODE 31-BIT
29-Nov-2012 18:44:55 0034 BSTT704I
29-Nov-2012 18:44:55 0034 BSTT704I ID 00
29-Nov-2012 18:44:55 0034 BSTT704I OPEN 192.168.1.60 23
29-Nov-2012 18:44:55 0034 BSTT704I SBCS RACOON
29-Nov-2012 18:44:55 0034 BSTT704I USER jcb
29-Nov-2012 18:44:55 0034 BSTT704I PASS
29-Nov-2012 18:44:55 0034 BSTT704I CMD pwd
29-Nov-2012 18:44:55 0034 BSTT704I CMD sh cifs.mounts &
29-Nov-2012 18:44:55 0034 BSTT704I SEND
29-Nov-2012 18:44:55 0034 BSTT704I QUIT
29-Nov-2012 18:44:55 0034 BSTT704I
29-Nov-2012 18:44:55 01E4 BSTT000I INITIATED  BSTTXTLC Build253 11/29/12 15.23
29-Nov-2012 18:44:55 01E4 BSTT020I CPU NATIVE  ID=012345 MODEL=1090 PART=P1
29-Nov-2012 18:44:55 01E4 BSTT025W LICENSE WILL EXPIRE IN     32 DAYS
29-Nov-2012 18:44:55 01E4 BSTT027I LICENSED TO BARNARD SOFTWARE, INC.
29-Nov-2012 18:44:55 01E4 BSTT028I IPV6/VSE         ENABLED
29-Nov-2012 18:44:55 01E4 BSTT694I TCP/IP ID SET TO 00   (BSI IPV4)
29-Nov-2012 18:44:55 01E4 BSTT701I IPv6/VSE BUILD  253
29-Nov-2012 18:44:55 01E4 BSTT695I CONNECTING TO PORT    23 IP 192.168.1.60
29-Nov-2012 18:44:55 01E4 BSTT018I PORT    23 OPENED RC=     0
29-Nov-2012 18:44:55 01E4 BSTT046I SBCS     SET RACOON
29-Nov-2012 18:44:55 01E4 BSTT033I USER jcb
29-Nov-2012 18:44:55 01E4 BSTT033I PASS
29-Nov-2012 18:44:55 01E4 BSTT704I
29-Nov-2012 18:44:55 01E4 BSTT704I Welcome to openSUSE 12.2 "Mantis" - Kernel 3.4.6-2.10
29-Nov-2012 18:44:55 01E4 BSTT704I dv9500t login:
29-Nov-2012 18:44:55 01E4 BSTT704I jcb
29-Nov-2012 18:44:55 01E4 BSTT704I Password:
29-Nov-2012 18:44:55 01E4 BSTT704I Last login: Thu Nov 29 17:38:15 from vse51b
29-Nov-2012 18:44:55 01E4 BSTT704I Have a lot of fun...
29-Nov-2012 18:44:55 01E4 BSTT704I tset: unknown terminal type network
29-Nov-2012 18:44:55 01E4 BSTT704I Terminal type?
29-Nov-2012 18:44:55 01E4 BSTT704I vt52
29-Nov-2012 18:44:55 01E4 BSTT704I vt52
29-Nov-2012 18:44:55 01E4 BSTT704I jcb@dv9500t:~>
29-Nov-2012 18:44:55 01E4 BSTT704I pwd
29-Nov-2012 18:44:55 01E4 BSTT704I p
29-Nov-2012 18:44:55 01E4 BSTT704I wd
29-Nov-2012 18:44:55 01E4 BSTT704I /home/jcb
29-Nov-2012 18:44:55 01E4 BSTT704I jcb@dv9500t:~>
29-Nov-2012 18:44:55 01E4 BSTT704I sh cifs.mounts &
29-Nov-2012 18:44:55 01E4 BSTT704I s
29-Nov-2012 18:44:55 01E4 BSTT704I h cifs.mounts &
29-Nov-2012 18:44:55 01E4 BSTT704I [1] 19899
29-Nov-2012 18:44:55 01E4 BSTT704I jcb@dv9500t:~>
29-Nov-2012 18:44:55 01E4 BSTT704I
29-Nov-2012 18:44:55 01E4 BSTT018I PORT    23 CLOSED RC=     0
29-Nov-2012 18:44:55 01E4 BSTT001I TERMINATED BSTTXTLC
29-Nov-2012 18:44:55 0034 BSTT001I TERMINATED BSTTTELN
```

Line Print Daemon Service

IPv6/VSE has a Line Print Daemon (LPD) Service (BSTTLPDS). This service makes z/VSE appear to be a printer on the network. Multiple print queues can be defined with the output for each queue directed to any supported destination. E.g., POWER LST, SAM, VSAM ESDS, etc.

The BSTTLPDS service follows RFC 1179 and will accept LPR control and data files arriving in any sequence. Text arriving in the LPR data file is expected to be ASCII text with no ASA characters and imbedded LineFeed and FormFeed characters. The ASCII data is translated to EBCDIC and written to the defined OUTPUT destination.

The BSTTLPDS service also supports user options passed in the control file. User options supported are the same as the BSTTFTPS FTP server SITE commands. User options containing blanks (spaces) can not be passed in the control file. Therefore, replace any blanks (spaces) in the User options with equal (=) signs. The equal signs will be removed before the option is processed.

BSTTFTPS FTP Server SITE Command	BSTTLPDS User option
SITE SBCS US_ENG_01	-oSBCS=US_ENG_01
SITE FNO STD1	-oFNO=STD1
SITE JSEP ON	-oJSEP=1

User options allow you to process not-standard format LPR data files. For example, -oTYPE=E would allow you to process an EBCDIC data file with EBCDIC LineFeed/FormFeed characters. Or, -oTYPE=I -oRECSZ=80 would allow processing of binary fixed length records.

Queues are defined to the BSTTLPDS Line Print Deamon Service using a pair of command. The 1st command is a QUEUE command which specifies a QUEUE name (up to 16 characters in length). The 2nd command is an OUTPUT command. The OUTPUT command has the same format as the OUTPUT command used by the BSTTFTPC/BSTTFTPS FTP services.

The data sent in the LPR data file is initially written to a z/VSE library member. The member name is dynamically create in the form LPDSTnnn.LPDSDATA where nnn is the z/VSE hex task id of the LPD service task. The member is created in the 1st lib.slib of the LIBDEF SOURCE,SEARCH chain.

Once both the control and data file have been read from the remote host LPR application, the connection to the remote host is closed and the data processed and output to the specified OUTPUT destination.

At this time the BSTTLPDS service has been tested with the Linux and Windows lpr/lpq command line applications.

Sample BSTTLPDS Execution JCL

The following sample JCL shows how to use the BSTTLPDS service. Note the use of mixed and lower case characters. On remote systems character case can be very important.

```
// DLBL IJSYSUC,'VSESP.USER.CATALOG',,VSAM
// DLBL BSAULOG,'TEST.AUDIT.LOG.FILE',,VSAM
/*
// OPTION SYSPARM='00'
// EXEC BSTTWAIT,SIZE=BSTTWAIT
/*
// EXEC BSTTLPDS,SIZE=BSTTLPDS
ID 00
OPEN 127.0.0.1
SBCS RACOON
*
* QUEUE COMMAND SPECIFIES QUEUE NAME
* OUTPUT COMMAND IS THE OUTPUT DESTINATION
* QUEUE AND OUTPUT COMMANDS ARE COMMAND PAIRS
*
QUEUE raw
OUTPUT POWER LST $$NAME$$ 0 P
*
QUEUE RAW
OUTPUT POWER LST $$NAME$$ 0 P
*
QUEUE ZVSE
OUTPUT POWER LST $$NAME$$ 0 L
*
QUEUE ESDS
OUTPUT ESDS BSAULOG
*
ATTACH LPD-1
ATTACH LPD-2
ATTACH LPD-3
ATTACH LPD-4
/*
```

Note the use of the literal $$NAME$$ in the OUTPUT POWER command. This is required. And, the OUTPUT commands processed by BSTTLPDS are not free form. Only a single space is permitted between any parameter.

Chapter 14

BSTTSLOG System Logging Utility

IPv6/VSE has a system logging utility. This utility will monitor the VSE/ESA or z/VSE system console messages and selectively log message to a Linux syslog-ng server. This allows VSE messages to appear on the Linux system log. The BSTTSLOG utility uses FILTER command to determine what messages are logged. By default no messages are logged. UDP port 514 is used for sending messages to the syslog-ng server.

FILTER command

The filter command is used to select messages for logging. If the string specified appears in the jobname, partition ID or message text a match is detected. If a plus sign (+) appears in the string, the plus sign is converted into a blank character.

```
FILTER LOG|NOLOG *|string
```

Sample BSTTSLOG Execution JCL

The following sample JCL shows how to use the BSTTSLOG utility. In this example messages with the prefix 1Q41I are ignored and all other messages are send to the syslog-ng server.

```
// LIBDEF *,SEARCH=(PRD2.CONFIG,BSILIB.TTDEV)
// EXEC BSTTSLOG,SIZE=BSTTSLOG
ID 10
OPEN 192.168.1.12 514
*
FILTER NOLOG 1Q41I
FILTER LOG   *
*
ATTACH LOGGER
/*
```

Chapter 15

BSTTPOPC POP Client

The BSTTPOPC.PROC is the IPv6/VSE REXX based POP (Post Office Protocol) client. The BSTTPOPC application reads a single control card from SYSIPT containing the server, port, user, password and delete option. It then logs into the remote POP daemon and reads the available emails. The emails are written to a SAM RECFM VB file. What you do with the email text written to the MAILOUT SAM file is completely up to you. Or, you can modify the BSTTPOPC.PROC to do just about anything needed.

JCL

```
*  BSTTPOPC
// ASSGN SYS001,DISK,TEMP,VOL=SYSWK2,SHR
// DLBL MAILOUT,'FTP3.TEST.FILE',0,SD
// EXTENT SYS001,SYSWK2,,,25015,10000
/*
// LIBDEF *,SEARCH=(BSILIB.TTDEV)
// LIBDEF PROC,SEARCH=PRD2.CONFIG
/*
// OPTION SYSPARM='00'
// SETPARM IPTRACE='NNNNNNNNN'
// EXEC REXX=BSTTPOPC,IPTRACE,SIZE=1M
206.130.104.55 110 user password DELETE
/*
// IF $RC > 0 THEN
//    GOTO END
*  IDCAMS PRINT
// ASSGN SYS001,DISK,TEMP,VOL=SYSWK2,SHR
// DLBL MAILOUT,'FTP3.TEST.FILE',0,SD
// EXTENT SYS001,SYSWK2,,,25015,10000
// EXEC IDCAMS,SIZE=IDCAMS
 PRINT IFILE(MAILOUT ENV(RECFM(VB) RECSZ(27640) BLKSZ(27648)))
/*
/. END
```

If the SYSIPT control card specifies the literal DELETE then each email read from the POP server is deleted after it is processed. If anything other than DELETE is specified the emails are left on the server. Warning: Deleted emails are gone. They can not be recovered.

Return Codes

BSTTPOPC sets the following z/VSE return codes.

Code	Description
0	Good completion. Email was written to the MAILOUT SAM file.
4	Mail box is empty.
8	An error occurred. See the SYSLST log output for details.

Sample Output

```
// OPTION SYSPARM='00'
// SETPARM IPTRACE='NNNNNNNN'
// EXEC REXX=BSTTPOPC,IPTRACE,SIZE=1M
-> USER bsi1957
<- +OK
-> PASS
<- +OK
-> STAT
<- +OK

1 Messages totaling 75234 bytes

-> LIST
<- +OK
Processing message 1 1 75234
-> RETR 1
<- +OK
  message has 1216 lines

Total output is 1216 text lines

-> QUIT
<- +OK
1S55I  LAST RETURN CODE WAS 0000
```

Chapter 16

BSI REXX Client

Dave L Clark of DAPSCO Information Systems developed this method of allowing VSE/ESA symbolic parameter substitution in BSTTFTPC, BSTTMTPC, BSTTLPRC and BSTTREXC. The REXX EXEC BSIREXXC and REXX external routine RXVSESYM are located in the IPv6/VSE lib.slib. Additional doc on this process can be found in the member RXVSESYM.DOC and the REXX EXEC BSIREXXC.PROC.

Using Symbolic Parameters in BSI Client Programs

The BSIREXXC.PROC REXX EXEC processes card input for the purpose of internally invoking the client application specified (BSTTFTPC, BSTTLPRC, BSTTMTPC or BSTTREXC). Card input consists of all input cards (not JCL) needed for the client program. Any JCL needed for the client program would precede execution of this procedure. Note that this procedure is only required in order to process symbolic variable substitution(s) and, as such, those symbolic variables must be passed to this procedure so that it has access to their values.

Before invoking BSIREXXC from REXX be sure to update the ARXEOJTB to add the phases BSTTFTPC, BSTTMTPC, BSTTLPRC and BSTTREXC. This will allow REXX to invoke the client application and handle the EOJ macro (SVC 14) used to terminate the program.

Sample Symbolic Parameter JCL

```
// JOB   ...
// ...  JCL for BSTTFTPC goes here  ...
// SETPARM CO='921'
// SETPARM ASOF='200405'
// EXEC REXX=BSIREXXC,PARM='BSTTFTPC',CO,ASOF
ID 00
OPEN xxx.xxx.xxx.xxx
USER xxxxxxxx
PASS xxxxxxxx
CWD \ACCT\SALESTAX\CO<CO>\DATAFILES\
INPUT VSAM TAX2000
TYPE A
STOR TAX2000_<ASOF>.PHX
QUIT
/* EOD */
```

Chapter 17

FLEX-ES FakeTape™ Mount Utility

IPv6/VSE provides a FLEX-ES FakeTape and P/390 Virtual Tape mount utility. This utility is *free* and can be used *without* a license for IPv6/VSE.

The BSTTFMNT program can be used to MOUNT, DISMOUNT or QUERY FLEX-ES FakeTape virtual tape files. BSTTFMNT will run under any version of VSE from VSE/SP to VSE/ESA 2.7. The BSTTFMNT program will run in any partition including dynamic partitions.

BSTTFMNT requires FLEX-ES Release 6.1.15 or higher.

Definition of FLEX-ES FakeTape Devices

BSTTFMNT will mount UnixWare/Linux files on FLEX-ES tape drives. The tape drives must be defined to FLEX-ES in the Resource Definition file with the devopt 'allowmountccws'.

```
c3480: cu 3480
    interface local(1)
    device(00) 3480 OFFLINE devopt 'allowmountccws'
    device(01) 3480 OFFLINE devopt 'allowmountccws'
    device(02) 3480 OFFLINE devopt 'allowmountccws'
    device(03) 3480 OFFLINE devopt 'allowmountccws'
end c3480
```

Execution of BSTTFMNT

The BSTTFMNT program can be used to MOUNT, DISMOUNT or QUERY FLEX-ES virtual tape files. The name of the virtual tape file is specified using the PARM= parameter on the // EXEC statement. SYS000 must be assigned to the virtual tape device.

Executing BSTTFMNT without a PARM= parameter causes the QUERY function to be invoked.

P/390 users: The virtual tape file name specified in the PARM= parameter must be a valid DOS FAT format (8.3 form) file name. The virtual tape file can be dismounted by using a special PARM='.' parameter.

FLEX-ES users: The virtual tape filename specified in the PARM= parameter must be a fully qualified Unixware/Linux path/filename. For example, to mount a file called file.dat in the directory /tapes, use PARM='/tapes/file.dat'. The virtual tape file can be dismounted by using a special PARM='OFFLINE' parameter (the word OFFLINE must be in upper case). Since Unixware/Linux file systems use mixed case directory and filenames be sure to specify the correct upper/lower case filename in the PARM= parameter.

You must specify a path name along with the tape filename. If you do not specify a path the tape file may be created in a very strange location. Always specify a fully qualified path/filename in the PARM= parameter.

UPSI Values

```
// UPSI 0x - Default mode
// UPSI 1x - Quiet mode
// UPSI x0 - No VSE return code set
// UPSI x1 - VSE return code set
```

FLEX-ES FakeTape Sample JCL

The following JCL will execute BSTTFMNT.
Three functions are available MOUNT, DISMOUNT and QUERY.

```
*  BSTTFMNT using the MOUNT function
// LIBDEF PHASE,SEARCH=lib.sublib
// ASSGN SYS000,580
// EXEC BSTTFMNT,SIZE=BSTTFMNT,PARM='/tapes/V000120.faketape'
/*
*  BSTTFMNT using the QUERY function
// LIBDEF PHASE,SEARCH=lib.sublib
// ASSGN SYS000,580
// EXEC BSTTFMNT,SIZE=BSTTFMNT
/*
*  BSTTFMNT using the DISMOUNT function
// LIBDEF PHASE,SEARCH=lib.sublib
// ASSGN SYS000,580
// EXEC BSTTFMNT,SIZE=BSTTFMNT,PARM=‘OFFLINE’
/*
```

Sample File Names

/tapes/testvol.dat /tapes/V120000.tape

Return Codes

```
4 - No file mounted (Query)
8 - Error (Any function)
```

Invoking BSTTFMNT from REXX

The following sample REXX EXEC JCL will execute BSTTFMNT dynamically. The REXX EXEC will append the current date to the filename used in the mount request. BSTTFMNT will set the VSE Return Code to 0 or 8 if // UPSI X1 is included in the JCL. The REXX rc variable can be tested for completion. If the // UPSI X1 is used you must update the ARXEOJTB to include BSTTFMNT or an abend will result.

```
*  Sample VSE/REXX EXEC

// EXEC LIBR,SIZE=512K
AC S=BSILIB.INSTALL
CATALOG TESTFMNT.PROC DATA=YES REP=YES
 /* VSE/REXX EXEC */
 /* TRACE I   */
 PARSE ARG CUU FILE
 IF FILE = 'QUERY' | FILE = 'OFFLINE' THEN
    DO
      ADDRESS JCL
      '// ASSGN SYS000,'CUU
      '// UPSI 10'
      ADDRESS LINK 'BSTTFMNT' FILE
      EXIT
    END
 ELSE
    DO
      TODAY = DATE('S')
      FILE = FILE'.'TODAY
      ADDRESS JCL
      '// ASSGN SYS000,'CUU
      '// UPSI 10'
      ADDRESS LINK 'BSTTFMNT' '/usr/flexes/bsi/'FILE
      EXIT
    END
 EXIT
/+
LIST TESTFMNT.REXX
/*
// LIBDEF PHASE,SEARCH=BSILIB.TTDEV
// LIBDEF PROC,SEARCH=BSILIB.INSTALL
// EXEC REXX=TESTFMNT,PARM='580 OFFLINE'
// EXEC REXX=TESTFMNT,PARM='580 JCBFILE'
// EXEC REXX=TESTFMNT,PARM='580 QUERY'
// EXEC REXX=TESTFMNT,PARM='580 OFFLINE'

*  Sample VSE/REXX EXEC Output

P2 0046 // JOB TESTFMNT
        DATE 05/13/2004, CLOCK 19/19/51
P2 0046 BSTT664I MOUNT: OFFLINE
P2 0046 BSTT664I MOUNT: /usr/flexes/bsi/JCBFILE.20040513
P2 0046 BSTT664I QUERY: /usr/flexes/bsi/JCBFILE.20040513
P2 0046 BSTT664I MOUNT: OFFLINE
P2 0046 EOJ TESTFMNT  MAX.RETURN CODE=0000
        DATE 05/13/2004, CLOCK 19/19/52, DURATION   00/00/01
```

P/390 Sample JCL

The following JCL will execute BSTTFMNT.
Three functions are available MOUNT, DISMOUNT and QUERY.

```
*  BSTTFMNT using the MOUNT function
// LIBDEF PHASE,SEARCH=lib.sublib
// ASSGN SYS000,580
// EXEC BSTTFMNT,SIZE=BSTTFMNT,PARM='D:\VIRTAPE\TESTFILE.DAT'
/*
*  BSTTFMNT using the QUERY function
// LIBDEF PHASE,SEARCH=lib.sublib
// ASSGN SYS000,580
// EXEC BSTTFMNT,SIZE=BSTTFMNT
/*
*  BSTTFMNT using the DISMOUNT function
// LIBDEF PHASE,SEARCH=lib.sublib
// ASSGN SYS000,580
// EXEC BSTTFMNT,SIZE=BSTTFMNT,PARM='.'
/*
```

P/390 Usage Note

After using BSTTFMNT to mount a virtual tape file, you may receive the message 4184A DEVICE IS WRITE PROTECTED ... SYS000=cuu. This message occurs if the file name specified in invalid. The file name specification is limited to upper case characters and must conform to the FAT 8.3 standard. HPFS long file names are ***not*** supported.

Sample File Names

D:\TAPE.580 D:\VT\BACKUP.DAT D:\VIRTAPE\L961031.LIB

Return Codes

```
4 - No file mounted (Query)
8 - Error (Any function)
```

Chapter 18

FLEX-ES Command Interface

IPv6/VSE provides a FLEX-ES and P/390 command execution utility. This utility is *free* and can be used *without* a license for IPv6/VSE.

The BSTTFCMD program is a REXX external function. This function can be used to execute UnixWare/Linux shell scripts or commands from within a VSE/REXX exec. Possible commands include executing FLEXESCLI commands to control the FLEX-ES environment. Output from the executed script or command is returned to the invoking REXX exec so it can be examined and processed. The BSTTFCMD REXX function requires REXX/VSE and will run under any version of VSE/ESA that supports REXX/VSE.

BSTTFCMD requires FLEX-ES Release 6.1.15 or higher.

Definition of FLEX-ES command Devices

BSTTFCMD will execute UnixWare/Linux shell scripts/command using a 3270-host interface. The 3270 devices used in this interface must be defined to FLEX-ES in the Resource Definition file with the devopt 'allowmountccws'. You should not add this devopt to existing 3274 CU definitions. Instead, add a new 3274 CU that will be used by the FLEX-ES Command Interface.

```
C3274: CU 3274
   INTERFACE LOCAL(1)
   DEVICE(00 - 07) 3278 OFFLINE devopt 'allowhostccws'
END C3274
```

These devices must also be defined to VSE/ESA using an IPL ADD statement.

```
ADD 460:467,3277
```

Execution of BSTTFCMD

The BSTTFCMD REXX function is used to execute UnixWare/Linux shell scripts and commands. The script or command is specified using the PARM= parameter on the // EXEC REXX= statement. SYS000 must be assigned to the 3270-host device. Multiple scripts/commands can be executed by separating them with a semi-colon in the PARM= string.

BSTTFREQ Sample REXX Exec

This is a sample REXX exec that will use the script/command specified in the PARM= parameter of the // EXEC REXX=BSTTFREQ JCL command.

```
   /* BSTTFREQ REXX BSTTFCMD TEST PROC */

   oldin = assgn('stdin','sysipt')
   oldout = assgn('stdout','syslst')
   oldmsg = rexxmsg('stdout')
2
   parse arg command

   resp = bsttfcmd(command, output.)

   If resp <> '0' Then Do
     Say ' Response = 'resp
     Exit 4
   End

   Say output.0 'lines returned'
   Do n = 1 To output.0
     Say n ' = 'output.n
   End

   exit 0
```

BSTTFREQ Sample JCL

This is sample JCL for executing the BSTTFREQ REXX exec. If you want to execute more than a single script/command you can separate them with a semi-colon.

```
// LIBDEF *,SEARCH(lib.slib)
// ASSGN SYS000,cuu
// EXEC REXX=BSTTFREQ,PARM='cd /usr/flexes/bsi;ls -ltr'
// EXEC REXX=BSTTFREQ,PARM='ls -ltr /var/log/'
/*
```

Where **lib.slib** is the IPv6/VSE library and sublibrary.

Cuu is the unit address of the 3270 host device.

BSTTFCMD Result Values

```
'0' is good completion.
'4 - I/O ERROR' is an I/O error occurred on the 3270-host device.
'8 - ARXEXCOM ERROR' is an error returned by ARXECOM.
```