



IBM IT Education Services

E13

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TCP/IP for VSE/ESA Potpourri

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TCP/IP for VSE/ESA Potpourri

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Topics



- Product Maintenance Levels
- New functions with enhancements in 1.4, 1.5 and service packs
 - Email
 - Additional clients and daemons
 - Other Enhancements
- Recommendations

Product Maintenance Levels



- IBM PTF distribution
 - PQ69970 (aka 1.5 Service Pack B)
 - | In VSE/ESA 2.7.1 and 2.6.3 refresh
 - | In VSE/ESA 2.7.0 and 2.6 PSP buckets
 - PQ69574 (aka 1.5 Service Pack A)
 - Apars with additional fixes also available
 - PQ71111 for update to VSE online messages
 - | Update jobstream in IPNOME.Z

Product Maintenance Levels



- Connectivity Systems Distribution
 - 1.5 Service Pack A on CSI website
 - Additional fixes available for each service pack on website
 - www.tcpip4vse.com/supp1.html
- Query Versions command
 - Displays TCPIP module levels
 - Updated in 1.5A to show fixes applied

Email Enhancements



- New Email attachment options (1.4.B)
 - Text to PDF conversion
 - | Invoked by SET command
 - SET PDF=ON
 - SET PDF=pdf_configuration_file (.L library member)
 - Print format control (font, orientation, etc.)
 - | Also supported for LPR clients, FTP server and HTTP web server
 - Binary attachments
 - | EXTTYPES.L file used to determine filetype

Email...



- New Email attachment options (1.4.B)...
 - HTML support
 - | File sent with HTML mime type if first 6 bytes of data begin with <html>
 - Multiple attachments
 - | Can be different types with 1.4.D

Email...

Email Client Attachment Example

```
// JOB EMAIL3
// EXEC CLIENT,SIZE=CLIENT,PARM='APPL=EMAIL'
SET HOST=MAILSERV
SET FROM=Class240
SET TO=jlawson@illustro.com
SET SUBJECT=Attached are some sample files
TEXT
Here are examples of multiple attachments and a PDF attachment.
/+
SET PDF=ON
ATTACH POWER.LST.A.PROGRAM.138 PROGRAM.PDF
SET PDF=OFF
ATTACH POWER.LST.A.DFHMPA.139 AS DUMP139.TXT
SEND
/*
/&
```

Email...

■ New Email Command (1.4.B)

- Provides defaults for email client and email script SET commands
- QUERY EMAIL to display current settings

		Default for
EMAIL	SMTP=servername	SET HOST
	FROM=useremail	SET FROM
	USER=userid	SET USER
	SUBJECT=string	SET SUBJECT
	TRUNC=YES NO	SET TRUNCATE
	TRANS=translatetable	SET TRANSLATE
	DEST=domain.name	SET TO for autoemail script
	RPORT=nnnnn	SET RPORT
	REPLYTO=replyemail	SET REPLYTO (1.4.D)
	ATSIGN=hexvalue	code used for @ (1.4.C)

Email...



- New SET Options (1.4.B)

- SET BCC synonym for SET BLIND

- Distribution lists

- SET TOLIST=list (list is .L library member)

- SET COPYLIST=list

- SET BCCLIST=list

```
CATALOG LIST1.L REPLACE=Y EOD=/+  
"John"<jlawson@illustro.com>  
"Robert"<rhedgpeth@illustro.com>  
/+
```

Email...



- New SET Options (1.4.B)...
 - SET NEWNAME=name
 - | Provides name for attachment in autoemail script
 - SET RPORT=portnumber
 - | Port number for SMTP server
 - SET TRUNCATION=ON|OFF
 - | Controls truncation of records with trailing blanks or nulls in attachments

Email...



- New SET Options (1.4.B)...
 - Variable support for email clients
 - Same SETVAR parameters used in AutoFTP

```
CATALOG EMSRIPT.L      R=Y
SET HOST=192.168.155.98
SET FROM=Class240
SET TO=&POWUSER@illustro.com
SET SUBJECT=Attached is a printout from VSE/POWER
SETVAR &NAME=&PWRNAME + ".TXT"
SET NEWNAME=&NAME
/+
```

Email...



- New SET Options (1.4.D)
 - SET VCARD=NO|YES|name
 - | Virtual business card attachment
 - | DEFAULT.VCF used if YES specified
 - | Create on PC and FTP to VSE library as binary object
 - SET VALIDATE=ON|OFF
 - | Removes binary bytes from text file attachments

Email...



- New SET Options (1.4.D)...
 - SET PRIORITY=1-5|term
 - | For email clients that show email priority
 - | Term can be LOWEST, LOW, MEDIUM, HIGH, HIGHEST
 - SET NOTIFY=emailaddress
 - | Email address to notify when recipient reads email
 - SET REPLYTO= and SET REPLYTOLIST=
 - | Email address or email list for sending email reply

Other Clients and Daemons

- Network Time Protocol Daemon (NTPD)
 - Allows other hosts to synchronize with the VSE TOD clock

```
DEFINE NTPD, ID=name
    [ , PORT=port ]
    [ , PROTOCOL= { UDP | TCP }
    [ , GMT=snum ]
    [ , ADJUSTMENT=snum1 ]
```

- Requires client on other hosts
 - Tardis is one

Other Clients and Daemons...

■ Discover Client

- Determines optimum MTU size between VSE and each remote host
- CICS, console, and batch
- You must set MTU size to maximum before running this client
- CICS transaction and VSE console:

```
DISCOVER [ipaddr|name]
```

Other Clients and Daemons...

DISCOVER on VSE console

```
87 discover 192.168.155.107
Z1 0082 TCP910I Client manager connection Established.
Z1 0082 TCP915I DISCOVER
Z1 0082 TCP910I DISCOVER Ready:
Z1 0082 TCP915I SET HOST= 192.168.155.107
Z1 0082 TCP910I 192.168.155.107
Z1 0082 TCP910I DISCOVER Ready:
Z1 0082 TCP915I DISCOVER
Z1 0082 TCP910I The best MTU discovered: 01480.
Z1 0082 TCP910I DISCOVER Ready:
Z1 0082 TCP915I QUIT
```

Other Clients and Daemons...

■ Traceroute Client

- Reports each hop to the destination and time for each hop
- CICS, console, and batch
- CICS transaction and VSE console:

```
TRACERT [ ipaddr | name ]
```

Other Clients and Daemons...

TRACERT on VSE console

```
87  tracert 206.171.236.253
Z1  0082  TCP910I  Client manager connection Established.
Z1  0082  TCP915I  TRACERT
Z1  0082  TCP910I  TRACERT Ready:
Z1  0082  TCP910I  TRACERT Ready:
Z1  0082  TCP915I  SET HOST= 206.171.236.253
Z1  0082  TCP910I  206.171.236.253
Z1  0082  TCP910I  TRACERT Ready:
Z1  0082  TCP915I  TRACERT
Z1  0082  TCP910I  Hop: 204.155.155.097 at milliseconds: 00196.
Z1  0082  TCP910I  Hop: 198.175.015.026 at milliseconds: 00084.
Z1  0082  TCP910I  Hop: 198.175.015.001 at milliseconds: 00082.
Z1  0082  TCP910I  Hop: 063.237.096.033 at milliseconds: 00082.
Z1  0082  TCP910I  Hop: 205.171.023.061 at milliseconds: 00089.
.
.
Z1  0082  TCP910I  Hop: 216.070.140.234 at milliseconds: 00109.
Z1  0082  TCP910I  Hop: 206.171.236.250 at milliseconds: 00132.
Z1  0082  TCP910I  TRACERT was successful, milliseconds: 00155.
Z1  0082  TCP910I  TRACERT Ready:
Z1  0082  TCP915I  QUIT
```

Other Clients and Daemons...

- Remote Execution Client (REXEC)
 - Issue command(s) to foreign TCP/IP hosts
 - Requires REXEC daemon on foreign hosts
 - Batch and CICS

```
// JOB REXEC
// EXEC CLIENT,PARM='APPL=REXEC,ID=00'
SET HOST=host_name
SET USER=name
SET PASS=password
COMMAND command
WAIT 300                                (1.4.D)
COMMAND command
QUIT
/*
/ &
```

Other Clients and Daemons...



- Remote Execution Client (REXEC)
 - New commands in 1.5.B
 - | SET WARNMATCH.
 - | If SETGOODMATCH, RC=0.
 - | If SETWARNMATCH, RC=4.
 - | If SETBADMATCH, RC=8.

Other Clients and Daemons...

- External FTP Batch Daemon (1.4.B)
 - VSE TCPIP File Server in batch partition
 - | Can remove some/all DEFINE FTPD entries
 - | FTP processing for remote FTP requests done in lower priority batch partition(s)

```
* $$ JOB JNM=FTPBATSR,DISP=K,CLASS=Z
// JOB FTPBATSR EXECUTE TCPIP FTPBATCH SERVER
// LIBDEF *,SEARCH=(TCPIP.TCP140B,TCPIP.TCP140)
// OPTION SYSPARM='00'
// EXEC FTPBATCH,SIZE=FTPBATCH,PARM='FTPDPORT=21'
/*
/&
* $$ EOJ
```

Other Clients and Daemons...

- External FTP Batch Daemon (1.4.D)...
 - Supports file transfer to/from VSE dataspace
 - Dataspace size defined in 4K page multiples

```
* $$ JOB JNM=FTPBATSR,DISP=K,CLASS=Z
// JOB FTPBATSR EXECUTE TCPIP FTPBATCH SERVER
// LIBDEF *,SEARCH=(TCPIP.TCP140D,TCPIP.TCP140)
// OPTION SYSPARM='00'
// EXEC FTPBATCH,SIZE=FTPBATCH,PARM='FTPDPORT=3121'
DEFINE DSPACE RAW FTPDSPAC 2000
/*
/&
* $$ EOJ
```


Other Clients and Daemons...

External FTPBATCH using Dataspace

```
// JOB  FTPJOB      EXAMPLE TCPIP BATCH FILE TRANSFER JOB
// LIBDEF *,SEARCH=(TCPIP.TCP140D,TCPIP.TCP140)
// DLBL VSMFILE,'TEST.FTP.FILE',,VSAM,CAT=USERCAT
// EXEC FTPBATCH,SIZE=FTPBATCH
* Step one - send file to VSE dataspace
LOPEN
LUSER vseuser
LPASS vsepasp
OPEN 192.155.152.173 3121
USER vseuser
PASS vsepasp
ASCII
QUOTE TYPE I
PUT %VSMFILE,KSDS,F,80 %FTPDSPAC,DSPACE,RAW,TESTFILE
CLOSE
LCLOSE
•End of transfer
TIMEWAIT 3          wait a few seconds
```

Other Clients and Daemons...


External FTPBATCH using Dataspace

```
* Step two - send file from dataspace to remote server
LOPEN 192.155.152.173 3121
LUSER vseuser
LPASS vsepasp
OPEN NTSERVER
USER ntuser
PASS ntpass
BINARY
PUT %FTPDPAC,DSPACE,RAW,TESTFILE TESTFILE.TXT
CLOSE
LCLOSE
/*
/ &
```

Other Clients and Daemons...

- External FTP Batch Daemon (1.5.B)...
 - Support for EPIC controlled datasets
 - | New parameter tells TCPIP to obtain record size and block size from EPIC catalog

```
// JOB  FTPJOB  EXAMPLE TCPIP BATCH FILE TRANSFER JOB
// LIBDEF *,SEARCH=(TCPIP.TCP140D,TCPIP.TCP140)
// DLBL SAMFILE,'SAMFILE',,SD
// EXEC FTPBATCH,SIZE=FTPBATCH
LOPEN
LUSER vseuser
LPASS vsepass
OPEN 192.155.152.173 3121
USER vseuser
PASS vsepass
PUT %SAMFILE,SAM,EPIC
CLOSE
QUIT
```



Other Clients and Daemons...

■ SSL Support Enhancements (1.5.B)

■ External FTP Batch Daemon

- | New options on EXEC FTPBATCH PARM statement

- SSL=SERVER
- SSL=CLIENT

■ FTP Server

- | DEFINE FTPD SSL=YES|NO

Other Clients and Daemons...

■ WHOIS Client (1.4.D)

```
* $$ JOB JNM=WHOIS,DISP=D,CLASS=0
// JOB WHOIS EXECUTE TCPIP WHOIS CLIENT
// LIBDEF *,SEARCH=(TCPIP.TCP140D,TCPIP.TCP140)
// EXEC CLIENT,PARM='APPL=WHOIS'
WHOIS TCPIP4VSE.COM
QUIT
/*
/&
* $$ EOJ
```

- Needs DNS server or name to resolve Internic address

Other Enhancements



■ New Hardware Support (1.5)

■ OSA Express

- | Hardware feature of G5, G6, zSeries 800 and 900 processors
- | Requires VSE/ESA 2.6 or 2.7

■ PCI Cryptographic Accelerator card on zSeries 800 and 900 processors

- | Improves performance of SSL
- | Requires VSE/ESA 2.7

Other Enhancements



■ New Hardware Support (1.5)

■ Hipersockets

- | Fast TCPIP communication among LPARs and VM virtual machines
- | Requires VSE/ESA 2.7
- | Supported on z/Series 800 or 900 processor
- | Supported on MP3000, G5 and G6 processors as guest running under z/VM 4.2 or later

Other Enhancements



- Redesigned DNS support (1.5)
 - Forward and reverse lookup
 - Multiple DNS servers
 - Additional record types and formats
- External and internal sockets mechanism improvements (1.5)

Other Enhancements



- Multi-threaded AutoLPR, AutoFTP and AutoEmail (1.4.B)
 - Concurrent event processing
 - Control parameters
 - | SET MAX_EVENTS=5
 - maximum number of concurrent events
 - | SET SINGLEDEST=ON|OFF
 - One or multiple outputs to one destination at a time
 - | DEFINE EVENT RETRY count and RETRY_TIME apply to single event

Other Enhancements...



- VSE FTP Server welcome message (1.4.C)
 - `DEFINE FTPD,WELCOME=FTPHELLO`
 - Welcome message defined in .L library member
 - Welcome text in columns 5 – 72
- KSDS file transfers by keyrange (1.4.D)
 - `SITE LOWKEY` specifies starting key
 - `SITE HIGHKEY` specifies ending key
 - Key values can be generic or full key

Other Enhancements...



- VSE FTP Server translation control (1.5.A)
 - EXTTYPES.L table
 - | Controls translation based on filetypes defined in the table
 - New option on DEFINE FTPD
 - | EXTTYPES=NO
 - | Suppresses use of EXTTYPES.L table
 - FTP user is responsible for specifying correct binary or ascii translation for ftp session.

Other Enhancements...



- Wait and retry options for FTPBATCH (1.4.D)
 - TIMEWAIT nnn
 - | Waits nnn seconds
 - SET RETRY nnn ttt
 - | Retries failed command nnn times every ttt seconds
- FTPBATCH diagnose support (1.4.D)
 - SET DIAGNOSE EVENTS in FTPBATCH job
- FTPBATCH supports FTP proxy servers (1.5.A)

Other Enhancements...

- Change directory support for ICCF library (1.4.C)
 - Does not support directory list (DIR)

```
CD ICCF.LIBRARY.10  
GET IPINIT00 IPINIT00.TXT
```

Other Enhancements...

■ CHECKTCP Utility

- Checks if TCPIP partition is running

```
* $$ JOB JNM=CHECKTCP,DISP=D,CLASS=0
// JOB CHECKTCP
// EXEC CHECKTCP,PARM='SYSID=00,WAIT=N'
/*
/&
* $$ EOJ
```

```
BG 0000 // JOB CHECKTCP
          DATE 07/14/2000, CLOCK 11/11/22
BG 0000 CTCPO2I  TCP/IP is currently active in Z1
BG 0000 EOJ CHECKTCP  MAX.RETURN CODE=0000
          DATE 07/14/2000, CLOCK 11/11/23, DURATION 00/00/00
```

Other Enhancements...



- **DIAGNOSE (1.4.D)**

- **TIMEWAIT nnn**

- | Waits nnn seconds

- **SET RETRY nnn ttt**

- | Retries failed command nnn times every ttt seconds

- **FTPBatch diagnose support (1.4.D)**

- **SET DIAGNOSE EVENTS in FTPBatch job**

Other Enhancements...



- **DIAGNOSE AUTOMATION (1.5.A)**
 - Event diagnose support
 - Diagnostic information on event processing
- **DIAGNOSE SSL (1.5.A)**
 - Diagnostic information for SSL
- **DIAGNOSE FTPD (1.5.B)**
 - Diagnostic information for FTP Server

Other Enhancements...



- **DIAGNOSE output control (1.5.A)**
 - **SET DIAGNOSE=NOCONSOLE**
 - | Diagnose output to SYSLST only
 - **SET DIAGNOSE=CONSOLE**
 - | Diagnose output to VSE console and SYSLST
- **QUERY DIAGNOSE (1.5.A)**
 - Displays current DIAGNOSE settings

Other Enhancements...

- Command time values can be seconds or minutes (1.5.A)

Example

RETRY=18000	(1/300 sec)
RETRY=60S	(seconds)
RETRY=1M	(minutes)

Other Enhancements...



- **DEFINE HTTPD LIMIT=value (1.5.B)**
 - Limits maximum number of HTTP sessions
 - Controls using too much GETVIS for HTTP functions
- **Support for DATA parameter on MSG command (1.5.B)**
 - `MSG xx, DATA='tcpip command'`
 - Requires `SET CONSOLE_HOLD=OFF`

Recommendations...



- Run in partition with 31-bit GETVIS
 - More 31-bit exploitation in 1.4 and later
 - 20 MB +
 - Use GETVIS partid,ALL to check VS usage
- Partition priorities w/Telnet (hi to low)
 - POWER, VTAM, TCP/IP, CICS(s), batch
 - Use FTPBATCH for host-initiated FTP or as host FTP server

Recommendations...



- Update TCPAPPL definitions
 - TN3270 and GPS VTAM APPL definitions
 - Code EAS=1 and SESSLIM on APPL entries or in GROUP entry
 - Saves VTAM buffer storage
 - TCPAPPL.B shipped with 1.5.A has been updated

Recommendations...



- Don't let TCP/IP partition see more network traffic than it needs to
 - Specify VSE's IP address in OSA and 3172 configurations
 - Filter non-IP traffic if the network attachment supports the option
 - Isolate VSE on its own LAN segment

Recommendations...



- SET GATEWAY=OFF if possible
 - Saves unnecessary scan of routing table
- Use POOL=NO on TELNET definitions
 - Costs more 31-bit partition GETVIS
- Use FTPBATCH for VSE batch FTP clients
 - Moves file I/O and FTP processing to lower priority batch partition

Recommendations...

- For debugging use the DIAGNOSE command
 - Particularly useful for diagnosing LPR, AFTP, and AutoEmail problems

```
DIAGNOSE { OFF|LPR|802.3|802.5|STALL|AFTP|SAM|
          FTP|FTPD|FILEIO|STORAGE|RESET|DNC|HTTP|
          FDDI|PERFORM|POWER|ROUTING|SWS|CONT|
          CAFFTP|CLOSE|EMAIL|AUTOMATION }
```

- SET DIAGNOSE=value also accepted

Recommendations...

TCP/IP Statistics

```
91 q statistics
Z1 0089 IPN515I (( TCP/IP Operational Statistics ))
Z1 0089 IPN516I  FTP Daemons                = 5
Z1 0089 IPN516I  - Current Active            = 0
Z1 0089 IPN516I  - Maximum Active           = 1
Z1 0089 IPN516I  - Current Buffers          = 0
Z1 0089 IPN516I  - Maximum Active Buffers   = 1
Z1 0089 IPN516I  Telnet Daemons             = 10
Z1 0089 IPN516I  - Current Active           = 3
Z1 0089 IPN516I  - Maximum Active           = 4
Z1 0089 IPN516I  - Current Buffers          = 0
Z1 0089 IPN516I  - Maximum Active Buffers   = 0
Z1 0089 IPN516I  LP Daemons                 = 5
Z1 0089 IPN516I  HTTP Daemons               = 2
```

Recommendations...

TCP/IP Statistics...

Z1	0089	IPN516I	Gopher Daemons	=	0
Z1	0089	IPN516I	FTP Sessions	=	5
Z1	0089	IPN516I	Telnet Sessions	=	3
Z1	0089	IPN516I	LPR Requests	=	0
Z1	0089	IPN516I	HTTP Requests	=	0
Z1	0089	IPN516I	Gopher Requests	=	0
Z1	0089	IPN516I	TCP Inbound Rejections	=	29
Z1	0089	IPN516I	FTP Files Sent	=	3
Z1	0089	IPN516I	FTP Files Received	=	0
Z1	0089	IPN516I	FTP File Bytes Sent	=	43296
Z1	0089	IPN516I	FTP File Bytes Received	=	0
Z1	0089	IPN516I	Telnet Bytes Sent	=	1899256
Z1	0089	IPN516I	Telnet Bytes Received	=	29911
Z1	0089	IPN516I	TCP Bytes Sent	=	2467631

Recommendations...

TCP/IP Statistics...

Z1	0089	IPN516I	TCP Bytes Received	=	31820
Z1	0089	IPN516I	UDP Bytes Sent	=	0
Z1	0089	IPN516I	UDP Bytes Received	=	0
Z1	0089	IPN516I	IP Bytes Sent	=	2786082
Z1	0089	IPN516I	IP Bytes Received	=	298376
Z1	0089	IPN516I	Storage Cushon Releases	=	0
Z1	0089	IPN516I	Received Blocks	=	0
Z1	0089	IPN516I	- Inbound Datagrams	=	0
Z1	0089	IPN516I	- Non-IP	=	0
Z1	0089	IPN516I	- Miss Routed IP	=	29
Z1	0089	IPN516I	- Arps	=	0
Z1	0089	IPN516I	- Arp Requests	=	0
Z1	0089	IPN516I	Transmitted Blocks	=	0
Z1	0089	IPN516I	- Outbound Datagrams	=	0
Z1	0089	IPN516I	- Arp Requests	=	0
Z1	0089	IPN516I	- Arp Replies	=	0


Recommendations...



- Key statistics to look at
 - Maximum active buffers vs. allocated
 - | FTP and Telnet
 - Non-IP and Miss-routed-IP datagrams
 - | Set filtering on in adapter (if available)
 - ARPS/ARP requests
 - | ARP_TIME set too low
 - Only if ARPDELETE ON active (default is OFF)
 - | Malfunctioning workstation/server on LAN
 - Use QUERY ARPS command to see who it is

Recommendations...



- Remove from IPINIT all SET commands for time values 
 - Product defaults have been updated
- Use QUERY SET command to see exactly which options you are running with
 - QUERY OPTIONS is identical

Recommendations...

QUERY SET Output

```
q set
0085 IPN451I (( TCP/IP Set Information ))
0085 IPN452I   System ID: 00
0085 IPN453I   IP Address: 204.155.155.115   Submask: 255.255.255.224
0085 IPN454I   All Bound Time: 30000   Link Retry Time: 18000
0085 IPN455I   Redispatch Time: 10   Dispatch Time: 30
0085 IPN456I   Retransmit Time: 100   Window: 4096
0085 IPN457I   Transfer Buffers: 20   Maximum Buffers: 4
0085 IPN518I   Receive MSS: 32684
0085 IPN458I   Console Hold: OFF   Debug: OFF   Record: OFF
0085 IPN459I   Gateway: OFF   Isolation: OFF   Security: ON
0085 IPN804I   Telnet translation will use System Default
0085 IPN806I   Checksum: Software Connect_Sequence: OFF
0085 IPN806I   Downcheck: OFF   Dynamic_Route: ON
0085 IPN806I   Fixed_Retransmit: OFF   Full_CETI: ON
0085 IPN806I   Full_Critical: OFF   Local_DLBL: ON
```

Recommendations...

QUERY SET Output

```
0085 IPN806I Match_Message: ON Ping_Message: ON
0085 IPN806I Reuse: ON Security_ARP: OFF
0085 IPN806I Security_IP: OFF Separator_Pages: OFF
0085 IPN806I SDOpen_Extra: OFF Spincheck: ON
0085 IPN806I Sockcheck: ON Upcase: OFF
0085 IPN806I Traffic: ON
0085 IPN806I ARPdelete: OFF ARP_Time: 90000
0085 IPN806I Auto_time: 9000 Pulse_Time: 18000
0085 IPN806I Console_Port: 0
0085 IPN806I Additional_Window: 100 Reuse_Size: 10
0085 IPN806I Window_Restart: 10 Window_Depth: 30
0085 IPN806I Slow_Start: 10 Slow_Restart: 10
0085 IPN806I Slow_Increment: 1
0085 IPN806I Default_Domain:
0085 IPN806I Close Connection Depth: 10 Separator Page Count: 0
0085 IPN806I FTPBATCH_Fetch: off
0085 IPN806I Subtask_OPEN: off
```

Information Sources



■ Manuals

■ Product documentation

- | VSE/ESA CD collection kit

- | On IBM VSE website or CSI website

 - www-1.ibm.com/servers/eserver/zseries/os/vse/support/tcpip/tcphome.htm

 - www.tcpip4vse.com/doc1.html

- | TCP/IP for VSE/ESA IBM Program Setup and Supplement manual updated for 1.5

■ TCP/IP redbook SG24-5626 `Getting Started with TCP/IP for VSE/ESA 1.4`

- | Other redbooks on IBM VSE website

■ Education

- TCP/IP for VSE/ESA Under the Covers class (A3750)