



Session: E16

TCP/IP for VSE/ESA Hot Topics

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TCP/IP for VSE/ESA

Hot Topics

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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
 - PQ79563 (aka 1.5 Service Pack D)
 - PQ77237 (aka 1.5 Service Pack C)
 - In VSE/ESA 2.7.2 refresh
 - In 2.7.1 RSU and 2.6.3 RSU
 - 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
 - PQ71111 for update to VSE online messages
 - Update jobstream in IPNOME.Z



Product Maintenance Levels

- Connectivity Systems Distribution
 - ❑ 1.5 Service Pack D 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.DFHDMPA.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
 - Documentation added in 1.5.D service pack

| | | 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 Email Command Options (1.5.C)
 - TRANSLATION= (default translation table)
 - TRATT=table
 - Translation table for email attachments
 - TRMAIL=table
 - Translation table for email body section
- New current date and time variables
 - &NOWDATE, &NOWTIME
- SET option CHECKNAME=NO
 - Suppress validity checking of "to" address



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 EMSCRIPT.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



Email...

- New SET Options (1.5.D)...
 - SET DISP=HOLD
 - Processed entries put in "hold", not "Y" status
 - SET DISP=FORCE|NOFORCE
 - Allows batch email client attachment of entry's with any disposition in addition to "K" and "D"
 - SET FROM with <> reinstated (dropped after 1.4)



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

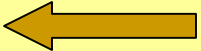
```
* Step two - send file from dataspace to remote server
LOPEN 192.155.152.173 3121
LUSER vseuser
LPASS vsepasp
OPEN NTSERVER
USER ntuser
PASS ntpass
BINARY
PUT %FTPDPAC,DSPACE,RAW,TESTFILE TESTFILE.TXT
CLOSE
LCLOSE
/*
/&
```



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)
- New SET_TASKS initialization command (1.5.C)
 - Pre-allocates task control blocks
 - Helps reduce 24-bit storage fragmentation
 - QUERY STOR command to determine proper setting



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...

- New Event Processing Options (1.5.C)
 - POWERSYSID
 - Support for POWER shared spool environment
 - PRIORITY=YES|NO
 - Uses POWER priority for scheduling events
 - ORDER=YES|NO
 - Files processed in order
 - SET MAX_EVENT replaced
 - SET MAX_LPR, SET MAX_EMAIL, SET MAX_FTP



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...

- FTP client variable support (1.5.D)
 - Maximum number of SETVAR variables increased from 40 to 80
- LPR Client DUMPVAR command (1.5.D)
 - Displays currently defined variables



Other Enhancements...

- LPR client form eject control (1.5.D)
 - ENDWITHEJECT (or SET ENDEJECT)=YES|NO
 - Generates additional formfeed if needed to ensure final page eject
- Script file record length controls (1.5.D)
 - SET LASTCOL=72 (last column to process)



Other Enhancements...

- File I/O driver for BIM-Edit file (1.5.D)
- File I/O driver for Vollie (1.5.C)
 - Distributed "as is" (1.5.D)
- 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...

- Startup and shutdown improvements
 - SET SETTLE_TIME (1.5D)
 - User defined startup delay before initiating network traffic (was 30 second internal setting)
 - Default 1500 (5 seconds)
 - Faster shutdown (1.5.D)
 - Overlapped processing during shutdown stages
 - SHUTDOWN IMMEDIATE or SHUT I command
 - CONNECT_STATS=OFF|ON
 - Option to print connection statistics at shutdown



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
- **QUERY FRAGMENT (1.5.C)**
 - Displays statistics for tuning datagram fragmentation



Other Enhancements...

- **DEFINE TELNETD BUFFERSIZE (1.5.D)**
 - User defined I/O buffer for TN3270 session
 - Up to 255 x 128, requires POOL=NO
- **GPSD MODE=EBCDIC option**
 - Transmits LPR output from GPS in EBCDIC
- **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
 - ❑ Storage use decreased by 64K (1.5.D)
- **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|
          CAFTP|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
 - TCPIP 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)**