

IPCS for Networkers Gaining Insight from Gigabytes of TCPIP Dump Data

Matthias Burkhard
IBM Germany

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Sheraton Seattle, Issaquah B
Session 16751



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IPCS for Networkers - Session 16751

The Problem – High CPU in TN3270

- TN3270 Server is using excessive CPU cycles
 - All sessions are SSL secured
 - Nothing has changed in the configuration of the server
 - Production LPAR (16k clients) at 100% CPU



The Problem Documentation

- A Dump of TN3270, TCPIP and OMVS
 - TN3270 SYSTCPIP CTRACE OPT=(TELNET)
 - Shows interaction between TN3270 and VTAM
 - Shows interaction between TN3270 and SSL
 - Shows interaction between TN3270 and TCP
 - TCPIP SYSTCPIP CTRACE OPT=(TCP)
 - Shows interaction between TCP and TN3270

The Root Cause

- LUMAP/PRTMAP statements were configured in Telnet Profile
 - Every workstation should get 1 Terminal and 1 Printer only
 - Some end users configured more than two sessions
 - Auto-Reconnect was configured
 - TN3270 Clients (PComm) were upgraded from 5.09 to V6
 - A pop-up window used to appear when TN3270 negotiation failed, asking for “Retry”
 - With V6 the “Retry” was automatically and infinitely

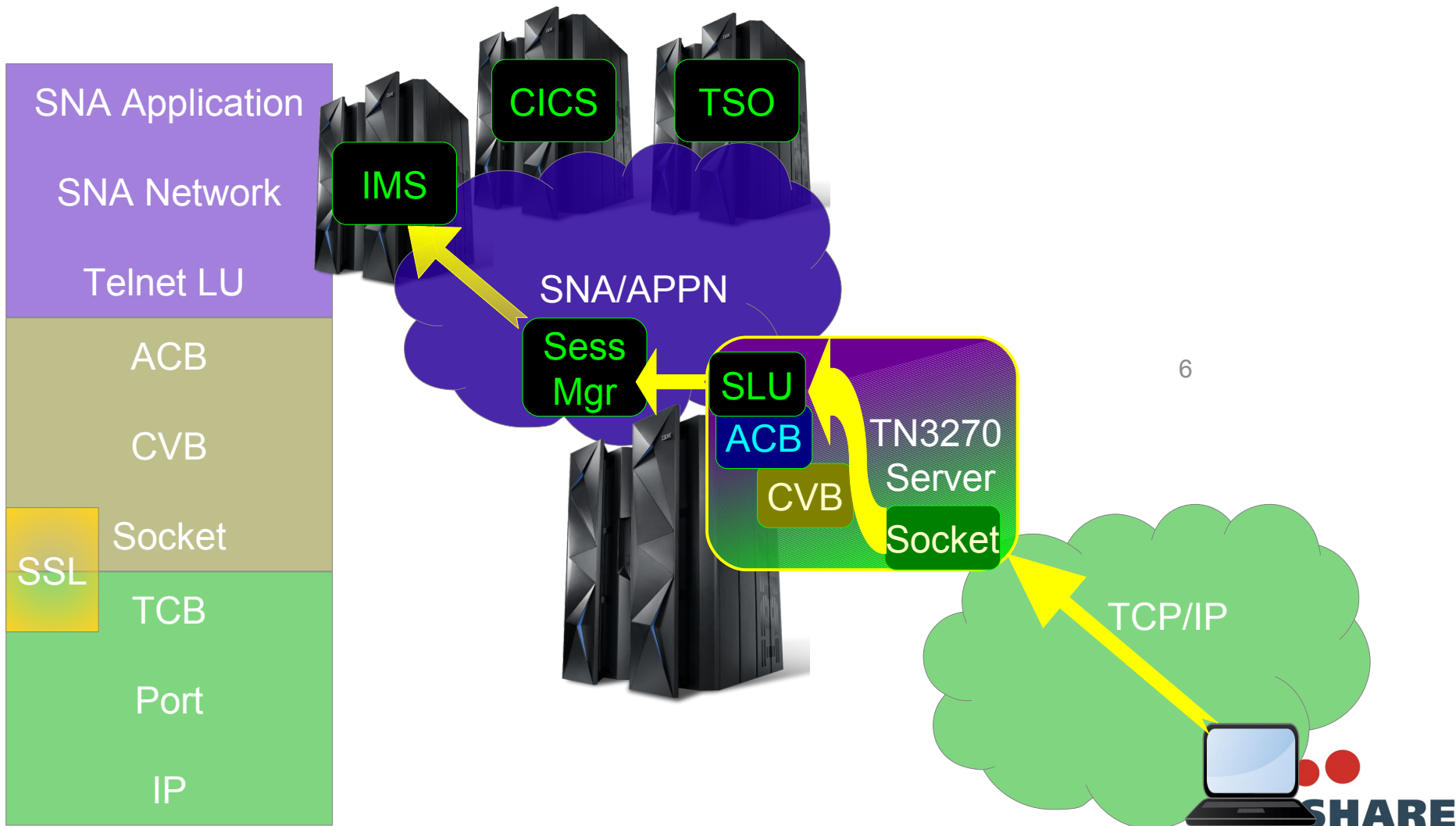
Background: Telnet 3270 Server

A Relay between SNA Applications and IP clients

- Towards SNA the TN3270 Server communicates with a VTAM application (CICS, IMS, TSO, Session Managers)
 - Uses a VTAM **A**ccess Method **C**ontrol **B**lock (**ACB**)
 - Every Telnet Client is represented by a **L**ogical **U**nit (**LU**)
 - Single Session only, S(econdary)LU only (terminal/printer)
 - Every Client requires a unique SNA LUNAME
- Towards IP the TN3270 Server uses TCP protocol
 - Has a **L**istener for clients to connect to (Standard **P**ort **23**)
 - Creates new TCP sockets for every client session
 - Supports **S**ecure **S**ocket **L**ayer (**SSL**) or **T**ransport **L**ayer **S**ecurity (TLS)

Background Telnet 3270 Server

Relay between SNA Applications and IP clients



6

IPCS analysis of a TCPIP / Telnet dump

- VERBX routines
- TCPIPCLIST
- CTRACE SYSTCPIP OPTIONS(TELNET)
- CTRACE SYSTCPIP OPTIONS((IPA(ipaddr)))
-

Dump and Trace(s) of the suspects ... Who is involved?

TN3270 Server
Controlblocks

LUCB

ACB

CVB

AIOCB

TCB

Address Spaces

VTAM

TN3270

OMVS

TCPIP

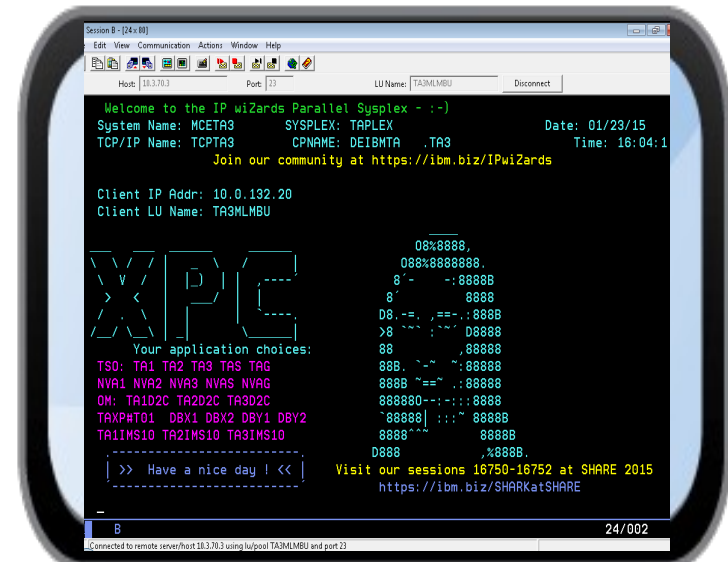
Four Address Spaces in z/OS

VTAM

TN3270

OMVS

TCPIP



Who is using my Telnet Server?

SYSTCPDA Packet Trace – SUMM

DP	Nr	hh:mm:ss.mmmmmmm	IpId	Seq_num	Ack_num	Wndw	Flags
IT	9658	11:12:02.140576	0AF6	362282668	0	8192	SYN
OT	9659	11:12:02.140717	19CC	3227678552	362282669	65535	ACK SYN
IT	9660	11:12:02.153006	0AF7	362282669	3227678553	256	ACK
IT	9661	11:12:02.155594	0AF8	362282669	3227678553	256	ACK PSH
				1603 0000 93010000	*....1....		*
OT	9662	11:12:02.156299	19CD	3227678553	362282821	16379	ACK PSH
				1603 0005 32020000	*.....		2....*
IT	9663	11:12:02.169987	0AF9	362282821	3227679888	251	ACK PSH
				1603 0000 44100000	*.....		D....*
OT	9664	11:12:02.173543	19CE	3227679888	362282965	16379	ACK PSH
				1403 0000 0101	*.....		*
OT	9665	11:12:02.173608	19CF	3227679894	362282965	16379	ACK PSH
				1603 0000 3CB4AA88	*.....h		<....*
OT	9666	11:12:02.173778	19D0	3227679959	362282965	16379	ACK PSH
				1703 0000 170689BD	*.....i.		*
IT	9667	11:12:02.185388	0AFA	362282965	3227679959	251	ACK
IT	9668	11:12:02.207679	0AFB	362282965	3227679987	251	ACK PSH
				1703 0000 177150C5	*.....&E		qP.*
OT	9669	11:12:02.207854	19D1	3227679987	362282993	16383	ACK PSH
				1703 0000 1BDAB611	*.....		*
IT	9670	11:12:02.223417	0AFC	362282993	3227680019	256	ACK PSH
				1703 0000 27E96223	*.....Z..		'.b#*
OT	9671	11:12:02.223593	19D2	3227680019	362283037	16382	ACK PSH
				1703 0000 30B82423	*.....		0.\$#*
IT	9672	11:12:02.235568	0AFD	362283037	3227680072	256	ACK PSH
				1703 0000 1E6367B5	*.....		cg.*
OT	9673	11:12:02.235699	19D3	3227680072	362283072	16382	ACK PSH
				1703 0000 1E49262A	*.....		I&**
OT	9674	11:12:02.240706	19D4	3227680107	362283072	16382	ACK FIN
IT	9675	11:12:02.253404	0AFE	362283072	3227680108	256	ACK

3-way Handshake

SSL/TLS Negotiation

TN3270 Negotiation

SYSTCPIP CTRACE – Big Data Analytics



IPCS OUTPUT STREAM -----

Command ==>

***** TOP OF DATA

Comp: SYSTCPIP Tcpi: TCPIP Parmlib: CTIEZB00
Fmt: EZBCTFM4 SSM: EZBCTSS4 Display:
Status: INACTIVE XWriter: DISCONNECT
Bufsize: 255M Maxsize: 1024M

COMPONENT TRACE SHORT FORMAT

COMP(SYSTCPIP)SUBNAME((TCPIP))

**** 12/22/2014

SYSNAME	MNEMONIC	ENTRY ID	TIME STAMP	DESCRIPTION
-----	-----	-----	-----	-----
OS01	TCP	40037D01	15:37:19.860846	Received msg triples
OS01	TCP	40037D00	15:37:19.860898	Start of Put procedure
OS01	TCP	40037D01	15:37:19.860898	Received msg triples
OS01	TCP	40037D01	15:37:30.235121	Received msg triples
OS01	TCP	40037D00	15:37:30.235224	Start of Put procedure
OS01	TCP	40037D01	15:37:30.235224	Received msg triples

SYSTCPIP CTRACE – Big Data Analytics

Filtering on what you know – here: Server Port



- `OPTION((TCP PORT(7723)))`
 - Found Listener TCB
 - TCTEL Connection Key
 - TCP close:Bypass

OS01	TCP	4003002F	15:37:19.861797	TCTEL Connection key
OS01	TCP	4003002F	15:37:19.863123	TCTEL Connection key
OS01	TCP	4003002F	15:37:19.864186	TCTEL Connection key
OS01	TCP	40037850	15:37:19.864992	Trace start of TCP close:Bypass
OS01	TCP	40037850	15:37:19.865396	Trace start of TCP close:Bypass
OS01	TCP	40037850	15:37:19.865580	Trace start of TCP close:Bypass
OS01	TCP	40037D1E	15:37:19.895484	Found Listener TCB
OS01	TCP	40037D1E	15:37:19.903506	Found Listener TCB
OS01	TCP	40037D1E	15:37:30.213621	Found Listener TCB

SYSTCPIP CTRACE – SUMMARY

Who is talking to us – follow the 'Listener' CID



- FOUND LISTENER TCB
 - IPADDR of remote client(s)
 - CID is the Listener's socket

COMPONENT TRACE SUMMARY FORMAT

COMP(SYSTCPIP)SUBNAME((TCPIP)) OPTIONS((CID(X'2D8F242D')))

**** 12/22/2014

SYSNAME	MNEMONIC	ENTRY ID	TIME STAMP	DESCRIPTION
-----	-----	-----	-----	-----
OS01	TCP	40037D1E	15:37:19.895484	Found Listener TCB
HASID..0034	PASID..0034	SASID..0034	USER...TCP3270A	
TCB...00000000	MODID..EZBTCPCN	REG14..2C458B06	DUCB...57000416	
CID...2D8F242D	PORT...7723	CPUA...00		
IPADDR. 10.6.10.7				

SYSTCPIP CTRACE – SUMMARY

Who is talking to us – follow a client

- TCTEL Connection key indicates a new client connecting
 - IPADDR of remote client(s)
 - CID is the session id of a single TCP connection

```
IPCS OUTPUT STREAM -----
Command ==> ip ctrace comp(systcpip) sub((tcpip)) opt((ipa(10.1.56.37))) summ
OS01      TCP      4003002F  15:37:20.149536  TCTEL Connection key
HASID..0210      PASID..0034      SASID..0010      USER...TCP3270A
TCB....009AF4A0  MODID..EZBTCICT  REG14..2C4F1630  DUCB...F3000035
CID....3095FBA9  PORT...7723      CPUA...00
IPADDR. 10.1.56.37

OS01      TCP      40037850  15:37:20.150732  Trace start of TCP close:Bypass
HASID..0210      PASID..0034      SASID..0010      USER...TCP3270A
TCB....009AF4A0  MODID..EZBTCSTR  REG14..2C4C6B36  DUCB...1200005C
CID....3095FBA9  PORT...7723      CPUA...01
IPADDR. 10.1.56.37
```

TCPIP dump – TCPIP CS TCB

Who is connected to us – 'netstat'

- TCP connections active in the system
 - IPADDR/Port of both, local and remote socket
 - ResrcCID is the session id of a single TCP connection

```
IPCS OUTPUT STREAM -----  
Command ==> ip tcpipcs tcb  
IPv4 TCB ResrcID ResrcNm TcpState  ApplName LuName      IPAddr/Port  
7B5A8B10 2DCA36A0 TCP3270A Established BPETPX1 0815XWL  Local  192.168.120.71..7723  
Remote 10.42.56.37..1339  
7C45EB10 2DCA5208 TCP3270A Established CXTERM 0815XWLR Local  192.168.120.71..7723  
Remote 10.42.56.37..1341
```

TN3270 Negotiation: What's flowing?

TCP Data (Hex)	Description (short)

SYN	<--- S MSS=1460
SYN_ACK	---> SA MSS=1460
3-way handshake complete	<--- A
FFFD27	---> DO NewEnvironment (ELF)
FFFD28	---> AP DO TN3270E
FFFB28	<--- AP WILL TN3270E
FFFA280802FFF0	---> AP Send Device-Type End Subopt
FFFA28020749424D2D333237382D322D	<--- AP Device-Type req IBM-3278-2-E
FFFA28020449424D2D333237	---> AP Device-Type is IBM-3278-2-E
FFFA280307000204FFF0	<--- AP Functions req Bind-Image Resp
FFFA280304000204FFF0	---> AP Functions is Bind-Image Resp
0300000000031010303919030	---> AP BIND-Image Seq(0000) BIND_IMAGE
0000000000005C21D60E2C5E2	---> AP USSMSG 10
000000000007DC1D811C1D1A397A78785	<--- AP 3270-Data Seq(0000) RU(ENTER)FMD

If everything is fine, TN3270 Negotiation is done after 8 packets max

SUMM FORMAT JOBNAME(TCP3270A)



JOB TCP3270A

SELECTED BY: JOBNAME

ASCB: 00F5E400

+0000 ASCB..... ASCB FWDP..... 00FCCB80 BWDP..... 00F79B80

+0020 R020..... 00000000 ASID..... 0210 R026..... 00

+002A DPH..... 00FE TCBE..... 00000000 LDA..... 7FF18E10

+0038 CSCB..... 2D56EB00 TSB..... 00000000

+0040 **EJST..... 0000153C BE839A3E**

+0048 EWST..... CE3E03B6 93E07908 JSTL..... 000141DE

+0054 ECB..... 809FD718 UBET..... CE3D753B TLCH..... 00000000

+00C8 **SRBT..... 0000034A 932E2A60** LTCB..... 00000000

TCB: 009CFCF0

+0138 STCB..... 7F4B2518 **TTIME.... 000000DB 9EBAC7E6**

TCB: 009CA4D0

+0138 STCB..... 7F432948 TTIME.... 0000005D E31C382A

CPU Time is being tracked in the ASCB: SRB and TCB time in TOD format

Every TCB keeps track of the CPU time spent under this TCB

Complete your session evaluations online at www.SHARE.org/Seattle-Eval



SUMM REGI JOBNAME(TCP3270A)

TCB: 009CFCF0

CMP..... 00000000 PKF..... 60 LMP..... FF

General purpose register values

0-3 00000001 809D7740 7F628000 7F4E7AE4

4-7 7F4B4010 00000000 7F628000 2D8302E0

8-11 00000000 00000000 00000000 00000000

12-15 2D80E230 7F6287B8 7F628940 809CFC68

TSFLG.... 00 STAB..... 009AD770 NDSP..... 00002000

JSCB..... 009FC7AC BITS..... 00000000 DAR..... 00

RTWA..... 00000000 FBYT1.... 00

PRB: 009CFC68

WLIC..... 00020001 OPSW..... 076C1400 AD80DE1C

LINK..... 019CFCF0

GPR0-3... 7F4B4104 7F4E82A0 7F4E7000 00000000

GPR4-7... 00000000 2D768540 00000002 7F4B4010

GPR8-11.. 7F4B4010 7F4B410C 00000000 0134C288

GPR12-15. 2D768360 00009F68 7F4E7AE4 7F4E8218

EP..... EZBTTSSL ENTPT.... AD803100

The biggest CPU burner is the TCB executing SSL code

TCPIPCS PROFILE TCP(TCP3270A)



TCPIPCS PROFILE TCP(TCP3270A)
Analysis of Telnet for TCP3270A. Index: 9

TELNETPARMS

SECUREPORT 7723

P DEBUG EXCEPTION CTRACE

P CONNTYPE SECURE

P KEYRING SAF tcp3270

ENDTELNETPARMS

BEGINVTAM

SECUREPORT 7723

ALLOWAPPL A06TS0* DISCONNECTABLE

ALLOWAPPL *

LUGROUP LUIPCALB

H050A6T

. . .

USSTCP USFILT21 IPADDR,10.40.60.19

LUMAP Q9304AC IPADDR,10.40.60.19

ENDVTAM

Telnet Profile indicates TN3270 is using its own SSL – not AT-TLS

CTRACE COMP(SYSTCPIP) SUB((TCP3270A))



Line 1137716 Cols

COMPONENT TRACE SHORT FORMA

COMP(SYSTCPIP)SUBNAME((TCP3270A))

**** 12/22/2014

SYSNAME	MNEMONIC	ENTRY ID	TIME STAMP	DESCRIPTION
-----	-----	-----	-----	-----
OS01	MESSAGE	50030009	16:36:55.350721	Allocate MSGB/DATAB/data buffer
OS01	TELNET	700100A9	16:36:55.350722	Issue BPX1AIO
OS01	TELNET	700100AA	16:36:55.350738	Return from BPX1AIO
. . .				
OS01	TELNET	700100A9	16:37:42.645516	Issue BPX1AIO
OS01	TELNET	700100AA	16:37:42.645521	Return from BPX1AIO
OS01	TELNET	70010045	16:37:42.645522	Send SSL Data to Client
OS01	MESSAGE	5003000C	16:37:42.645523	Free MSGB/DATAB/data buffer
OS01	MESSAGE	5003000E	16:37:42.645523	Free MSGB
OS01	TELNET	700100C1	16:37:42.645523	TxRef count change

Quite some activity here, 1.3 million trace entries within 47 seconds!



CTRACE COMP(SYSTCPIP) SUB((TCP3270A)) REPORT VIEW; X ALL ; F ' SK' ALL



```
8262 CHARS ' SK'
OS01      TELNET      70010056  16:36:55.353637  SKCLOSE Issued
OS01      TELNET      70010056  16:36:55.354294  SKCLOSE Issued
OS01      TELNET      70010056  16:36:55.360855  SKCLOSE Issued
OS01      TELNET      70010056  16:36:55.362084  SKCLOSE Issued
OS01      TELNET      7001003E  16:36:55.386030  SKSOCINIT Succeeded
OS01      TELNET      7001003E  16:36:55.393068  SKSOCINIT Succeeded
OS01      TELNET      7001003E  16:36:55.393646  SKSOCINIT Succeeded
OS01      TELNET      7001003E  16:36:55.393915  SKSOCINIT Succeeded
OS01      TELNET      7001003E  16:36:55.394699  SKSOCINIT Succeeded
OS01      TELNET      7001003E  16:36:55.399457  SKSOCINIT Succeeded
OS01      TELNET      7001003E  16:36:55.406733  SKSOCINIT Succeeded
```

SKSOCINIT indicates TLS handshake went ok (after 3-way handshake)

SKCLOSE indicates the TLS 'session' is being terminated again



CTRACE COMP(SYSTCPIP) SUB((TCP3270A)) OPT((TELNET)) SUMM



```
8262 CHARS ' SK'  
OS01      TELNET      7001003E  15:36:55.386030  SKSOCINIT Succeeded  
HASID..0210      PASID..0210      SASID..0210      USER...  
TCB....009ACC68  MODID..EZBTTSMT  REG14..2D6AAAD6  DUCB...3200004D  
CID....3095844A  PORT...7723      CPUA...03  
IPADDR. 10.6.10.48
```

```
OS01      TELNET      70010056  15:36:55.547749  SKCLOSE Issued  
HASID..0210      PASID..0210      SASID..0210      USER...  
TCB....009AD108  MODID..EZBTTCCU  REG14..2D699B76  DUCB...87000830  
CID....3095844A  PORT...7723      CPUA...00  
IPADDR. 10.6.10.48
```

Way too many TLS sessions being established and terminated

TN3270 usually are long-lived ...

CTRACE COMP(SYSTCPIP) SUB((TCP3270A)) OPT((TELNET IPA(10.6.10.48))) SUMM

```
192 CHARS ' SK'
OS01      TELNET      7001003E  15:36:55.386030  SKSOCINIT Succeeded
CID....3095844A  PORT...7723      CPUA...03
OS01      TELNET      70010056  15:36:55.547749  SKCLOSE Issued
CID....3095844A  PORT...7723      CPUA...00
OS01      TELNET      7001003E  15:36:55.796899  SKSOCINIT Succeeded
CID....30958686  PORT...7723      CPUA...04
OS01      TELNET      70010056  15:36:55.956536  SKCLOSE Issued
CID....30958686  PORT...7723      CPUA...00
OS01      TELNET      7001003E  15:36:56.296100  SKSOCINIT Succeeded
CID....30958854  PORT...7723      CPUA...04
OS01      TELNET      70010056  15:36:56.457326  SKCLOSE Issued
CID....30958854  PORT...7723      CPUA...00
. . .
OS01      TELNET      7001003E  15:37:42.228562  SKSOCINIT Succeeded
CID....30967419  PORT...7723      CPUA...04
OS01      TELNET      70010056  15:37:42.392132  SKCLOSE Issued
CID....30967419  PORT...7723      CPUA...03
```

CTRACE COMP(SYSTCPIP) SUB((TCP3270A)) OPT((CID(X'3095844A')) FULL

```
OS01      TELNET      70010079  15:36:55.546687  ÜDebug Conn
HASID..0210      PASID..0210      SASID..0210      USER...
TCB....00000000  MODID..EZBTZDBG  REG14..2D7E74A2  DUCB...A5000019
CID....3095844A  PORT...7723      CPUA...00
IPADDR. 10.6.10.48
  ADDR...00000000  00000000_7CB6BD20  LEN....000008  CVB Token
    +0000  01015DA7  A2000000      ! ..)xs...      !
  ADDR...00000000  00000000_7F52A089  LEN....000008  Module in error
    +0000  C5E9C2E3  E3D9C3E5      ! EZBTTRCV      !
  ADDR...00000000  00000000_7F529C76  LEN....000002  Error Code
    +0000  1001      ! ..      !
  ADDR...00000000  00000000_7F52A0D4  LEN....000030  Error Description
    +0000  C3938985  95A34084  89A28396  95958583  ! Client disconnec !
    +0010  A3858440  86999694  40A38885  40839695  ! ted from the con !
    +0020  958583A3  8996954B  40404040  40404040  ! nection.      !
OS01      TELNET      70010028  15:36:55.546690  Queue & Post to ConnMgr
OS01      TELNET      70010056  15:36:55.547749  SKCLOSE Issued
```

Client decided to disconnect – why?

CTRACE COMP(SYSTCPIP) SUB((TCP3270A)) OPT((CID(X'3095844A')) FULL



```
OS01      TELNET      70010014  15:36:55.486455  Send Data to Client
+0000  FFFA2802  060506FF  F0                      ! .....0          !
OS01      TELNET      70010083  15:36:55.486473  ÜTelnet Debug Flow
ADDR...00000000  00000000_7F558029  LEN...000008  Module in error
+0000  C5E9C2E3  D7C5D3E4                      ! EZBTPELU          !
ADDR...00000000  00000000_7F557C5E  LEN...000002  Error Code
+0000  3003                      ! ..                !
OS01      TELNET      70010079  15:36:55.546687  ÜDebug Conn
ADDR...00000000  00000000_7F52A089  LEN...000008  Module in error
ADDR...00000000  00000000_7F529C76  LEN...000002  Error Code
+0000  1001                      ! ..                !
ADDR...00000000  00000000_7F52A0D4  LEN...000030  Error Description
+0000  C3938985  95A34084  89A28396  95958583  ! Client disconnect !
+0010  A3858440  86999694  40A38885  40839695  ! ted from the con !
OS01      TELNET      70010056  15:36:55.547749  SKCLOSE Issued
```

Following a single TCP connection using the CID
Error 3003 - described in EZZ6034I – translates to All LUS in use



CTRACE COMP(SYSTCPIP) SUB((TCP3270A)) OPT((CID(X'3095844A')) FULL

```
OS01      TELNET      70010014  15:36:55.386051  Send Data to Client
+0000      FFFD28                                ! ... !
OS01      TELNET      70010013  15:36:55.436392  Receive Data from Client
+0000      FFFB28                                ! ... !
OS01      TELNET      70010014  15:36:55.436397  Send Data to Client
+0000      FFFA2808  02FFF0                        ! .....0 !
OS01      TELNET      70010013  15:36:55.486431  Receive Data from Client
+0000      FFFA2802  0749424D  2D333237  382D322D  45FFF0
OS01      TELNET      70010079  15:36:55.486452  ÜDebug Conn
+0000      C5E9C2E3  D7C7D3E4                        ! EZBTPGLU !
ADDR...00000000  00000000_7F558326  LEN...000002  Error Code
+0000      3003                                ! .. !
ADDR...00000000  00000000_7F55876C  LEN...000030  Error Description
+0000      D3E4A240  81998540  81939340  899540A4  ! LUs are all in u !
+0010      A2854B40  40404040  40404040  40404040  ! se. !
OS01      TELNET      70010014  15:36:55.486455  Send Data to Client
+0000      FFFA2802  060506FF  F0                        ! .....0 !
```

TN3270 negotiation fails causing the client to disconnect

What is PCOMM doing ?

Filter:	telnet or tcp[13]&7	▼	Expression...	Clear	Apply	
No.	Time	sPort	dPort	Suboption	Reason	Info
1	0.000000000	49268	23			49268→23 [SYN]
2	0.000621000	23	49268			23→49268 [SYN]
4	0.001895000	23	49268			Telnet Data ..
5	0.057331000	49268	23			Telnet Data ..
7	0.008797000	23	49268	SEND,DEVICE-TYPE		Telnet Data ..
8	0.053175000	49268	23	DEVICE-TYPE,REQUEST		Telnet Data ..
10	0.000773000	23	49268	DEVICE-TYPE,REJECT,REASON	UNKNOWN-ERROR	Telnet Data ..
11	0.064266000	49268	23			49268→23 [FIN]
13	0.000952000	23	49268			23→49268 [FIN]
15	2.012657000	49269	23			49269→23 [SYN]
16	0.000720000	23	49269			23→49269 [SYN]
18	0.001605000	23	49269			Telnet Data ..
19	0.052764000	49269	23			Telnet Data ..
21	0.001294000	23	49269	SEND,DEVICE-TYPE		Telnet Data ..
22	0.055472000	49269	23	DEVICE-TYPE,REQUEST		Telnet Data ..
24	0.001214000	23	49269	DEVICE-TYPE,REJECT,REASON	UNKNOWN-ERROR	Telnet Data ..
25	0.061048000	49269	23			49269→23 [FIN]
27	0.000922000	23	49269			23→49269 [FIN]
29	2.010730000	49270	23			49270→23 [SYN]
30	0.000882000	23	49270			23→49270 [SYN]
32	0.001911000	23	49270			Telnet Data ..
33	0.053568000	49270	23			Telnet Data ..
35	0.001186000	23	49270	SEND,DEVICE-TYPE		Telnet Data ..

<

III

▼ Telnet

0000

00 16 3e 0f ee 5c 52 54 00 ea 74 b3 08 00 45 00

..>..\RT ..t...E.

0010

00 31 a2 80 40 00 3e 06 0f 8b 0a 03 46 03 c0 a8

.1..@.>.F...

0020

7a 0d 00 17 c0 74 83 36 78 21 18 cc 37 eb 50 18

z....t.6 x!..7.P.

0030

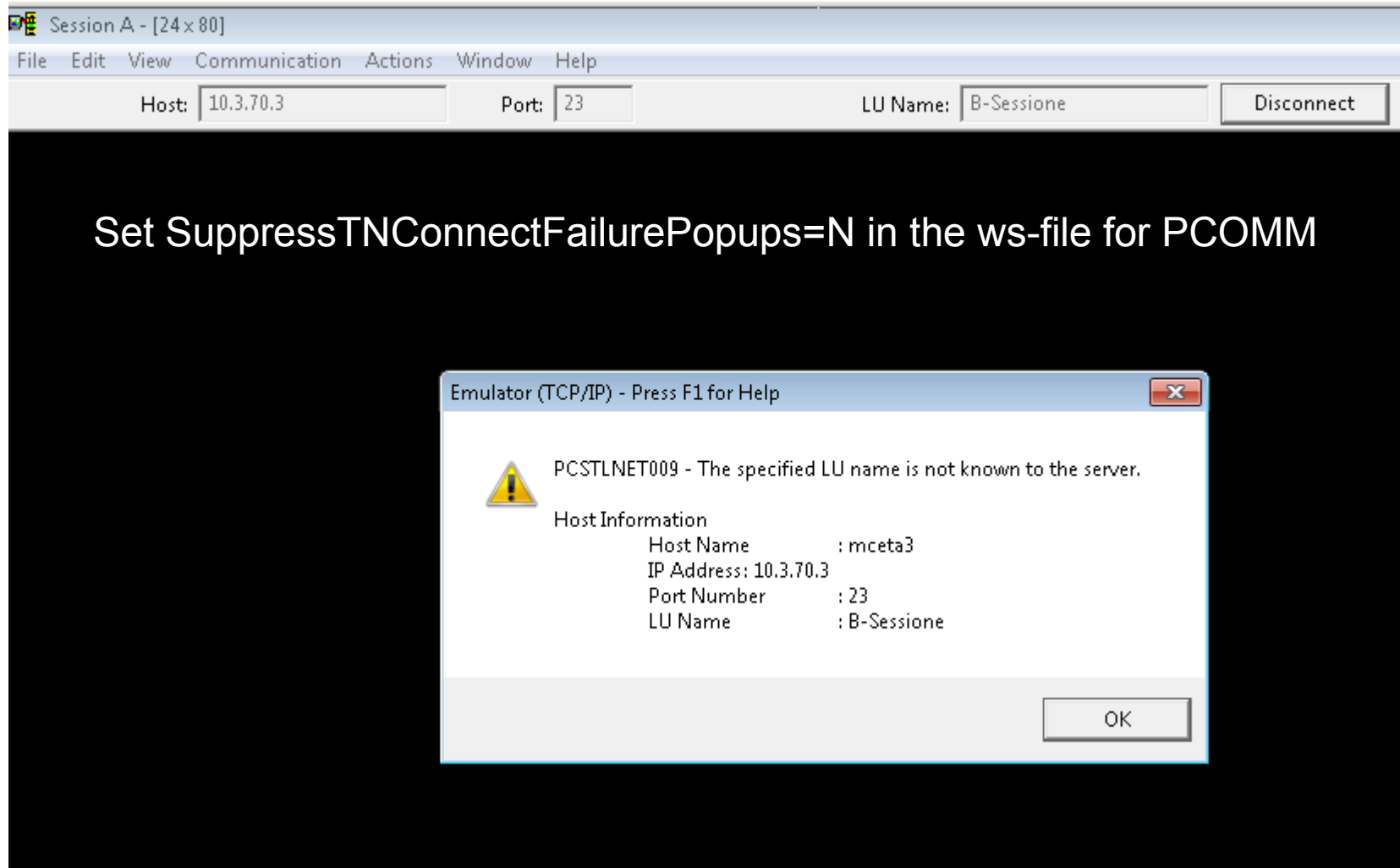
0f ff e3 6b 00 00 ff fa 28 02 06 05 06 ff f0

...k... (.....

PCOMM stubbornly reconnects causing the same scenario 24hX7

Complete your session evaluations online at www.SHARE.org/Seattle-Eval

What was PCOMM doing in Pcomm V5.9 ?



Pre PCOMM V6.0 the user was presented a popup, informing about the TN3270 Negotiation problem. This has changed in PCOMM V6 !

CTRACE TELNET: Filter on IP address

Using the FULL option you get every packet's details

Telnet Negotiation

```
FFFD27 DO      NewEnv (ELF)
FFFD2E DO      TLS
FFFC2E WONT    TLS
FFFD28 DO      TN327OE
FFFB28 WILL    TN327OE
FFFA28 SB      TN327OE
                00 Associate
                01 Connect
                02 Dev-Type
                03 Functions
                04 Is
                05 Reason
                06 Reject
                07 Request
                08 Send
```

Keepalive Probes

```
FFFB06 WILL    TIMEMARK
FFFC06 WONT    TIMEMARK
FFFD06 DO      TIMEMARK
```

Telnet Reject Reason Codes

RFC2355

CONN-PARTNER	00
DEVICE-IN-USE	01
INV-ASSOCIATE	02
INV-NAME	03
INV-DEVICE-TYPE	04
TYPE-NAME-ERROR	05
UNKNOWN-ERROR	06
UNSUPPORTED-REQ	07