

Understanding CIP TN3270 Tracing

Document ID: 12325

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Related Information

Introduction

This document describes CIP TN3270 tracing.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

CIP TN3270 Tracing with If-Console Commands

Assume CIP card is in slot 1 position on the router. Enter the CIP console using the following global command:

```
Router#if-con 1 c
```

```
Entering CONSOLE for CIP 1
```

Type **quit** to end this session.

The CIP console command **trace70** is used to trace both upstream SNA and downstream TCP sessions in CIP TN3270 environment. Trace70 is used in CIP microcode Version 22-x; the equivalent in CIP microcode Version 24-x and higher is **tn3270 trace / capture**.

For CIP microcode 22-xx:

```
CIP-Slot1#trace70
usage: trace70 <"ON" | "OFF">

      = "LU" | "PU" | "DLUR" | "TNETCP" | "TNETSESS" | "TN3270" | "ALL"

      = "FSM" | "PACKET" | "ERROR" | "CONTROL" | "ALL"

CIP-Slot1#trace70 on all all
```

To stop the capture:

```
CIP-Slot1#capture70 reset
```

For CIP/CPA microcode 24-xx and later:

```
CIP-Slot1#tn3270 capture
Incorrect usage of "tn3270 capture".

tn3270 capture          - Turns display filter of Tn3270-server for lu or ip
                        Usage: tn3270 capture <RESET> | <WHAT> | <IP A.B.C.D [mask]>
                               | <PU pu-name> | <LU <lu>>
                        <RESET> = stop capturing
                        <WHAT>  = query which LUs are being captured
                        <lu>    = <pu-name.locaddr | lu-name>
                        locaddr = LU locaddr 1..255

CIP-Slot1#tn3270 capture ip 172.17.240.41
<---This would trace the session with the tn3270 client with IP address is 172.17.240.41
```

To stop the capture:

```
CIP-Slot1#tn3270 capture reset

CIP-Slot1#tn3270 trace
Incorrect usage of "tn3270 trace".

tn3270 trace          - Turns display of Tn3270-server logging ON/OFF for a certain CATEG
                        of a specific COMPONENT.

                        Usage: tn3270 trace <"ON" | "OFF"> <component> <what>
                               <component> = "LU" | "PU" | "DLUR" | "LINK" | "TNETCP" | "TNETSESS"
                                               | "TN3270" | "ALL"
                               <what>      = "FSM" | "PACKET" | "ERROR" | "CONTROL" | "ALL"

CIP-Slot1#tn3270 trace on all all
```

To stop the capture:

```
CIP-Slot1#tn3270 trace off all all
```

Sample Trace Output

Direct PU Configured

```
cappuccino(config-if)#tn
cappuccino(cfg-tn3270)#pu cappu1 05d18101 10.14.20.11 tok 1 20
cappuccino(tn3270-pu)#exit
cappuccino(cfg-tn3270)#

%CIP2: [pu external state trans]4[puIndex]14:[puNameLclAdmin]CAPPU1
%CIP2: ----:[puSnmpState]3:
%CIP2: [tnet ext state transition]25[ipAddrLcl]10.14.20.11:[tcpPort
%CIP2: ----Lcl]0x17:[listenPointStateExtern]2:
%CIP2: PU 14: fsm ([reset],func_create_pu_sess)-->[inactive]
%CIP2: TN3270S: Link CAPPU1 from state 0, event 0, to state 1
%CIP2: TN3270S: Link CAPPU1 from state 1, event 1, to state 3
%CIP2: TN3270S: Link CAPPU1 from state 3, event 2, to state 4
%CIP2: TN3270S: Link CAPPU1 Active, MAXDATA=1033
%CIP2: [pu external state trans]4[puIndex]14:[puNameLclAdmin]CAPPU1
%CIP2: ----:[puSnmpState]2:
%CIP2: PU 14: fsm ([inactive],func_create_pu_sess)-->[inactive]
%CIP2: Out Pu 14: len=21,2D000000 013C6B80 00111201 05000000
                                     == 0x11 ACTPU from VTAM
%CIP2: PU 14: fsm ([inactive],ru_req_actpu)-->[ready]
%CIP2: Out Pu 14: Len=12,2D000100 013D6B80 000D0201
                                     == 0x0d ACTLU from VTAM
                                     == 0x01 1st static LU
%CIP2: Out Lu 14.1: sna-state=0000,lu-flags=00000100
%CIP2: In Pu 14: Len=25,2D000001 013DEB80 000D0201 00000000
%CIP2: [LU entered as specific]16[puIndex]14:[luLocaddr]0x1:[luName
%CIP2: ----Sna]CAPPU101:
%CIP2: LU 14.1: fsm ([Reset],Req_Actlu)-->[Actlud]
%CIP2: Out Pu 14: Len=12,2D000200 013E6B80 000D0201
                                     == 0x02 2nd static LU
                                     Because there're 2 LUs defined in VTAM for this PU
%CIP2: Out Lu 14.2: sna-state=0000,lu-flags=00000100
%CIP2: In Pu 14: Len=25,2D000002 013EEB80 000D0201 00000000
%CIP2: [LU entered as specific]16[puIndex]14:[luLocaddr]0x2:[luName
%CIP2: ----Sna]CAPPU102:
%CIP2: LU 14.2: fsm ([Reset],Req_Actlu)-->[Actlud]
%CIP2: [tnet ext state transition]25[ipAddrLcl]10.14.20.11:[tcpPort
%CIP2: ----Lcl]0x17:[listenPointStateExtern]3:
cappuccino(cfg-tn3270)#
```

Start an LU-LU Session from Reflection Client by Entering IP Address

Static LU

```
IP2: [bad tnet connect]13[ipAddrClient]10.14.10.21:[tcpPortClient
%CIP2: ----]0xD61:[connectReasonCode]0x3:[tn3270eDeviceType]IBM-327
%CIP2: ----8-2-E:[tn3270eDeviceName]CAP01L02:[tn3270eSubErr]not fou
%CIP2: ----n:
%CIP2: Out Tnet 127: Len=3,FFFD28
%CIP2: In Tnet 127: Len=3,FFFB28
%CIP2: Out Tnet 127: Len=7,FFFA2808 02FFF0
%CIP2: In Tnet 127: Len=28,FFFA2802 0749424D 2D333237 382D322D
%CIP2: Out Tnet 127: Len=12,FFFA2802 060503FF F0FFFE28
%CIP2: [tnet session connected]15[puIndex]14:[luLocaddr]0x2:[ipAddr
%CIP2: ----Client]10.14.10.21:[tcpPortClient]0xD62:[ipAddrLcl]10.14
%CIP2: ----.20.11:[tcpPortLcl]0x17:[connectSpecificP]specific:
%CIP2: Out Tnet 127: Len=3,FFFD28
%CIP2: In Tnet 127: Len=3,FFFB28
%CIP2: Out Tnet 127: Len=7,FFFA2808 02FFF0
```

```

%CIP2: In Tnet 127: Len=28,FFFA2802 0749424D 2D333237 382D322D
%CIP2: Out Tnet 127: Len=28,FFFA2802 0449424D 2D333237 382D322D
%CIP2: In Tnet 127: Len=12,FFFA2803 07000102 0304FFF0
%CIP2: Out Tnet 127: Len=12,FFFA2803 04000102 0304FFF0
%CIP2: In Pu 14: Len=20,2C000002 00010B80 00810620 0C060300
          ==          ===== NOTIFY
          We sends NOTIFY to VTAM to notify we're ready
%CIP2: LU 14.2: fsm ([Actlud],Tnet_Conn)-->[Ntfy_Av_Sent]
%CIP2: Out Pu 14: Len=12,2C000200 00018B80 00810620
%CIP2: Out Lu 14.2: sna-state=0101,lu-flags=00040100
%CIP2: LU 14.2: fsm ([Ntfy_Av_Sent],Rsp_Ntfy)-->[Sscp]
%CIP2: Out Pu 14: Len=50,2D000201 013F6B80 00310103 03B19030
          ==          == 0x31 BIND from VTAM
          to establish LULU session between
          VM Primary LU and client 2ndary LU
%CIP2: Out Lu 14.2: sna-state=0101,lu-flags=00040100
%CIP2: In Pu 14: Len=10,2D000102 013FEB80 0031
          == 0xEB 1st bit of it indicated +Rsp
          of BIND from us
%CIP2: [bind parameters]10[luLocaddr]0x2:[snaMaxRuIn]1024:[snaMaxRu
%CIP2: ----Out]1536:[luType]0x2:
%CIP2: LU 14.2: fsm ([Sscp],Req_Bind)-->[Bound]
%CIP2: Out Pu 14: Len=10,2D000201 01406B80 00A0
          == 0xA0 (SDT)Start Data Traffic
          from VTAM
%CIP2: Out Lu 14.2: sna-state=0101,lu-flags=00041100
%CIP2: Out Tnet 127: Len=48,03000000 00310103 03B19030 80000887
%CIP2: In Pu 14: Len=10,2D000102 0140EB80 00A0
          == 0xEB 1st bit of it indicated +Rsp
          of SDT from us
%CIP2: LU 14.2: fsm ([Bound],Req_Sdt)-->[Lulu]
%CIP2: Out Pu 14: Len=1033,28000201 00010291 C0F5C711 40401DE8
%CIP2: Out Lu 14.2: sna-state=0101,lu-flags=00047100
%CIP2: Out Tnet 127: Len=1029,00000100 0005C711 40401DE8 E5D461C5
%CIP2: Out Pu 14: Len=518,24000201 00014040 40404040 40404040
%CIP2: Out Lu 14.2: sna-state=0111,lu-flags=85045100
%CIP2: Out Tnet 127: Len=512,40404040 40404040 40404040 40404040
%CIP2: In Pu 14: Len=9,2D000102 00008301 00
%CIP2: Out Pu 14: Len=141,2C000201 00020180 00404040 40404040
%CIP2: Out Lu 14.2: sna-state=0111,lu-flags=85045100
%CIP2: Out Tnet 127: Len=134,40404040 40404040 40404040 40404040
%CIP2: In Pu 14: Len=9,2C000102 00028380 00
cappuccino(cfg-tn3270)#

```

Dynamic LU Request from Reflection

```

TN3270 Client
%CIP2: [tnet session connected]15[puIndex]14:[luLocaddr]0x3:[ipAddr
%CIP2: ----Client]10.14.10.21:[tcpPortClient]0xD63:[ipAddrLcl]10.14
%CIP2: ----.20.11:[tcpPortLcl]0x17:[connectSpecificP]dynamic:
%CIP2: Out Tnet 125: Len=3,FFFD28
%CIP2: In Tnet 125: Len=3,FFFC28
%CIP2: Out Tnet 125: Len=3,FFFD18
%CIP2: In Tnet 125: Len=3,FFFB18
%CIP2: Out Tnet 125: Len=6,FFFA1801 FFF0
%CIP2: In Tnet 125: Len=18,FFFA1800 49424D2D 33323739 2D322D45
%CIP2: Out Tnet 125: Len=12,FFFD19FF FB19FFFD 00FFFB00
%CIP2: In Tnet 125: Len=12,FFFB19FF FD19FFFB 00FFFD00
%CIP2: [send PSID]8[puIndex]14:[luLocaddr]0x3:
%CIP2: In Pu 14: Len=101,2C000000 000D0B82 0041038D 00000000
          ===== NMVT req from us
%CIP2: PU 14: fsm ([ready],func_rts)-->[wait]
0%CIP2: LU 14.3: fsm ([Reset],Tnet_Conn)-->[Psid_Sent]
%CIP2: Out Pu 14: Len=12,2C000000 000D8B82 0041038D
%CIP2: LU 14.3: fsm ([Psid_Sent],Rsp_Psid_Pos)-->[Actlu_Wt]
%CIP2: PU 14: fsm ([wait],ru_rsp_sscpu)-->[ready]

```

```

%CIP2: Out Pu 14: Len=12,2D000300 01406B80 000D0201
                               ==                   == 0xD0 ACTLU from VTAM
                               Notice 0x03 above is *dynamically* created
                               on VTAM. Also 0x00 right next to 0x03 indicates
                               that this' on SSCP-LU session.
%CIP2: Out Lu 14.3: sna-state=0000,lu-flags=00000000
%CIP2: In Pu 14: Len=25,2D000003 0140EB80 000D0201 00000000
%CIP2: LU 14.3: fsm ([Actlu_Wt],Req_Actlu)-->[Sscp]
%CIP2: Out Pu 14: Len=50,2D000301 01416B80 00310103 03B19030
                               ==                   == 0x31 BIND from VTAM
                               Notice 0x01 above indicates this BIND
                               came from Primary LU, in this case is VM
%CIP2: Out Lu 14.3: sna-state=0101,lu-flags=00000000
%CIP2: In Pu 14: Len=10,2D000103 0141EB80 0031
%CIP2: [bind parameters]10[luLocaddr]0x3:[snaMaxRuIn]1024:[snaMaxRu
%CIP2: ----Out]1536:[luType]0x2:
%CIP2: LU 14.3: fsm ([Sscp],Req_Bind)-->[Bound]
%CIP2: Out Pu 14: Len=10,2D000301 01426B80 00A0
                               == 0xA0 SDT again from VTAM
%CIP2: Out Lu 14.3: sna-state=0101,lu-flags=00001000
%CIP2: In Pu 14: Len=10,2D000103 0142EB80 00A0
%CIP2: LU 14.3: fsm ([Bound],Req_Sdt)-->[Lulu]
%CIP2: Out Pu 14: Len=1033,28000301 00010291 C0F5C711 40401DE8
%CIP2: Out Lu 14.3: sna-state=0101,lu-flags=00007000
%CIP2: Out Tnet 125: Len=1024,05C71140 401DE8E5 D461C5E2 C140D6D5
%CIP2: Out Pu 14: Len=518,24000301 00014040 40404040 40404040
%CIP2: Out Lu 14.3: sna-state=0111,lu-flags=85005000
%CIP2: Out Tnet 125: Len=512,40404040 40404040 40404040 40404040
%CIP2: In Pu 14: Len=9,2D000103 00008301 00
%CIP2: Out Pu 14: Len=141,2C000301 00020181 00404040 40404040
%CIP2: Out Lu 14.3: sna-state=0111,lu-flags=85005000
%CIP2: Out Tnet 125: Len=134,40404040 40404040 40404040 40404040
%CIP2: In Pu 14: Len=9,2C000103 00028381 00

```

User Enters USERID/PASSWORD on Reflection Screen to Log on to VM

```

%CIP2: In Tnet 125: Len=23,7DD9D611 D840A4A2 8599F1F0 11D950A4
%CIP2: Out Lu 14.3: sna-state=0101,lu-flags=0B005000
%CIP2: In Pu 14: Len=30,2C000103 00010392 A07DD9D6 11D840A4
           ++++++++ +++++*****~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:
           where 6 bytes of ++++ is TH,
           3 bytes of **** is RH,
           The rest of ~~~ is RU which is 3270 data
           to paint screen.
           At this point, RU is strictly for 3270 data

           RU=0392A0 is BC, EC (Begin Chain and End Chain)
           DR1, PI (definite Rsp, Pacing)
           BB, CDI (Begin bracket, Change Direction)

           Change Direction meaning it's tn3270S's
           turn to send data back to VTAM

%CIP2: Out Pu 14: Len=60,2C000301 00030381 40F5C311 5B5F1DC1
%CIP2: Out Lu 14.3: sna-state=0109,lu-flags=0B005000
%CIP2: Out Tnet 125: Len=53,05C3115B 5F1DC113 115D6B1D 60D9E4D5
%CIP2: In Pu 14: Len=9,2C000103 00038381 40
%CIP2: Out Pu 14: Len=148,2C000301 00040381 C0F1C311 5B5F1DC1
%CIP2: Out Lu 14.3: sna-state=0101,lu-flags=0F005000
%CIP2: Out Tnet 125: Len=141,01C3115B 5F1DC111 5D6B1D60 D9E4D5D5
%CIP2: In Pu 14: Len=9,2C000103 00048381 C0
%CIP2: Out Pu 14: Len=76,2C000301 00050381 C0F1C311 5B5F1DC1
%CIP2: Out Lu 14.3: sna-state=0101,lu-flags=8F005000
%CIP2: Out Tnet 125: Len=69,01C3115B 5F1DC111 5D6B1D60 D9E4D5D5
%CIP2: In Pu 14: Len=9,2C000103 00058381 C0

```

```

%CIP2: Out Pu 14: Len=212,2C000301 00060381 C0F1C311 5B5F1DC1
%CIP2: Out Lu 14.3: sna-state=0101,lu-flags=8F005000
%CIP2: Out Tnet 125: Len=205,01C3115B 5F1DC111 5D6B1D60 D9E4D5D5
%CIP2: In Pu 14: Len=9,2C000103 00068381 C0
cappuccino(cfg-tn3270)#

```

User Clicks on DISCONNECT on Reflection (Dynamic one) to Disconnect the Dynamic LULU Session

```

%CIP2: [bad request data or type]17[puIndex]14:[luLocaddr]0x3:[ruDu
%CIP2: ----mp] Len=12,2C000003 00018790 00083100 :
%CIP2: In Pu 14: Len=15,2D000103 00026B80 0032FE08 310000
                                     == 0x32 UNBIND from us to VTAM to
                                     tear down LULU session
%CIP2: LU 14.3: fsm ([Lulu],Tnet_Disc)-->[Unbind_Sent]
%CIP2: Out Pu 14: Len=10,2D000301 0002EB80 0032
%CIP2: Out Lu 14.3: sna-state=0101,lu-flags=8F001000
%CIP2: In Pu 14: Len=20,2C000003 00030B80 00810620 0C060000
                                     ===== NOTIFY from us again
%CIP2: LU 14.3: fsm ([Unbind_Sent],Rsp_Unbind)-->[Ntfy_Ua_Sent]
%CIP2: Out Pu 14: Len=1033,28000300 00010380 00C3C9E2 C3D640E2
%CIP2: Out Lu 14.3: sna-state=0100,lu-flags=8F003000
%CIP2: In Pu 14: Len=13,2C000003 00018790 00083100 00
%CIP2: Out Pu 14: Len=480,24000300 0001E3E3 E3E3E3E3 E34040C5
%CIP2: Out Lu 14.3: sna-state=0100,lu-flags=8F001000
%CIP2: Out Pu 14: Len=12,2C000300 00038B80 00810620
%CIP2: Out Lu 14.3: sna-state=0100,lu-flags=8F001000
%CIP2: LU 14.3: fsm ([Ntfy_Ua_Sent],Rsp_Ntfy)-->[Actlud]

```

User Clicks on DISCONNECT on Reflection (Dynamic) to Disconnect the Static LULU Session

```

%CIP2: In Pu 14: Len=15,2D000102 00046B80 0032FE08 310000
                                     == Same thing as above
%CIP2: LU 14.2: fsm ([Lulu],Tnet_Disc)-->[Unbind_Sent]
%CIP2: [bad request data or type]17[puIndex]14:[luLocaddr]0x2:[ruDu
%CIP2: ----mp] Len=12,2C000002 00018790 00083100 :
%CIP2: Out Pu 14: Len=10,2D000201 0004EB80 0032
%CIP2: Out Lu 14.2: sna-state=0101,lu-flags=0A041100
%CIP2: In Pu 14: Len=20,2C000002 00050B80 00810620 0C060000
%CIP2: LU 14.2: fsm ([Unbind_Sent],Rsp_Unbind)-->[Ntfy_Ua_Sent]
%CIP2: Out Pu 14: Len=1033,28000200 00010380 00C3C9E2 C3D640E2
%CIP2: Out Lu 14.2: sna-state=0100,lu-flags=0A043100
%CIP2: In Pu 14: Len=13,2C000002 00018790 00083100 00
%CIP2: Out Pu 14: Len=480,24000200 0001E3E3 E3E3E3E3 E34040C5
%CIP2: Out Lu 14.2: sna-state=0100,lu-flags=0A041100
%CIP2: Out Pu 14: Len=12,2C000200 00058B80 00810620
%CIP2: Out Lu 14.2: sna-state=0100,lu-flags=0A041100
%CIP2: LU 14.2: fsm ([Ntfy_Ua_Sent],Rsp_Ntfy)-->[Actlud]

```

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Updated: Sep 09, 2005

Document ID: 12325
