Innovations in Network Management with NetView for z/OS

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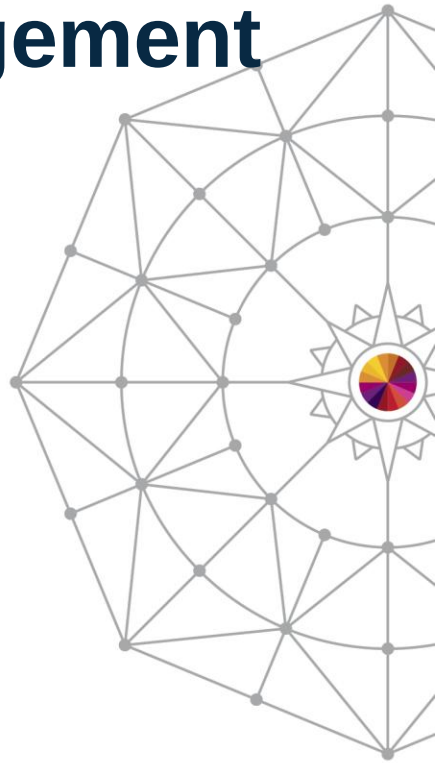
Session 16083



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Abstract

- NetView for z/OS provides TCP/IP management support to address the needs of today's complex networks. This session uses problem-solving scenarios to illustrate the use of some new as well as existing capabilities. One common set of problems requires running and reading an IP packet trace. This session gives an example of the use of packet traces for solving some types of problems. Another common set of problems requires browsing and searching records from multiple logs. The NetView for z/OS consolidated log facility (CANZLOG) combines disparate logs into one.

Agenda

- Packet Trace
- DDVIPA Changes
- Monitoring Sysplex Distributor

Packet Trace with NetView V6.1

- Start / stop a single (“global”) trace
- Display unformatted packets
- View formatted packets and analysis of trace records
- Save traces into NetView data sets
- Control multiple systems from a single point

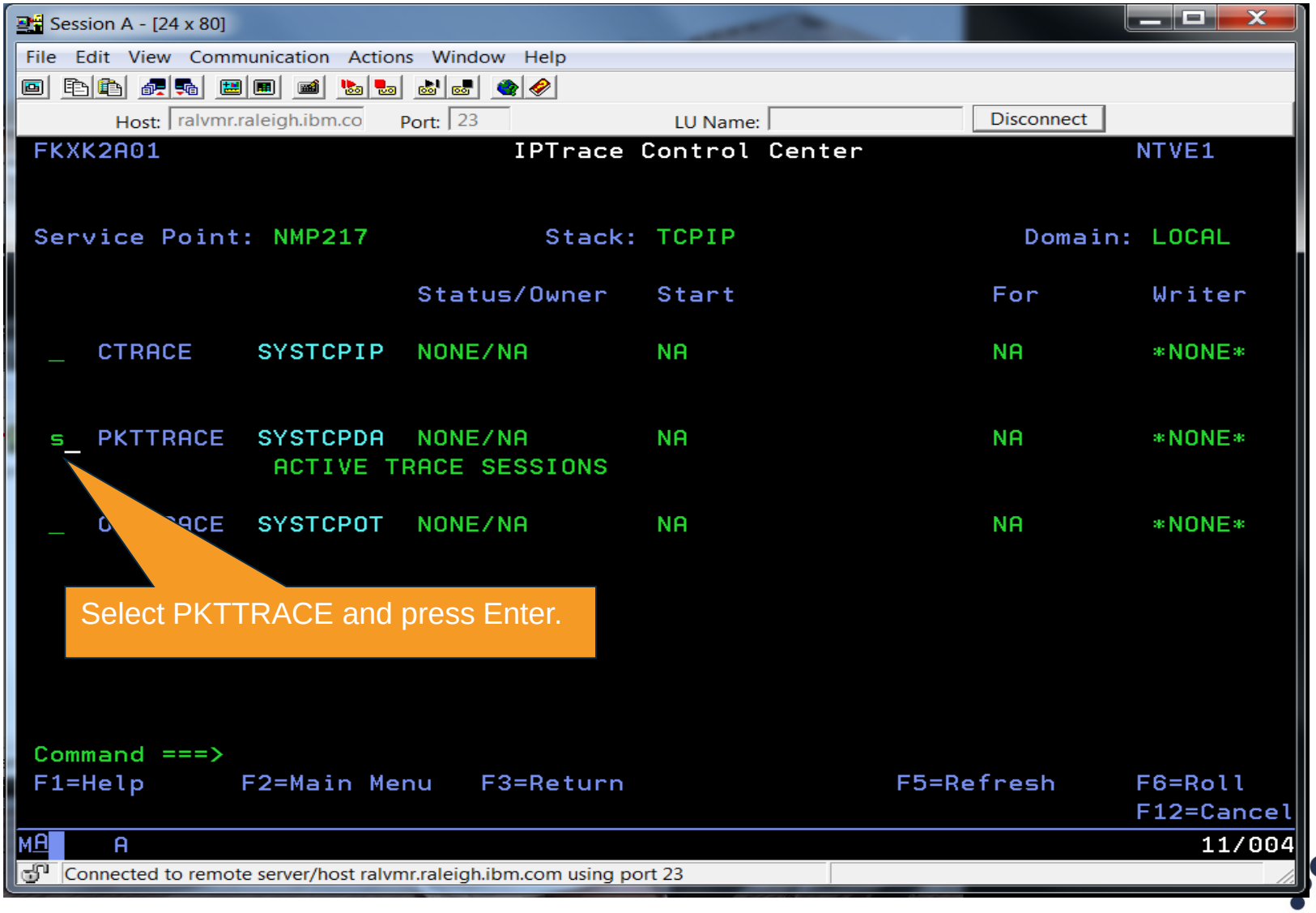
New in NetView for z/OS V6.2

- Support for multiple, concurrent packet traces (“instance” traces)
  - Multiple users can trace multiple problems from a given stack at the same time, each using different trace criteria.
  - Operators can define filters for specific issues
  - Avoids creation of unneeded trace records
  - Requires z/OS Communications Server V2.1
- Save traces in IPCS format
  - Traces can be analyzed in IPCS using the IPCS formatter tool
  - Traces can be converted to Sniffer format for use in other tools
  - Traces from different systems can be merged into a single trace
  - Traces can be sent to Comm Server Support for diagnosis
- Navigation / Filter enhancements

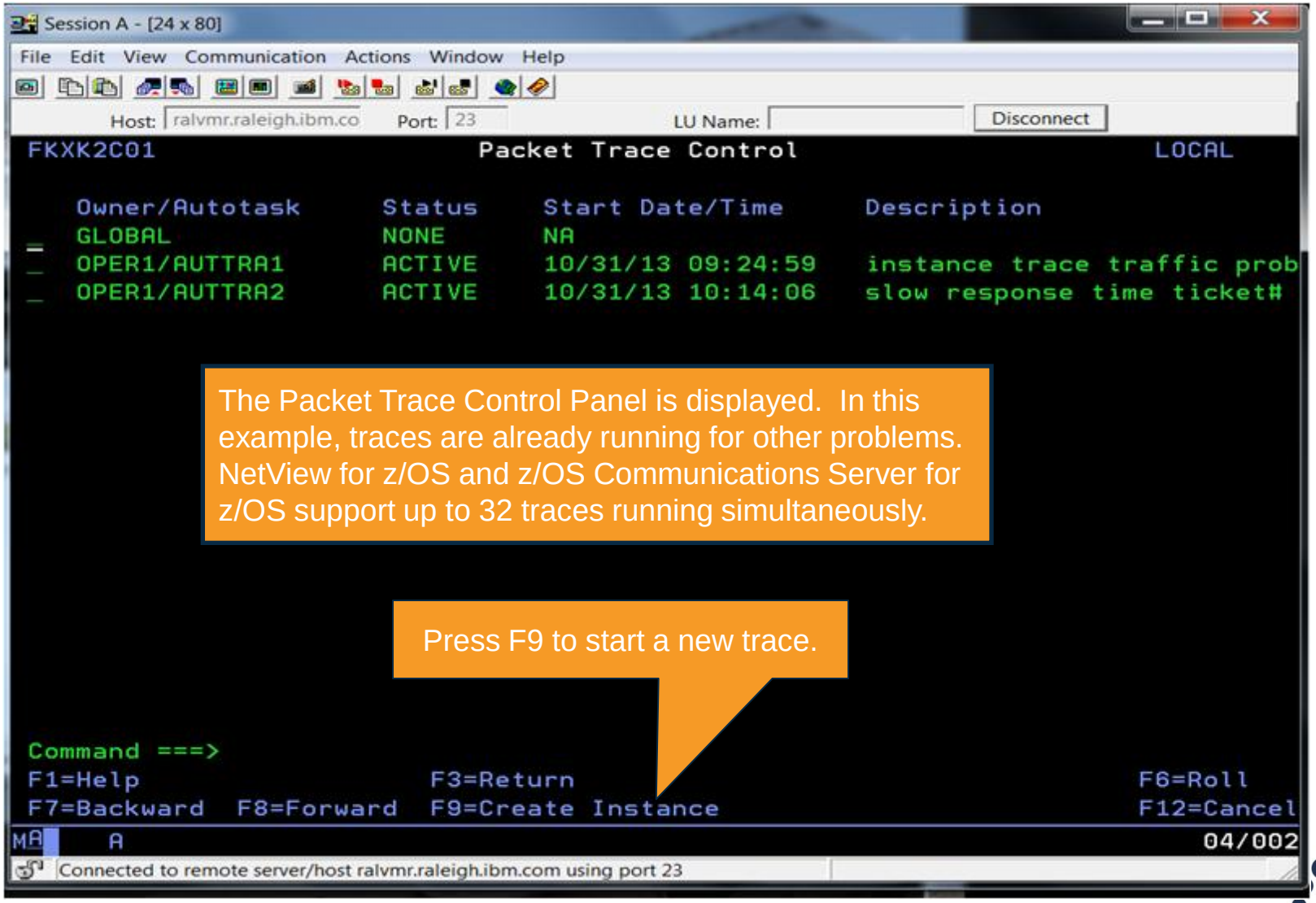
Scenario: Packet Trace Connectivity

- Scenario:
  - Users report an intermittent problem where it takes “a long time” to connect to an application. Occasionally, the connection attempt fails. They have noticed the problem occurs almost every day, at somewhat predictable times.
- Resolution Steps:
  - Use packet trace to help determine if there is a network problem.
  - Tracing the entire network should encompass the problem, but would result in a lot of packets to review.
  - By determining individual users' IP addresses, we can limit the data that has to be reviewed.
  - Multiple traces can help to compare a working connection attempt to a failing one.
  - Further analysis may be desired. The traces are saved in IPCS format, allowing them to be read by IPCS, where they can be merged or analyzed in more depth.

Scenario 1: Packet Trace



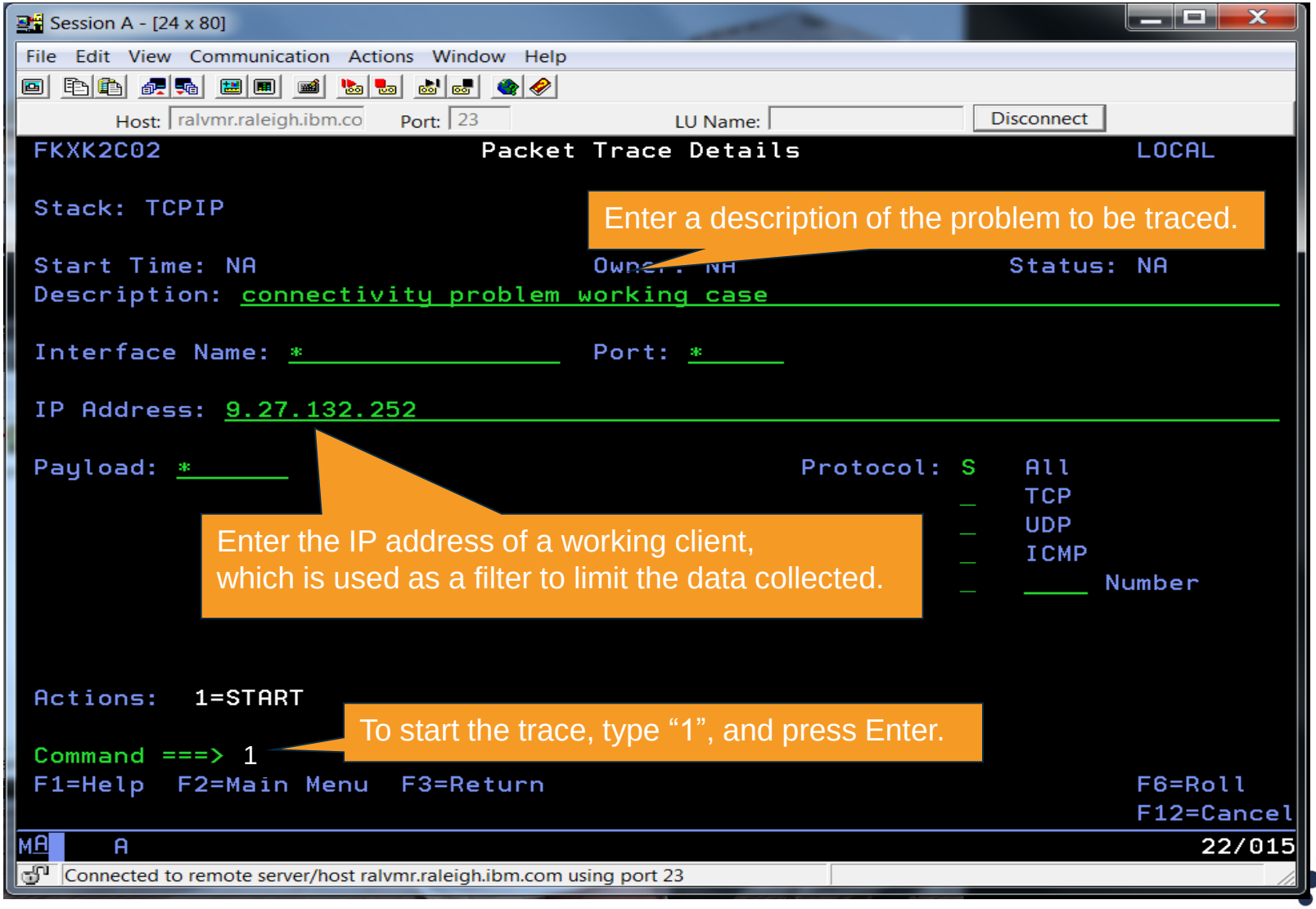
Scenario 1: Packet Trace



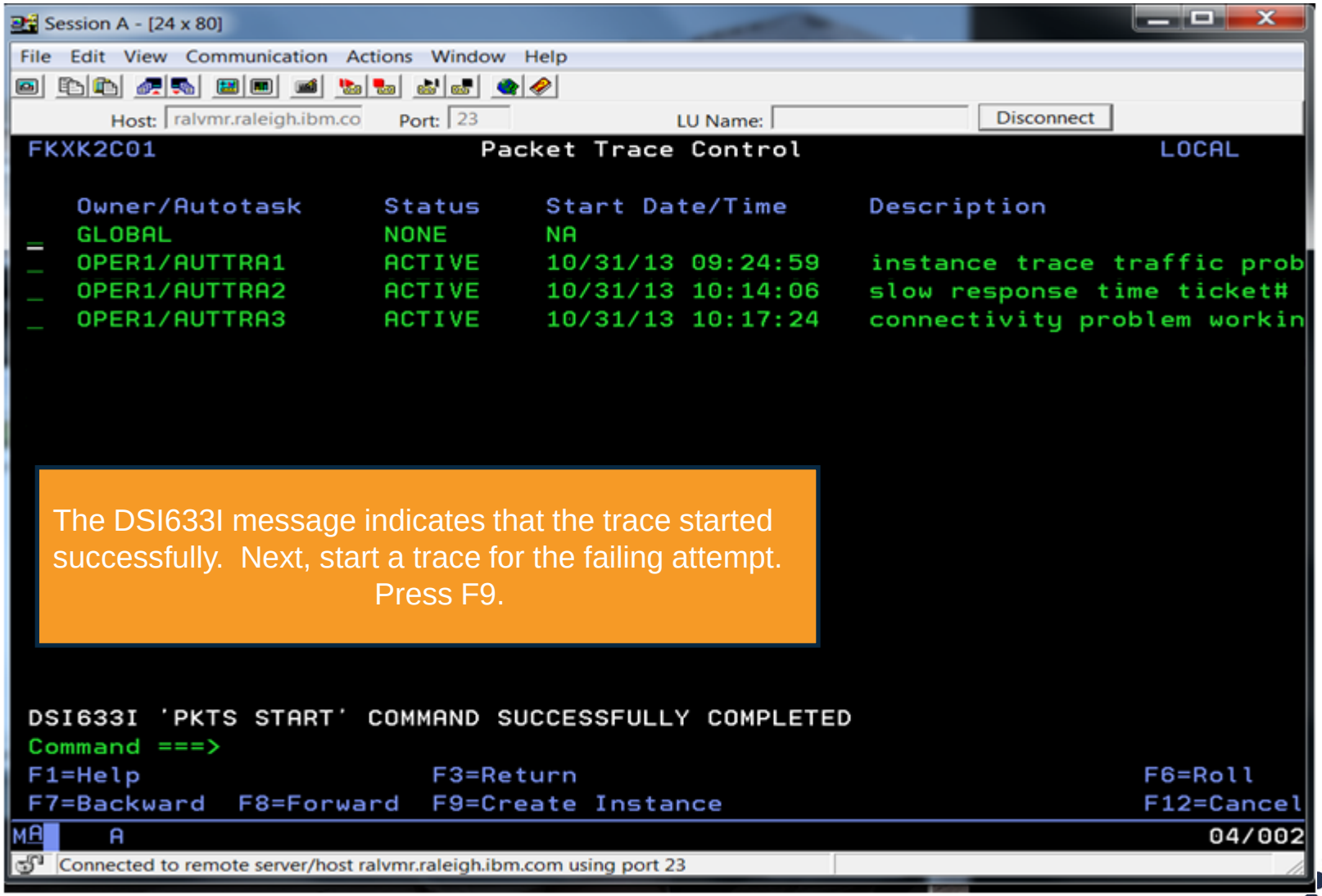
The Packet Trace Control Panel is displayed. In this example, traces are already running for other problems. NetView for z/OS and z/OS Communications Server for z/OS support up to 32 traces running simultaneously.

Press F9 to start a new trace.

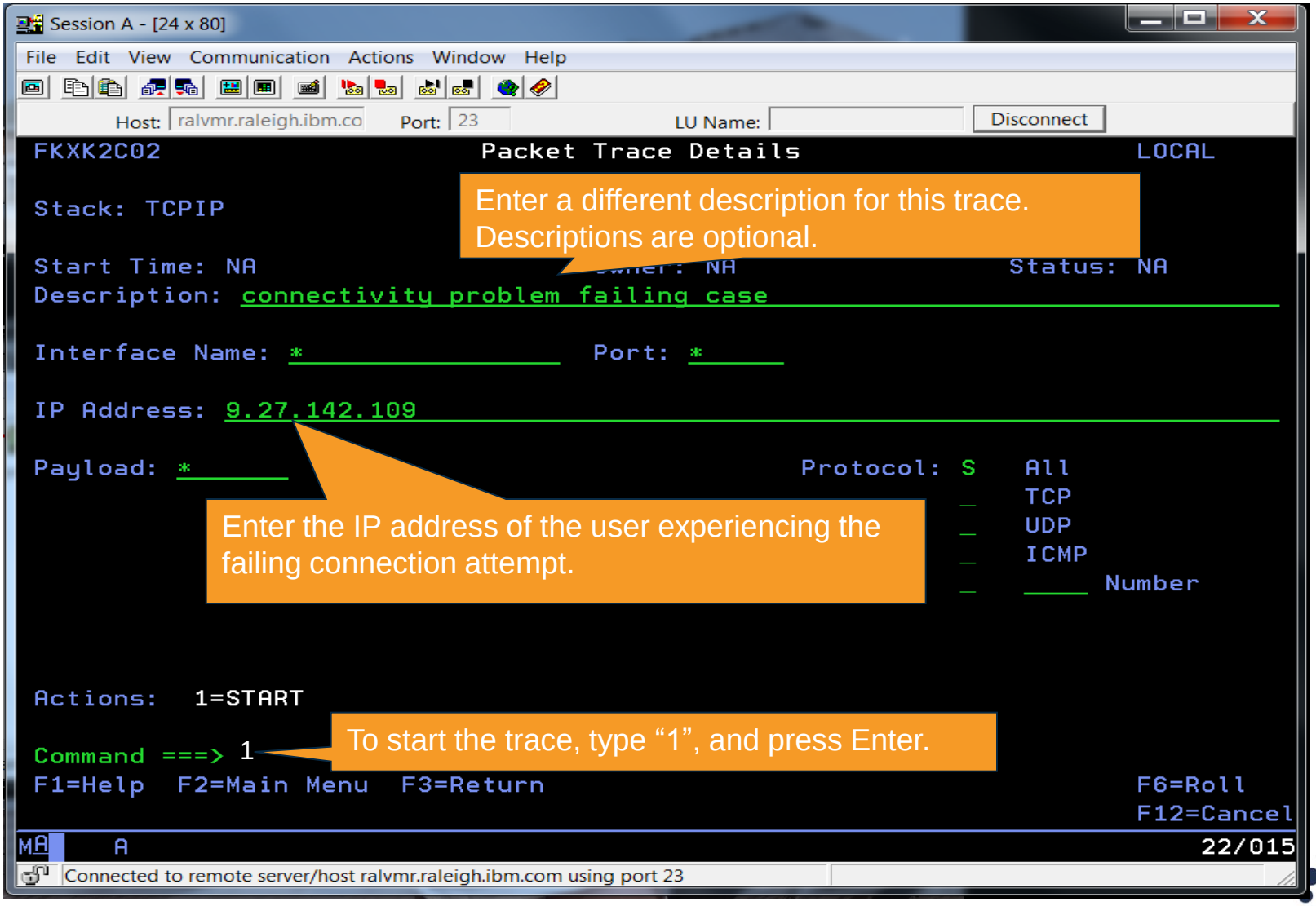
Scenario 1: Packet Trace



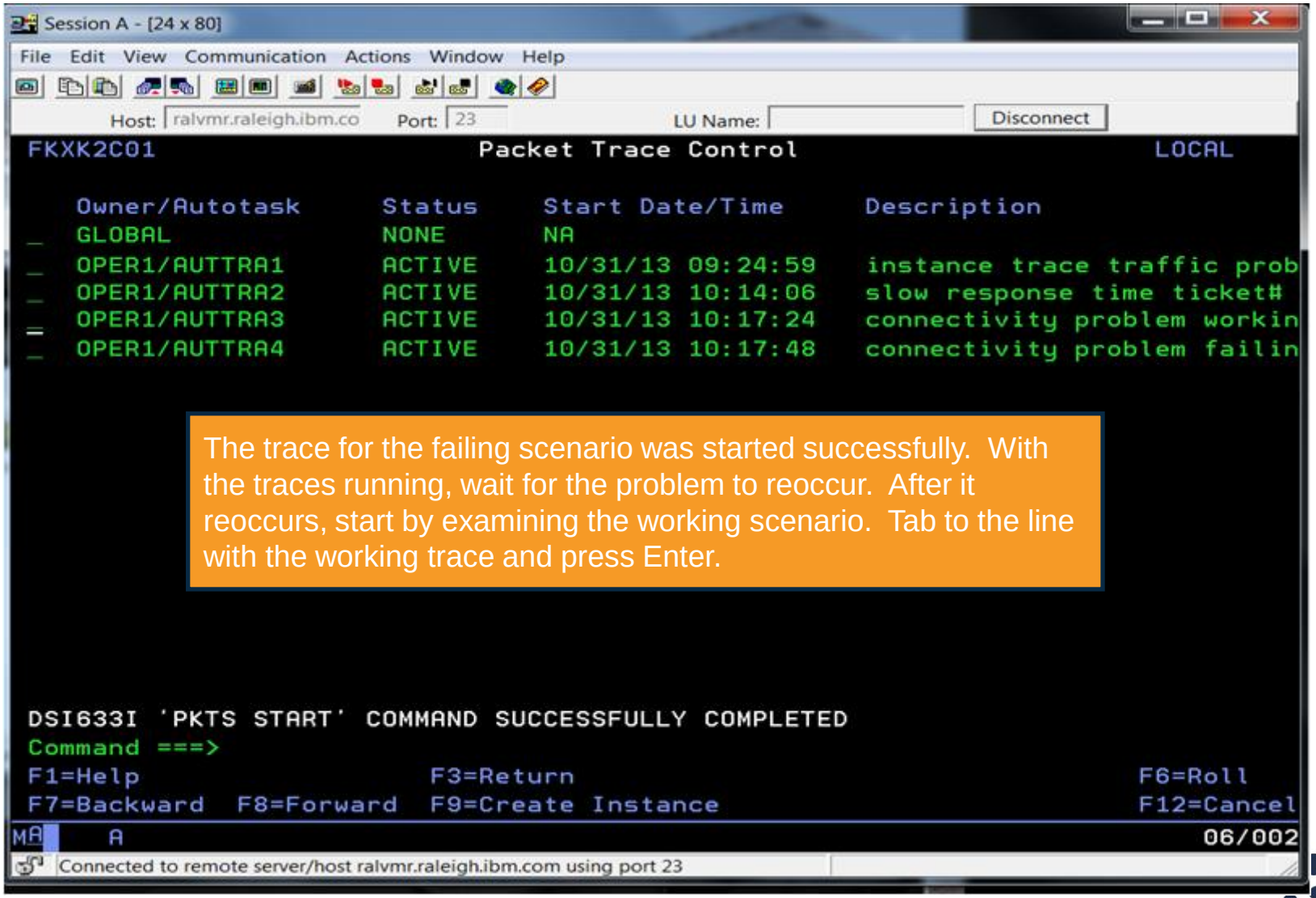
Scenario 1: Packet Trace



Scenario 1: Packet Trace

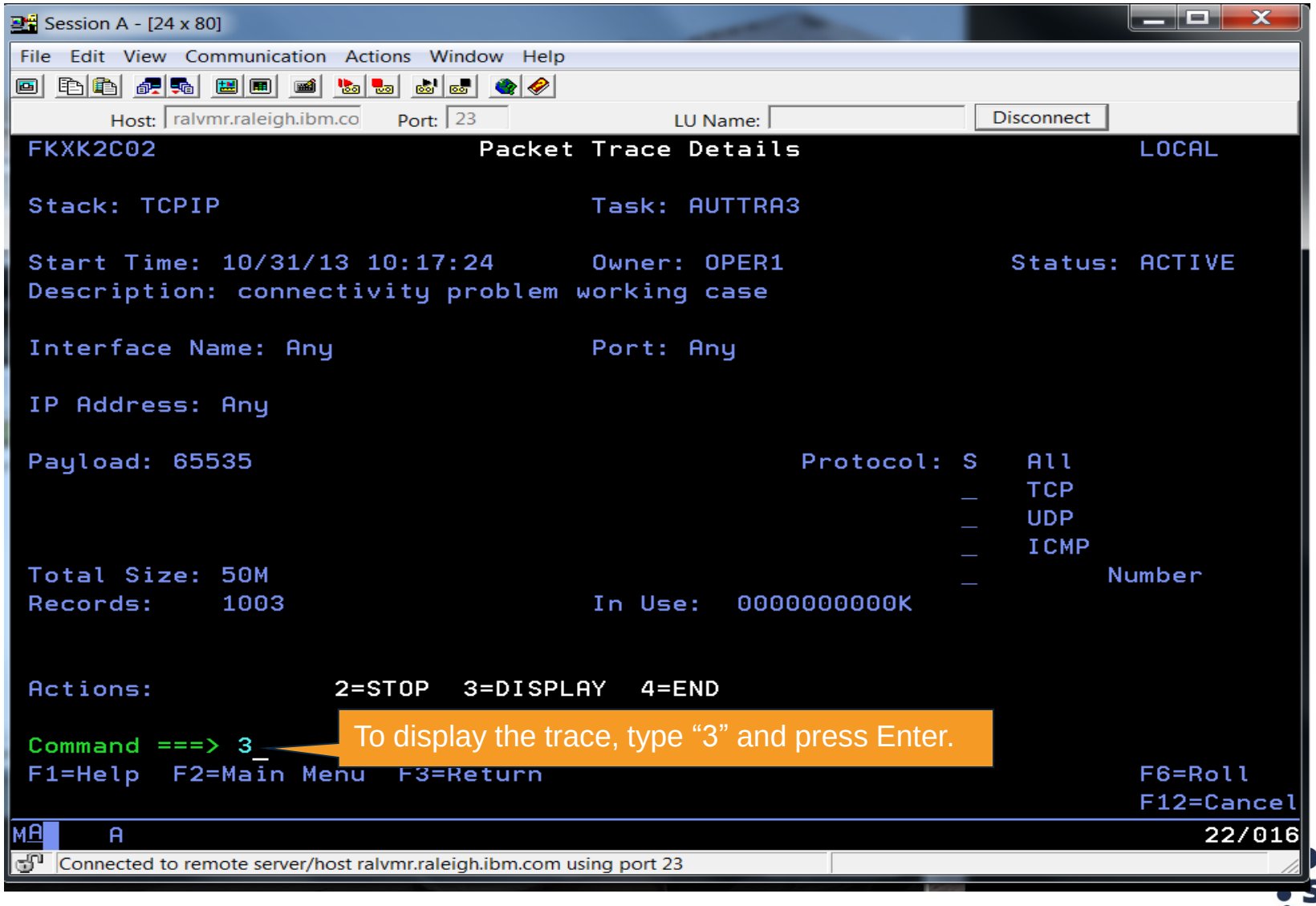


Scenario 1: Packet Trace

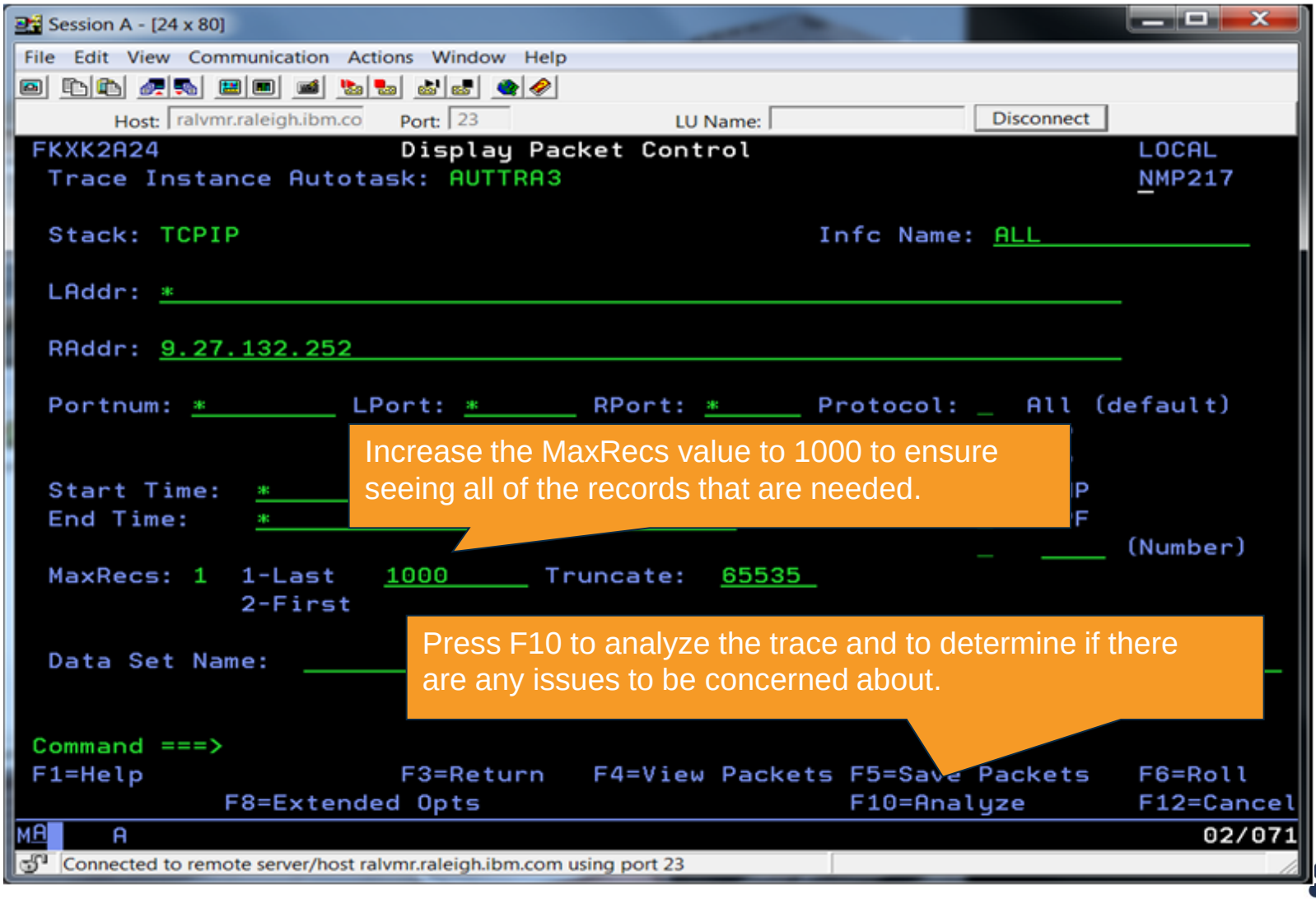


The trace for the failing scenario was started successfully. With the traces running, wait for the problem to reoccur. After it reoccurs, start by examining the working scenario. Tab to the line with the working trace and press Enter.

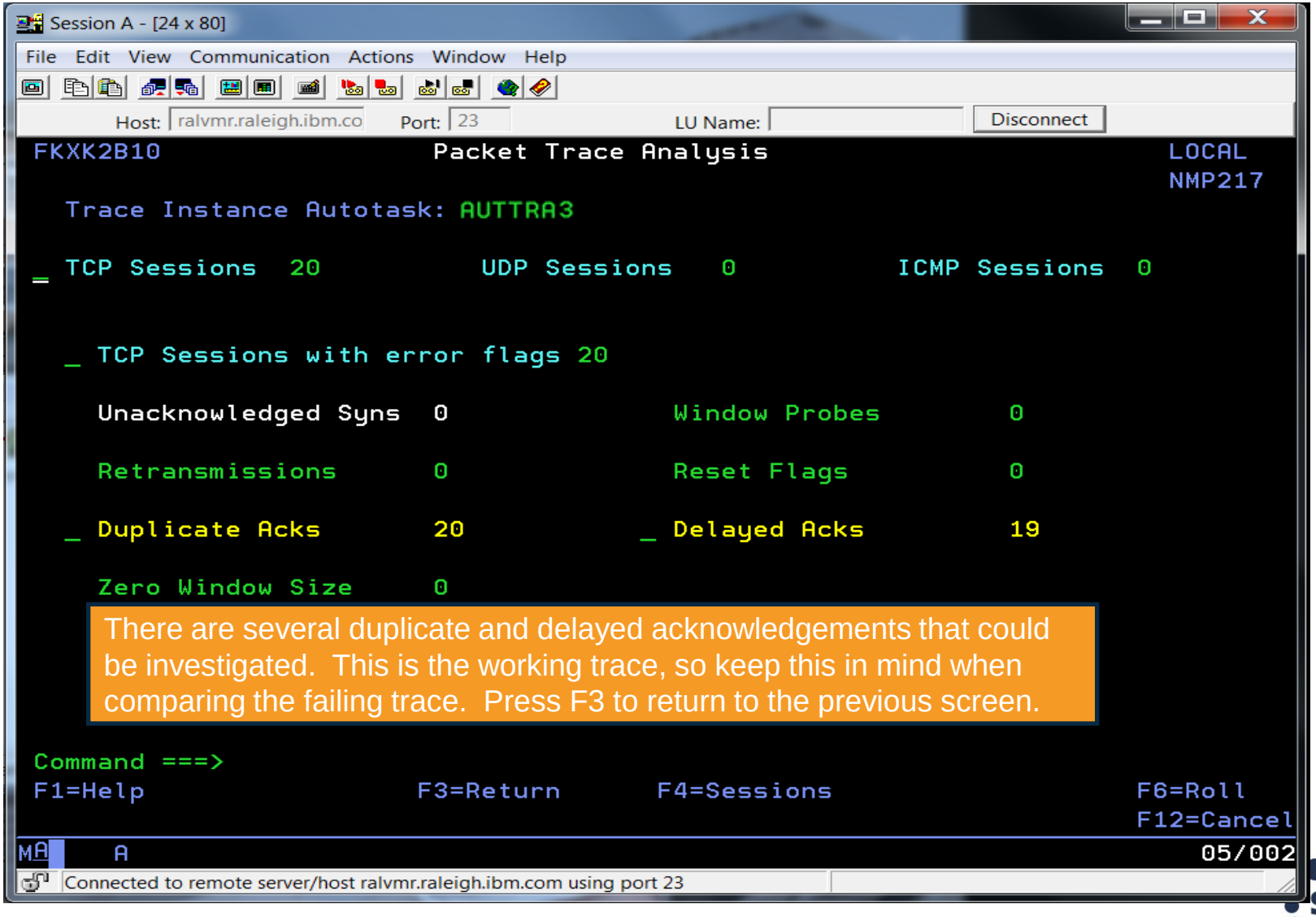
Scenario 1: Packet Trace



Scenario 1: Packet Trace



Scenario 1: Packet Trace



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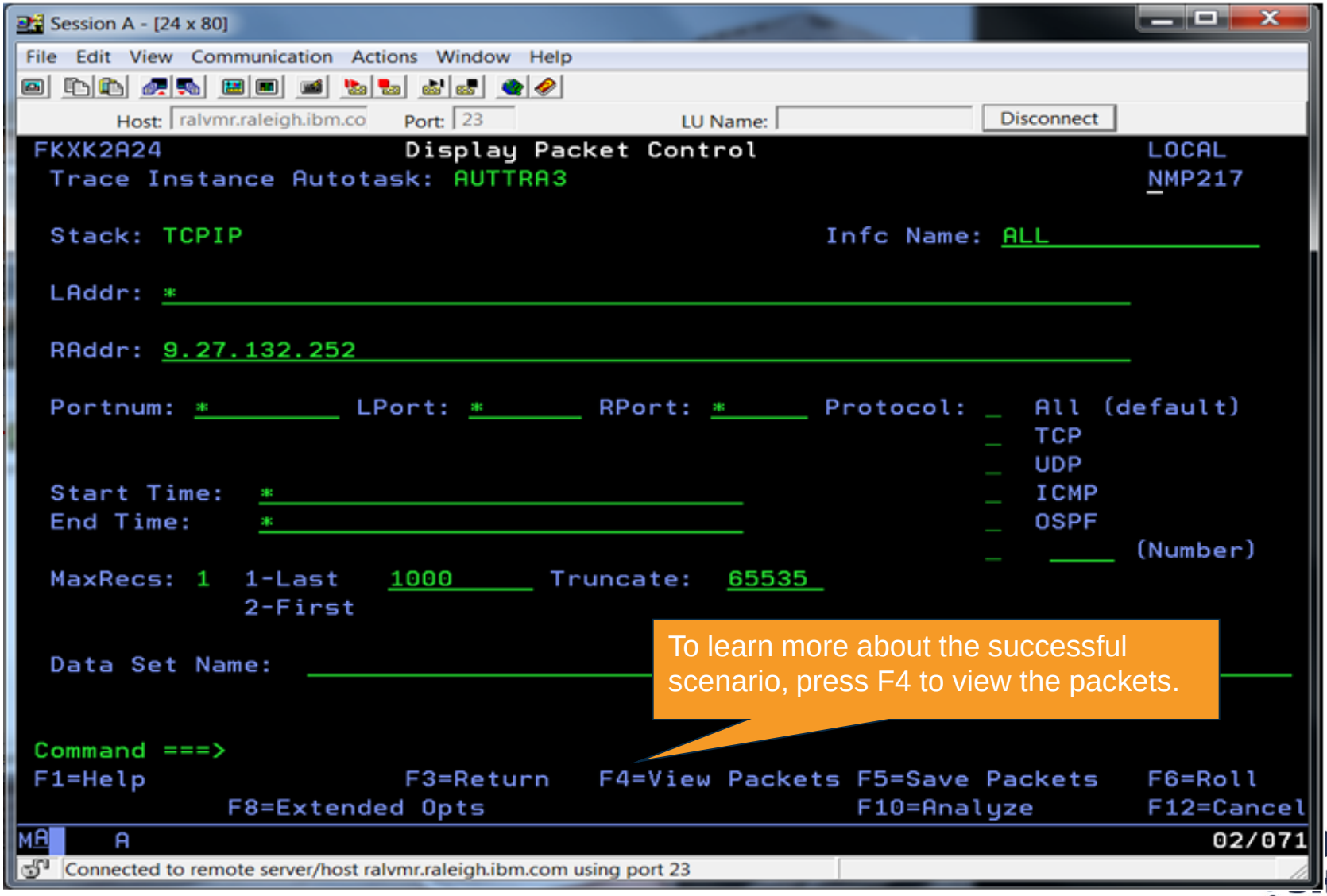
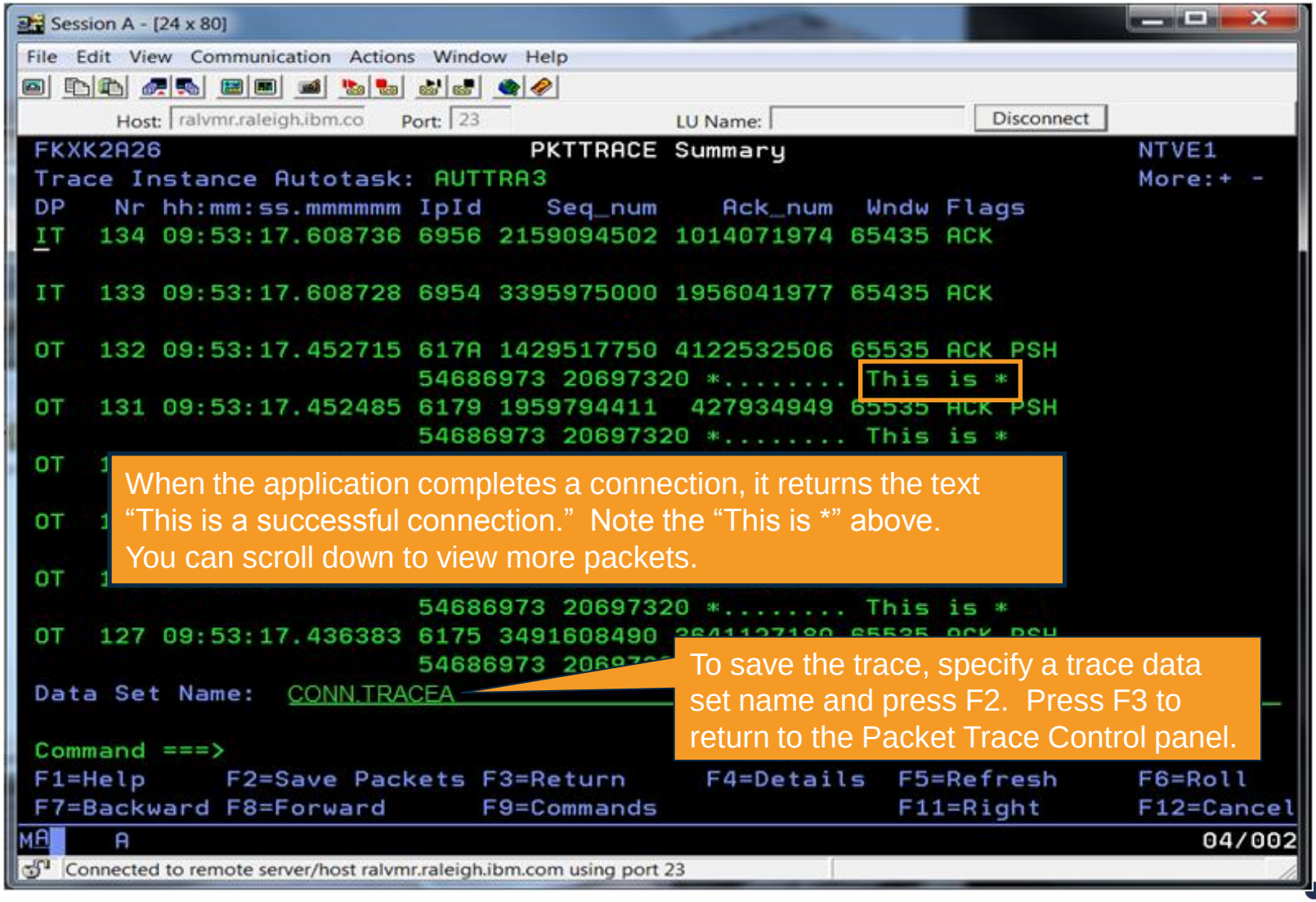


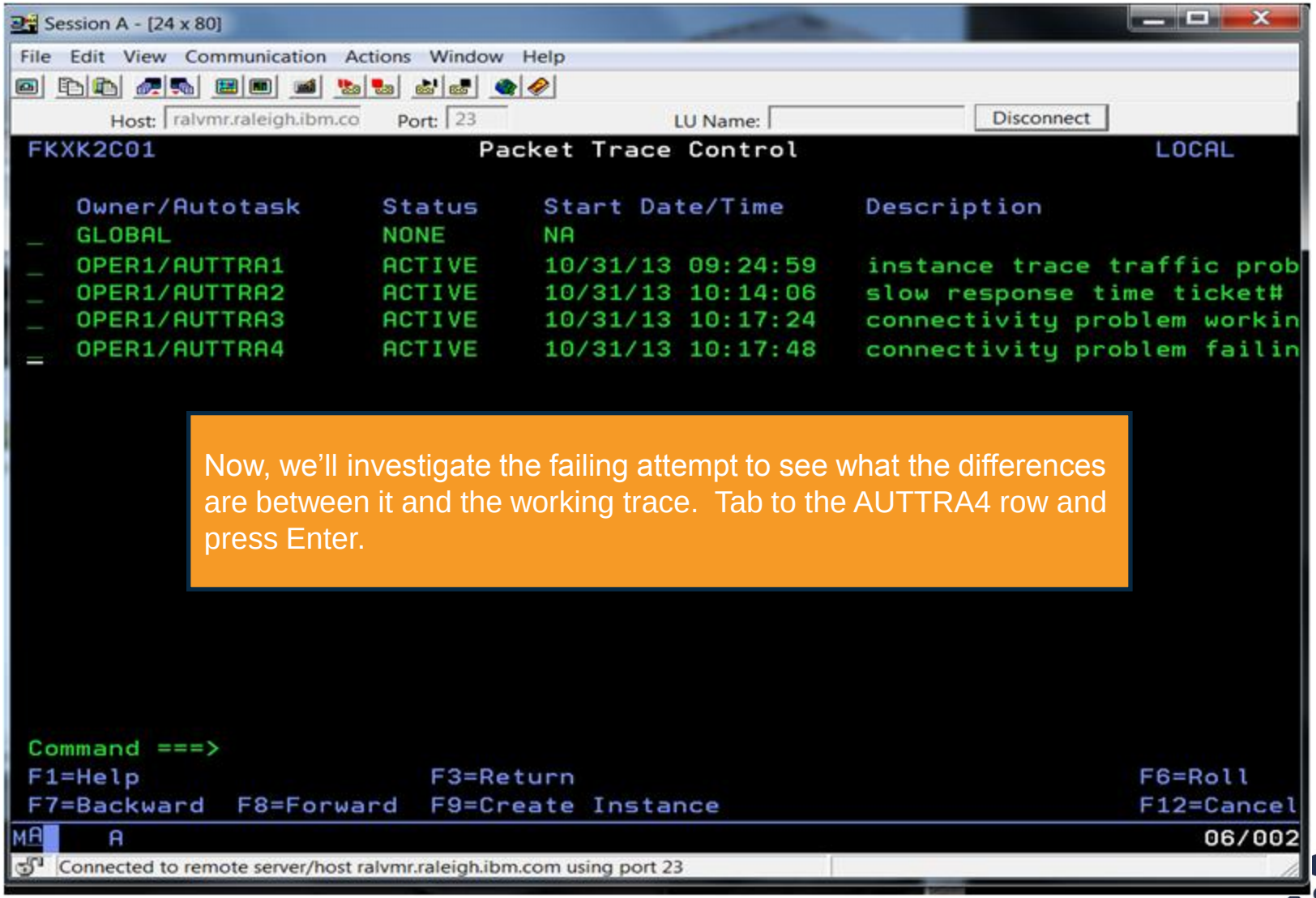
Scenario 1: Packet Trace



When the application completes a connection, it returns the text "This is a successful connection." Note the "This is *" above. You can scroll down to view more packets.

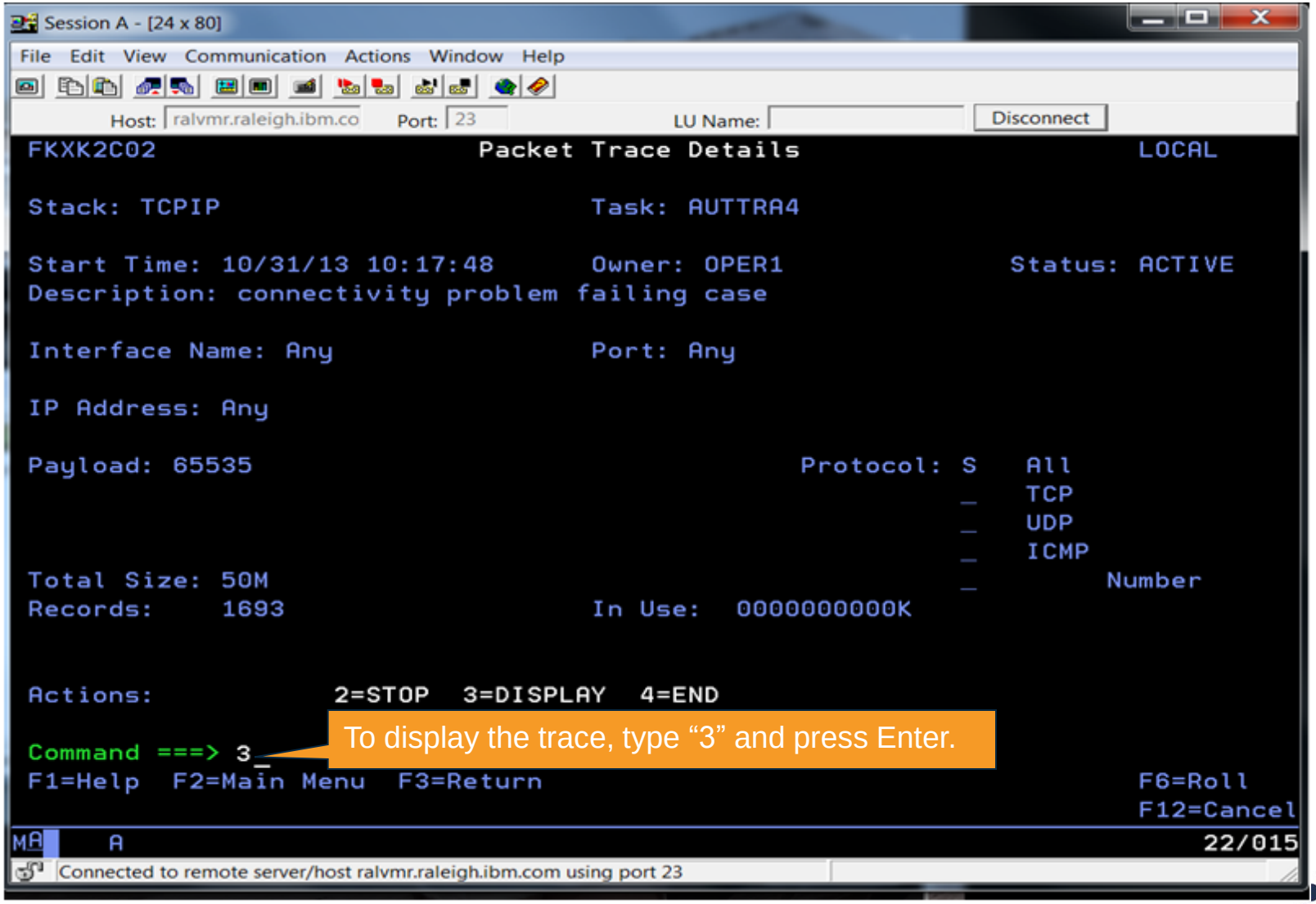
To save the trace, specify a trace data set name and press F2. Press F3 to return to the Packet Trace Control panel.

Scenario 1: Packet Trace

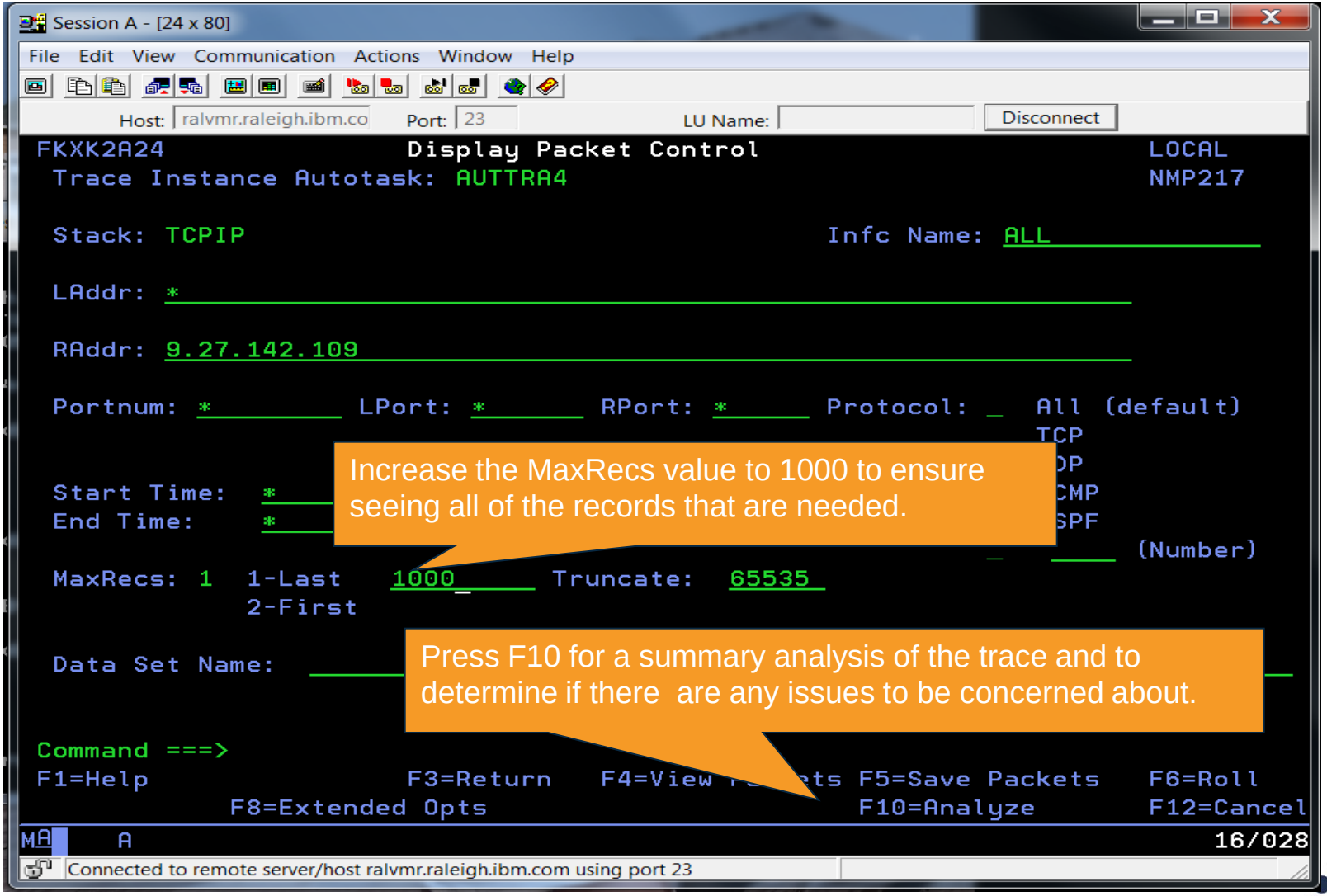


Now, we'll investigate the failing attempt to see what the differences are between it and the working trace. Tab to the AUTTRA4 row and press Enter.

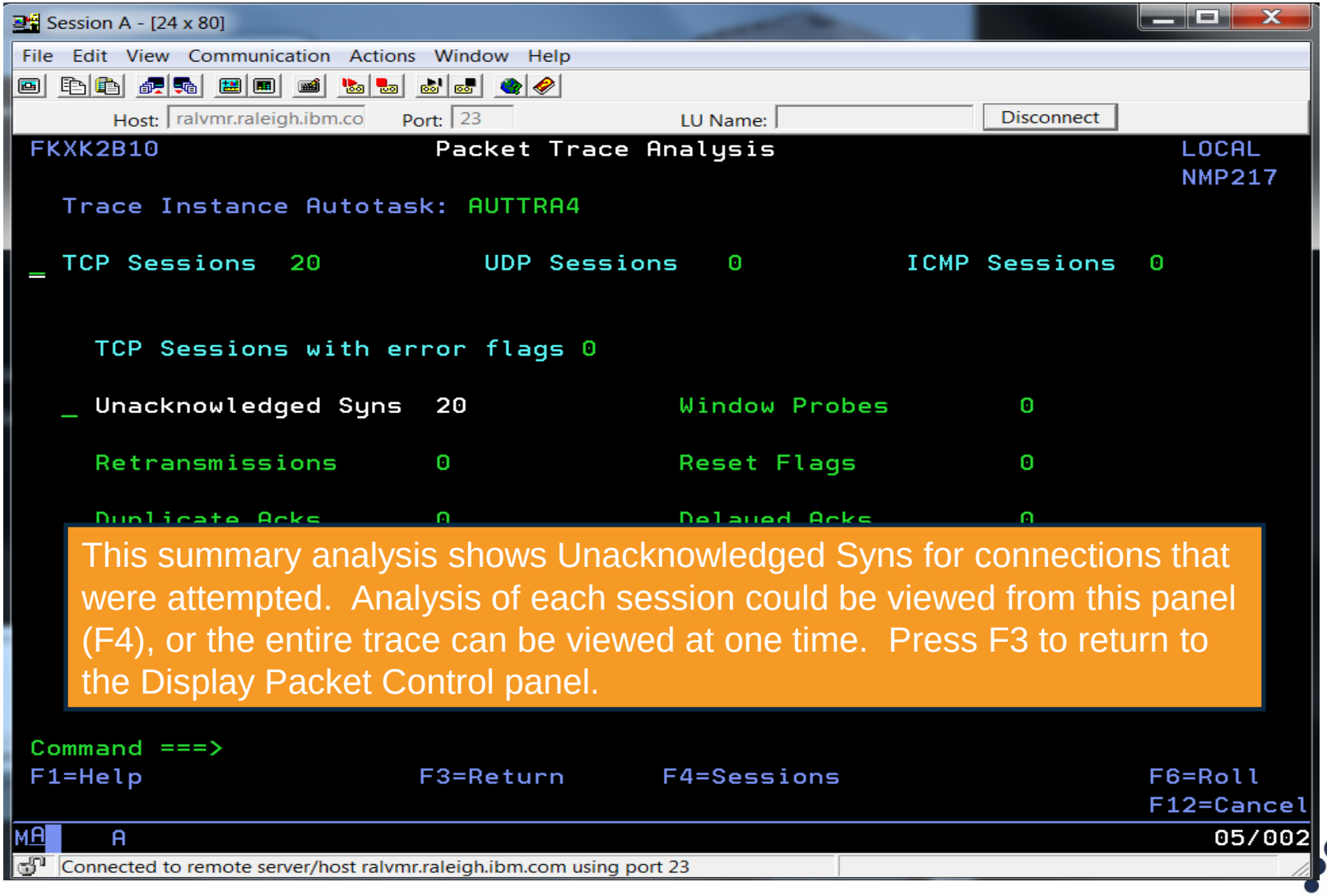
Scenario 1: Packet Trace



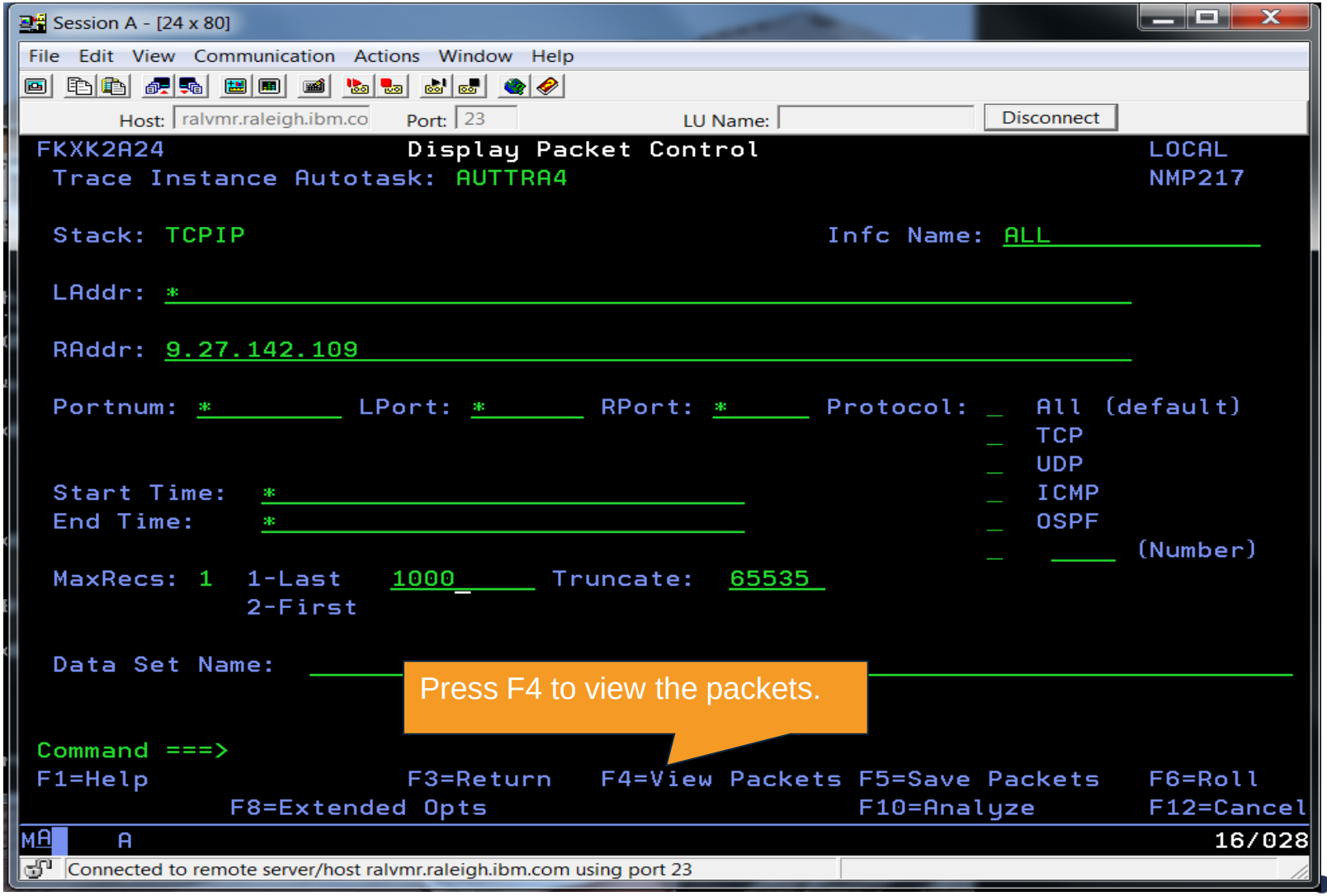
Scenario 1: Packet Trace



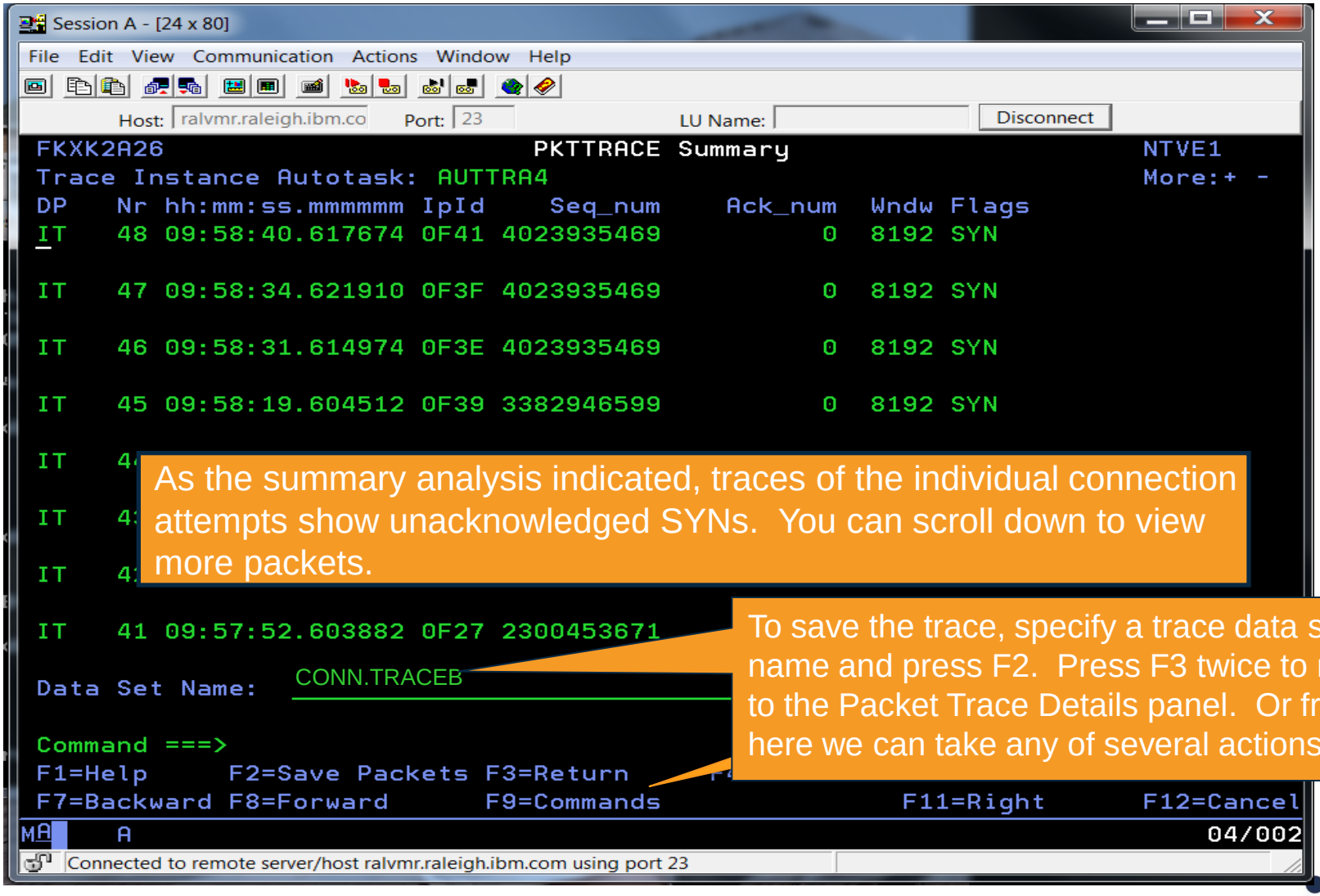
Scenario 1: Packet Trace



Scenario 1: Packet Trace



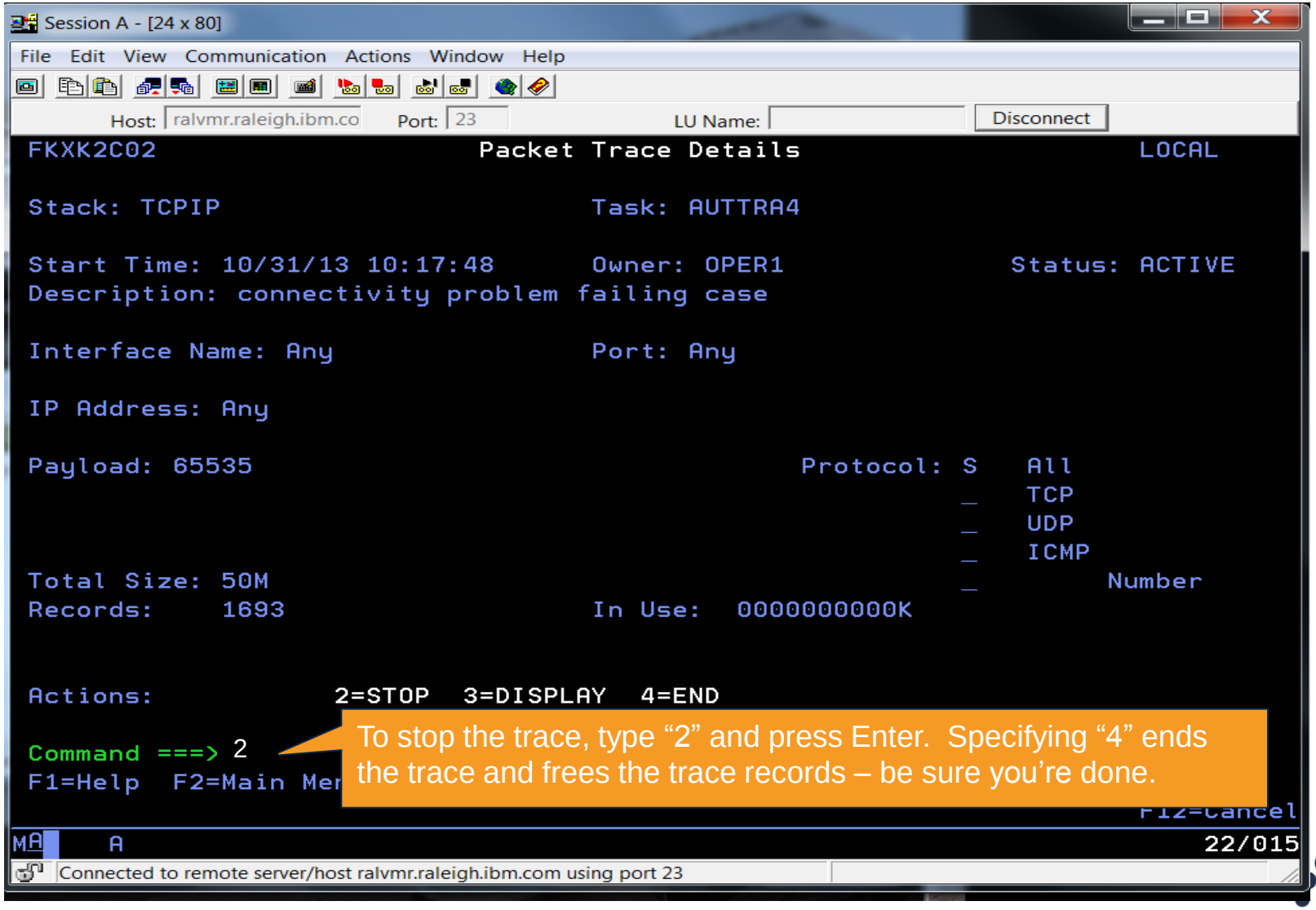
Scenario 1: Packet Trace



As the summary analysis indicated, traces of the individual connection attempts show unacknowledged SYNs. You can scroll down to view more packets.

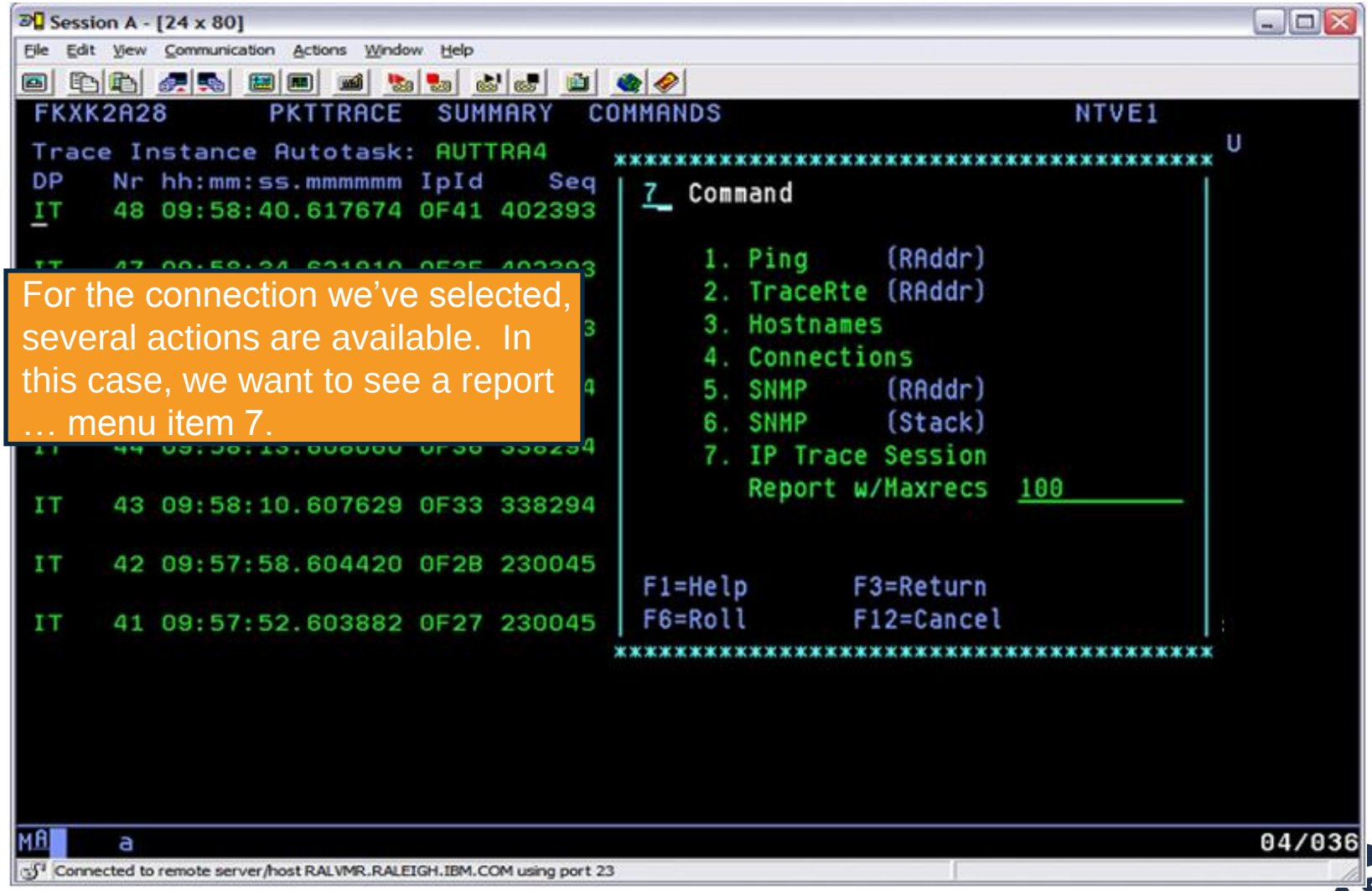
To save the trace, specify a trace data set name and press F2. Press F3 twice to return to the Packet Trace Details panel. Or from here we can take any of several actions: F9

Scenario 1: Packet Trace



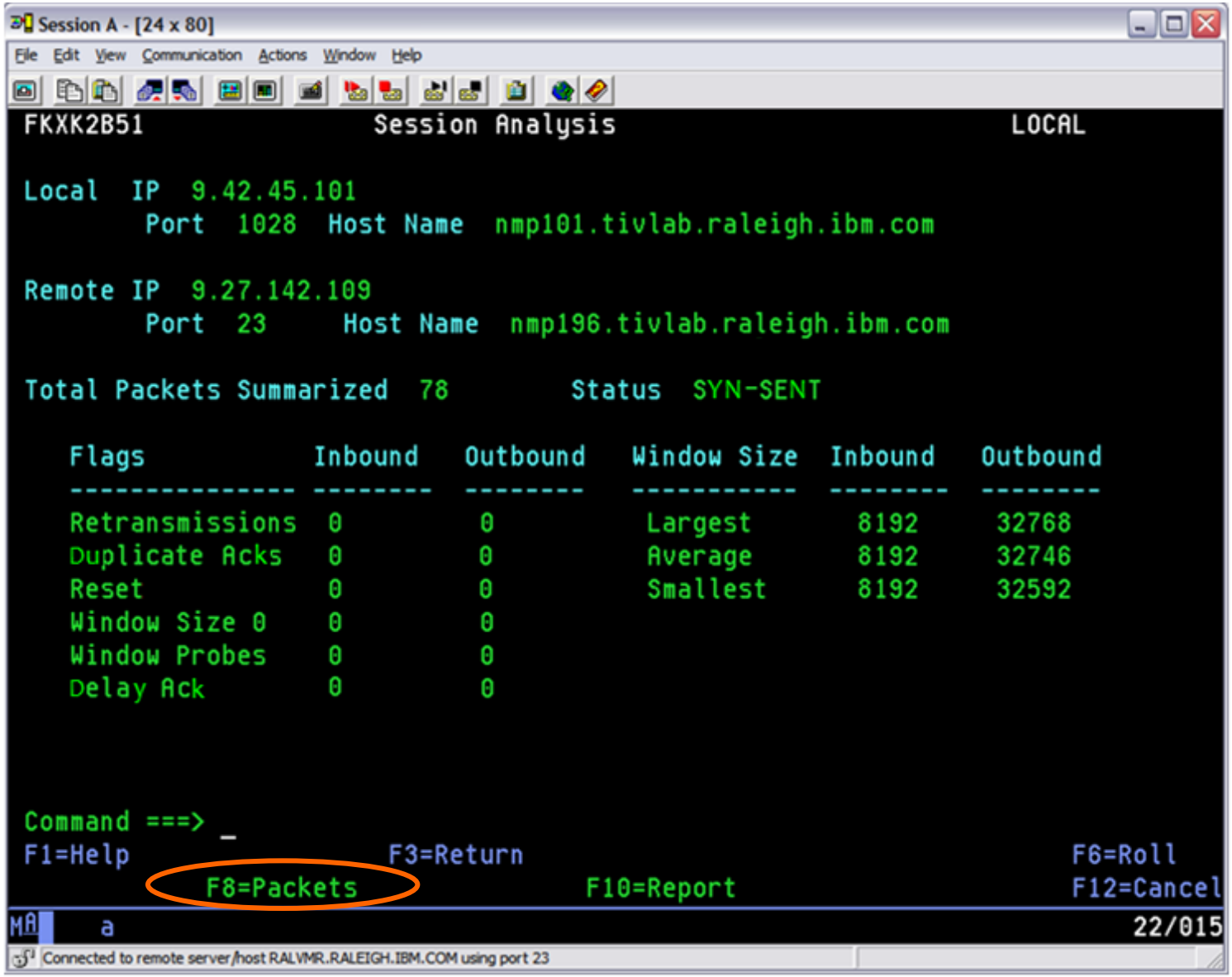
To stop the trace, type “2” and press Enter. Specifying “4” ends the trace and frees the trace records – be sure you’re done.

Scenario 1: Packet Trace

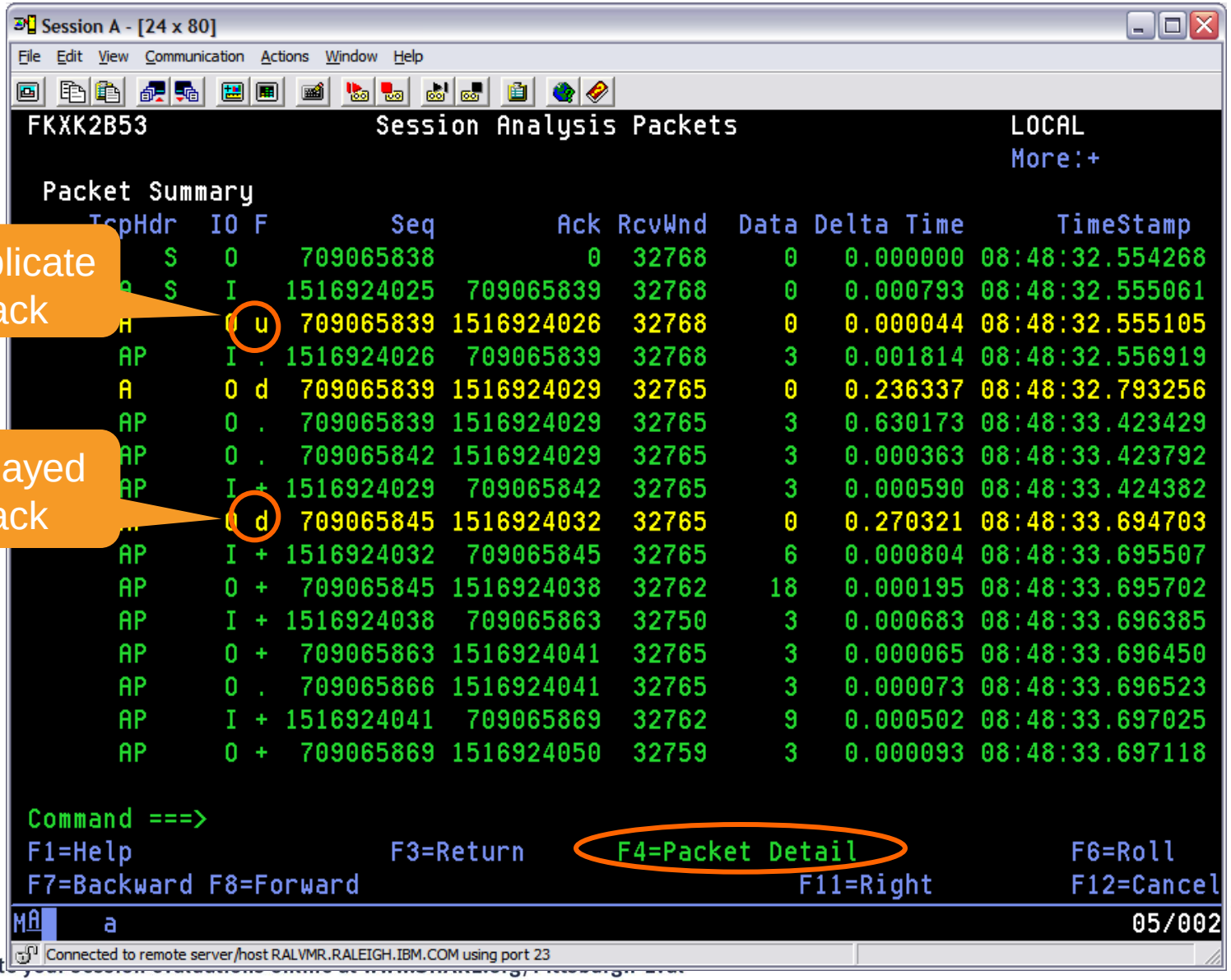


For the connection we've selected, several actions are available. In this case, we want to see a report … menu item 7.

Scenario 1: Analysis for selected session



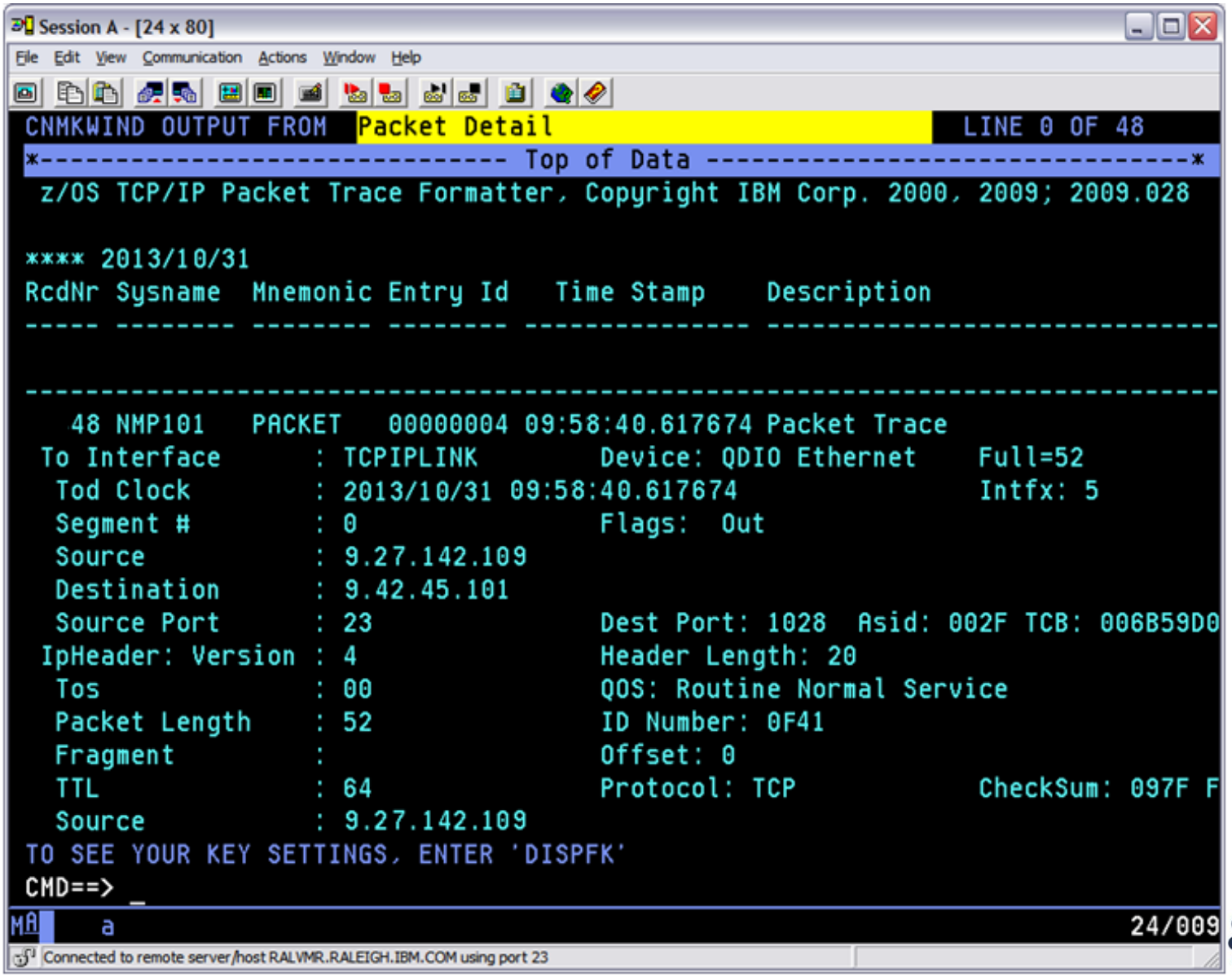
Scenario 1: Individual packets for the session



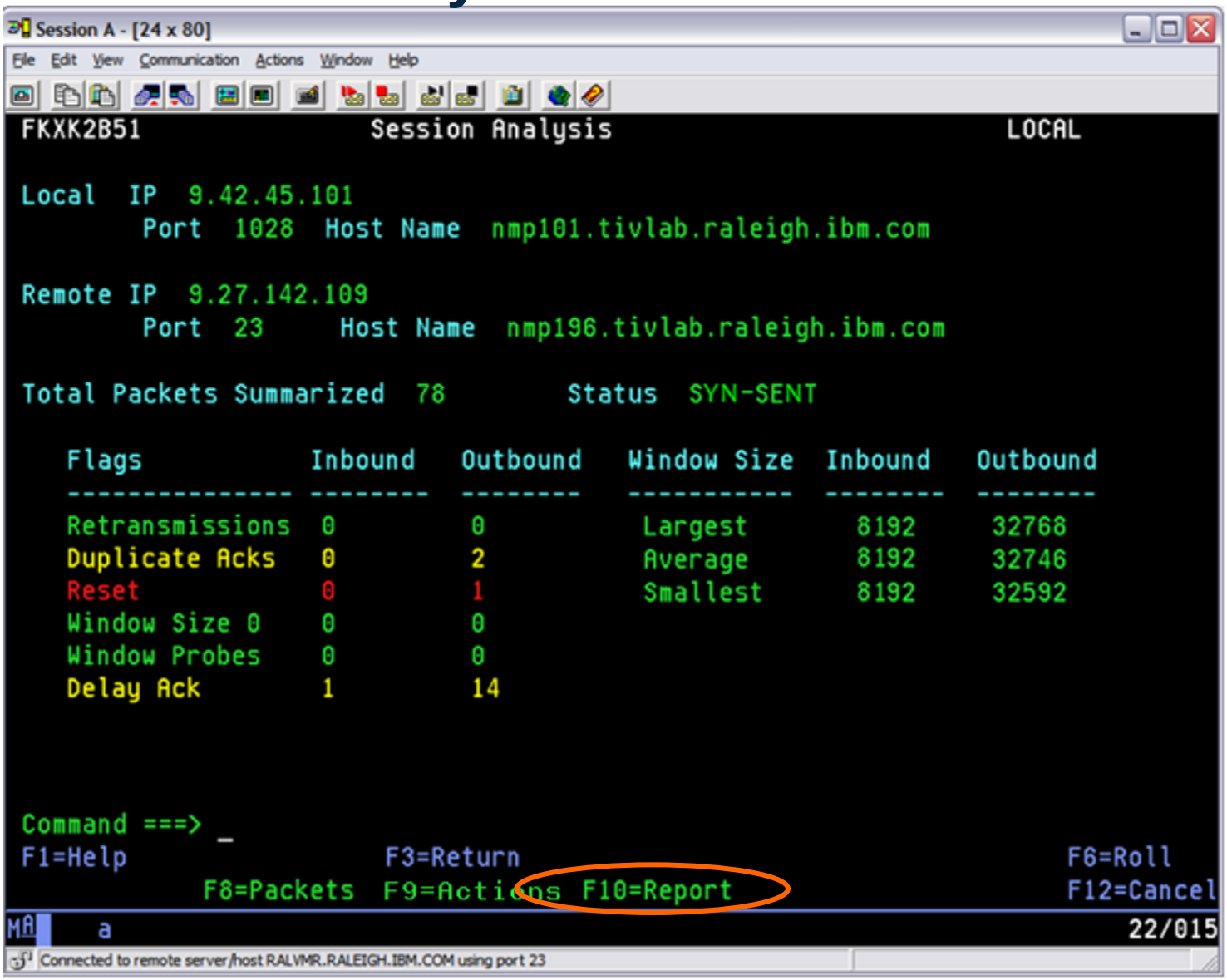
duplicate ack

delayed ack

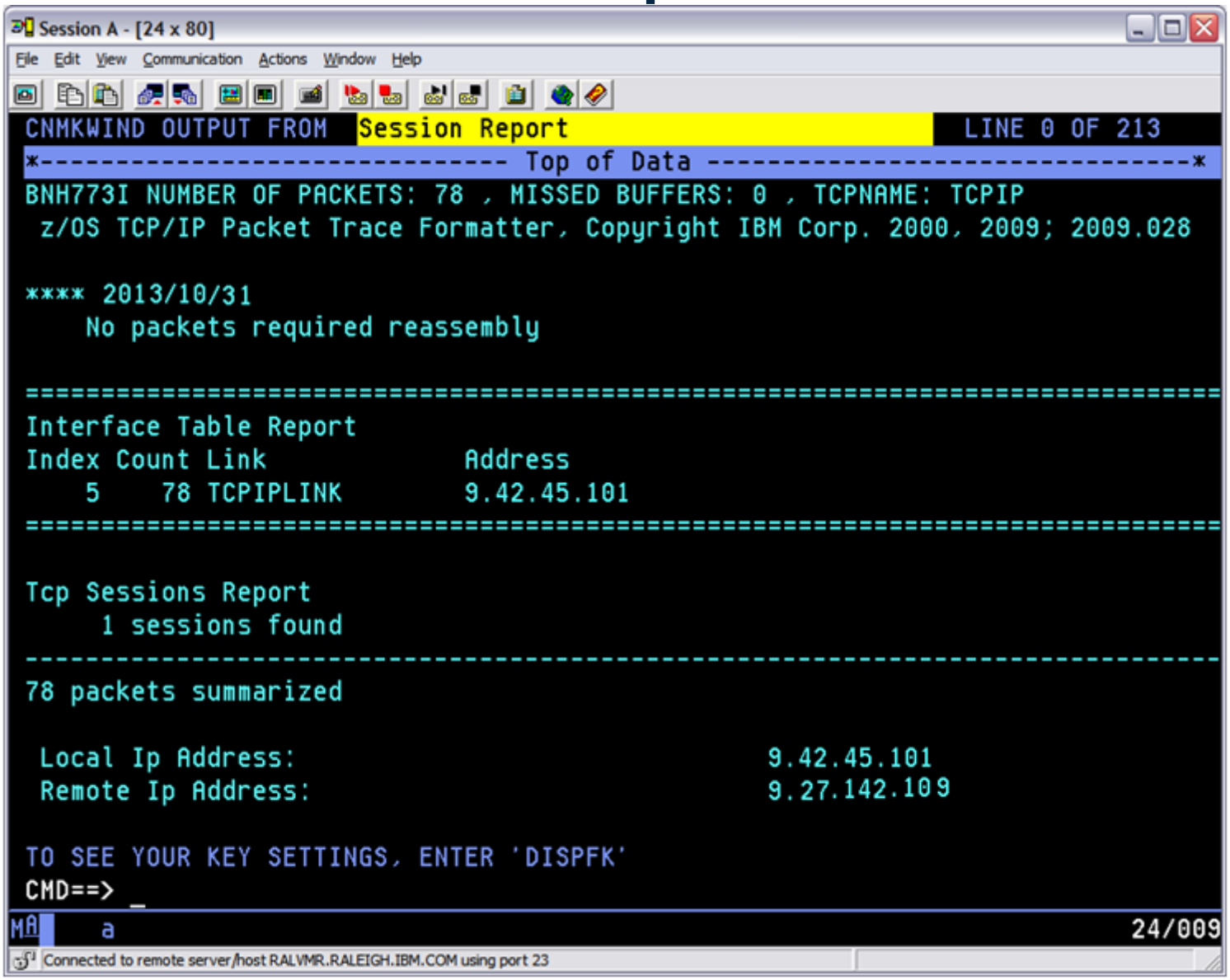
Scenario 1: Packet Details



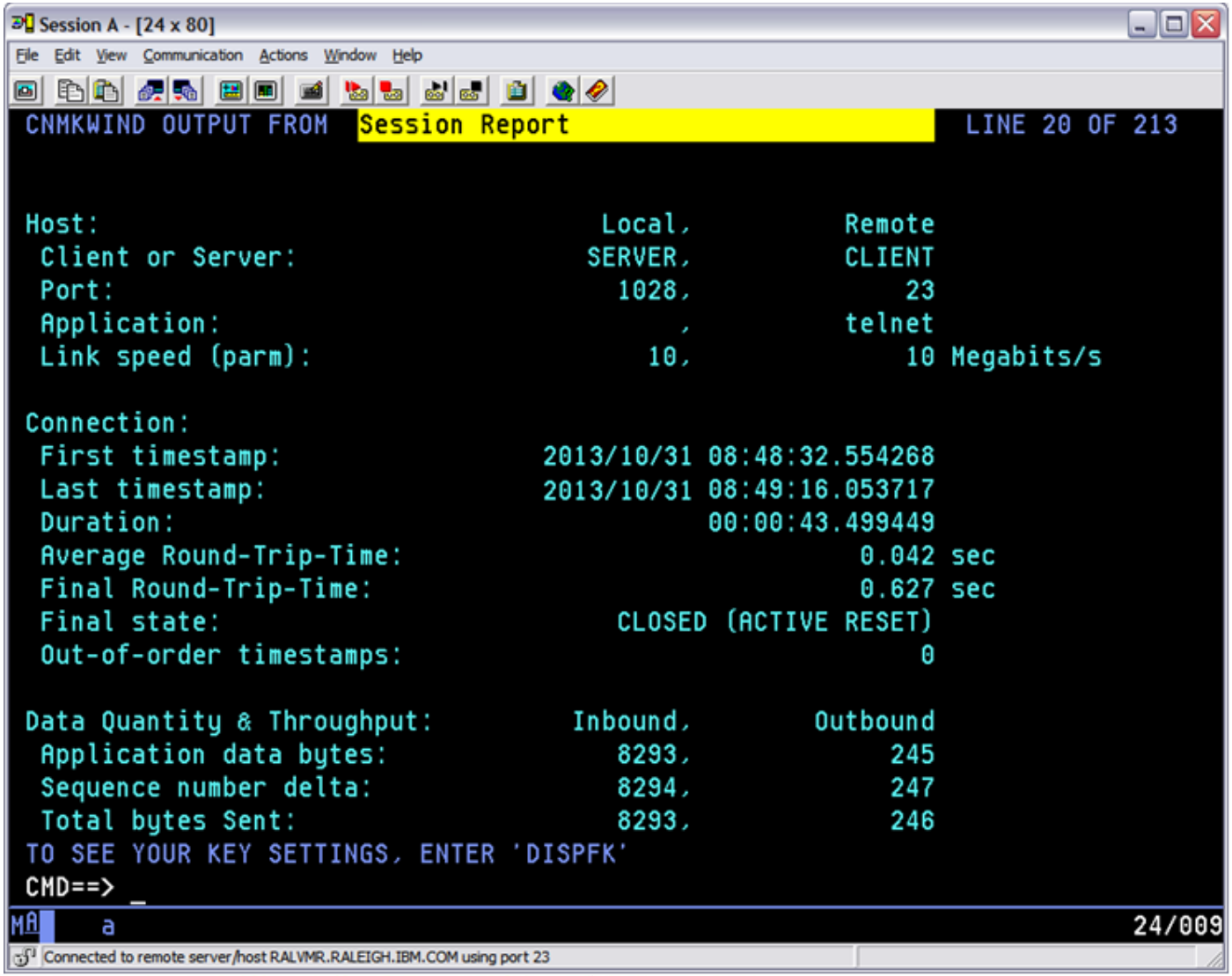
Scenario 1: Analysis for selected session



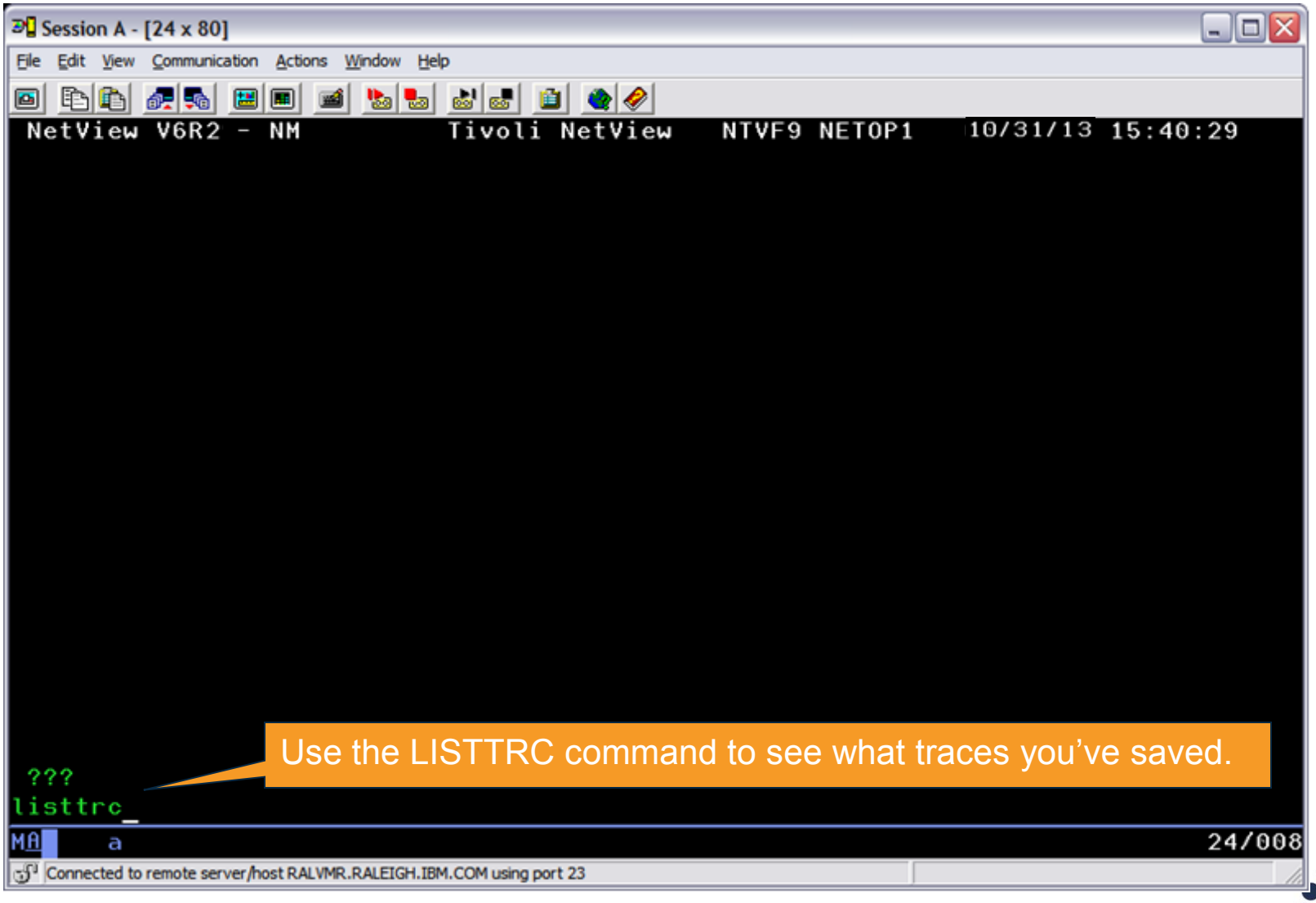
Scenario 1: Session Report



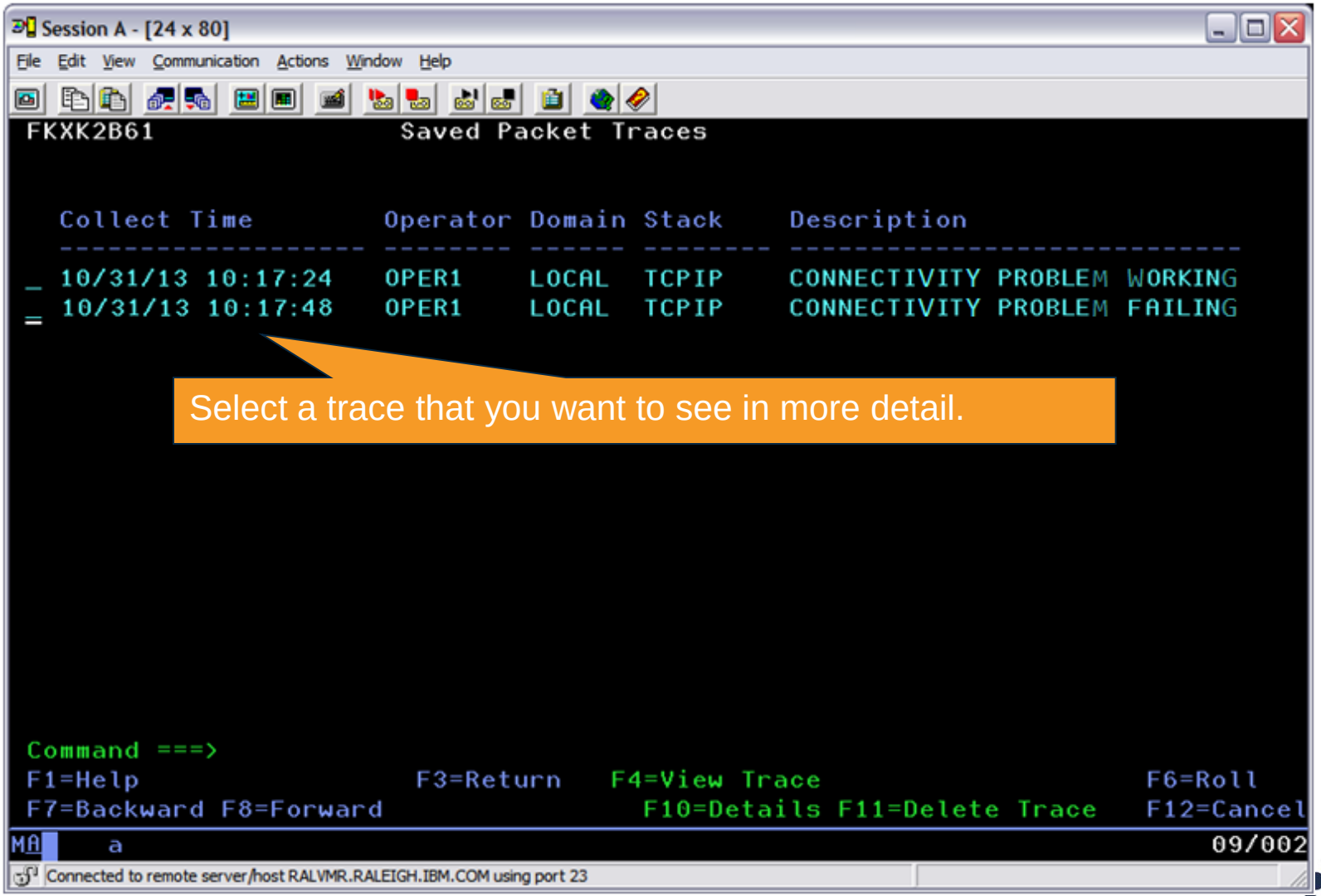
Scenario 1: Session Report (cont.)



Scenario 1: Packet Trace



Scenario 1: Packet Trace



Scenario Summary

- The packet trace comparison between the working and failing results provides enough information to continue to the next step of your diagnosis:
  - Is it the application?
  - Is it something with that specific TCP/IP request?

Packet Trace Summary

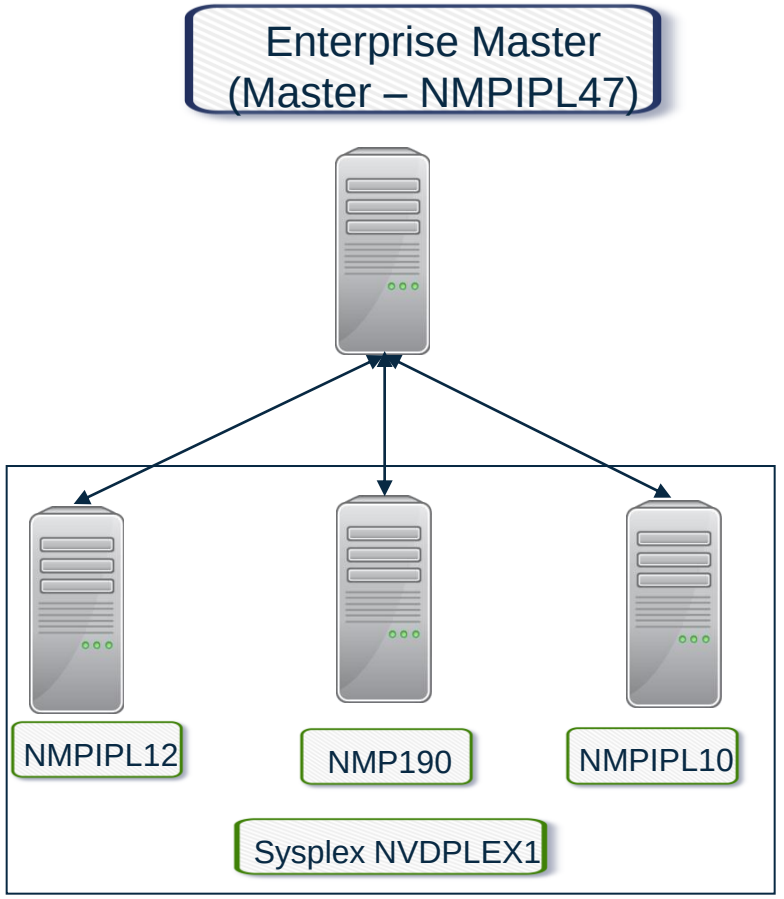
- Packet trace can be controlled through the global trace or multiple instance traces
  - “Global” trace: only 1 per stack
  - “Instance” traces: up to 32 per stack
- Multi-trace function requires z/OS Communications Server V2.1 and NetView for z/OS V6.2.
- Multiple traces can be useful for tracing specific parts of a network, avoiding extraneous data.
- Traces can be saved in CTRACE format for further analysis in IPCS.

Agenda

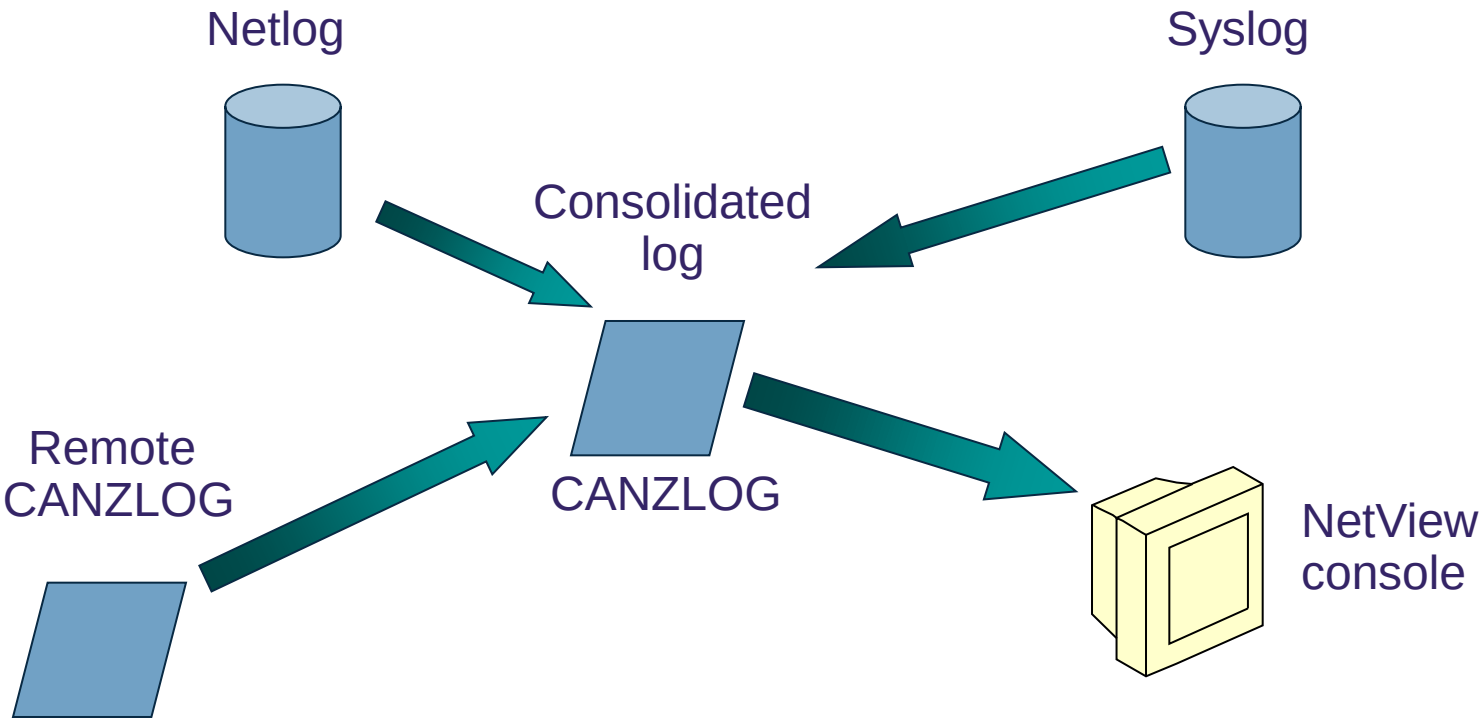
- Packet Trace
- DDVIPA Changes
- Monitoring Sysplex Distributor

Scenario 2: DDVIPA Configuration Changes

- Scenario:
  - All 3 systems in PLEX1 need to add a Sysplex Distributor. The changes are all scheduled to occur at the same time, but 2 of the new Sysplex Distributor IP addresses are not working.
- Resolution steps:
  - Using the Canzlog remote browse GROUP function from an enterprise master NetView, see why the DDVIPA configuration changes did not work on all 3 systems in the sysplex.
  - Also, take advantage of new CZFORMAT option (ORIGIN) and the new relative time filter.



Consolidated Log Browse with NetView V6.2



CANZLOG = **C**onsolidated **A**udit, **N**etView and **z**/OS **LOG**

Canzlog Enhancements

- Recording of messages before NetView SSI initializes (early IPL)
- Truncation of verbose MLWTOs
- Remote browse support
- New formatting options
- Relative time filter

Canzlog Remote Browse

- The updated BROWSE command can accept a remote domain, a remote alias, a Canzlog group, or a sysplex name.
- The BROWSE command can browse a data set member from a remote domain, such as the CNMSTYLE member.
- A Canzlog group, a set of arbitrary NetView domains in the enterprise, can be defined in the CNMSTYLE member.
- The Canzlog panel has been updated to accept a remote Canzlog browse request (Target).

Canzlog GROUP browse

- The Canzlog BR command can be used to browse a Canzlog from multiple domains
  - The messages from all the domains are consolidated into one log
  - The messages in the log are sorted by time
  - Use the new DEFAULTS/OVERRIDE CZFORMAT command to specify ORIGIN in front of each message
  - Additional filter options can be specified
  - A filter name, if used, is resolved on the local side before making the remote request

Scenario 2: GROUP information

NetView stylesheet:

```
RMTSYN.IP.NTV7A = NMPIPL12.TIVLAB.RALEIGH.IBM.COM/4022 ON USIBMNT
RMTALIAS.NTV7ATST = IP.NTV7A
RMTSYN.IP.NTV74 = NMP190.TIVLAB.RALEIGH.IBM.COM/4022 ON USIBMNT
RMTALIAS.NTV74TST = IP.NTV74
RMTSYN.IP.NTV70 = NMPIPL10.TIVLAB.RALEIGH.IBM.COM/4022 ON USIBMNT
RMTALIAS.NTV70TST = IP.NTV70
RMTSYN.IP.NTVE6 = NMPIPL30.TIVLAB.RALEIGH.IBM.COM/4022 ON USIBMNT
RMTALIAS.NTVE6TST = IP.NTVE6
ENT.GROUP.PLEX1 = NTV7ATST NTV74TST NTV70TST
```

Issue RESTYLE ENT to dynamically add a GROUP.

QRYGROUP Output

```
NetView V6R2 - NM          Tivoli NetView    NTVAF NETOP1
* NTVAF     QRYGROUP
C NTVAF
CNM100I The list of groups stored in COMMON
PLEX1
* NTVAF     QRYGROUP PLEX1
C NTVAF
CNM100I The list of members stored in PLEX1
NTV7ATST
NTV70TST
NTV74TST
```

ENT.GROUP.groupname defines a group of local or remote NetView instances. You can use a group to define a logical cluster of NetView instances; you can then use the group with the BROWSE command to see data from all NetView instances in the cluster. A group can include specific NetView domains, sysplexes, and other groups.

Scenario 2: Relative Time

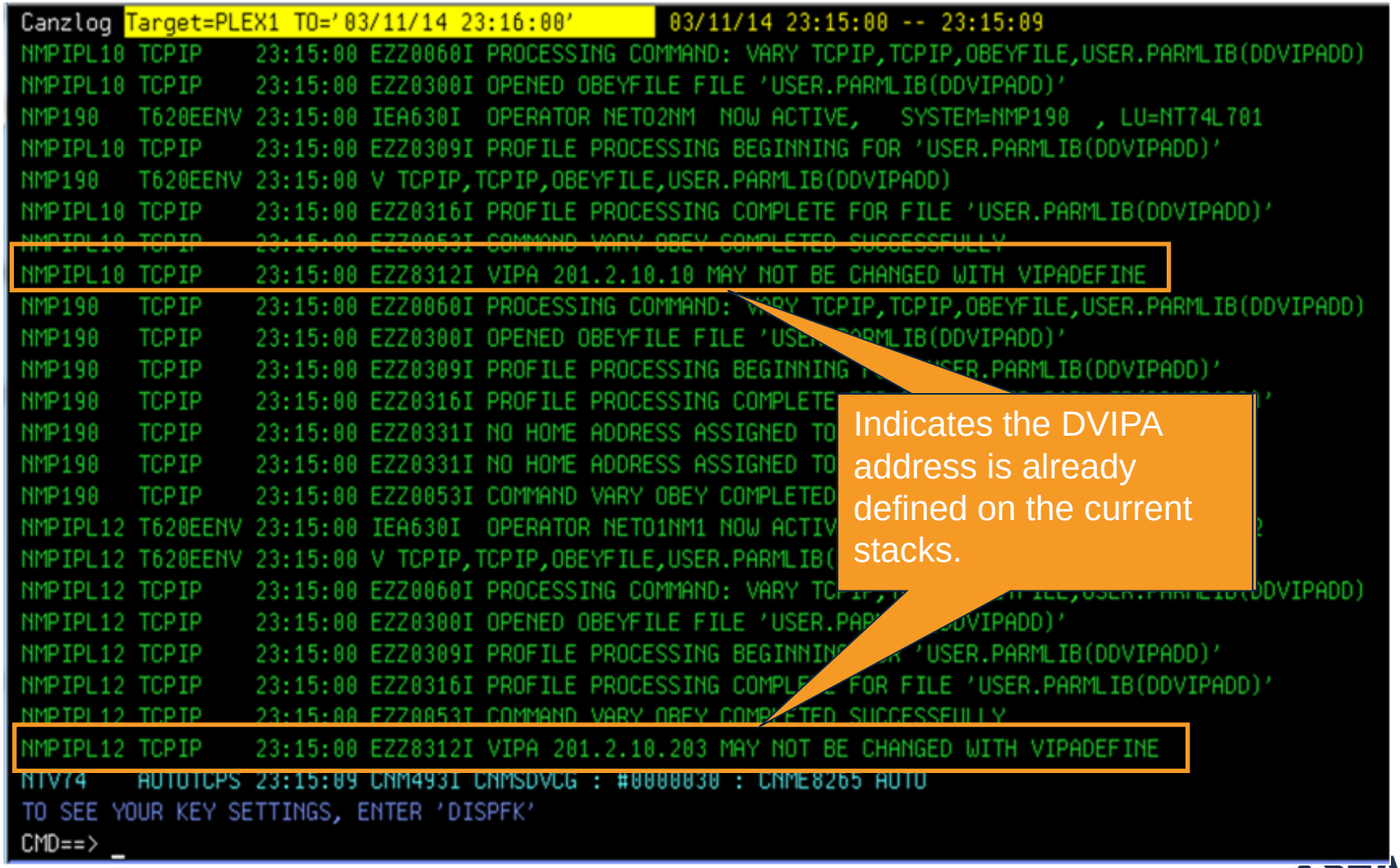
```
CNMKCZLG                Specify Canzlog Filters

From:                                    To:          '03/11/14 23:16:00'
For:        0D 0H 1M
Tag:                                     MSGID:
Jobname:                                 Jobid:
ASID:                                    ASType:
Console:                                 Route Code:
Domain:                                  System ID:
AutoTok:                                 Desc Code:
AuthUser:                                AuthGroup:
Opid:                                    UCHARS:
CHKey:                                   WTOKey:
Text - case sensitive; faster search:

Text - case insensitive; slower search:

Target:     plex1
Name:                   Remark:

TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
CMD==>
```

Timer for OBEYFILES to add new Sysplex distributors was set to run at 23:15:00 on 03/11/14. Immediate results are the desired display, so only 1 minute from 23:15:00 is specified.

The group we just defined

For on this panel specifies the duration of the timespan to be included. Use the *For* field if you want to specify the timespan in terms of duration, rather than specifying the the start and end times.

Scenario 2: Filtered Results



Summary

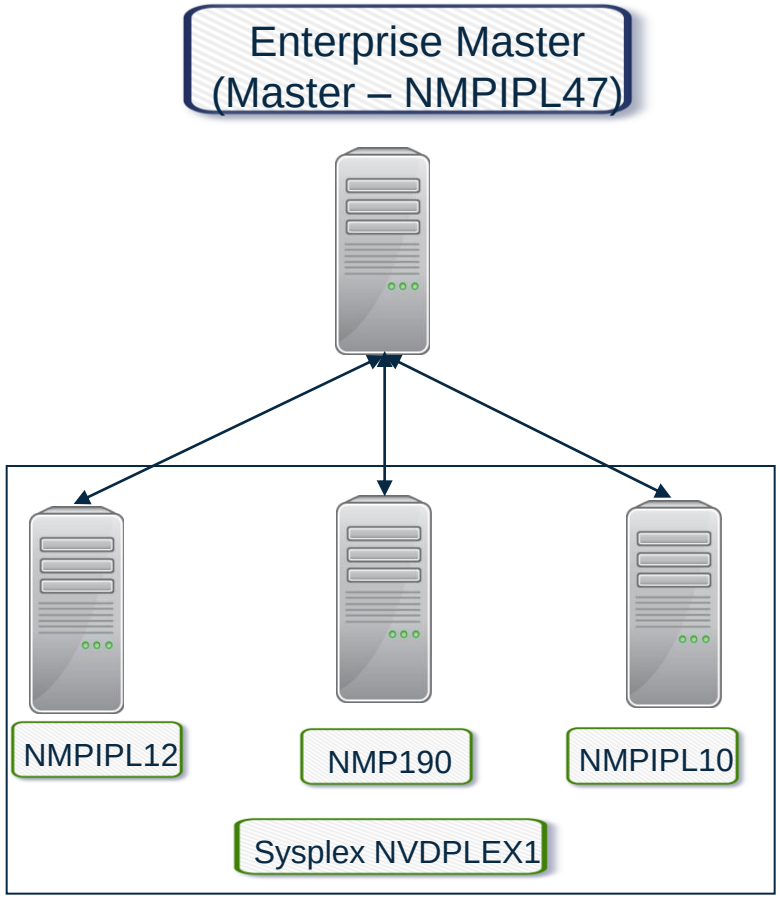
- CANZLOG brings together syslog and netlog messages, from local and/or remote systems
- Very robust, flexible filtering
  - Any message attribute or combination
    - “What happened over the weekend?”
    - “Show me all the IEF123 messages from systems X, Y and Z.”
    - “I need to see all the ABC* and DEF* messages from jobs JOB1 and JOB2 during first shift last Tuesday with descriptor code 2.”
  - Scope
    - Common (public): available to all operators (subject to authorization check)
    - Task (private): available only to operator who defined the filter criteria
  - Actions
    - Save: save filter to storage and on disk
    - Replace: replace an existing filter in storage and on disk
    - Delete: delete filter from storage and disk
- Seamless archiving and retrieval
- Export to IBM Service

Agenda

- Packet Trace
- DDVIPA Changes
- Monitoring Sysplex Distributor

Scenario 3: Monitoring Sysplex Distributor

- Scenario:
  - Sysplex Distributor seems to be favoring one z/OS system significantly more than others for new TCP connections. Why?
- Resolution steps:
  - Check the WLM weight for the target systems
  - Consider machine types



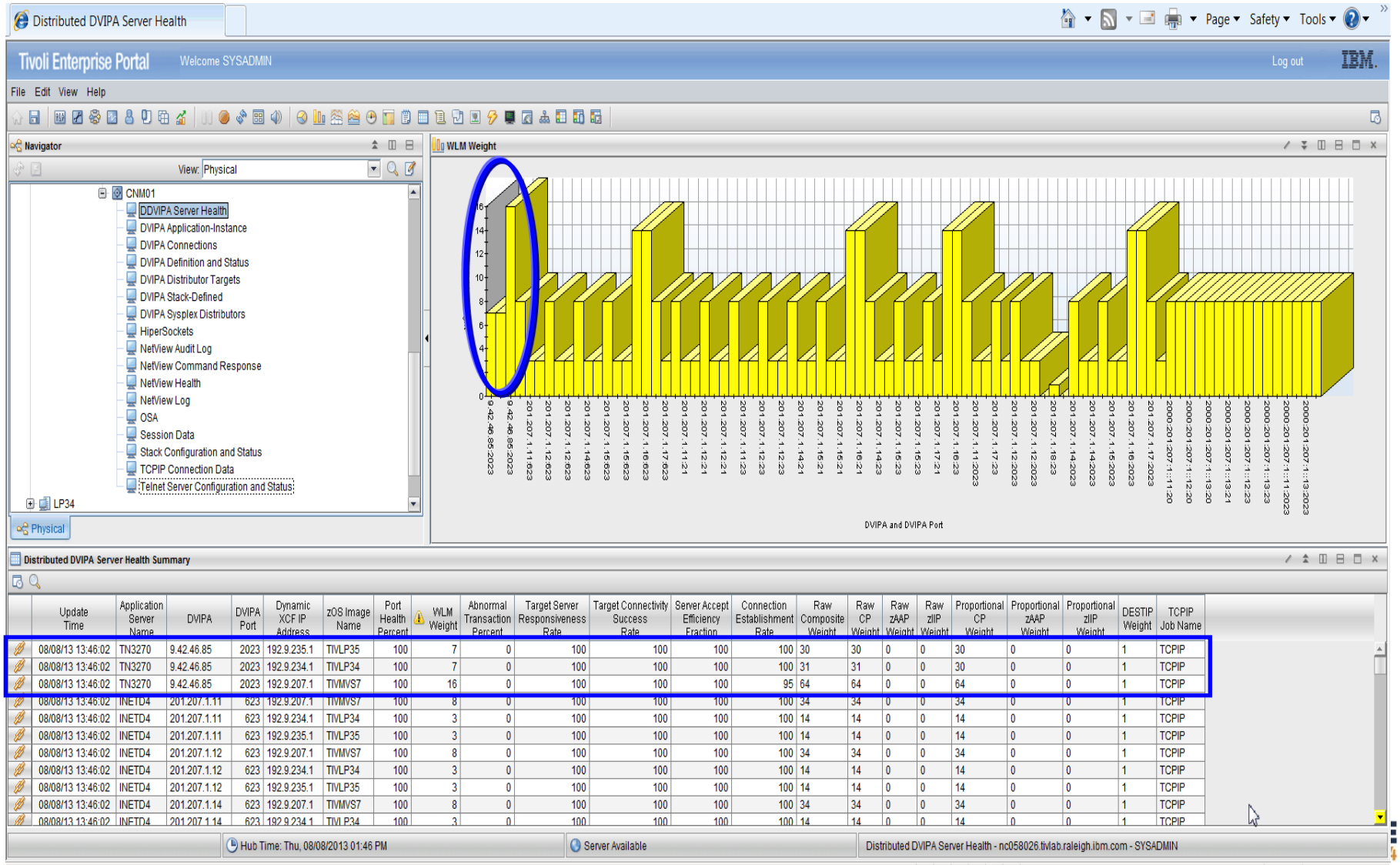
NetView DVIPA Monitoring

- NetView provides the following DVIPA information:
  - DVIPA Definition and Status
  - Sysplex Distributors
  - Distributed DVIPA (DDVIPA) Targets
  - DDVIPA Server Health, including a view for DDVIPA Unhealthy Servers
  - DVIPA Connections
  - VIPA Routing
  - DDVIPA Connection Routing

Scenario 3: Sysplex Distributor Favoring a System

- The NetView DDVIPA Server Health workspace displays the WLM weight for DDVIPA targets. WLM weight is a key factor for DDVIPA connection distribution.
- Scenario information:
  - DVIPA 9.42.46.85 on port 2023

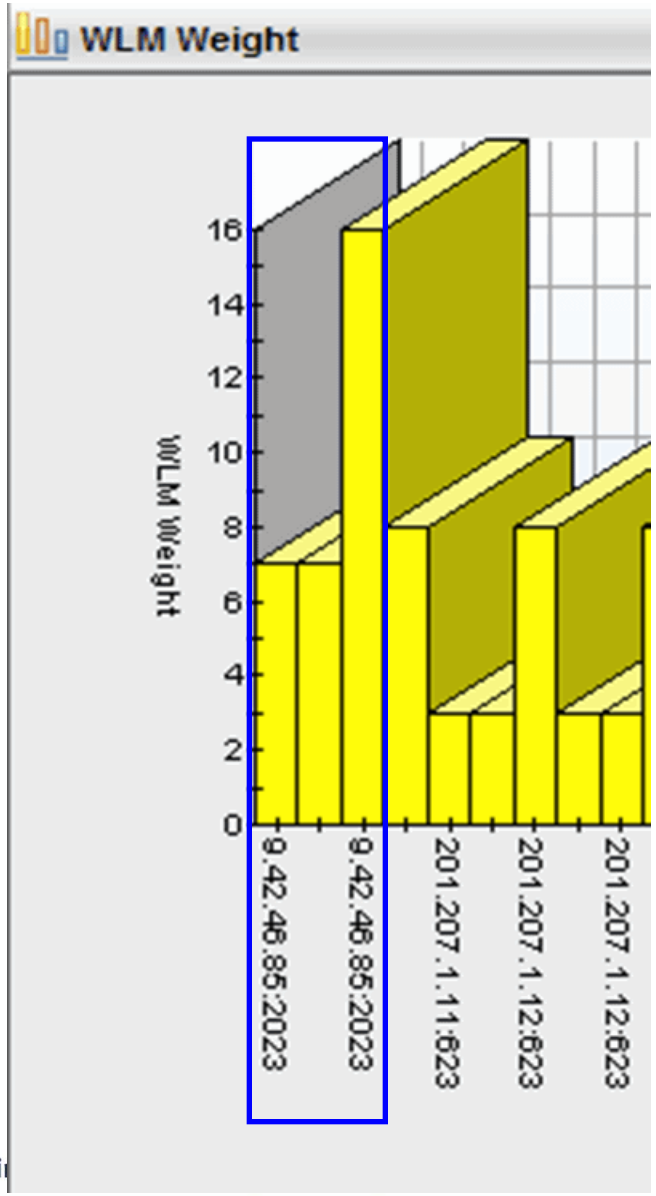
Scenario 3: WLM Weight and DDVIPA Server Health



Update Time	Application Server Name	DVIPA	DVIPA Port	Dynamic XCF IP Address	zOS Image Name	Port Health Percent	WLM Weight	Abnormal Transaction Percent	Target Server Responsiveness Rate	Target Connectivity Success Rate	Server Accept Efficiency Fraction	Connection Establishment Rate	Raw Composite Weight	Raw CP Weight	Raw zAAP Weight	Raw zIIP Weight	Proportional CP Weight	Proportional zAAP Weight	Proportional zIIP Weight	DESTIP Weight	TCPIP Job Name
08/08/13 13:46:02	TN3270	9.42.46.85	2023	192.9.235.1	TIVLP35	100	7	0	100	100	100	100	30	30	0	0	30	0	0	1	TCPIP
08/08/13 13:46:02	TN3270	9.42.46.85	2023	192.9.234.1	TIVLP34	100	7	0	100	100	100	100	31	31	0	0	30	0	0	1	TCPIP
08/08/13 13:46:02	TN3270	9.42.46.85	2023	192.9.207.1	TIVMVS7	100	16	0	100	100	100	95	64	64	0	0	64	0	0	1	TCPIP
08/08/13 13:46:02	INETD4	201.207.1.11	623	192.9.207.1	TIVMVS7	100	8	0	100	100	100	100	34	34	0	0	34	0	0	1	TCPIP
08/08/13 13:46:02	INETD4	201.207.1.11	623	192.9.234.1	TIVLP34	100	3	0	100	100	100	100	14	14	0	0	14	0	0	1	TCPIP
08/08/13 13:46:02	INETD4	201.207.1.11	623	192.9.235.1	TIVLP35	100	3	0	100	100	100	100	14	14	0	0	14	0	0	1	TCPIP
08/08/13 13:46:02	INETD4	201.207.1.12	623	192.9.207.1	TIVMVS7	100	8	0	100	100	100	100	34	34	0	0	34	0	0	1	TCPIP
08/08/13 13:46:02	INETD4	201.207.1.12	623	192.9.234.1	TIVLP34	100	3	0	100	100	100	100	14	14	0	0	14	0	0	1	TCPIP
08/08/13 13:46:02	INETD4	201.207.1.12	623	192.9.235.1	TIVLP35	100	3	0	100	100	100	100	14	14	0	0	14	0	0	1	TCPIP
08/08/13 13:46:02	INETD4	201.207.1.14	623	192.9.207.1	TIVMVS7	100	8	0	100	100	100	100	34	34	0	0	34	0	0	1	TCPIP
08/08/13 13:46:02	INETD4	201.207.1.14	623	192.9.234.1	TIVLP34	100	3	0	100	100	100	100	14	14	0	0	14	0	0	1	TCPIP

Scenario 3: WLM Weight Bar Chart

First 3 bars show WLM weight for DVIPA 9.42.45.84 and Port 2023.



Scenario 3: WLM Weight and DDVIPA Server Health

Application Server Name	DVIPA	DVIPA Port	Dynamic XCF IP Address	zOS Image Name	Port Health Percent	WLM Weight	Abnormal Transaction Percent	Target Server Responsiveness Rate	Target Connectivity Success Rate
TN3270	9.42.46.85	2023	192.9.235.1	TIVLP35	100	7	0	100	100
TN3270	9.42.46.85	2023	192.9.234.1	TIVLP34	100	7	0	100	100
TN3270	9.42.46.85	2023	192.9.207.1	TIVMVS7	100	16	0	100	100

Server Accept Efficiency Fraction	Connection Establishment Rate	Raw Composite Weight	Raw CP Weight	Raw zAAP Weight	Raw zIIP Weight	Proportional CP Weight
100	100	30	30	0	0	30
100	100	31	31	0	0	30
100	95	64	64	0	0	64

WLM Weight for TIVMVS7 (zEC 12) is double that of TIVLP34 (z10) and TIVLP35 (z10).

Summary

- NetView monitors a wide variety of DVIPA metrics and brings them together for easy analysis
- Allows quick assessment of DDIPVA Server health
- Allows easy determination of problems

More Information

- IP management with NetView for z/OS
  https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/Tivoli+System+z+Monitoring+and+Application+Management/page/Tivoli+NetView+for+zOS
- NetView website
  http://www.ibm.com/software/tivoli/products/netview-zos/
- NetView customer forum
  http://tech.groups.yahoo.com/group/NetView/
- NetView wiki
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- NetView media gallery
  https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli+System+z+Monitoring+and+Application+Management/page/Media+Gallery+for+Tivoli+NetView+for+zOS
- NetView documentation
  http://www.ibm.com/support/knowledgecenter/SSZJDU_6.2.0/com.ibm.itnetviewforzos.doc/ic-homepage.html?lang=en

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- IBM Tivoli OMEGAMON XE on z/OS 5.3.0, IBM Tivoli OMEGAMON Dashboard Edition on z/OS 5.3.0, IBM Tivoli OMEGAMON XE for Messaging for z/OS 7.3.0, IBM Tivoli OMEGAMON XE for CICS on z/OS 5.3.0, IBM Tivoli OMEGAMON XE for Storage on z/OS 5.3.0
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- IBM Tivoli NetView Monitoring for GDPS V6.2.1
- IBM Tivoli Workload Scheduler for z/OS V9.2

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11:15	15621:	What's New with OMEGAMON V5 Family	Room 311
1:30	15619:	System Automation for z/OS: Beginner's Hands-on Lab, Part 1 of 2	Room 301
3:00	15620:	System Automation for z/OS: Beginner's Hands-on Lab, Part 2 of 2	Room 301

Tuesday

11:15	15625:	Learn the Latest Problem Solving Solutions for z/OS and Storage Subsystems with OMEGAMON	Room 311
4:15	15548:	OMEGAMON XE for Storage - VSAM RLS and z/OS copy Services Monitoring	Room 317

Wednesday

10:00	16084:	How IBM Can Identify z/OS Networking Issues Without Tracing	Room 311
4:15	15615:	OMEGAMON V5 Enhanced 3270 Hands-on Lab	Room 301
5:45	15618:	OMEGAMON Advanced Topics: User Interface Customization and the Tivoli Enterprise Portal - Hands-on Lab	Room 301

Thursday

11:15	15641:	Clever Automation with IBM SA z/OS V3.5	Room 405
3:00	16083:	Innovations in Network Management with NetView for z/OS	Room 311

Friday

10:00	15839:	Predictive Analytics and IT Service Management	Room 303

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