IBM Tivoli OMEGAMON XE for Mainframe Networks TN3270 Updates Technote

The technote explains changes to documented TN3270 functionality introduced in the IBM Tivoli OMEGAMON XE for Mainframe Networks product in this APAR. These changes were made to correct the problem that the Telnet Session Count attribute was misleading in that it continually increased and was not decremented.

This APAR also adds an attribute to differentiate between connections that are in session with an application and connections that are not in session with an application (sessionless). To address these updates, the TN3270 Server Session Summary table has been updated to show only Telnet connections that have a session with an application, and a new table has been added that shows only the Telnet connections that do not have a session with an application.

This APAR also provides SSL Status information for active connections. This information was previously available only for completed connections.

Users who enabled the LE (Language Environment) variable **TZ** (for timezone) might have noticed that the timestamps associated with their TN3270 sessions were incorrect. For example, the start time for the session might be incorrect by the number of hours that the user's locale is offset from the universal time (also called GMT). OMEGAMON XE for Mainframe Networks uses the C language function `mktime`, and the `mktime` function is sensitive to the TZ environment variable. This APAR also addresses this issue and fixes the problem where TN3270 workspace timestamps were reported incorrectly for those users who enabled the TZ environment variable.

This technote includes the following updates:
- "Updates to the online help for Tivoli Enterprise Portal"

Updates to the online help for Tivoli Enterprise Portal

The following updates were made to the online help for IBM Tivoli OMEGAMON XE for Mainframe Networks Version 4.2.0 Fix Pack 3 for Enhanced Monitoring and z/OS v1.12 Compatibility.
- The following new attribute was added to the TCPIP Address Space attribute group (KN3TAS) and to the TN3270 workspaces:

  Telnet Session Count
  > The number of Telnet connections that are currently in session with an application. The format is an integer.
- The existing **Telnet Session Count** attribute in the TCPIP Address Space attribute group (KN3TAS) was renamed to Telnet Connection Count and is now defined as follows:

Telnet Connection Count
> The total number of Telnet connections. The format is an integer.

This attribute is displayed in the Address Space workspace, the TN3270 workspaces, and the TCP/IP Summary and Summary History workspaces.

- The following attributes were updated in the TN3270 Server Sess Avail attribute group (KN3TNA):

SSL Status
> The Secure Sockets Layer (SSL) status for the session. This value is stored as an integer and displayed as a string. While a TN3270 session is active, the SSL status will show as either SECURE, NON_SSL, or Unknown. The SECURE and NON_SSL statuses are only available if the session is monitored by means of a MONITORGROUP definition. At session termination, more granular descriptions of the SSL status are available and the SECURE session's status will be updated to reflect the session's status. The valid values are:
> - 0 = NON_SSL
> - 1 = SERVER_AUTH
> - 2 = NO_SAF
> - 3 = SAF
> - 9 = Unknown
> - 128 = SECURE. This is an interim state that can be displayed while a session or connection is active. The session termination record updates the row with more granular security information when the session or connection ends.

- The following attribute was added to the TN3270 Server Sess Avail attribute group (KN3TNA) and the TN3270 Server Sessions workspace.

Session Indicator
> Indicates whether the Telnet connection has a session with an application and the status of the session. This value is stored as an integer and displayed as a string. The following values are valid:
> - 0 = None
> - 1 = Active
> - 2 = Completed
>
> This attribute is not displayed by default.

- The following attribute was updated in the TN3270 Server Sess Avail attribute group (KN3TNA) and the TN3270 Server Sessions workspace.

Session Type
> The session type. While a TN3270 session is active, the Session Type attribute always displays as Unknown if the session is not monitored by means of a MONITORGROUP definition. At session termination, more granular descriptions of the SSL status are available and the SECURE session's status will be updated to reflect the session's status.This value is stored as an integer and displayed as a string. Valid values are:
> - 0 = Unknown
> - 1 = TN3270
> - 2 = TN3270E
> - 3 = Linemode
> - 4 = DBCSTransform
> - 5 = Binary

- Updates were made to some workspace descriptions in the help. Those changes are reflected in the updated workspace descriptions under "Updates to the user's guide" on page 6 and are flagged with change bars.

Updates to the planning and configuration guide

The following updates were made to the *IBM Tivoli OMEGAMON XE for Mainframe Networks: Planning and Configuration Guide*, Version 4.2.0 Fix Pack 3 for Enhanced Monitoring and z/OS v1.12 Compatibility.

- When you configure this monitoring agent, you can choose whether to monitor your TN3270 server's connections. To do this, you must enable TN3270 collection either globally or on a stack-specific basis using either the Configuration Tool or the PARMLIB method. You must also enable TN3270 monitoring on every system where the monitoring agent is running, using the process defined in the Chapter 3 "Preparing your z/OS environment." The updates made in this APAR are dependent on the setting for the MONITORGROUP, IPGROUP, and MONITORMAP parameters in your TN3270 server profile.

  - If you have coded the MONITORGROUP, IPGROUP, and MONITORMAP parameters in your TN3270 server profile in order to enable response time collection on all of your TN3270 clients, the following applies.

    The Telnet Connection Count attribute in the TN3270 Server Sessions workspace and the TCP/IP Address Space and TCP/IP Summary and Summary History workspaces reflects the count of TN3270 connections on the TCPIP stack. This count includes both TN3270 connections that are "in session" (that is, associated with an SNA application such as TSO) and those TN3270 connections that are "sessionless." This count is meaningful because both sessions and sessionless connections require the use of a TN3270 LU from the available TN3270 LU Pool. When the available TN3270 LU pool is exhausted, no further TN3270 connections can be established

    In this case, the rows of data in the new TN3270 Server Sessionless Connections Summary Table reflect the TN3270 connections that are current, as well as completed TN3270 sessionsless connections that match the TN3270 display criteria but not currently in session with a SNA application. The rows of data in the existing TN3270 Server Session Summary Table reflect the TN3270 connections that are both active and are currently in session with a SNA application, as well as completed TN3270 sessions that match the TN3270 display criteria.

  - If you have coded the MONITORGROUP, IPGROUP, and MONITORMAP parameters in your TN3270 server profile, but the TCP/IP address ranges in the IPGROUP definitions do not include the IP addresses of all possible TN3270 clients, then the value for Telnet Connection Count is calculated as follows:

    The Telnet Connection Count attribute in the TN3270 Server Sessions workspace and the TCP/IP Address Space and TCP/IP Summary and Summary History workspaces include TN3270 connections that are "in session" (that is, associated with an SNA application such as TSO), plus the "sessionless" TN3270 connections from TN3270 clients whose TCP/IP addresses are in an address range defined by an IPGROUP definition.

    In this case, sessionless TN3270 connections for TN3270 clients whose TCP/IP addresses are not in an address range defined by an IPGROUP definition are included in the value of Telnet Connection Count.

  - If you have **not** coded the MONITORGROUP, IPGROUP, and MONITORMAP parameters in your TN3270 server profile, the following applies.

    The Telnet Connection Count attribute in the TN3270 Server Sessions workspace and the TCP/IP Address Space and TCP/IP Summary and Summary History workspaces reflects the count of TN3270 Connections that are in session on the TCPIP stack. This count includes those TN3270 connections that are in session only (that is associated with an SNA application such as TSO).

    In this case, the value for the Telnet Connection Count attribute should match the value for the Telnet Session Count attribute. The rows of data in the new TN3270 Server Sessionless Connections Summary Table should be empty because no data is available. The rows of data in the existing TN3270 Server Session Summary Table reflect the TN3270 connections that are both active and currently in session with a SNA application, as well as completed TN3270 sessions that match the TN3270 display criteria.

- Updates to Table 9 on pages 45-46 of the current (Fix Pack 3) planning and configuration guide, titled "Data collected once every collection interval." The value for TCPIP Address Space row size has been increased from 564 to 572.

LPAR name				
TCP/IP address space name				
Type of data	**Real-time data attributes table**	**Row size in bytes**	**Frequency per interval**	**Memory usage**
TCP/IP and VTAM® (required collection)	TCPIP Address Space	**572**	1 row per TCPIP address space	
	TCPIP Devices	432	1 row per device	
	KN3 ICMP General Statistics	100	Up to 2 rows per TCPIP Address Space	
	KN3 ICMP Type Statistics	80	1 row per ICMP type per ICMP version	
	KN3 Interface Address	132	1 row per TCP/IP interface address	
	KN3 Interface Read Queue	312	1 row per read queue per active OSA Queued Direction I/O (QDIO) or HiperSockets interface	
	KN3 Interface Statistics	288	1 row per active strategic TCP/IP interface (max 256)	
	KN3 Interface Status	344	1 row per TCP/IP interface	
	KN3 Interface Write Queue	200	1 row per configured queue priority per OSA-Express Queued Direct I/O (QDIO) or HiperSocket interface	
	KN3 IP General Statistics	84	1 row per TCP/IP address space	
	KN3 TCP Counter Statistics	280	1 row per TCP/IP address space	
	KN3 UDP Counter Statistics	128	1 row per TCPIP Address Space	

LPAR name				
TCP/IP address space name				
Type of data	**Real-time data attributes table**	**Row size in bytes**	**Frequency per interval**	**Memory usage**
	OSA-Express LPARS	106	16 rows per OSA Channel per LPAR per local channel subsystem	
	OSA-Express Ports	768	1 row per OSA channel of channel subtype: gigabitEthernet,fastEthernet or oneThousandBaseTEthernet per port	
	OSA 10 Gigabit Ports Control	390	1 row per OSA channel of channel subtype: tenGigabitEthernet per port	
	OSA 10 Gigabit Ports Errors	420	1 row per OSA channel of channel subtype: tenGigabitEthernet per port	
	OSA 10 Gigabit Ports Summary	480	1 row per OSA channel of channel subtype: tenGigabitEthernet per port	
	OSA 10 Gigabit Ports Throughput	420	1 row per OSA channel of channel subtype: tenGigabitEthernet per port	
	OSA-Express3 Ports Control	390	1 row per OSA channel of channel subtype: osaexp3gigabitEthernet, osaexp3oneThousandBaseTEthernet or osaexp3tenGigabitEthernet per port	
	OSA-Express3 Ports Errors	476	1 row per OSA channel of channel subtype: osaexp3gigabitEthernet, osaexp3oneThousandBaseTEthernet or osaexp3tenGigabitEthernet per port	
	OSA-Express3 Ports Summary	592	1 row per OSA channel of channel subtype: osaexp3gigabitEthernet, osaexp3oneThousandBaseTEthernet or osaexp3tenGigabitEthernet per port	
	OSA-Express3 Ports Throughput	484	1 row per OSA channel of channel subtype: osaexp3gigabitEthernet, osaexp3oneThousandBaseTEthernet or osaexp3tenGigabitEthernet per port	
	TCPIP Memory Statistics	472	1 row per TCP/IP address space	
	TCPIP Stack Layer	552	1 row per TCP/IP address space	
TCP/IP Connection and Application Performance statistics collection	TCPIP Applications	572	1 row per TCP/IP application	
	TCPIP Connections	600	1 row per TCPIP connection	
	TCPIP Details	396	1 row per TCP connection	
	TCP Listener	208	1 row per TCP listener	
	UDP Connections	304	1 row per UDP endpoint	
Routing Table Statistics Collection	TCPIP Gateways	600	1 row per TCP/IP gateway collected on Routing Table Collection Frequency	
IPSec Security Collection	IPSec Status	360	1 row per TCP/IP address space	
	Current IP Filters	812	1 row per IP filter	
	Dynamic IP Tunnels	1024	1 row per dynamic IP tunnel	
	IKE Tunnels	664	1 row per IKE tunnel	
	Manual IP Tunnels	364	1 row per manual IP tunnel	

- Updates to Table 12 on page 48 of the current (Fix Pack 3) planning and configuration guide, titled "TN3270 data collected." The value for TN3270 Server Sess Avail row size has been increased from 400 to 408.

LPAR name				
TCP/IP address space name				
Type of data	**Real-time data attribute table**	**Row size in bytes**	**Frequency**	**Maximum rows stored**
TN3270 Server Statistics Collection	TN3270 Server Sess Avail	**408**	1 row per TN3270 server session that is active or was closed in the last 24 hours	
	TN3270 Response Time Buckets	204	0 rows	0

- Updates to Table 78 on page 240 of the current (Fix Pack 3) planning and configuration guide, titled "TCPIP Address Space (KN3TAS) worksheet." The record size and formula size have been increased from 598 to 600.

Interval	Record size	Formula	TCP/IP address space resources	TCP/IP stack	Expected storage required for 24 hours
15 minutes	**600**	4 x 24 x **600** x 1 x 1 / 1024	1	1	56 KB

- Updates to Table 126 on page 253 of the current (Fix Pack 3) planning and configuration guide, titled "TN3270 data collected." The record size and formula size have been increased from 428 to 436.

Type of data	Historical data attribute table	Row size in bytes	Frequency	Subtotal storage required
TN3270 Server Statistics Data Collection	TN3270 Server Sess Avail	**436**	1 row per active TN3270 server session + 1 row per closed TN3270 server session	14 KB

- Updates to Table 127 on page 253 of the current (Fix Pack 3) planning and configuration guide, titled "TN3270 Server Sess Avail (KN3TNA) worksheet." The record size and formula size have been increased from 428 to 436.

Record size	Formula	TN3270 server sessions	TCP/IP stack	Expected storage required for 24 hours
436	((4 x 8 x **436** x 1 x 1 x 1) + (**436** x 1 x 1 x 1)) / 1024	1	1	14 KB

Updates to the user's guide

The following updates were made to the *IBM Tivoli OMEGAMON XE for Mainframe Networks: Users'
Guide*, Version 4.2.0 Fix Pack 3 for Enhanced Monitoring and z/OS v1.12 Compatibility.

Updates to the TN3270 Server Sessions workspace

The TN3270 Server Sessions workspace has been updated as follows:

- The existing Telnet Session Count attribute in the Active TN3270 Sessions Table view has been renamed
  to Telnet Connection Count to reflect its actual meaning, which is all connections (in session with an
  application and not in session with an application).

- A new attribute Telnet Session Count has been added to the Active TN3270 Sessions Table view. The
  following existing links continue to be available from this table view:
  - TN3270 Server Session Pair
  - TN3270 Server Sessions for Remote IP
  - TN3270 Server Sessions for SNA Name

- The Active TN3270 Server Session graph view has been changed to plot the existing Telnet Connection
  Count as well as the new Telnet Session Count.

- The existing TN3270 Server Session Summary Table now displays only Telnet connections that are in
  session with an application, as well as completed TN3270 Server Sessions that meet the TN3270 display
  interval criteria. The following existing links continue to be available from this table view:
  - TN3270 Server Session Pair
  - TN3270 Server Session Details
  - TN3270 Server Sessions for Remote IP
  - TN3270 Server Sessions for SNA Name
  - System CPU Utilization
  - TCP Connections

- A new table, the TN3270 Server Sessionless Connection Summary table, has been added below the
  TN3270 Server Session Summary Table to display Telnet connections that are not in session with an
  application, and sessionless Telnet connections that completed within the TN3270 display interval. The
  following links are available from this table view:
  - TN3270 Server Sessions for Remote IP (the default link)
  - TN3270 Server Session Details
  - TCP Connections Link

Updates to the user guide description of this workspace are indicated with change bars in "TN3270
Server Sessions workspace."

TN3270 Server Sessions workspace

The TN3270 Server Sessions workspace provides the ability to monitor TN3270 connections and sessions
from a remote TN3270 client to a z/OS® TN3270 server. This workspace identifies the active and
completed sessions that have high response times.

This workspace is displayed by clicking TN3270 Navigator item.

This workspace displays the following views:

Additional workspaces:
> Right-clicking on the TN3270 Navigator item displays links to the following workspaces:
> - TN3270 Server Sessions (default)
> - TN3270 Server Session Availability

Links to other workspaces:
> Right-clicking the row in the Active TN3270 Sessions table provides links to the following
> workspaces:

- TN3270 Server Sessions Pair (default). You are prompted to specify a Telnet LU Name and SNA Application Name. This is the default link.
- "TN3270 Server Sessions for Remote IP workspace" on page 12. You are prompted to specify a Remote IP Address.
- "TN3270 Server Sessions for SNA Name workspace" on page 15. You are prompted to specify a SNA Application Name.

Click the Link icon by a row in the TN3270 Server Session Summary table in this workspace to display the following workspaces:
- TN3270 Server Sessions Pair (default). You are prompted to specify a Telnet LU Name and SNA Application Name. This is the default link.
- TN3270 Server Session Details
- "TN3270 Server Sessions for Remote IP workspace" on page 12. You are prompted to specify a Remote IP Address.
- "TN3270 Server Sessions for SNA Name workspace" on page 15. You are prompted to specify a SNA Application Name.
- The IBM® Tivoli® OMEGAMON® XE on z/OS System CPU Utilization workspace. This link will be displayed if the OMEGAMON XE on z/OS monitoring agent has been installed and configured on the z/OS system being monitored and the Tivoli Enterprise Portal user is authorized to view the target product's workspaces.
- TCP Connections

Click the Link icon by a row in the TN3270 Sessionless Server Connection Summary table in this workspace to display the following workspaces:
- "TN3270 Server Sessions for Remote IP workspace" on page 12 (default). You are prompted to specify a Remote IP Address.
- TN3270 Server Sessions Details
- TCP Connections

Data source:
z/OS Communication Server Network Management Interface

Default filter:
Average total response time > 1 second

Configuration parameter:
The TN3270 Server Statistics Collection Configuration Tool parameter enables and disables data collection for this workspace. The TCP/IP Connection and Application Performance Statistics Collection parameter in the Configuration Tool enables Telnet Connection Count information.

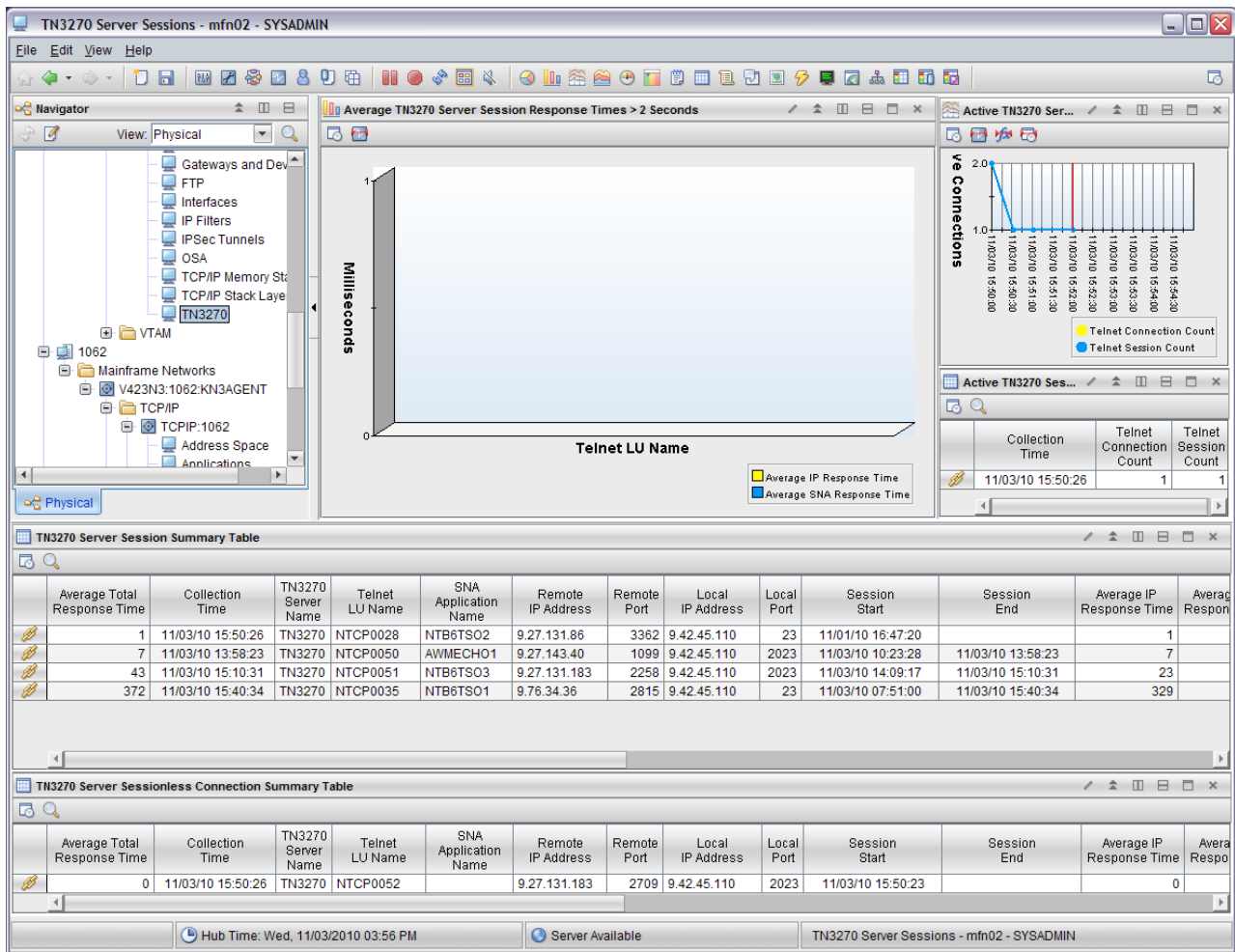Figure 1 on page 9 shows the TN3270 Server Sessions workspace.

Figure 1. The OMEGAMON XE for Mainframe Networks TN3270 Server Sessions workspace

The TN3270 Server Sessions workspace provides the following views:

- The **Average TN3270 Server Session Response Times > 2 Seconds** : Displays Average IP Response Time and Average SNA Response Time in a stacked bar chart graphed against Telnet LU Name for TN3270 sessions that have Average Total Response Times over 2 seconds, where:
  - **Yellow** represents the Average IP Response Time.
  - **Blue** represents the Average SNA Response Time.
- **Active TN3270 Server Sessions**: Displays the number of active Telnet sessions and active Telnet connections at the end of the collection interval in a line graph, graphed over time, where:
  - **Yellow** represents the Telnet Connection Count.
  - **Blue** represents the Telnet Session Count.
- The **"Active TN3270 Sessions table" on page 10**: Displays the Telnet Session Count and the Telnet Connection Count.

  Clicking the row in this table provides links to the following workspaces:

  - TN3270 Server Sessions Pair (default). You are prompted to specify a Telnet LU Name and SNA Application Name. This is the default link.
  - "TN3270 Server Sessions for Remote IP workspace" on page 12. You are prompted to specify a Remote IP Address.
  - "TN3270 Server Sessions for SNA Name workspace" on page 15. You are prompted to specify a SNA Application Name.

- The **"TN3270 Server Session Summary table"**: Displays performance data for TN3270 server sessions that are in session with an application with an Average Total Response Time greater than 1 second. The displayed sessions have a collection time within the TN3270 display interval (by default, last 2 hours). This data includes active sessions (sliding window and bucket count metrics are collected for these sessions each collection interval) and sessions opened or closed since the last collection. There is no default sort order.

  Clicking the row in this table provides links to the following workspaces:

  – TN3270 Server Session Pair (default). You are prompted to specify a Telnet LU Name and SNA Application Name. This is the default link.

  – TN3270 Server Session Detail

  – "TN3270 Server Sessions for Remote IP workspace" on page 12. You are prompted to specify a Remote IP Address.

  – "TN3270 Server Sessions for SNA Name workspace" on page 15. You are prompted to specify a SNA Application Name.

  – **System CPU Utilization**. IBM Tivoli OMEGAMON XE on z/OS System CPU Utilization workspace. This link is displayed if the OMEGAMON XE on z/OS monitoring agent has been installed and configured on the z/OS system being monitored and the Tivoli Enterprise Portal user is authorized to view the target product's workspaces.

  – TCP Connections

- The **"TN3270 Server Sessionless Connection Summary table" on page 11**: Displays performance data for TN3270 server sessions for Telnet connections that are not in session with an application. The displayed connections were active within the TN3270 display interval (by default, last 2 hours).

  Clicking the row in this table provides links to the following workspaces:

  – "TN3270 Server Sessions for Remote IP workspace" on page 12 (default). You are prompted to specify a Remote IP Address.

  – TN3270 Server Session Detail

  – TCP Connections

For more information on sliding window response times and bucket counts, see *z/OS Communications Server IP Configuration Guide*.

Active TN3270 Sessions table

The Active TN3270 Sessions table displays only two attributes (in addition to Collection Time):

- **Telnet Session Count**, defined as the number of Telnet connections that are currently in session with an application. The format is an integer.
- **Telnet Connection Count**, defined as the total number of Telnet connections. The format is an integer.

TN3270 Server Session Summary table

The TN3270 Server Session Summary table displays the following attributes:
- Average Total Response Time
- TN3270 Server Name
- Telnet LU Name
- SNA Application Name
- Remote IP Address
- Remote Port
- Local IP Address
- Local Port
- Session Start
- Session End
- Average IP Response Time
- Average SNA Response Time
- Average Transaction Count
- Response Time Collection Time

- Total Transactions Detected
- Definite Responses Detected
- Response Time Standard Deviation
- IP Response Time Standard Deviation
- SNA Response Time Standard Deviation
- Total Bytes Received (in GB)
- Total Bytes Received
- Total Bytes Sent (in GB)
- Total Bytes Sent
- Session Type
- LU Selection Method
- Logmode Name
- SSL Status

For more information about these attributes, see the TN3270 Server Sess Avail attributes.

TN3270 Server Sessionless Connection Summary table

The TN3270 Server Sessionless Connection Summary table displays the following attributes:
- Average Total Response Time
- TN3270 Server Name
- Telnet LU Name
- SNA Application Name
- Remote IP Address
- Remote Port
- Local IP Address
- Local Port
- Session Start
- Session End
- Average IP Response Time
- Average SNA Response Time
- Average Transaction Count
- Response Time Collection Time
- Total Transactions Detected
- Definite Responses Detected
- Response Time Standard Deviation
- IP Response Time Standard Deviation
- SNA Response Time Standard Deviation
- Total Bytes Received (in GB)
- Total Bytes Received
- Total Bytes Sent (in GB)
- Total Bytes Sent
- Session Type
- LU Selection Method
- Logmode Name
- SSL Status

For more information about these attributes, see the TN3270 Server Sess Avail attributes.

Updates to the TN3270 Server Sessions for Remote IP workspace

The TN3270 Server Sessions for Remote IP workspace has been updated as follows:
- The existing Telnet Session Count in the Active TN3270 Sessions Table view has been renamed to Telnet Connection Count.
- The new attribute (Telnet Session Count) has been added to the Active TN3270 Sessions Table view. The following existing links continue to be available from this summary table:

- TN3270 Server Session Pair
- TN3270 Server Sessions for Remote IP
- TN3270 Server Sessions for SNA Name
- The Active TN3270 Server Session graph view has been changed to plot Telnet Connection Count, as well as the new Telnet Session Count.

Updates to the user guide description of this workspace are indicated with change bars in "TN3270 Server Sessions for Remote IP workspace."

TN3270 Server Sessions for Remote IP workspace

The TN3270 Server Sessions for Remote IP workspace displays performance data for active or completed TN3270 connection from a specified remote IP address. In order to be displayed, performance data must have been collected for a session within the TN3270 display interval (by default, last 2 hours). This data includes active TN3270 connections with or without application sessions, and TN3270 connections without application sessions that ended within the TN3270 display interval.

This workspace is displayed by right-clicking on a link for a TN3270 connection in one of the following workspaces:
- TN3270 Server Sessions
- TN3270 Server Sessions for SNA Name

Additional workspaces:
This workspace cannot be accessed from the TN3270 Navigator item.

Links to other workspaces:
Right-clicking the row in the Active TN3270 Sessions table provides links to the following workspaces:
- TN3270 Server Sessions Pair (default). You are prompted to specify a Telnet LU Name and SNA Application Name. This is the default link.
- "TN3270 Server Sessions for Remote IP workspace." You are prompted to specify a Remote IP Address.
- "TN3270 Server Sessions for SNA Name workspace" on page 15. You are prompted to specify a SNA Application Name.

Right-clicking the row in the TN3270 Server Session Summary table for *remote_IP_address* provides links to the following workspaces:
- TN3270 Server Sessions Pair (default)
- TN3270 Server Session Details
- "TN3270 Server Sessions for SNA Name workspace" on page 15
- TCP Connections

Data source:
z/OS Communication Server Network Management Interface

Default filter:
Remote IP Address

Configuration parameter:
The TN3270 Server Statistics Collection Configuration Tool parameter enables and disables data collection for this workspace. The TCP/IP Connection and Application Performance Statistics Collection parameter in the Configuration Tool enables Telnet Connection Count information.

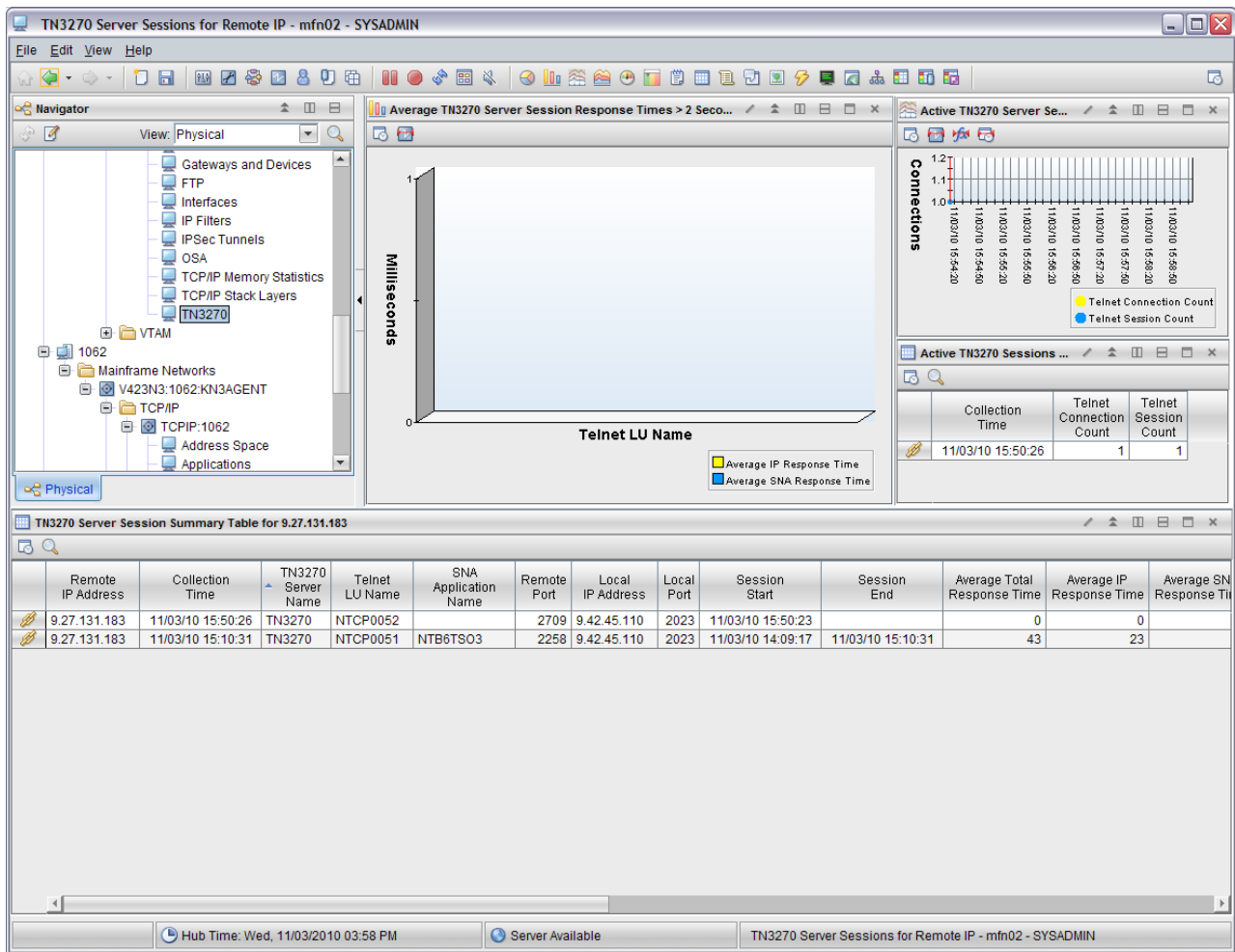Figure 2 on page 13 shows the TN3270 Server Sessions for Remote IP workspace.

Figure 2. The OMEGAMON XE for Mainframe Networks TN3270 Server Sessions for Remote IP workspace

The TN3270 Server Sessions for Remote IP workspace provides the following views:

- **Average TN3270 Server Session Response Times > 2 Seconds**: Displays Average IP Response Time and Average SNA response time in a stacked bar chart graphed against Telnet LU Name for TN3270 sessions that have average Total Response Times over 2 seconds and the specified Remote IP Address, where:
  - **Yellow** represents the Average IP Response Time.
  - **Blue** represents the Average SNA Response Time.
- **Active TN3270 Server Sessions**: Displays the number of active Telnet sessions and active Telnet connections at the end of the collection interval in a line graph, graphed over time, where:
  - **Yellow** represents the Telnet Connection Count.
  - **Blue** represents the Telnet Session Count.
- **"Active TN3270 Sessions table" on page 14**: Displays the number of active Telnet sessions and active Telnet connections at a specific collection time.

  Right-clicking the row in this table provides links to the following workspaces:
  - TN3270 Server Sessions Pair. You are prompted to specify a Telnet LU Name and SNA Application Name. This is the default link.
  - "TN3270 Server Sessions for Remote IP workspace" on page 12. You are prompted to specify a Remote IP Address.
  - "TN3270 Server Sessions for SNA Name workspace" on page 15. You are prompted to specify a SNA Application Name.

- "TN3270 Server Session Summary table for *remote_IP_address*": Provides performance data for TN3270 Telnet connection with or without application sessions from a specified remote IP address. The displayed connections have a collection time within the TN3270 display interval (by default, last 2 hours). This data includes active TN3270 connections with or without application sessions, and TN3270 connections without application sessions that ended within the TN3270 display interval. There is no default sort order.

  Right-clicking the row in this table provides links to the following workspaces:
  - TN3270 Server Session Pair
  - TN3270 Server Session Details
  - "TN3270 Server Sessions for SNA Name workspace" on page 15
  - TCP Connections

  For additional information about sliding windows, see *z/OS Communications Server IP Configuration Guide*.

Active TN3270 Sessions table

The Active TN3270 Server Sessions table displays the number of active Telnet sessions and active Telnet connections at the end of the collection interval. This table displays only two attributes (in addition to Collection Time):

- **Telnet Session Count**, defined as the number of Telnet connections that are currently in session with an application. The format is an integer.
- **Telnet Connection Count**, defined as the total number of Telnet connections. The format is an integer.

TN3270 Server Session Summary table for *remote_IP_address*

The TN3270 Server Sessions Summary table for *remote_IP_address* displays the following attributes:
- Remote IP Address
- TN3270 Server Name
- Telnet LU Name
- SNA Application Name
- Remote Port
- Local IP Address
- Local Port
- Session Start
- Session End
- Average Total Response Time
- Average IP Response Time
- Average SNA Response Time
- Average Transaction Count
- Response Time Collection Time
- Total Transactions Detected
- Definite Responses Detected
- Response Time Standard Deviation
- IP Response Time Standard Deviation
- SNA Response Time Standard Deviation
- Total Bytes Received (in GB)
- Total Bytes Received
- Total Bytes Sent (in GB)
- Total Bytes Sent
- Total Bytes (in GB)
- Total Bytes
- Session Type
- LU Selection Method
- Logmode Name
- SSL Status

The TN3270 Server Session Summary table for *remote_IP_address* displays performance data for TN3270 Telnet connection with or without application sessions from a specified remote IP address. The displayed connections have a collection time within the TN3270 display interval (by default, last 2 hours). This data includes active TN3270 connections with or without application sessions, and TN3270 connections without application sessions that ended within the TN3270 display interval. There is no default sort order.

For more information about these attributes, see the TN3270 Server Sess Avail attributes.

Updates to the TN3270 Server Sessions for SNA Name workspace

The TN3270 Server Sessions for SNA Name workspace has been updated as follows:
- The existing Telnet Session Count in the Active TN3270 Sessions Table view has been renamed to Telnet Connection Count and the meaning of the Telnet Session Count attribute has been changed to mean "the total number of Telnet connections." See "Updates to the online help for Tivoli Enterprise Portal" on page 1 for more information.
- The new attribute (Telnet Session Count) has been added to the Active TN3270 Sessions Table view. The following existing links continue to be available:
  – TN3270 Server Session Pair
  – TN3270 Server Sessions for Remote IP
  – TN3270 Server Sessions for SNA Name
- The Active TN3270 Server Session graph view has been changed to plot Telnet Connection Count, as well as the new Telnet Session Count.

Updates to the user guide description of this workspace are indicated with change bars in "TN3270 Server Sessions for Remote IP workspace" on page 12.

TN3270 Server Sessions for SNA Name workspace

The TN3270 Server Sessions for SNA Name workspace displays performance data for active or completed TN3270 server sessions with a specified SNA Application Name and an Average Total Response Time over 1 second. In order to be displayed, performance data must have been collected for a session within the TN3270 display interval (by default, last 2 hours). This data includes active sessions (sliding window and bucket count metrics are collected for these sessions each collection interval) and sessions opened or closed since the last collection.

This workspace is displayed by right-clicking on a link for a TN3270 session in one of the following workspaces:
- "TN3270 Server Sessions workspace" on page 7
- "TN3270 Server Sessions for Remote IP workspace" on page 12
- "TN3270 Server Sessions for SNA Name workspace"

The tables and graphs in this workspace display data only if the TN3270 server you are monitoring is on running a z/OS version 1.8 or higher system. If the TN3270 server is running on a pre-z/OS version 1.8 system, the average response times are set to 0 and therefore all rows are filtered out by the default query.

Additional workspaces:
> This workspace cannot be accessed from the TN3270 Navigator item.

Links to other workspaces:
> Right-clicking the link icon for a row in the Active Telnet Session Count Summary table provides links to the following workspaces:
> - TN3270 Server Sessions Pair (default). You are prompted to specify a Telnet LU Name and SNA Application Name. This is the default link.

- "TN3270 Server Sessions for Remote IP workspace" on page 12. You are prompted to specify a Remote IP Address.
- "TN3270 Server Sessions for SNA Name workspace" on page 15. You are prompted to specify a SNA Application Name.

Right-clicking the link icon for a row in the TN3270 Server Session Summary table for *SNA Name* provides links to the following workspaces:

- TN3270 Server Sessions Pair (default)
- TN3270 Server Session Details
- "TN3270 Server Sessions for Remote IP workspace" on page 12
- TCP Connections

Data source:
z/OS Communication Server Network Management Interface

Default filter:
SNA Application Name and Average Total Response Time > 1 Second

Configuration parameter:
The TN3270 Server Statistics Collection Configuration Tool parameter enables and disables data collection for this workspace. The TCP/IP Connection and Application Performance Statistics Collection parameter in the Configuration Tool enables Telnet Connection Count information.

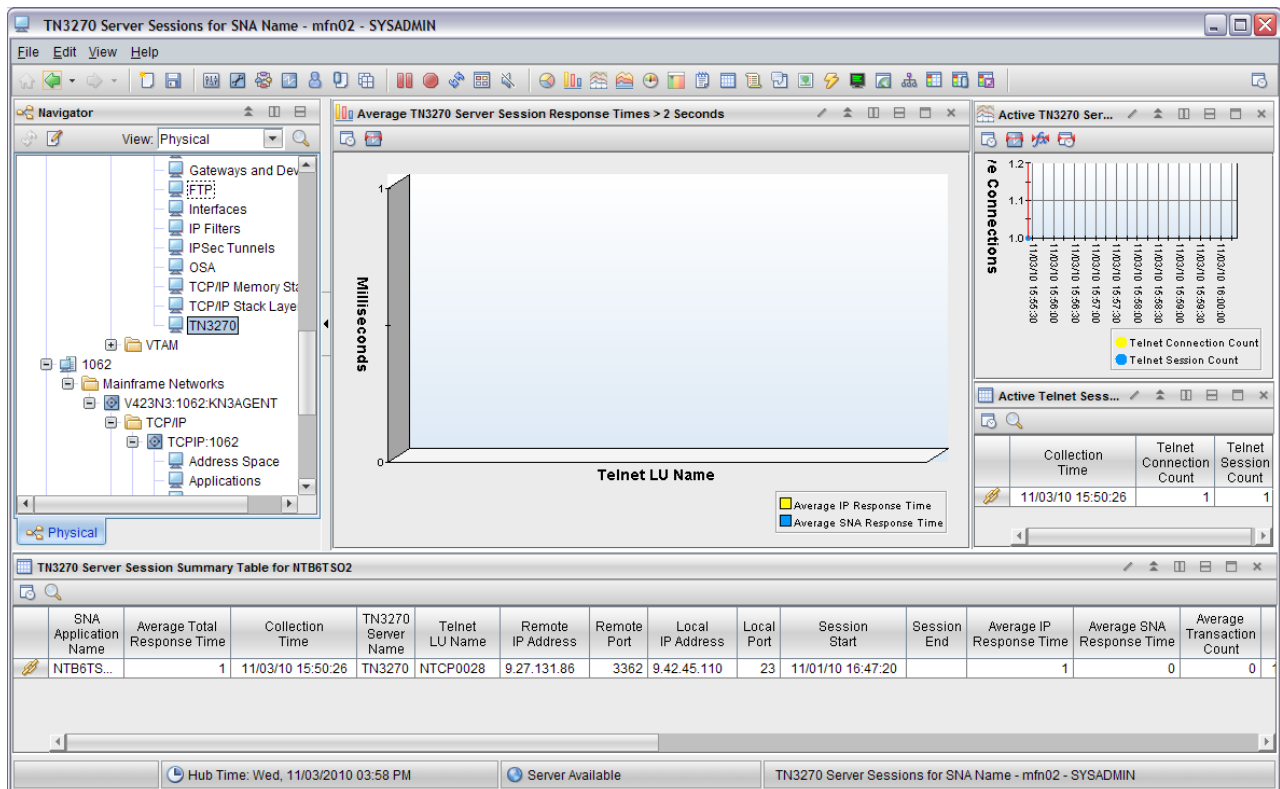Figure 3 shows the TN3270 Server Sessions for SNA Name workspace.

Figure 3. The OMEGAMON XE for Mainframe Networks TN3270 Server Sessions for SNA Name workspace

The TN3270 Server Sessions for SNA Name workspace provides the following views:

- **Average TN3270 Server Session Response Times > 2 Seconds**: Displays Average IP Response Time and Average SNA Response Time in a stacked bar chart graphed against Telnet LU Name, where:
  – **Yellow** represents the Average IP Response Time.

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- **Blue** represents the Average SNA Response Time.
- **Active TN3270 Server Sessions**: Displays the number of active Telnet sessions and active Telnet connections at the end of the collection interval in a line graph, graphed over time, where:
  - **Yellow** represents the Telnet Connection Count.
  - **Blue** represents the Telnet Session Count.
- **"Active Telnet Session Count Summary table"**: Displays the number of Telnet sessions at a specific collection time.

  Right-clicking the link icon for a row in this table provides links to the following workspaces:
  - TN3270 Server Sessions Pair. You are prompted to specify a Telnet LU Name and SNA Application Name. This is the default link.
  - "TN3270 Server Sessions for Remote IP workspace" on page 12. You are prompted to specify a Remote IP Address.
  - "TN3270 Server Sessions for SNA Name workspace" on page 15. You are prompted to specify a SNA Application Name.
- The "Active Telnet Session Count Summary table" : Displays the number of Telnet sessions at a specific collection time. Additional information is provided in the following section.
- The "TN3270 Server Session Summary table for *SNA Name*": Provides a tabular summary of all the available performance data for active or completed TN3270 server sessions with the specified SNA application name. The TN3270 Server Session Summary table for *SNA Name* displays performance data for TN3270 server sessions from a specified SNA application name. The displayed sessions have a collection time within the TN3270 display interval (by default, last 2 hours).

  Right-clicking the link icon for a row in this table provides links to the following workspaces:
  - TN3270 Server Session Pair
  - TN3270 Server Session Details
  - "TN3270 Server Sessions for Remote IP workspace" on page 12
  - TCP Connections

  For additional information about sliding windows, see *z/OS Communications Server IP Configuration Guide*.

Active Telnet Session Count Summary table

The row in the Active Telnet Session Count Summary table displays the number of active Telnet sessions and active Telnet connections at a specific collection time. The Active TN3270 Server Sessions table displays only two attributes (in addition to Collection Time):

- **Telnet Session Count**, defined as the number of Telnet connections that are currently in session with an application. The format is an integer.
- **Telnet Connection Count**, defined as the total number of Telnet connections. The format is an integer.

TN3270 Server Session Summary table for *SNA Name*

The TN3270 Server Session Summary table for *SNA Name* displays the following attributes:
- SNA Application name
- Average Total Response Time
- TN3270 Server Name
- Telnet LU Name
- Remote IP Address
- Remote Port
- Local IP Address
- Local Port
- Session Start
- Session End
- Average IP Response Time
- Average SNA Response Time
- Average Transaction Count

- Response Time Collection Time
- Total Transactions Detected
- Definite Responses Detected
- Response Time Standard Deviation
- IP Response Time Standard Deviation
- SNA Response Time Standard Deviation
- Total Bytes Received (in GB)
- Total Bytes Received
- Total Bytes Sent (in GB)
- Total Bytes Sent
- Total Bytes (in GB)
- Total Bytes
- Session Type
- LU Selection Method
- Logmode Name
- SSL Status

For more information about these attributes, see the TN3270 Server Sess Avail attributes.

The TN3270 Server Session Summary table for *SNA Name* displays performance data for TN3270 server sessions from a specified SNA application name. The displayed sessions have a collection time within the TN3270 display interval (by default, last 2 hours).

Updates to the TCP/IP Address Space workspace

The TCP/IP Address Space workspace has been updated as follows:
- The existing Telnet Session Count in the Address Space Summary Table view was renamed to Telnet Connection Count.
- In the Telnet Pool Usage view, Telnet Session Count in the legend has been changed to Telnet Connection Count.

Updates to the user guide description of this workspace are indicated in **bold** in "Address Space workspace."

Address Space workspace

The Address Space workspace displays address space information for the TCP/IP stack selected.

This workspace is displayed by clicking on the Address Space Navigator item in the TCP/IP branch of the Navigation tree.

Note: If the address space being monitored is running on z/OS v1.11 or earlier, the values for this attribute group are retrieved using SNMP. If the address space being monitored is running on z/OS v1.12 or later, the values for this attribute group are retrieved using the z/OS Communications Server callable Network Management Interface.

Additional workspaces:
No additional workspaces are available from the Address Space Navigator item.

Links to other workspaces:
No links to other workspaces are available from the summary table in this workspace.

Data source:
Address space data is collected from the following sources:
- z/OS control blocks
- z/OS Communications Server Network Management Interfaces (NMIs) (z/OS v1.11 or earlier) and callable NMIs (z/OS v1.12 and later)

- • If the address space being monitored is running on z/OS v1.11 or earlier, the following SNMP MIBs:
  - – RFC2011
  - – RFC2012
  - – RFC2013
- • If the address space being monitored is running on z/OS v1.11 or earlier, data for this workspace is collected using SNMP, and the SNMP daemon is a product prerequisite. Therefore this workspace in always enabled.
- • If the address space being monitored is running on z/OS v1.12 or later, the TCP/IP Stack Layer Statistics Collection parameter in the Configuration Tool enables and disables data collection for some attributes in this workspace. The TCP/IP Connection and Application Performance Statistics Collection parameter in the Configuration Tool enables Telnet Connection Count information. The Interface Statistics Collection parameter in the Configuration Tool enables and disables data collection for other attributes in this workspace.

Default filter:
> None

Configuration parameter:
> The TCP/IP Stack Layer Statistics Collection parameter in the Configuration Tool enables and disables data collection for this workspace.

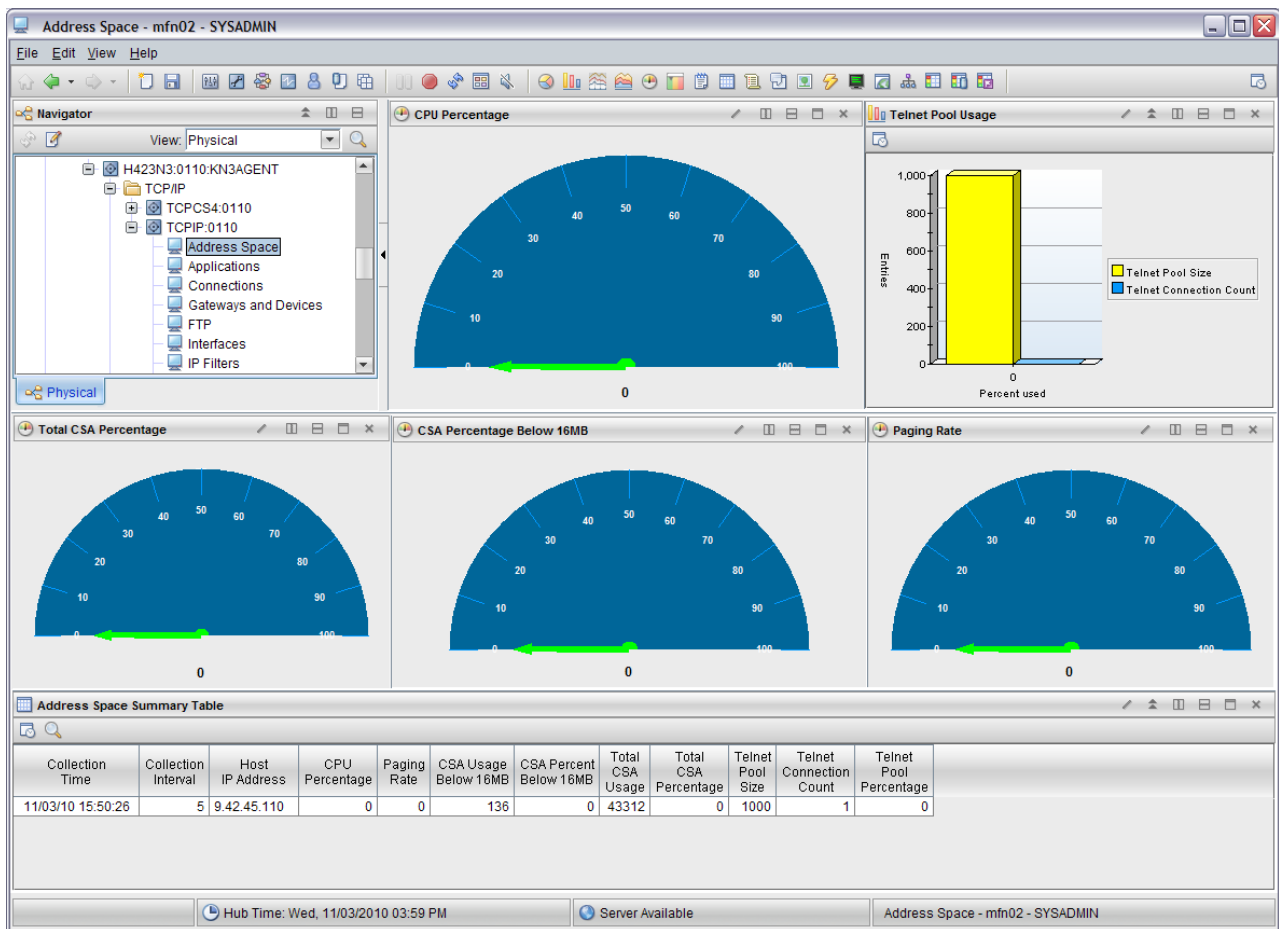Figure 4 shows the Address Space workspace.

Figure 4. The OMEGAMON XE for Mainframe Networks Address Space workspace

The Address Space workspace displays the following views:

- **CPU Percentage**: Displays the percentage of CPU in use when the last sampling interval ended using a circular gauge.
- **Telnet Pool Usage**: Displays the Telnet Pool Size and the Telnet Session Count as a bar chart, where:
  - **Yellow** represents Telnet Pool Size.
  - **Blue** represents Telnet Connection Count.
- **Total CSA Percentage**: Displays the percentage of the Common Service Area (CSA) used when the last sampling interval ended as a circular gauge.
- **CSA Percentage Below 16MB**: Displays the percentage of CSA storage below 16 megabytes in use when the last sampling interval ended as a circular gauge.
- **Paging Rate**: Displays the paging rate when the last sampling interval ended as a circular gauge.
- **"Address Space Summary table"**: Provides details about the address space information displayed in the charts on the Address Space workspace.

Address Space Summary table

The following attributes are displayed in the Address Space Summary table:

- Collection Interval
- Host IP Address
- Host IP Address (IPv4 only)
- CPU Percentage
- Paging Rate
- CSA Usage Below 16MB
- CSA Percent Below 16MB
- Total CSA Usage
- Total CSA Percentage
- Telnet Pool Size
- Telnet Connection Count
- Telnet Pool Percentage

For more information about these attributes, see the TCP/IP Address Space attributes.

Note: The TCP/IP Address Space workspace and the TCP/IP Summary workspace share a common attribute table, TCPIP_Address_Space. Only a subset of the attributes are displayed in each workspace.

Updates to the TCP/IP Summary workspace

The TCP/IP Summary workspace has been updated as follows:

- In the Resource Summary view, Telnet Session Count in the legend has been renamed to Telnet Connection Count.
- The existing Telnet Session Count in the TCP/IP Summary Table view has been renamed to Telnet Connection Count.

Updates to the user guide description of this workspace are indicated with change bars in "TCP/IP Summary workspace."

TCP/IP Summary workspace

The TCP/IP Summary workspace shows the general health and activity of the TCP/IP stack. A TCP/IP protocol stack is uniquely defined within a z/OS system image by the TCP/IP job name and the fully qualified host name or IP address.

This workspace is displayed by clicking the TCP/IP stack Navigator item for any monitored TCP/IP stack.

Note: If the address space being monitored is running on z/OS v1.11 or earlier, the values for this attribute group are retrieved using SNMP. If the address space being monitored is running on z/OS v1.12 or later, the values for this attribute group are retrieved using the z/OS Communications Server callable Network Management Interface.

Additional workspaces:
>Right-click the TCP/IP stack Navigator item to display the following additional workspaces:
>- "TCP/IP Summary History workspace" on page 24.

Links to other workspaces:
>No links to other workspaces are available from the summary table in this workspace.

Data source:
>TCP/IP stack data is collected from the following sources:
>- z/OS control blocks
>- z/OS Communications Server SNMP (z/OS v1.11 or earlier) and callable Network Management Interfaces (NMIs) (z/OS v1.12 and later)
>- If the address space being monitored is running on z/OS v1.11 or earlier, the following SNMP MIBs:
> - RFC2011
> - RFC2012
> - RFC2013

Default filter:
>None

Configuration parameter:
>- If the address space being monitored is running on z/OS v1.11 or earlier, data for this workspace is collected using SNMP, and the SNMP daemon is a product prerequisite. Therefore this workspace in always enabled.
>- If the address space being monitored is running on z/OS v1.12 or later, the TCP/IP Stack Layer Statistics Collection parameter in the Configuration Tool enables and disables data collection for some attributes in this workspace. The TCP/IP Connection and Application Performance Statistics Collection parameter in the Configuration Tool enables Telnet Connection Count information. The Interface Statistics Collection parameter in the Configuration Tool enables and disables data collection for other attributes in this workspace.

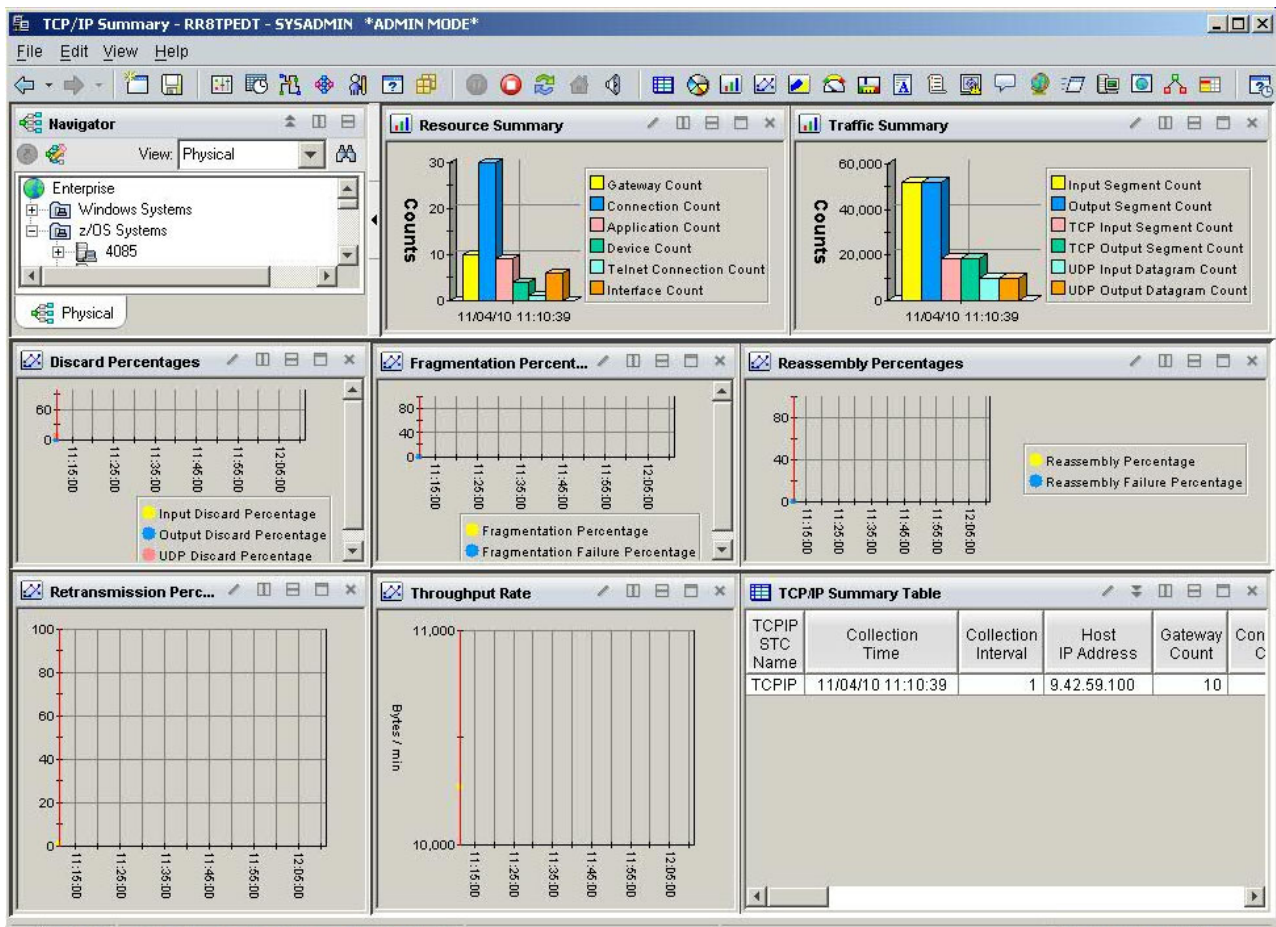Figure 5 on page 22 shows the TCP/IP Summary workspace.

Figure 5. The OMEGAMON XE for Mainframe Networks TCP/IP Summary workspace

The TCP/IP Summary workspace contains the following views:

- **Resource Summary**: Displays the count of TCP/IP resources by type in a bar chart, where:
  - **Yellow** represents the Gateway Count.
  - **Blue** represents the Connection Count.
  - **Pink** represents the Application Count.
  - **Green** represents the Device Count.
  - **Turquoise** represents the Telnet Connection Count.
  - **Orange** represents the Interface Count.
- **Traffic Summary**: Displays the count of TCP/IP resources by type in a bar chart, where:
  - **Yellow** represents the Input Segment Count.
  - **Blue** represents the Output Segment Count.
  - **Pink** represents the TCP Input Segment Count.
  - **Green** represents the TCP Input Segment Count.
  - **Turquoise** represents the UDP Input Datagram Count.
  - **Orange** represents the UDP Output Datagram Count.
- **Discard Percentages** : Provides the following data in a line chart, where:
  - **Yellow** represents the Input Discard Percentage.
  - **Blue** represents the Output Discard Percentage.
  - **Pink** represents the UDP Discard Percentage.
- **Fragmentation Percentages**: Provides the following data in a line chart, where:
  - **Yellow** represents the Fragmentation Percentage.
  - **Blue** represents the Fragmentation Failure Percentage.
- **Reassembly Percentages**: Provides the following data in a line chart, where:

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- – **Yellow** represents the Reassembly Percentage.
  - – **Blue** represents the Reassembly Failure Percentage.
- **Retransmission Percentages**: Shows the percentage of TCP segments retransmitted over time in a line graph.
- **Throughput Rate**: Shows the byte rate, or number of bytes received or sent, per minute, over time in a line graph.
- **"TCP/IP Summary table"**: Displays the TCP/IP Summary attributes that can be used to view information about TCP/IP stack conditions, find and fix problems in your network, or create situations that monitor information for a selected TCP/IP stack.

TCP/IP Summary table

The following attributes are displayed in the TCP/IP Summary table:
- TCPIP STC Name
- Collection Interval
- Host IP Address
- Host IP Address (IPv4 only)
- Gateway Count
- Connection Count
- Byte Rate
- Application Count
- Device Count
- Interface Count
- Telnet Pool Size
- Telnet Connection Count
- Telnet Pool Percentage
- Input Packet Count (in G)
- Input Packet Count
- Output Packet Count (in G)
- Output Packet Count
- Input Discards
- Input Discard Percentage
- Output Discards
- Output Discard Percentage
- Reassembly Count
- Reassembly Percentage
- Reassembly Failure Count
- Reassembly Failure Percentage
- Fragmentation Count
- Fragmentation Percentage
- Fragmentation Failures
- Fragmentation Failure Percentage
- TCP Session Count
- TCP Input Segment Count (in G)
- TCP Input Segment Count
- TCP Output Segment Count (in G)
- TCP Output Segment Count
- TCP Retransmitted Segments
- TCP Retransmit Percentage
- UDP Input Datagram Count (in G)
- UDP Input Datagram Count
- UDP Output Datagram Count (in G)
- UDP Output Datagram Count
- UDP Input Errors
- UDP No Port Count
- UDP Discard Percentage

For more information about these attributes, see the TCP/IP Address Space attributes.

Note: The TCP/IP Address Space workspace and the TCP/IP Summary workspace share a common attribute table, TCPIP_Address_Space. Only a subset of the attributes is displayed in each workspace.

Updates to the TCP/IP Summary History workspace

The TCP/IP Summary History workspace has been updated as follows:
- The title of the Telnet Session Count view has been changed to Telnet Connection Count.
- The legend on the graph for the Telnet Connection Count view has been changed from Telnet Session Count to Telnet Connection Count.
- The label on the Y-axis of the graph for the Telnet Connection Count view has been changed from Sessions to Connections.
- The existing Telnet Session Count in the TCP/IP History Summary Table view has been renamed to Telnet Connection Count.

Updates to the user guide description of this workspace are indicated with change bars in the in "TCP/IP Summary History workspace."

TCP/IP Summary History workspace

The TCP/IP Summary workspace displays historical performance data for the general health and activity of the TCP/IP stack. A TCP/IP protocol stack is uniquely defined within a z/OS system image by the TCP/IP job name and the fully qualified host name or IP address. This workspace displays the most recent 24 hours of historical data by default.

This workspace can be displayed by right-clicking on the TCP/IP stack icon in the Navigator and selecting the TCP/IP Summary History workspace from the workspace list.

Note: If the address space being monitored is running on z/OS v1.11 or earlier, the values for this attribute group are retrieved using SNMP. If the address space being monitored is running on z/OS v1.12 or later, the values for this attribute group are retrieved using the z/OS Communications Server callable Network Management Interface.

Additional workspaces:
> Click the on the TCP/IP stack icon in the Navigator to display the "TCP/IP Summary workspace" on page 20.

Links to other workspaces:
> No links to other workspaces are available from the summary table in this workspace.

Data source:
> TCP/IP stack data is collected from the following sources:
> - z/OS control blocks
> - z/OS Communications Server SNMP (z/OS v1.11 or earlier) and callable Network Management Interfaces (NMIs) (z/OS v1.12 and later)
> - If the address space being monitored is running on z/OS v1.11 or earlier, the following SNMP MIBs:
>   - RFC2011
>   - RFC2012
>   - RFC2013
> - If the monitoring agent address space is running on z/OS v1.11 or earlier, data for this workspace is collected using SNMP, and the SNMP daemon is a product prerequisite.
> - If the monitoring address space is running on z/OS v1.12 or later, data for this workspace is collected using the z/OS Communications Server Network Management Interfaces (NMIs).

Default filter:
>   None

Configuration parameter:
>   The TCP/IP Stack Layer Statistics Collection parameter in the Configuration Tool enables and
>   disables data collection for some attributes in this workspace. The TCP/IP Connection and
>   Application Performance Statistics Collection parameter in the Configuration Tool enables Telnet
>   Connection Count information. The Interface Statistics Collection parameter in the Configuration
>   Tool enables and disables data collection for other attributes in this workspace.

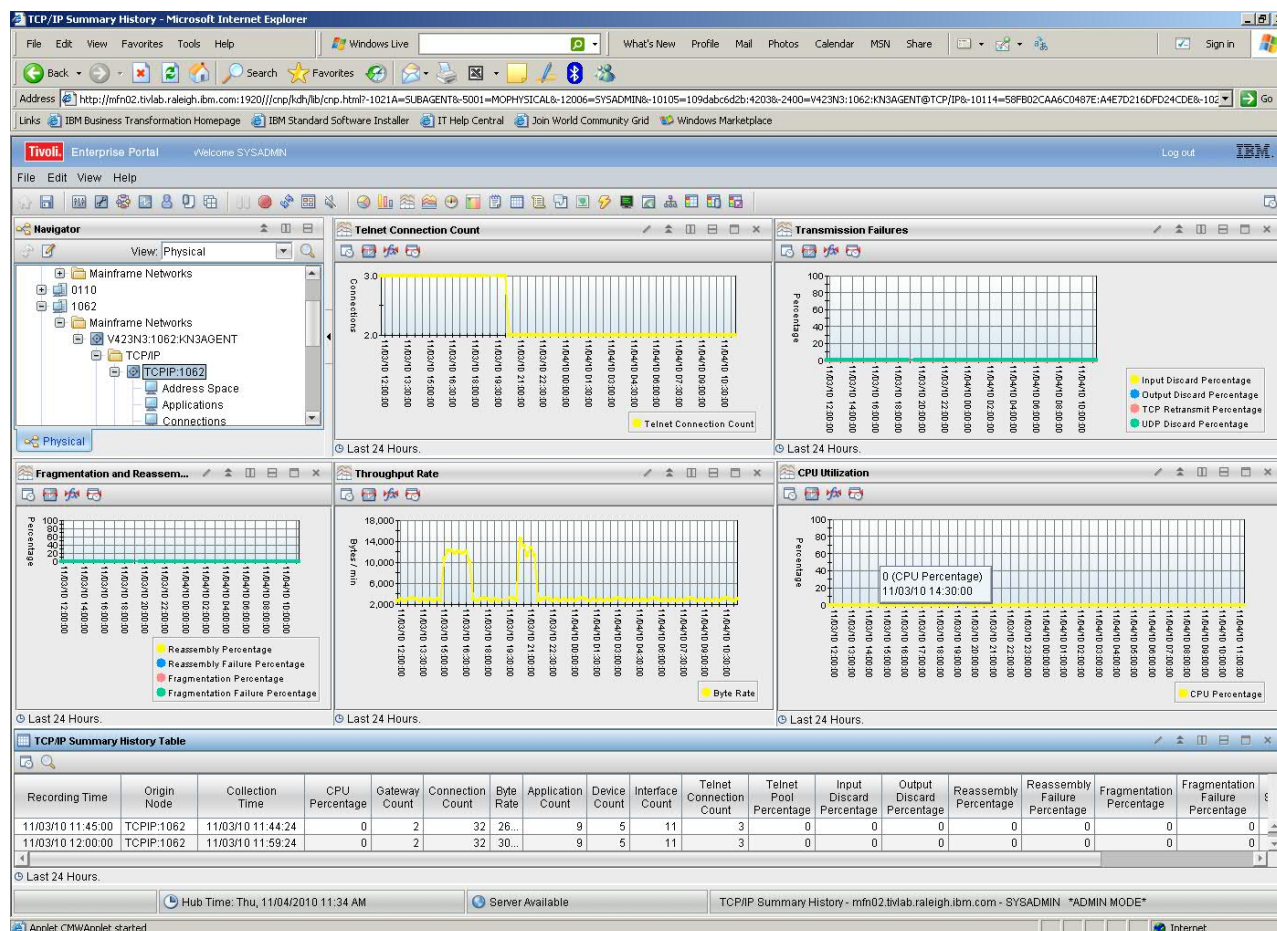Figure 6 shows the TCP/IP Summary History workspace.

Figure 6. The OMEGAMON XE for Mainframe Networks TCP/IP Summary History workspace

The TCP/IP Summary History workspace provides the following views:

- **Telnet Connection Count**: Shows a historical view of the number of active Telnet connections for the specified time period in a line graph.
- **Transmission Failures**: Shows a historical view of the percentage of transmission failures for the specified time period in a time-line chart, where:
  - **Yellow** represents the input discard percentage.
  - **Blue** represents output discard percentage.
  - **Pink** represents the TCP retransmit percentage.
  - **Green** represents the UDP discard percentage.
- **Fragmentation and Reassembly**: Shows a historical view of the percentage of packet fragmentation and reassembly for the specified time period in a time-line chart, where:
  - **Yellow** represents the reassembly percentage.

- **Blue** represents reassembly failure percentage.
- **Pink** represents the fragmentation percentage.
- **Green** represents the fragmentation failure percentage.
- **Throughput Rate**: Shows a historical view of throughput expressed in bytes as a percentage of capacity for the specified time period in a time-line chart.
- **CPU Utilization**: Shows a historical view of CPU utilization expressed as a percentage of capacity for the specified time period in a time-line chart.
- **"TCP/IP Summary History Summary table"**: Provides detailed performance information about the TCP/IP stack displayed in the charts on the TCP/IP Summary History workspace.

TCP/IP Summary History Summary table

The TCP/IP Summary History Summary table provides detailed performance information about the TCP/IP stack displayed in the charts on the TCP/IP Summary History workspace.

The attributes displayed in the history workspace represents a subset of the attributes supported by the TCP/IP Summary workspace (for enhanced performance). For a complete list of the attributes available in the TCP/IP Summary History Summary table, and a brief description of each, see the TN3270 Address Space attributes. Because this is a history panel, a unique attribute is listed in addition to the TCP/IP Summary attributes: Recording Time.

Updates to the troubleshooting guide

No updates were made to the troubleshooting guide.

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