

TN3270E Working Group

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**Base Definitions of Managed Objects for
TN3270E Using SMIv2**

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Abstract

The purpose of this memo is to define a Management Information Base (MIB) for configuring and managing TN3270E Servers. The MIB defined by this memo is intended to provide generic support for both Host and Gateway TN3270E Server implementations. It is the intent that the MIB defined herein be extended by subsequent memos to provide non-generic configuration support and to enable TN3270E Response Time Monitoring. It is the intent of this MIB to fully adhere to all prerequisite MIBs unless explicitly stated. Deviations will be documented in corresponding conformance statements. The specification of this MIB will utilize the Structure of Management Information (SMI) for Version 2 of the Simple Network Management Protocol Version (refer to [RFC1902](#), reference [1]).

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[1.](#) **Introduction**

This document is a product of the TN3270E Working Group. Its purpose is to define a MIB module for extending the traditional MIBs supported by a TCP/IP implementation for configuration and management of TN3270E Servers.

[2.](#) **The SNMPv2 Network Management Framework**

The SNMP Network Management Framework presently consists of three major components. They are:

- o the SMI, described in [RFC 1902](#) [1], - the mechanisms used for describing and naming objects for the purpose of management.
- o the MIB-II, STD 17, [RFC 1213](#) [5], - the core set of managed objects for the Internet suite of protocols.
- o the protocol, [RFC 1157](#) [9] and/or [RFC 1905](#) [7] - the protocol for accessing managed information.

Textual conventions are defined in [RFC 1903](#) [6], and conformance statements are defined in [RFC 1904](#) [8].

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

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This memo specifies a MIB module that is compliant to the SNMPv2 SMI. A semantically identical MIB conforming to the SNMPv1 SMI can be produced through the appropriate translation.

2.1. Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to refer to the object type.

3. Structure of the MIB

The TN3270E-MIB is split into the following components:

- o TN3270E Server Control
- o TN3270E Server Resource Configuration
- o TCP Connection Table Additions

The TN3270E-MIB is defined for support primarily by TN3270E Servers. Use of this MIB by TN3270 Servers that do not support the TN3270E protocol is not explicitly addressed by this memo. A significant portion of the objects do apply in the TN3270 only case. Addressing the TN3270 only case was not done since it is unlikely that this MIB would be implemented by TN3270 only servers.

3.1. TN3270E Server Control

This group of objects provides for TN3270 and TN3270E configuration and consists of:

- o tn3270eSrvrConfTable
- o tn3270eSrvrPortTable
- o tn3270eSrvrStatsTable

3.1.1. tn3270eSrvrConfTable

The tn3270eSrvrConfTable contains a set of objects primarily for

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configuring and managing a TN3270E Server. This table, as well most of the tables in the TN3270E-MIB, are structured to be indexed by the local IP Address (`tn3270eSrvrConfIpAddr`) and a unsigned integer (`tn3270eSrvrConfigIndex`). The primary index, `tn3270eSrvrConfIpAddr`, was added to the tables in order for the tables to be used at both a TN3270E Server host implementation as well as by a management application that supports multiple TN3270E capable hosts. The second index element, `tn3270eSrvrConfigIndex`, was added in order to support multiple TN3270E Servers on the same host.

`tn3270eSrvrConfInactivityTimer` defines the inactivity period for TN3270 and TN3270E Sessions. `tn3270eSrvrConfSessionTermState` defines how a session should be terminated. The three objects:

- o `tn3270eSrvrConfActivityCheck`
- o `tn3270eSrvrConfActivityTimeout`
- o `tn3270eSrvrConfActivityInterval`

defines the parameters for performing the "Telnet Timing Mark Option" as defined by [RFC 860](#) [3]. The object `tn3270eSrvrConfActivityOption` was defined to enable sending of a NOP command as oppose to a TIMEMARK command. Sending a NOP command results in less overhead then a TIMEMARK command since a client doesn't send a reply.

The objects `tn3270eSrvrConfAdminStatus` and `tn3270eSrvrConfOperStatus` exists in order to enable remote starting and stopping of a TN3270E Server. `tn3270eSrvrConfProtoSupported` indicates which of the TN3270 and TN3270E options that a server supports. The object `tn3270eSrvrConfSrvrType` indicates the implementation type of TN3270E Server that the `tn3270eSrvrConfEntry` represents. The object `tn3270eSrvrConfRowStatus` provides the capability to perform remote creation and deletion operations on this table.

3.1.2. `tn3270eSrvrPortTable`

The `tn3270eSrvrPortTable` exists in order to assign and retrieve the local ports associated with a TN3270E Server. Some implementations support multiple local port usage.

3.1.3. `tn3270eSrvrStatsTable`

The `tn3270eSrvrStatsTable` defines a series of objects used to provide general statistics on the use of a TN3270E Server.

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3.2. TN3270E Server Resource Configuration

The TN3270E Server Resource Configuration collection of objects consists of four tables:

- o tn3270eIpGroupTable
- o tn3270eResPoolTable
- o tn3270eResMapTable
- o tn3270eIpMapTable

3.2.1. tn3270eIpGroupTable and tn3270eResPoolTable enable

implementations to define groupings of both IP Addresses and Resource Pools for mapping IP Addresses to resources. The mapping of a IP Group to a Resource Pool is enabled via tn3270eResPoolIpGroupName. Creating an entry in the tn3270eResPoolTable results in creation of an entry or entries in both the tn3270eResMapTable and tn3270eIpMapTable. Both the tn3270eIpGroupTable and the tn3270eResPoolTable are optional since not every TN3270E Server has the ability to define their IP to Resource mappings in this manner. tn3270eResPoolClientPort exists to enable implementations to restrict a collection of resources to a particular local port. This object is optional since not every implementation provides this type of support.

3.2.2. tn3270eResMapTable and tn3270eIpMapTable

The tables: tn3270eResMapTable and tn3270eIpMapTable provide mappings of IP Address(es) to Resource(s) and Resource(s) to IP Address(es). The index objects, tn3270eResMapClientPort and tn3270eIpMapClientPort, as allowed to be zero when these tables are implemented by TN3270E Servers that do provide local port to resource mapping.

3.3. TCP Connection Table Additions

The TCP Connection Table is defined by [RFC 2012](#) (Refer to reference 10, TCP-MIB Definitions). Traditionally, the contents of the TCP Connection Table has been implementation dependent. Its formal definition consists of the following objects:

- o tcpConnState (INTEGER)
- o tcpConnLocalAddress (IpAddress)
- o tcpConnLocalPort (INTEGER)
- o tcpConnRemAddress (IpAddress)
- o tcpConnRemPort (INTEGER)

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and is indexed by: tcpConnLocalAddress, tcpConnLocalPort, tcpConnRemAddress and tcpConnRemPort. The tn3270eTcpConnTableGroup contains the objects defined by the tn3270eTcpConnTable for keeping a list of the current set of TN3270 and TN3270E sessions at a TN3270E Server. The tn3270eTcpConnTable has the same index elements as the tcpConnTable but doesn't AUGMENT it since the relationship is not one-to-one.

4. Definitions

```
TN3270E-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, BITS, Unsigned32,
    experimental, Integer32, InetAddress, TimeTicks,
    Counter32
        FROM SNMPv2-SMI
    TEXTUAL-CONVENTION, RowStatus, DisplayString
        FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP
        FROM SNMPv2-CONF
    tcpConnLocalAddress, tcpConnLocalPort,
    tcpConnRemAddress, tcpConnRemPort
        FROM TCP-MIB
;

tn3270eMIB MODULE-IDENTITY
LAST-UPDATED "9706200000Z" -- June 20, 1997
ORGANIZATION "TN3270E Working Group"
CONTACT-INFO
    "Kenneth White (kennethw@vnet.ibm.com)
     IBM Corp."
DESCRIPTION
    "This module defines a portion of the management
     information base (MIB) for managing TN3270E Servers"
-- Need an experimental OID from IANA
::= { experimental 2001 }

-- Textual Conventions

ResourceType ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "The type of resource defined by a Resource Pool. Refer
         to tn3270eResPoolTable."
SYNTAX      INTEGER {
                other(0),
```

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```

    lu(1),
    printer(2)
}

```

Tn3270Functions ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This textual convention is intended to reflect the current set of TN3270 and TN3270E functions that can be negotiated between a server and its client:

[RFC856](#)

transmitBinary	The sender of this command REQUESTS permission to begin transmitting, or confirms that it will now begin transmitting characters which are to be interpreted as 8 bits of binary data by the receiver of the data.
----------------	--

[RFC820](#)

timeMark	The sender of this command REQUESTS that the receiver of this command return a WILL TIMING-MARK in the data stream at the 'appropriate place' ...
----------	---

[RFC885](#)

endOfRecord	The sender of this command requests permission to begin transmission of the Telnet END-OF-RECORD (EOR) code when transmitting data characters, or the sender of this command confirms it will now begin transmission of EORs with transmitted data characters.
-------------	--

[RFC1091](#)

terminalType	Sender is willing to send terminal type information in a subsequent sub-negotiation.
--------------	--

[RFC1041](#)

tn3270Regime	Sender is willing to send list of supported 3270 Regimes in a subsequent sub-negotiation.
--------------	---

[RFC1647](#)

scsCtlCodes	(Printer sessions only). Allows the use of the SNA Character Stream (SCS) and SCS control codes on the session. SCS is used with LU type 1 SNA sessions.
-------------	--

dataStreamCtl	(Printer sessions only). Allows the use of the standard 3270 data stream. This corresponds to LU type 3 SNA sessions.
---------------	---

responses	Provides support for positive and negative response handling. Allows the server to reflect to the client any and
-----------	--

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```

                                all definite, exception, and no response
                                requests sent by the host application.

bindImage          Allows the server to send the SNA Bind
                    image and Unbind notification to the
                    client.

sysreq             Allows the client and server to emulate
                    some (or all, depending on the server) of
                    the functions of the SYSREQ key in an SNA
                    environment.""

SYNTAX      BITS {
    transmitBinary(0), -- rfc856
    timemark(1),       -- rfc860
    endOfRecord(2),   -- rfc885
    terminalType(3),  -- rfc1091
    tn3270Regime(4), -- rfc1041
    scsCtlCodes(5),   -- rfc1647
    dataStreamCtl(6), -- rfc1647
    responses(7),    -- rfc1647
    bindImage(8),     -- rfc1647
    sysreq(9)         -- rfc1647
}

DeviceTypes ::= TEXTUAL-CONVENTION
  STATUS      current
  DESCRIPTION
    "This textual convention defines the list of device types
     that can be set as defined by RFC 1647."
SYNTAX      INTEGER { -- terminals
    unknown(0),
    ibm3278d2(1),    -- (24 row x 80 col display)
    ibm3278d2E(2),   -- (24 row x 80 col display)
    ibm3278d3(3),   -- (32 row x 80 col display)
    ibm3278d3E(4),  -- (32 row x 80 col display)
    ibm3278d4(5),   -- (43 row x 80 col display)
    ibm3278d4E(6),  -- (43 row x 80 col display)
    ibm3278d5(7),   -- (27 row x 132 col display)
    ibm3278d5E(8),  -- (27 row x 132 col display)
    ibmDynamic(9),   -- (no pre-defined display size)
    ibm3287d1(10)   -- printers
}

-- Top-level structure of the MIB

tn3270eNotifications OBJECT IDENTIFIER ::= { tn3270eMIB 0 }
tn3270eObjects        OBJECT IDENTIFIER ::= { tn3270eMIB 1 }
tn3270eConformance   OBJECT IDENTIFIER ::= { tn3270eMIB 3 }

-- MIB Objects

```

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```

tn3270eSrvrConfTable OBJECT-TYPE
  SYNTAX      SEQUENCE OF Tn3270eSrvrConfEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "This table defines the configuration elements for
     TN3270 Servers. The number of entries in this table
     is expected to vary depending on the location of the
     table. A particular TN3270 Server is expected to
     have a single entry. Modeling of the configuration
     elements as a table enable use of the table by
     management applications as well as allowing multiple
     TN3270 Servers to exist at the same host."
 ::= { tn3270eObjects 1 }

```

```

tn3270eSrvrConfEntry OBJECT-TYPE
  SYNTAX      Tn3270eSrvrConfEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "Definition of the configuration elements for a single
     TN3270 Server."
  INDEX      { tn3270eSrvrConfIpAddr, tn3270eSrvrConfIndex }
 ::= { tn3270eSrvrConfTable 1 }

```

```

Tn3270eSrvrConfEntry ::= SEQUENCE {
  tn3270eSrvrConfIpAddr          InetAddress,
  tn3270eSrvrConfIndex           Unsigned32,
  tn3270eSrvrConfInactivityTimer Unsigned32,
  tn3270eSrvrConfActivityCheck   INTEGER,
  tn3270eSrvrConfActivityTimeout Unsigned32,
  tn3270eSrvrConfActivityInterval Unsigned32,
  tn3270eSrvrConfProtoSupported  Tn3270Functions,
  tn3270eSrvrConfAdminStatus     INTEGER,
  tn3270eSrvrConfOperStatus      INTEGER,
  tn3270eSrvrConfSessionTermState INTEGER,
  tn3270eSrvrConfSrvrType        INTEGER,
  tn3270eSrvrConfRowStatus       RowStatus
}

```

```

tn3270eSrvrConfIpAddr OBJECT-TYPE
  SYNTAX      InetAddress
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "Indicates the local IP Address associated with a TN3270
     Server. A value of 0 is allowed when the entry exists
     at a single TN3270 Server instance host."

```

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```
::= { tn3270eSrvrConfEntry 1 }

tn3270eSrvrConfIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Indicates the instance of a TN3270/TN3270E Server that
         exists at the IP Host pointed to by tn3270eSrvrConfIpAddr."
    ::= { tn3270eSrvrConfEntry 2 }

tn3270eSrvrConfInactivityTimer OBJECT-TYPE
    SYNTAX      Unsigned32 (0..99999999)
    UNITS "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The inactivity time-out specified in seconds. When a
         connection has been inactive for the number of seconds
         specified by this object it is closed. The default of
         0 means no inactivity time-out."
    DEFVAL { 0 }
    ::= { tn3270eSrvrConfEntry 3 }

tn3270eSrvrConfActivityCheck OBJECT-TYPE
    SYNTAX      INTEGER {
                    noCheck(0),
                    timeMark(1),
                    nop(2)
                }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object is intended to enable either timemark or
         nop processing."
    DEFVAL { noCheck }
    ::= { tn3270eSrvrConfEntry 4 }

tn3270eSrvrConfActivityTimeout OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The TIMEMARK or NOP processing time-out specified in seconds."
    DEFVAL { 600 } -- 10 minutes
    ::= { tn3270eSrvrConfEntry 5 }
```

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```
tn3270eSrvrConfActivityInterval OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The scan interval to be used by the Telnet Server.
         TIMEMARK or NOP processing scans the Telnet sessions
         on the interval provided by this object looking for
         sessions that have been idle for more than the value
         provided by tn3270eSrvrConfActivityTimeout."
    DEFVAL { 120 } -- 2 minutes
    ::= { tn3270eSrvrConfEntry 6 }

tn3270eSrvrConfProtoSupported OBJECT-TYPE
    SYNTAX      Tn3270Functions
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the TN3270 functions supported by a
         TN3270 Server."
    DEFVAL { { scsCtlCodes, dataStreamCtl,
              responses, bindImage, sysreq } }
    ::= { tn3270eSrvrConfEntry 7 }

tn3270eSrvrConfAdminStatus OBJECT-TYPE
    SYNTAX  INTEGER {
                up(1),
                down(2),
                stopImmediate(3)
            }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The desired state of the Telnet Server. The stopImmediate
         state is intended to enable Servers to gracefully terminate
         via down or to terminate immediate without ending its
         client connections. There is no requirement for support
         of stopImmediate."
    ::= { tn3270eSrvrConfEntry 8 }

tn3270eSrvrConfOperStatus OBJECT-TYPE
    SYNTAX  INTEGER {
                up(1),
                down(2)
            }
    MAX-ACCESS  read-only
    STATUS      current
```

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DESCRIPTION

"The current operational state of the Telnet Server."
 ::= { tn3270eSrvrConfEntry 9 }

tn3270eSrvrConfSessionTermState OBJECT-TYPE

SYNTAX INTEGER {
 terminate(1),
 luSessionPend(2),
 queueSession(3)
}

MAX-ACCESS read-create
STATUS current

DESCRIPTION

"The current state for determining what happens when
Telnet connection terminates:

terminate(1) => Terminate connection.
luSessionPend(2) => Allows the client's session to revert
to their Default Application upon
termination of their Telnet connection.

queueSession(3) => ????"

DEFVAL { terminate }
 ::= { tn3270eSrvrConfEntry 10 }

tn3270eSrvrConfSrvrType OBJECT-TYPE

SYNTAX INTEGER {
 unknown(0),
 host(1),
 gateway(2)
}

MAX-ACCESS read-only
STATUS current

DESCRIPTION

"This object indicates the type of TN3270/TN3270E Server.
The existence of MIB tables and objects that will be
defined by follow-on MIBs may be predicated on whether the
TN3270/TN3270E Server is local to the same host as the
secondary LU used to attach the IP client into a SNA
network."

::= { tn3270eSrvrConfEntry 11 }

tn3270eSrvrConfRowStatus OBJECT-TYPE

SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"This object allows entries to be created and deleted in the
tn3270eSrvrConfTable. Creating an entry in this table

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at a management application informs enable that application to manage the associating TN3270 Server. Deleting an entry removes it from that application's management domain.

A server based implementation of this table may chose to not support creation or deletion of its (probably only) entry in this table via this object.

An entry in this table is deleted by setting this object to destroy(6)."

REFERENCE

"[RFC 1903](#), 'Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2).'"
`::= { tn3270eSrvrConfEntry 12 }`

tn3270eSrvrPortTable OBJECT-TYPE
SYNTAX SEQUENCE OF **Tn3270eSrvrPortEntry**
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "This table defines the ports associated with TN3270/
 TN3270E Servers."
`::= { tn3270eObjects 2 }`

tn3270eSrvrPortEntry OBJECT-TYPE
SYNTAX **Tn3270eSrvrPortEntry**
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "Definition of a single server port assignment."
INDEX { **tn3270eSrvrConfIpAddr**, **tn3270eSrvrConfIndex**,
 tn3270eSrvrPort }
`::= { tn3270eSrvrPortTable 1 }`

Tn3270eSrvrPortEntry ::= SEQUENCE {
 tn3270eSrvrPort Unsigned32,
 tn3270eSrvrPortRowStatus RowStatus
}

tn3270eSrvrPort OBJECT-TYPE
SYNTAX Unsigned32 (0..65535)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "Indicates a port assigned to a server."
`::= { tn3270eSrvrPortEntry 1 }`

tn3270eSrvrPortRowStatus OBJECT-TYPE

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SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object allows entries to be created and deleted in the tn3270eSrvrPortTable.

An entry in this table is deleted by setting this object to destroy(6)."

REFERENCE
[RFC 1903](#), 'Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2).'
 ::= { tn3270eSrvrPortEntry 2 }

tn3270eSrvrStatsTable OBJECT-TYPE
SYNTAX SEQUENCE OF Tn3270eSrvrStatsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This table defines a set of statistics concerning global TN3270 Server performance."
 ::= { tn3270eObjects 3 }

tn3270eSrvrStatsEntry OBJECT-TYPE
SYNTAX Tn3270eSrvrStatsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Collection of a set of statistic objects for a single TN3270 Server."
INDEX { tn3270eSrvrConfIpAddr, tn3270eSrvrConfIndex }
 ::= { tn3270eSrvrStatsTable 1 }

Tn3270eSrvrStatsEntry ::= SEQUENCE {
 tn3270eSrvrStatsUpTime TimeTicks,
 tn3270eSrvrStatsMaxLus Integer32,
 tn3270eSrvrStatsLusInUse Integer32,
 tn3270eSrvrStatsSpareLus Integer32,
 tn3270eSrvrStatsMaxPtrs Integer32,
 tn3270eSrvrStatsPtrsInUse Integer32,
 tn3270eSrvrStatsSparePtrs Integer32,
 tn3270eSrvrStatsConnectsIn Counter32,
 tn3270eSrvrStatsConnRejects Counter32,
 tn3270eSrvrStatsDisconnects Counter32
 }

tn3270eSrvrStatsUpTime OBJECT-TYPE
SYNTAX TimeTicks

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```
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Indicates the amount of time that a particular TN3270
    has been active. This is total time since the server was
    started and is not reset on tn3270eSrvrConfOperStatus."
 ::= { tn3270eSrvrStatsEntry 1 }

tn3270eSrvrStatsMaxLus OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Indicates the maximum number of LUs for use by a
    TN3270 Server."
 ::= { tn3270eSrvrStatsEntry 2 }

tn3270eSrvrStatsLusInUse OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Indicates the current number of LUs in use by a
    TN3270 Server."
 ::= { tn3270eSrvrStatsEntry 3 }

tn3270eSrvrStatsSpareLus OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Indicates the number of free LUs for a particular TN3270
    Server."
 ::= { tn3270eSrvrStatsEntry 4 }

tn3270eSrvrStatsMaxPtrs OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Indicates the maximum number of Printer Resources for use by a
    TN3270 Server."
 ::= { tn3270eSrvrStatsEntry 5 }

tn3270eSrvrStatsPtrsInUse OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
```

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DESCRIPTION

"Indicates the current number of Printer Resources in use by a TN3270 Server."

`::= { tn3270eSrvrStatsEntry 6 }`

`tn3270eSrvrStatsSparePtrs` OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the number of free Printer Resources for a particular TN3270 Server."

`::= { tn3270eSrvrStatsEntry 7 }`

`tn3270eSrvrStatsConnectsIn` OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the number of client connections received by a TN3270 Server."

`::= { tn3270eSrvrStatsEntry 8 }`

`tn3270eSrvrStatsConnRejects` OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the number of client connections rejected during connection setup."

`::= { tn3270eSrvrStatsEntry 9 }`

`tn3270eSrvrStatsDisconnects` OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the number of client connections disconnected by a TN3270 Server."

`::= { tn3270eSrvrStatsEntry 10 }`

`tn3270eIpGroupTable` OBJECT-TYPE

SYNTAX SEQUENCE OF `Tn3270eIpGroupEntry`

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table defines IP Address groupings for use by the Telnet Server."

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```
 ::= { tn3270eObjects 4 }

tn3270eIpGroupEntry OBJECT-TYPE
    SYNTAX      Tn3270eIpGroupEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Definition of a single IP Address entry. All entries with
         the same 1st index, tn3270eIpGroupName are considered to
         be in the same IP Group."
    INDEX      { tn3270eSrvrConfIpAddr, tn3270eSrvrConfIndex,
                 tn3270eIpGroupName, tn3270eIpGroupIpAddress }
    ::= { tn3270eIpGroupTable 1 }

Tn3270eIpGroupEntry ::= SEQUENCE {
    tn3270eIpGroupName          DisplayString,
    tn3270eIpGroupIpAddress     IpAddress,
    tn3270eIpGroupSubnetMask    IpAddress,
    tn3270eIpGroupRowStatus     RowStatus }

tn3270eIpGroupName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(1..8))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The name of a IP Group."
    ::= { tn3270eIpGroupEntry 1 }

tn3270eIpGroupIpAddress OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The IP Address of a member of a IP Group."
    ::= { tn3270eIpGroupEntry 2 }

tn3270eIpGroupSubnetMask OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The corresponding subnet mask associated with
         tn3270eIpGroupIpAddress. A single IP Address
         is represented by having this object contain
         the value of 255.255.255.255."
    ::= { tn3270eIpGroupEntry 3 }

tn3270eIpGroupRowStatus OBJECT-TYPE
```

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SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object allows entries to be created and deleted in the tn3270eIpGroupTable.

An entry in this table is deleted by setting this object to destroy(6)."

REFERENCE
[RFC 1903](#), 'Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2).'
::= { tn3270eIpGroupEntry 4 }

tn3270eResPoolTable OBJECT-TYPE
SYNTAX SEQUENCE OF Tn3270eResPoolEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This table defines Resource groupings and using the term pool as defined by [RFC 1647](#)."
::= { tn3270eObjects 5 }

tn3270eResPoolEntry OBJECT-TYPE
SYNTAX Tn3270eResPoolEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Definition of a single Resource Pool member. All entries with the same 1st index, tn3270eResPoolName are considered to be in the same Pool."
INDEX { tn3270eSrvrConfIpAddr, tn3270eSrvrConfIndex,
tn3270eResPoolName, tn3270eResPoolElementName }
::= { tn3270eResPoolTable 1 }

Tn3270eResPoolEntry ::= SEQUENCE {
tn3270eResPoolName DisplayString,
tn3270eResPoolElementName DisplayString,
tn3270eResPoolIpGroupName DisplayString,
tn3270eResPoolElementType ResourceType,
tn3270eResPoolClientPort Unsigned32,
tn3270eResPoolRowStatus RowStatus }

tn3270eResPoolName OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..255))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

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```
        "The name of a Resource Pool.."
 ::= { tn3270eResPoolEntry 1 }

tn3270eResPoolElementName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(1..8))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Name of a member of a Resource Pool."
 ::= { tn3270eResPoolEntry 2 }

tn3270eResPoolIpGroupName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(1..8))
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The name of a IP Group to map a Resource Element to."
 ::= { tn3270eResPoolEntry 3 }

tn3270eResPoolElementType OBJECT-TYPE
    SYNTAX      ResourceType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The type of the entity in a Resource Pool."
 ::= { tn3270eResPoolEntry 4 }

tn3270eResPoolClientPort OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "If specified this a pool to a specific client
         port."
 ::= { tn3270eResPoolEntry 5 }

tn3270eResPoolRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object allows entries to be created and deleted in the
         tn3270eResPoolTable.

        An entry in this table is deleted by setting this object
         to destroy(6)."

REFERENCE
    "RFC 1903, 'Textual Conventions for version 2 of the Simple
```

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```
        Network Management Protocol (SNMPv2)."
 ::= { tn3270eResPoolEntry 6 }

tn3270eResMapTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Tn3270eResMapEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table defines Resource Element to IP Address mappings."
 ::= { tn3270eObjects 6 }

tn3270eResMapEntry OBJECT-TYPE
SYNTAX      Tn3270eResMapEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Definition of the mapping of a Resource Element to
     a IP Address."
INDEX  { tn3270eSrvrConfIpAddr, tn3270eSrvrConfIndex,
          tn3270eResMapClientPort, tn3270eResMapElementName }
 ::= { tn3270eResMapTable 1 }

Tn3270eResMapEntry ::= SEQUENCE {
    tn3270eResMapClientPort      Unsigned32,
    tn3270eResMapElementName    DisplayString,
    tn3270eResMapIpAddress       IpAddress,
    tn3270eResMapSubnetMask     IpAddress,
    tn3270eResMapElementType    ResourceType,
    tn3270eResMapRowStatus      RowStatus }

tn3270eResMapClientPort OBJECT-TYPE
SYNTAX      Unsigned32 (0..65535)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The port that this assignment is restricted to. Note that
     a value of 0 for this object implies that the assignment
     is global to all client ports."
 ::= { tn3270eResMapEntry 1 }

tn3270eResMapElementName OBJECT-TYPE
SYNTAX      DisplayString (SIZE(1..8))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The Name of a resource element."
 ::= { tn3270eResMapEntry 2 }
```

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tn3270eResMapIpAddress OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "A client IP Address or subnet if tn3270eResMapSubnetMask
 is set to 255.255.255.255."
::= { tn3270eResMapEntry 3 }

tn3270eResMapSubnetMask OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "The corresponding subnet mask associated with
 tn3270eResMapIpAddress. A single IP Address
 is represented by having this object contain
 the value of 255.255.255.255."
::= { tn3270eResMapEntry 4 }

tn3270eResMapElementType OBJECT-TYPE
SYNTAX ResourceType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "The type of the entity in a Resource Pool."
::= { tn3270eResMapEntry 5 }

tn3270eResMapRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "This object allows entries to be created and deleted in the
 tn3270eResMapTable.

Entries in this table should occur automatically when an entry is created in the tn3270eResPoolTable. Deleting an entry in the tn3270eResPoolTable should remove all corresponding entries in this table.

The tn3270eResPoolTable is optional. This implies that entries can be added directly to this table."

REFERENCE
 "[RFC 1903](#), 'Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2).'"
::= { tn3270eResMapEntry 6 }

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tn3270eIpMapTable OBJECT-TYPE
SYNTAX SEQUENCE OF Tn3270eIpMapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This table defines IP Address to Resource Element mappings."
::= { tn3270eObjects 7 }

tn3270eIpMapEntry OBJECT-TYPE
SYNTAX Tn3270eIpMapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Definition of the mapping of a IP
Address or Group to a Resource Element."
INDEX { tn3270eSrvrConfIpAddr, tn3270eSrvrConfIndex,
tn3270eIpMapIpAddress, tn3270eIpMapSubnetMask,
tn3270eIpMapClientPort }
::= { tn3270eIpMapTable 1 }

Tn3270eIpMapEntry ::= SEQUENCE {
tn3270eIpMapIpAddress IpAddress,
tn3270eIpMapSubnetMask IpAddress,
tn3270eIpMapClientPort Unsigned32,
tn3270eIpMapResElementName DisplayString,
tn3270eIpMapElementType ResourceType,
tn3270eIpMapRowStatus RowStatus }

tn3270eIpMapIpAddress OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The IP Address of a member of a IP Group."
::= { tn3270eIpMapEntry 1 }

tn3270eIpMapSubnetMask OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The corresponding subnet mask associated with
tn3270eIpGroupIpAddress. A single IP Address
is represented by having this object contain
the value of 255.255.255.255."
::= { tn3270eIpMapEntry 2 }

tn3270eIpMapClientPort OBJECT-TYPE

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SYNTAX Unsigned32 (0..65535)
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION "The port that this assignment is restricted to. Note that a value of 0 for this object implies that the assignment is global to all client ports."
 ::= { tn3270eIpMapEntry 3 }

tn3270eIpMapResElementName OBJECT-TYPE
 SYNTAX DisplayString (SIZE(0..8))
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION "The Resource Element mapping to IP Address(es)."
 ::= { tn3270eIpMapEntry 4 }

tn3270eIpMapElementType OBJECT-TYPE
 SYNTAX ResourceType
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION "The type resource element."
 ::= { tn3270eIpMapEntry 5 }

tn3270eIpMapRowStatus OBJECT-TYPE
 SYNTAX RowStatus
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION "This object allows entries to be created and deleted in the tn3270eIpMapMapTable.

Entries in this table should occur automatically when an entry is created in the tn3270eResPoolTable. Deleting an entry in the tn3270eResPoolTable should remove all corresponding entries in this table.

The tn3270eResPoolTable is optional. This implies that entries can be added directly to this table."

REFERENCE "[RFC 1903](#), 'Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2).'"
 ::= { tn3270eIpMapEntry 6 }

-- Define the set of objects to add to the Tcp Connection Table

tn3270eTcpConnTable OBJECT-TYPE

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```
SYNTAX SEQUENCE OF Tn3270eTcpConnEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "Extends tcpConnTable to support TN3270 and TN3270E
     performance monitoring."
 ::= { tn3270eObjects 8 }

tn3270eTcpConnEntry OBJECT-TYPE
SYNTAX Tn3270eTcpConnEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "Provides information about a single TN3270/TN3270E
     session."
INDEX { tcpConnLocalAddress, tcpConnLocalPort,
         tcpConnRemAddress, tcpConnRemPort }
 ::= { tn3270eTcpConnTable 1 }

Tn3270eTcpConnEntry ::=
SEQUENCE
{
    tn3270eTcpConnLastActivity      TimeTicks,
    tn3270eTcpConnBytesIn          Counter32,
    tn3270eTcpConnBytesOut         Counter32,
    tn3270eTcpConnTargetAppl       DisplayString,
    tn3270eTcpConnResourceName     DisplayString,
    tn3270eTcpConnResourceType     ResourceType,
    tn3270eTcpConnClientUserId     DisplayString,
    tn3270eTcpConnDeviceType       DeviceTypes,
    tn3270eTcpConnProto            Tn3270Functions
}

tn3270eTcpConnLastActivity OBJECT-TYPE
SYNTAX  TimeTicks
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
    "The number of 100ths of seconds since this entry
     was last used."
DEFVAL { 0 }
 ::= { tn3270eTcpConnEntry 1 }

tn3270eTcpConnBytesIn  OBJECT-TYPE
SYNTAX  Counter32
UNITS "octets"
MAX-ACCESS  read-only
STATUS  current
```

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DESCRIPTION
"The number of bytes received by the Server from TCP
for this connection."
 ::= { tn3270eTcpConnEntry 2 }

tn3270eTcpConnBytesOut OBJECT-TYPE
SYNTAX Counter32
UNITS "octets"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of bytes sent to TCP for this connection."
 ::= { tn3270eTcpConnEntry 3 }

tn3270eTcpConnTargetAppl OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"When the corresponding TCP connection is for a
3172 Telnet session then this object contains the
Target VTAM Application name. For gateway server
implementations this object will not be known and
should be returned as a null OCTET STRING."
 ::= { tn3270eTcpConnEntry 4 }

tn3270eTcpConnResourceName OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"LU/Print secondary name for connecting a IP Client
into a SNA network."
 ::= { tn3270eTcpConnEntry 5 }

tn3270eTcpConnResourceType OBJECT-TYPE
SYNTAX ResourceType
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates the type of resource identified by
tn3270eTcpConnResourceName."
 ::= { tn3270eTcpConnEntry 6 }

tn3270eTcpConnClientUserId OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
MAX-ACCESS read-only
STATUS current

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DESCRIPTION
"When the corresponding TCP connection is for a
3172 Telnet session then this object contains the
Client's userid."
 ::= { tn3270eTcpConnEntry 7 }

tn3270eTcpConnDeviceType OBJECT-TYPE
SYNTAX DeviceTypes
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates the device type if negotiated with client."
 ::= { tn3270eTcpConnEntry 8 }

tn3270eTcpConnProto OBJECT-TYPE
SYNTAX Tn3270Functions
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This flag will indicate which of the TN3270 and TN3270E
functions that are supported by the Server was negotiated
with a client. Refer to tn3270eSrvrConfProtoSupported."
 ::= { tn3270eTcpConnEntry 9 }

-- Conformance Definitions

tn3270eGroups OBJECT IDENTIFIER ::= { tn3270eConformance 1 }
tn3270eCompliances OBJECT IDENTIFIER ::= { tn3270eConformance 2 }

-- compliance statements tn3270eCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for agents that support the TN3270
MIB."
MODULE -- this module
MANDATORY-GROUPS { tn3270eBasicGroup,
tn3270eSessionGroup
}
GROUP tn3270ePoolGroup
DESCRIPTION
"This group is optional."
OBJECT tn3270eSrvrConfActivityCheck
MIN-ACCESS read-only
DESCRIPTION
"The agent is not required to support a set to this
object if the associating TN3270 Server doesn't
support either TIMEMARK or NOP processing. In

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```
        this case an agent should return noCheck on
        retrieval."
OBJECT tn3270eSrvrConfActivityTimeout
    MIN-ACCESS  read-only
    DESCRIPTION
        "The agent is not required to support a set to this
        object if the functions enabled by
        tn3270eSrvrConfActivityCheck are not supported.
        An agent in this case should return a value of 0."
OBJECT tn3270eSrvrConfActivityInterval
    MIN-ACCESS  read-only
    DESCRIPTION
        "The agent is not required to support a set to this
        object if the functions enabled by
        tn3270eSrvrConfActivityCheck are not supported.
        An agent in this case should return a value of 0."
OBJECT tn3270eTcpConnTargetAppl
    DESCRIPTION
        "A TN3270 Server is not required to support this
        object if it doesn't provide for Target Application
        mapping. In this case either a null OCTET STRING
        can be returned or noSuchObject."
OBJECT tn3270eTcpConnClientUserId
    DESCRIPTION
        "A TN3270 Server is not required to support this
        object if it doesn't provide for Target Application
        mapping. In this case either a null OCTET STRING
        can be returned or noSuchObject."
 ::= { tn3270eCompliances 1 }

-- units of conformance

tn3270eBasicGroup OBJECT-GROUP
    OBJECTS {
        tn3270eSrvrConfInactivityTimer,
        tn3270eSrvrConfActivityCheck,
        tn3270eSrvrConfActivityTimeout,
        tn3270eSrvrConfActivityInterval,
        tn3270eSrvrConfProtoSupported,
        tn3270eSrvrConfAdminStatus,
        tn3270eSrvrConfOperStatus,
        tn3270eSrvrConfSessionTermState,
        tn3270eSrvrConfSrvrType,
        tn3270eSrvrConfRowStatus,
        tn3270eSrvrPortRowStatus,
        tn3270eSrvrStatsUpTime,
        tn3270eSrvrStatsMaxLus,
        tn3270eSrvrStatsLusInUse,
```

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```
tn3270eSrvrStatsSpareLus,
tn3270eSrvrStatsMaxPtrs,
tn3270eSrvrStatsPtrsInUse,
tn3270eSrvrStatsSparePtrs,
tn3270eSrvrStatsConnectsIn,
tn3270eSrvrStatsConnRejects,
tn3270eSrvrStatsDisconnects,
tn3270eResMapIpAddress,
tn3270eResMapSubnetMask,
tn3270eResMapElementType,
tn3270eResMapRowStatus,
tn3270eIpMapResElementName,
tn3270eIpMapElementType,
tn3270eIpMapRowStatus

}

STATUS current
DESCRIPTION
"This group is mandatory for all hosts supporting the
TN3270E-MIB."
::= { tn3270eGroups 1 }

tn3270ePoolGroup OBJECT-GROUP
OBJECTS {
    tn3270eIpGroupSubnetMask,
    tn3270eIpGroupRowStatus,
    tn3270eResPoolElementType,
    tn3270eResPoolIpGroupName,
    tn3270eResPoolClientPort,
    tn3270eResPoolRowStatus
}
STATUS current
DESCRIPTION
"This group is optional and allows a server to configure
a collection of IP Address and Resource Pools and their
mappings."
::= { tn3270eGroups 2 }

tn3270eSessionGroup OBJECT-GROUP
OBJECTS {
    tn3270eTcpConnLastActivity,
    tn3270eTcpConnBytesIn,
    tn3270eTcpConnBytesOut,
    tn3270eTcpConnTargetAppl,
    tn3270eTcpConnResourceName,
    tn3270eTcpConnResourceType,
    tn3270eTcpConnClientUserId,
    tn3270eTcpConnDeviceType,
    tn3270eTcpConnProto
```

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```

    }
STATUS current
DESCRIPTION
    "This group is mandatory for all hosts supporting the
     TN3270E-MIB."
::= { tn3270eGroups 3 }

END

```

5. Security Considerations

Certain management information defined in this MIB may be considered sensitive in some network environments. Therefore, authentication of received SNMP requests and controlled access to management information should be employed in such environments. The method for this authentication is a function of the SNMP Administrative Framework, and has not been expanded by this MIB.

Several objects in this MIB allow write access or provide for remote creation. Allowing this support in a non-secure environment can have a negative effect on network operations. It is recommended that implementers seriously consider whether set operations should be allowed without providing, at a minimum, authentication of request origin. It is recommended that without such support that the following objects be implemented as read-only:

- o tn3270eSrvrConfInactivityTimer
- o tn3270eSrvrConfActivityCheck
- o tn3270eSrvrConfActivityTimeout
- o tn3270eSrvrConfActivityInterval
- o tn3270eSrvrConfAdminStatus
- o tn3270eSrvrConfSessionTermState
- o tn3270eIpGroupSubnetMask
- o tn3270eResPoolIpGroupName
- o tn3270eResPoolElementType
- o tn3270eResPoolClientPort
- o tn3270eResMapIpAddress
- o tn3270eResMapSubnetMask
- o tn3270eResMapElementType
- o tn3270eIpMapResElementName
- o tn3270eIpMapElementType

The following objects should either be implemented as read-only or not implemented when security is an issue as previously discussed:

- o tn3270eSrvrConfRowStatus
- o tn3270eSrvrPortRowStatus

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- o tn3270eIpGroupRowStatus
- o tn3270eResPoolRowStatus
- o tn3270eResMapRowStatus
- o tn3270eIpMapRowStatus

6. Acknowledgments

This document is a product of the TN3270E Working Group.

7. References

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- [2] Network Working Group, Postel, J., and Reynolds, J., "Telnet Protocol Specification", [RFC 854](#), May 1983.
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- [5] McCloghrie, K., and M. Rose, Editors, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", STD 17, [RFC 1213](#), Hughes LAN Systems, Performance Systems International, March 1991.
- [6] SNMPv2 Working Group, Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1903](#), January 1996.
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- [9] Case, J., M. Fedor, M. Schoffstall, J. Davin, "Simple Network Management Protocol", [RFC 1157](#), SNMP Research, Performance Systems International, MIT Laboratory for Computer Science, May 1990.
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