

TN3270E Working Group

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Kenneth White

IBM Corp.

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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 Collection.

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.

This memo considers IPv6 addressability to be out of scope with respect to the MIB module defined herein. It is the intent of the author of this document to address IPv6 addressing in an additional submission.

[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

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statements are defined in [RFC 1904](#) [8].

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

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 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 Resource/IP Address Mappings

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 TN3270E Server configuration and consists of:

- o tn3270eSrvrConfTable
- o tn3270eSrvrPortTable
- o tn3270eSrvrStatsTable

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3.1.1. tn3270eSrvrConfTable

The tn3270eSrvrConfTable contains a set of objects primarily for configuring and managing a TN3270E Server. This table, as well most of the tables in the TN3270E-MIB, are structured to be indexed by a unsigned integer, tn3270eSrvrConfIndex. The primary index element, tn3270eSrvrConfIndex, enables support of multiple TN3270E Servers on the same host.

An earlier version of this memo had used the local IP Address associated with a TN3270E Server along with tn3270eSrvrConfIndex as the primary indexes into most of its tables. Use of a local IP Address was thought to enable representation of these tables by management applications. This approach was dropped since it introduces a level of complexity with respect to MIB table indexing for little actually benefit.

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 tn3270eSrvrConfActivityCheck is defined to enable selection of either a NOP command or a TIMEMARK command. Sending a NOP command results in less overhead than 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. `tn3270eSrvrConfFunctionsSupported` indicates which of the TN3270 and TN3270E options that a server supports. The object `tn3270eSrvrConfSessionTermState` defines as a global option what processing steps that a TN3270E Server should perform when a TN3270E Session terminates with respect to the associating TCP Connection. 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 TN3270E Server

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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.

[3.2.](#) TN3270E Server Resource Configuration

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

- o `tn3270eIpGroupTable`
- o `tn3270eResPoolTable`
- o `tn3270eIpResMapTable`

The `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 the tn3270eIpResMapTable.

3.3. Resource/IP Address Mappings

Two tables are defined by this memo to enable mapping of Resource Name to IP Address and IP Address to Resource Name:

- o tn3270eResMapTable
- o TCP Connection Table Additions

3.3.1. tn3270eResMapTable

The tn3270eResMapTable is a read-only table that provides for mapping a resource name to a IP Client's IP Address. An entry in this table is added when a TCP Connection is received by a TN3270E Server and mapped to a resource. The entry is deleted with the resource to IP Address association is no longer valid.

3.3.2. 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

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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)

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, IpAddress, TimeTicks,
    Counter32, Gauge32
        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 "9707280000Z" -- July 28, 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 }
```

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-- Textual Conventions

```
Tn3270ResourceType ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        "The type of resource defined by a Resource Pool. Refer
        to tn3270eResPoolTable."
    SYNTAX INTEGER {
```

```
    other(0),
    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

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 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
}
```

Tn3270DeviceTypes ::= 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

```
tn3270eSrvrConfTable OBJECT-TYPE
    SYNTAX            SEQUENCE OF Tn3270eSrvrConfEntry
    MAX-ACCESS        not-accessible
    STATUS            current
    DESCRIPTION
        "This table defines the configuration elements for
        TN3270E Servers. The number of entries in this table
        is expected to vary depending on the location of the
        table. A particular TN3270E Server is expected to
        have a single entry. Modeling of the configuration
        elements as a table allows multiple
        TN3270E 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
        TN3270E Server."
    INDEX             { tn3270eSrvrConfIndex }
    ::= { tn3270eSrvrConfTable 1 }

Tn3270eSrvrConfEntry ::= SEQUENCE {
    tn3270eSrvrConfIndex            Unsigned32,
    tn3270eSrvrConfInactivityTimeout Unsigned32,
    tn3270eSrvrConfActivityCheck    INTEGER,
    tn3270eSrvrConfActivityTimeout  Unsigned32,
    tn3270eSrvrConfActivityInterval Unsigned32,
    tn3270eSrvrFunctionsSupported   Tn3270Functions,
    tn3270eSrvrConfAdminStatus      INTEGER,
    tn3270eSrvrConfOperStatus       INTEGER,
    tn3270eSrvrConfSessionTermState INTEGER,
    tn3270eSrvrConfSrvrType         INTEGER,
    tn3270eSrvrConfRowStatus        RowStatus
```

}

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tn3270eSrvrConfIndex OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Indicates the instance of a TN3270E Server that exists at a IP Host."

::= { tn3270eSrvrConfEntry 1 }

tn3270eSrvrConfInactivityTimeout 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 2 }

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 3 }

tn3270eSrvrConfActivityTimeout OBJECT-TYPE

SYNTAX Unsigned32 (1..99999999)

UNITS "seconds"

```
MAX-ACCESS read-create
STATUS current
DESCRIPTION
    "The TIMEMARK or NOP processing time-out specified in seconds.
    Note that a value of 0 is not allowed for this object since
    the function that uses this object relies on
    tn3270eSrvrConfActivityCheck for function enablement."
DEFVAL { 600 } -- 10 minutes
 ::= { tn3270eSrvrConfEntry 4 }
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```
tn3270eSrvrConfActivityInterval OBJECT-TYPE
SYNTAX Unsigned32 (1..99999999)
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
    "The scan interval to be used by a TN3270E 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.
    Note that a value of 0 is not allowed for this object since
    the function that uses this object relies on
    tn3270eSrvrConfActivityCheck for function enablement."
DEFVAL { 120 } -- 2 minutes
 ::= { tn3270eSrvrConfEntry 5 }
```

```
tn3270eSrvrFunctionsSupported OBJECT-TYPE
SYNTAX Tn3270Functions
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object indicates the functions supported by a
    TN3270E Server."
DEFVAL { { scsCtlCodes, dataStreamCtl,
           responses, bindImage, sysreq } }
 ::= { tn3270eSrvrConfEntry 6 }
```

```
tn3270eSrvrConfAdminStatus OBJECT-TYPE
SYNTAX INTEGER {
    up(1),
    down(2),
```

```

                stopImmediate(3)
            }
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "The desired state of the TN3270E Server:

    up(1)      - Activate a TN3270E Server.
    down(2)    - Informs the associating TN3270E Server
                to gracefully terminate its processing.
    stopImmediate(3) - Informs the associating TN3270E Server
                to terminate immediately.
```

Implementation as to the exact symantics of either down(2) or stopImmediate(3) processing is left as implementation dependent. A TN3270E Server that does not distinguish

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```

    between down or stopImmediate transitions should not
    support stopImmediate."
 ::= { tn3270eSrvrConfEntry 7 }
```

tn3270eSrvrConfOperStatus OBJECT-TYPE

```

SYNTAX INTEGER {
                up(1),
                down(2)
            }
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The current operational state of a TN3270E Server:

```

    up(1) - The corresponding TN3270E Server is active.
    down(2) - The corresponding TN3270E Server is inactive."
```

```

 ::= { tn3270eSrvrConfEntry 8 }
```

tn3270eSrvrConfSessionTermState OBJECT-TYPE

```

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

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The current state for determining what a TN3270E Server should do when a TN3270 Session terminates:

terminate(1) => Terminate TCP connection.

luSessionPend(2) => Do not drop the TCP Connection associated with a IP Client when their TN3270 Session ends. Processing should redrive session initialization as if the client was first connecting.

queueSession(3) => QUEUESESSION deals with CLSDST-Pass. An example is the easiest explanation. Assume APPL1 does a CLSDST-Pass to APPL2. Then the client logs off APPL. Without QUEUESESSION the connection would now be broken. With QUEUESESSION the TN3270E Server keeps the LU around after getting the APPL2 unbind waiting for a bind from APPL1."

DEFVAL { terminate }

::= { tn3270eSrvrConfEntry 9 }

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tn3270eSrvrConfSrvrType OBJECT-TYPE

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

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates the type of TN3270E Server. The existence of MIB tables and objects that will be defined by follow-on MIBs may be predicated on whether the TN3270E Server can be local to the same host as a Target Application (host(1)) or will always be remote (gateway(2))."

::= { tn3270eSrvrConfEntry 10 }

tn3270eSrvrConfRowStatus OBJECT-TYPE

```

SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object allows entries to be created and deleted in the
    tn3270eSrvrConfTable.

    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 11 }
```

tn3270eSrvrPortTable OBJECT-TYPE

```

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

tn3270eSrvrPortEntry OBJECT-TYPE

```

SYNTAX      Tn3270eSrvrPortEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Definition of a single TCP port assignment to a
    TN3270E Server."
```

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```

INDEX      { 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

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 TN3270E 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 { tn3270eSrvrConfIndex }

::= { tn3270eSrvrStatsTable 1 }

Tn3270eSrvrStatsEntry ::= SEQUENCE {
tn3270eSrvrStatsUpTime TimeTicks,


```

tn3270eSrvrStatsMaxLus      Unsigned32,
tn3270eSrvrStatsLusInUse   Gauge32,
tn3270eSrvrStatsSpareLus   Gauge32,
tn3270eSrvrStatsMaxPtrs    Unsigned32,
tn3270eSrvrStatsPtrsInUse  Gauge32,
tn3270eSrvrStatsSparePtrs  Gauge32,
tn3270eSrvrStatsConnectsIn Counter32,
tn3270eSrvrStatsConnRejects Counter32,
tn3270eSrvrStatsDisconnects Counter32
}

```

tn3270eSrvrStatsUpTime OBJECT-TYPE

```

SYNTAX      TimeTicks
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION

```

"Indicates the amount of time that a particular TN3270E has be active. This is total time since the server was started and is not reset on tn3270eSrvrConfOperStatus."

```
 ::= { tn3270eSrvrStatsEntry 1 }
```

tn3270eSrvrStatsMaxLus OBJECT-TYPE

```

SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION

```

"Indicates the maximum number of LUs for use by a TN3270E Server."

```
 ::= { tn3270eSrvrStatsEntry 2 }
```

tn3270eSrvrStatsLusInUse OBJECT-TYPE

```

SYNTAX      Gauge32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION

```

"Indicates the current number of LUs in use by a TN3270E Server."

```
 ::= { tn3270eSrvrStatsEntry 3 }
```

tn3270eSrvrStatsSpareLus OBJECT-TYPE

```

SYNTAX      Gauge32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION

```

"Indicates the number of free LUs for a particular TN3270E Server. It is possible that the difference between tn3270eSrvrStatsMaxLus and tn3270eSrvrStatsLusInUse does not equal tn3270eSrvrStatsSpareLus. An LU may exist but not be useable by a IP Client connection."

::= { tn3270eSrvrStatsEntry 4 }

tn3270eSrvrStatsMaxPtrs OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the maximum number of Printer Resources for use by a TN3270E Server."

::= { tn3270eSrvrStatsEntry 5 }

tn3270eSrvrStatsPtrsInUse OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the current number of Printer Resources in use by a TN3270E Server."

::= { tn3270eSrvrStatsEntry 6 }

tn3270eSrvrStatsSparePtrs OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the number of free Printer Resources for a particular TN3270E Server. It is possible that the difference between tn3270eSrvrStatsMaxPtrs and tn3270eSrvrStatsPtrsInUse does not equal tn3270eSrvrStatsSparePtrs. A Printer resource may exist but not be useable by a IP Client connection."

::= { tn3270eSrvrStatsEntry 7 }

tn3270eSrvrStatsConnectsIn OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the number of client connections received by a TN3270E Server."

::= { tn3270eSrvrStatsEntry 8 }

tn3270eSrvrStatsConnRejects OBJECT-TYPE

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SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates the number of client connections rejected during
connection setup. An example of this is when no LU or
Printer resource is available to associate with the
TCP Connection of a IP Client."
 ::= { tn3270eSrvrStatsEntry 9 }

tn3270eSrvrStatsDisconnects OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates the number of client connections disconnected by a
TN3270E 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 a
TN3270E Server."
 ::= { 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 first two indexes, tn3270eSrvrConfIndex and
tn3270eIpGroupName, are considered to be in the same
IP Group."
INDEX { tn3270eSrvrConfIndex,
tn3270eIpGroupName,
tn3270eIpGroupIpAddress }

```
::= { tn3270eIpGroupTable 1 }
```

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

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```
tn3270eIpGroupName OBJECT-TYPE  
    SYNTAX      DisplayString (SIZE(1..24))  
    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."  
    DEFVAL { 'FFFFFFFF'H }  
    ::= { tn3270eIpGroupEntry 3 }
```

```
tn3270eIpGroupRowStatus OBJECT-TYPE  
    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

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"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 first two indexes, tn3270eSrvrConfIndex and tn3270eResPoolName, are considered to be in the same Pool."

INDEX { tn3270eSrvrConfIndex,
tn3270eResPoolName,
tn3270eResPoolElementName }

::= { tn3270eResPoolTable 1 }

Tn3270eResPoolEntry ::= SEQUENCE {

tn3270eResPoolName DisplayString,

tn3270eResPoolElementName DisplayString,

tn3270eResPoolElementType Tn3270ResourceType,

tn3270eResPoolRowStatus RowStatus }

tn3270eResPoolName OBJECT-TYPE

SYNTAX DisplayString (SIZE(1..24))

MAX-ACCESS not-accessible

STATUS current
DESCRIPTION
"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 }

tn3270eResPoolElementType OBJECT-TYPE
SYNTAX Tn3270ResourceType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The type of the entity in a Resource Pool."
 ::= { tn3270eResPoolEntry 3 }

tn3270eResPoolRowStatus 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
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
Network Management Protocol (SNMPv2).'
 ::= { tn3270eResPoolEntry 4 }

tn3270eIpResMapTable OBJECT-TYPE
SYNTAX SEQUENCE OF Tn3270eIpResMapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"This table defines Resource Pool to IP Group mappings. Since both the Resource Pool Name and IP Group Name are included in the index clause of this table multiple Resource Pools can be assigned to the same IP Group. This enables use of multiple Resource Pools for use in IP to resource mapping. Assigning multiple IP Groups to the same Resource Pool is also allowed but is not the primary purpose for how the indexing is structured.

Assignment of Resource Pool to IP Group can be restricted based on TCP Port. A index value of 0 for tn3270eIpResMapClientPort disables restriction of resource assignment based on IP Client target port selection."

```
::= { tn3270eObjects 6 }
```

```
tn3270eIpResMapEntry OBJECT-TYPE
```

```
SYNTAX      Tn3270eIpResMapEntry
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "Definition of a single Resource Pool to IP Group mapping."
```

```
INDEX { tn3270eSrvrConfIndex,  
        tn3270eIpResMapPoolName,  
        tn3270eIpResMapIpGroupName,  
        tn3270eIpResMapClientPort }
```

```
::= { tn3270eIpResMapTable 1 }
```

```
Tn3270eIpResMapEntry ::= SEQUENCE {
```

```
    tn3270eIpResMapPoolName      DisplayString,
```

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```
tn3270eIpResMapIpGroupName      DisplayString,
```

```
tn3270eIpResMapClientPort      Unsigned32,
```

```
tn3270eIpResMapRowStatus       RowStatus }
```

```
tn3270eIpResMapPoolName OBJECT-TYPE
```

```
SYNTAX      DisplayString (SIZE(1..24))
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The name of a Resource Pool."
```

```
::= { tn3270eIpResMapEntry 1 }
```

tn3270eIpResMapIpGroupName OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..24))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The name of the IP Group that is mapped to a
Resource Pool."
 ::= { tn3270eIpResMapEntry 2 }

tn3270eIpResMapClientPort OBJECT-TYPE
SYNTAX Unsigned32 (0..65535)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The port to restrict a Resource Pool to a IP Group
mapping. A value of 0 for this objects implies that
the mapping is not restricted."
 ::= { tn3270eIpResMapEntry 3 }

tn3270eIpResMapRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object allows entries to be created and deleted in the
tn3270eIpResMapTable.

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).'
 ::= { tn3270eIpResMapEntry 4 }

tn3270eResMapTable OBJECT-TYPE
SYNTAX SEQUENCE OF Tn3270eResMapEntry

MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This table defines the actual mapping of a resource to
a IP Address."


```

 ::= { tn3270eObjects 7 }

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 { tn3270eSrvrConfIndex,
            tn3270eResMapElementName,
            tn3270eResMapIpAddress }
    ::= { tn3270eResMapTable 1 }

Tn3270eResMapEntry ::= SEQUENCE {
    tn3270eResMapElementName    DisplayString,
    tn3270eResMapIpAddress      IPAddress,
    tn3270eResMapElementType    Tn3270ResourceType }

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

tn3270eResMapIpAddress OBJECT-TYPE
    SYNTAX      IPAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A client IP Address."
    ::= { tn3270eResMapEntry 2 }

tn3270eResMapElementType OBJECT-TYPE
    SYNTAX      Tn3270ResourceType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of the associating resource element/"
    ::= { tn3270eResMapEntry 3 }

```

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

```
tn3270eTcpConnTable OBJECT-TYPE
    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 in formation about a single TN3270/TN3270E
        session."
    INDEX { tcpConnLocalAddress, tcpConnLocalPort,
            tcpConnRemAddress, tcpConnRemPort }
    ::= { tn3270eTcpConnTable 1 }
```

```
Tn3270eTcpConnEntry ::=
    SEQUENCE
    {
        tn3270eTcpConnLastActivity      TimeTicks,
        tn3270eTcpConnBytesIn           Counter32,
        tn3270eTcpConnBytesOut          Counter32,
        tn3270eTcpConnResourceName      DisplayString,
        tn3270eTcpConnResourceType      Tn3270ResourceType,
        tn3270eTcpConnDeviceType        Tn3270DeviceTypes,
        tn3270eTcpConnFunctions         Tn3270Functions
    }
```

```
tn3270eTcpConnLastActivity OBJECT-TYPE
    SYNTAX TimeTicks
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of 100ths of seconds since any data was
        transferred for the associating TCP Connection."
    DEFVAL { 0 }
    ::= { tn3270eTcpConnEntry 1 }
```

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

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STATUS current
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 }

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 4 }

tn3270eTcpConnResourceType OBJECT-TYPE
SYNTAX Tn3270ResourceType
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Indicates the type of resource identified by
 tn3270eTcpConnResourceName."
 ::= { tn3270eTcpConnEntry 5 }

tn3270eTcpConnDeviceType OBJECT-TYPE
SYNTAX Tn3270DeviceTypes
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Indicates the device type if negotiated with client.
 This object is also known as logmode."
 ::= { tn3270eTcpConnEntry 6 }

```
tn3270eTcpConnFunctions OBJECT-TYPE
    SYNTAX      Tn3270Functions
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object will indicates which of the TN3270 and TN3270E
```

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```
        functions that are supported by the Server was negotiated
        with a client. Refer to tn3270eSrvrFunctionsSupported."
 ::= { tn3270eTcpConnEntry 7 }
```

-- 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
        TN3270E-MIB."
    MODULE -- this module
        MANDATORY-GROUPS { tn3270eBasicGroup,
                           tn3270eSessionGroup
                           }
    OBJECT tn3270eSrvrConfActivityCheck
        MIN-ACCESS  read-only
        DESCRIPTION
            "The agent is not required to support a set to this
            object if the associating TN3270E Server doesn't
            support either TIMEMARK or NOP processing. In
            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 tn3270eSrvrConfAdminStatus
  DESCRIPTION
    "A TN3270E Server is not required to support a
    stopImmediate state transition."
 ::= { tn3270eCompliances 1 }

```

-- units of conformance

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```

tn3270eBasicGroup OBJECT-GROUP
  OBJECTS {
    tn3270eSrvrConfInactivityTimeout,
    tn3270eSrvrConfActivityCheck,
    tn3270eSrvrConfActivityTimeout,
    tn3270eSrvrConfActivityInterval,
    tn3270eSrvrFunctionsSupported,
    tn3270eSrvrConfAdminStatus,
    tn3270eSrvrConfOperStatus,
    tn3270eSrvrConfSessionTermState,
    tn3270eSrvrConfSrvrType,
    tn3270eSrvrConfRowStatus,
    tn3270eSrvrPortRowStatus,
    tn3270eSrvrStatsUpTime,
    tn3270eSrvrStatsMaxLus,
    tn3270eSrvrStatsLusInUse,
    tn3270eSrvrStatsSpareLus,
    tn3270eSrvrStatsMaxPtrs,
    tn3270eSrvrStatsPtrsInUse,
    tn3270eSrvrStatsSparePtrs,
    tn3270eSrvrStatsConnectsIn,
    tn3270eSrvrStatsConnRejects,
    tn3270eSrvrStatsDisconnects,
    tn3270eIpGroupSubnetMask,
    tn3270eIpGroupRowStatus,
    tn3270eResPoolElementType,
    tn3270eResPoolRowStatus,
    tn3270eIpResMapRowStatus
  }

```

```

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

tn3270eSessionGroup OBJECT-GROUP
OBJECTS {
    tn3270eResMapElementType,
    tn3270eTcpConnLastActivity,
    tn3270eTcpConnBytesIn,
    tn3270eTcpConnBytesOut,
    tn3270eTcpConnResourceName,
    tn3270eTcpConnResourceType,
    tn3270eTcpConnDeviceType,
    tn3270eTcpConnFunctions
}
STATUS current
DESCRIPTION

```

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```

    "This group is mandatory for all hosts supporting the
    TN3270E-MIB."
 ::= { tn3270eGroups 2 }

```

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 tn3270eSrvrConfInactivityTimeout
- o tn3270eSrvrConfActivityCheck
- o tn3270eSrvrConfActivityTimeout
- o tn3270eSrvrConfActivityInterval
- o tn3270eSrvrConfAdminStatus
- o tn3270eSrvrConfSessionTermState
- o tn3270eIpGroupSubnetMask
- o tn3270eResPoolElementType

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
- o tn3270eIpGroupRowStatus
- o tn3270eResPoolRowStatus
- o tn3270eResMapRowStatus

6. Acknowledgments

This document is a product of the TN3270E Working Group.

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7. References

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Mark Option", [RFC 860](#), May 1983.

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- [10] IETF SNMPv2 Working Group and McCloghrie, K., "TCP-MIB

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[8.](#) Authors' Address

Kenneth D. White
Dept. G80/Bldg 503

IBM Corporation
Research Triangle Park, NC 27709, USA
E-mail: kennethw@vnet.ibm.com