Network Working Group
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Category: Experimental

T. Sung
Novell, Inc.

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TCP/IPX Connection Mib Specification

Status of this Memo

This document defines an Experimental Protocol for the Internet community. This does not specify an Internet standard of any kind. Discussion and suggestions for improvement are requested. Distribution of this memo is unlimited.

IESG Note:

Internet Engineering Steering Group comment from the Area Director for Transport Services: Please note well that this memo is an individual product of the author. Implementation experience, particularly on the effectiveness of the protocols in dual-stack environments, is needed.

1. Introduction

Traditionally, TCP and UDP runs over IP. STD 17, RFC 1213 defines TCP connection MIB object and UDP listener object assuming just that. For TCP and UDP running over IPX, tcpConnTable and udpTable objects from RFC 1213 cannot be used since they define the address to be of type IpAddress. As such, we need to define new objects that can properly describe TCP and UDP connections over IPX.

New MIB objects, tcpIpxConnTable, udpIpxTable, tcpUnspecConnTable and udpUnspecTable are presented in this paper, to be used in place of tcpConnTable and udpListenerTable when TCP and UDP are running over IPX.

2. Objects

```
        TCPIPX-MIB DEFINITIONS ::= BEGIN

        IMPORTS
                OBJECT-TYPE
                        FROM RFC-1212;


    -- IPX address type.
    -- First 4 octests are the network numbers and the last 6
    -- octests are the node numbers.  In ascii, it is represented
```

```
        -- as hex digits, as in:  nnnnnnnn:mmmmmmmmmmmm

        IpxAddress ::= OCTET STRING (size (10))

           -- TCP/IPX MIB object idenfifiers

        novell        OBJECT IDENTIFIER ::= { enterprises 23 }
        mibDoc        OBJECT IDENTIFIER ::= { novell 2 }
        tcpx          OBJECT IDENTIFIER ::= { mibDoc 29 }
        tcpxTcp       OBJECT IDENTIFIER ::= { tcpx 1 }
        tcpxUdp       OBJECT IDENTIFIER ::= { tcpx 2 }



          -- the TCP/IPX Connection table

           -- The TCP/IPX connection table contains information
           -- about this entity's existing TCP connections over
           -- IPX.

           tcpIpxConnTable OBJECT-TYPE
               SYNTAX  SEQUENCE OF TcpIpxConnEntry
               ACCESS  not-accessible
               STATUS  mandatory
               DESCRIPTION
                       "A table containing information specific on
                       TCP connection over IPX network layer."

               ::= { tcpxTcp 1 }

           tcpIpxConnEntry OBJECT-TYPE
               SYNTAX  TcpIpxConnEntry
               ACCESS  not-accessible
               STATUS  mandatory
               DESCRIPTION
                       "Information about a particular current TCP
                       connection over IPX  An object of this type is
                       transient, in that it ceases to exist when (or
                       soon after) the connection makes the transition
                       to the CLOSED state."
               INDEX   { tcpIpxConnLocalAddress,
                         tcpIpxConnLocalPort,
                         tcpIpxConnRemAddress,
                         tcpIpxConnRemPort }
              ::= { tcpIpxConnTable 1 }

           TcpIpxConnEntry ::=
               SEQUENCE {
```

```
                tcpIpxConnState
                    INTEGER,
                tcpIpxConnLocalAddress
                    IpxAddress
                tcpIpxConnLocalPort
                    INTEGER (0..65535),
                tcpIpxConnRemAddress
                    IpxAddress,
                tcpIpxConnRemPort
                    INTEGER (0..65535)
            }

        tcpIpxConnState OBJECT-TYPE
            SYNTAX  INTEGER {
                        closed(1),
                        listen(2),
                        synSent(3),
                        synReceived(4),
                        established(5),
                        finWait1(6),
                        finWait2(7),
                        closeWait(8),
                        lastAck(9),
                        closing(10),
                        timeWait(11),
                        deleteTCB(12)
                    }
            ACCESS  read-write
            STATUS  mandatory
            DESCRIPTION
                    "The state of this TCP connection.

                    The only value which may be set by a management
                    station is deleteTCB(12).  Accordingly, it is
                    appropriate for an agent to return a 'badValue'
                    response if a management station attempts to set
                    this object to any other value.

                    If a management station sets this object to the
                    value deleteTCB(12), then this has the effect of
                    deleting the TCB (as defined in RFC 793) of the
                    corresponding connection on the managed node,
                    resulting in immediate termination of the
                    connection.

                    As an implementation-specific option, a RST
                    segment may be sent from the managed node to the
                    other TCP endpoint (note however that RST
```

```
                segments are not sent reliably)."
        ::= { tcpIpxConnEntry 1 }

    tcpIpxConnLocalAddress OBJECT-TYPE
        SYNTAX  IpxAddress
        ACCESS  read-only
        STATUS  mandatory
        DESCRIPTION
                "The local IPX address for this TCP connection.
                In the case of a connection in the listen state
                which is willing to accept connections for any
                interface, the value 00000000:000000000000 is
                used.  See tcpUnspecConnTable for connections in
                the listen  state which is willing to accept
                connects for any IP interface associated with
                the node."
        ::= { tcpIpxConnEntry 2 }

    -- NetworkAddress defined in SMI only include IP currently,
    -- so we can't use it to represent both IP and IPX address.

    tcpIpxConnLocalPort OBJECT-TYPE
        SYNTAX  INTEGER (0..65535)
        ACCESS  read-only
        STATUS  mandatory
        DESCRIPTION
                "The local port number for this TCP connection."
        ::= { tcpIpxConnEntry 3 }

    tcpIpxConnRemAddress OBJECT-TYPE
        SYNTAX  IpxAddress
        ACCESS  read-only
        STATUS  mandatory
        DESCRIPTION
                "The remote IPX address for this TCP connection."
        ::= { tcpIpxConnEntry 4 }

    tcpIpxConnRemPort OBJECT-TYPE
        SYNTAX  INTEGER (0..65535)
        ACCESS  read-only
        STATUS  mandatory
        DESCRIPTION
                "The remote port number for this TCP connection."
        ::= { tcpIpxConnEntry 5 }
```

```
-- the UDP Listener table

-- The UDP listener table contains information about this
-- entity's UDP end-points on which a local application is
-- currently accepting datagrams.

udpIpxTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF UdpIpxEntry
    ACCESS  not-accessible
    STATUS  mandatory
    DESCRIPTION
            "A table containing UDP listener information."
    ::= { tcpxUdp 1 }

udpIpxEntry OBJECT-TYPE
    SYNTAX  UdpIpxEntry
    ACCESS  not-accessible
    STATUS  mandatory
    DESCRIPTION
            "Information about a particular current UDP
            listener."
    INDEX   { udpIpxLocalAddress, udpIpxLocalPort }
    ::= { udpIpxTable 1 }

UdpIpxEntry ::=
    SEQUENCE {
        udpIpxLocalAddress
 IpxAddress
        udpIpxLocalPort
            INTEGER (0..65535)
    }

udpIpxLocalAddress OBJECT-TYPE
    SYNTAX  IpxAddress
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
            "The local IPX address for this UDP listener.  In
            the case of a UDP listener which is willing to
            accept datagrams for any interface, the value
            00000000:000000000000 is used.  See
            udpUnspecTable for UDP listener which is
            willing to accept datagrams from any network
            layer."
    ::= { udpIpxEntry 1 }

udpIpxLocalPort OBJECT-TYPE
    SYNTAX  INTEGER (0..65535)
```

```
            ACCESS  read-only
            STATUS  mandatory
            DESCRIPTION
                    "The local port number for this UDP listener."
            ::= { udpIpxEntry 2 }


        -- the TCP/UNSPEC Connection table

        -- The TCP/UPSPEC connection table contains information
        -- about this entity's existing TCP connections over
        -- unspecified network.
        -- Since the network is unspecified, the network
        -- address is also unspecified.  Hence, this
        -- connection table does not include any network
        -- address.

        tcpUnspecConnTable OBJECT-TYPE
            SYNTAX  SEQUENCE OF TcpIpxConnEntry
            ACCESS  not-accessible
            STATUS  mandatory
            DESCRIPTION
                    "A table containing information specific on
                    TCP connection over unspecified network layer."

            ::= { tcpxTcp 2 }

        tcpUnspecConnEntry OBJECT-TYPE
            SYNTAX  TcpUnspecConnEntry
            ACCESS  not-accessible
            STATUS  mandatory
            DESCRIPTION
                    "Information about a particular current TCP
                    connection over unspecified network layer.  An
                    object of this type is transient, in that it
                    ceases to exist when the connection makes
                    transition beyond LISTEN state, or when (or
                    soon after) the connection makes transition
                    to the CLOSED state,"

            INDEX   { tcpUnspecConnLocalPort }
            ::= { tcpUnspecConnTable 1 }

        TcpUnspecConnEntry ::=
            SEQUENCE {
                tcpUnspecConnState
                    INTEGER,
                tcpUnspecConnLocalPort
```

```
                INTEGER (0..65535),
        }

    tcpUnspecConnState OBJECT-TYPE
        SYNTAX  INTEGER {
                    closed(1),
                    listen(2),
                    deleteTCB(12)
                }
        ACCESS  read-write
        STATUS  mandatory
        DESCRIPTION
                "The state of this TCP connection.

                Since the TCP connection can belong to this table
                only when its state is less than SYN_SENT, only
                closed and listen state apply.

                The only value which may be set by a management
                station is deleteTCB(12).  Accordingly, it is
                appropriate for an agent to return a 'badValue'
                response if a management station attempts to set
                this object to any other value.

                If a management station sets this object to the
                value deleteTCB(12), then this has the effect of
                deleting the TCB (as defined in RFC 793) of the
                corresponding connection on the managed node,
                resulting in immediate termination of the
                connection.

                As an implementation-specific option, a RST
                segment may be sent from the managed node to the
                other TCP endpoint (note however that RST
                segments are not sent reliably)."
        ::= { tcpUnspecConnEntry 1 }

    tcpUnspecConnLocalPort OBJECT-TYPE
        SYNTAX  INTEGER (0..65535)
        ACCESS  read-only
        STATUS  mandatory
        DESCRIPTION
                "The local port number for this TCP connection."
        ::= { tcpUnspecConnEntry 2 }
```

```
        -- the UDP Listener table

        -- The UDP listener table contains information about this
        -- entity's UDP end-points over unspecified network layer,
        -- on which a local application is currently accepting
        -- datagrams.  If network layer is unspecified, the network
        -- address is also unspecified.  Hence, this table does not
        -- include any network address.

        udpUnspecTable OBJECT-TYPE
            SYNTAX  SEQUENCE OF UdpUnspecEntry
            ACCESS  not-accessible
            STATUS  mandatory
            DESCRIPTION
                     "A table containing UDP listener information."
            ::= { tcpxUdp 2 }

        udpUnspecEntry OBJECT-TYPE
            SYNTAX  UdpUnspecEntry
            ACCESS  not-accessible
            STATUS  mandatory
            DESCRIPTION
                    "Information about a particular current UDP
                    listener."
            INDEX   { udpUnspecLocalPort }
            ::= { udpUnspecTable 1 }

        UdpUnspecEntry ::=
            SEQUENCE {
                udpUnspecLocalPort
                    INTEGER (0..65535)
            }

        udpUnspecLocalPort OBJECT-TYPE
            SYNTAX  INTEGER (0..65535)
            ACCESS  read-only
            STATUS  mandatory
            DESCRIPTION
                    "The local port number for this UDP listener."
            ::= { udpUnspecEntry 1 }

         END
```

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Security Considerations

Security issues are not discussed in this memo.

Author's Address

Tae Sung
Novell, Inc.
2180 Fortune Drive
San Jose, California, 95131

Phone: (408)577-8439
EMail: tae@novell.Com