PacketCable™ 1.5 Specifications

Signaling Extension MIB

PKT-SP-MIB-EXSIG1.5-I02-050812

ISSUED

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Key to Document Status Codes:

Work in Progress	An incomplete document, designed to guide discussion and generate feedback, that may include several alternative requirements for consideration.
Draft	A document in specification format considered largely complete, but lacking review by Members and vendors. Drafts are susceptible to substantial change during the review process.
Issued	A stable document, which has undergone rigorous member and vendor review and is suitable for product design and development, cross-vendor interoperability, and for certification testing.
Closed	A static document, reviewed, tested, validated, and closed to further engineering change requests to the specification through CableLabs.

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1 SCOPE

1.1 Purpose of the Document

New objects that are being introduced beyond PacketCable 1.0 for Signaling MIBS are being grouped in this document so that the additional changes made can be tracked easily.

1.2 Requirements

Throughout this document, the words that are used to define the significance of particular requirements are capitalized. These words are:

"MUST"	This word or the adjective "REQUIRED" means that the item is an absolute requirement of this specification.
"MUST NOT"	This phrase means that the item is an absolute prohibition of this specification.
"SHOULD"	This word or the adjective "RECOMMENDED" means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighed before choosing a different course.
"SHOULD NOT"	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
"MAY"	This word or the adjective "OPTIONAL" means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.

2 REFERENCES

2.1 Normative References

In order to claim compliance with this specification, it is necessary to conform to the following standards and other works as indicated, in addition to the other requirements of this specification. Notwithstanding, intellectual property rights may be required to use or implement such normative references.

[1] PacketCable 1.5 MTA Device Provisioning Specification, PKT-SP-PROV1.5-I02-050812, August 12, 2005, Cable Television Laboratories, Inc.

[2] IETF STD 62, Simple Network Management Protocol Version 3 (SNMPv3), December 2002.

[3] IETF RFC 2669, Cable Device Management Information Base for DOCSIS compliant Cable Modems and Cable Modem Termination Systems.

[4] Data-Over-Cable Service Interface Specifications, DOCSIS 1.1, Operations Support System Interface, SP-OSSIv1.1-I07-030730, July 30, 2003, Cable Television Laboratories, Inc.

[5] IETF STD 5, Internet Protocol, September 1981.

[6] IETF RFC 2011, SNMPv2 Management Information Base for the Internet Protocol using SMIv2, November 1996.

[7] IETF RFC 2863, The Interfaces Group MIB, June 2000.

[8] eDOCSIS Specification, SP-eDOCSIS-I06-050812, August 12, 2005, Cable Television Laboratories.

[9] CableLabs Definition MIB Specification, CL-SP-MIB-CLABDEF-I05-050408, April 8, 2005, Cable Television Laboratories, Inc.

[10] Data-Over-Cable Service Interface Specifications, DOCSIS 2.0, Operations Support System Interface Specification, SP-OSSIv2.0-I09-050812, August 12, 2005, Cable Television Laboratories, Inc.

[11] PacketCable 1.5 MTA MIB Specification, PKT-SP-MIB-MTA1.5-I01-050128, January 28, 2005, Cable Television Laboratories, Inc.

[12] PacketCable 1.5 Signaling MIB Specification, PKT-SP-MIB-SIG1.5-I01-050128, January 28, 2005, Cable Television Laboratories, Inc.

[13] PacketCable 1.5 MIBs Framework, PKT-SP-MIBS1.5-I01-050128, January 28, 2005, Cable Television Laboratories, Inc.

[14] IETF RFC 2833, RTP Payload for DTMF Digits, Telephony Tones and Signals, May 2000.

[15] PacketCable 1.5 Audio/Video Codecs Specification, PKT-SP-CODEC1.5-I02-050812, August 12, 2005, Cable Television Laboratories, Inc.

[16] PacketCable 1.5 Network-Based Call Signaling Protocol Specification, PKT-SP-NCS1.5-I02-050812, August 12, 2005.

2.2 Informative References

[17] Data-Over-Cable Service Interface Specifications, Cable Modem to Customer Premise Equipment Interface Specification, CMCI, DOCSIS SP-CMCI-I10-050408, April 8, 2005, Cable Television Laboratories, Inc.

[18] IETF RFC 3417, Transport Mappings for the Simple Network Management Protocol (SNMP), December 2002.

[19] IETF RFC 2579, Textual Conventions for SMIv2, April 1999.

[20] IETF RFC 3410, Introduction and Applicability Statements for Internet-Standard Management Framework, December 2002.

[21] IETF RFC 3411, An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks, December 2002.

[22] IETF RFC 3412, Message Processing and Dispatching for the Simple Network Management Protocol (SNMP), December 2002.

[23] IETF RFC 2821, Simple Mail Transfer Protocol, April 2001.

[24] PacketCable 1.5 Dynamic Quality of Service Specification, PKT-SP-DQOS1.5-I02-050812, August 12, 2005, Cable Television Laboratories, Inc.

[25] IETF RFC 3594, PacketCable Security Ticket Control Sub-Option for the DHCP CableLabs Client Configuration (CCC) Option, September 2003.

[26] IETF RFC 2782, A DNS RR for specifying the location of services (DNS SRV), February 2000.

[27] IETF RFC 3584, Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework, August 2003.

[28] PacketCable 1.5 Management Event MIB Specification, PKT-SP-EVEMIB1.5-I02-050812, August 12, 2005, Cable Television Laboratories, Inc.

2.3 Reference Acquisition

CableLabs Specifications:

- Cable Television Laboratories, Inc., 858 Coal Creek Circle, Louisville, CO 80027; Phone 303-661-9100; Fax 303-661-9199; Internet: http://www.cablelabs.com/, http://www.packetcable.com.
- Internet Engineering Task Force (IETF) Secretariat c/o Corporation for National Research Initiatives, 1895 Preston White Drive, Suite 100, Reston, VA 20191-5434, Phone 703-620-8990, Fax 703-620-9071, Internet: www.ietf.org/

3 ABBREVIATIONS

There are no abbreviations used in this document.

4 REQUIREMENTS

The PacketCable™ Extension Signaling MIB MUST be implemented as defined below.

```
PKTC-EN-SIG-MIB DEFINITIONS ::= BEGIN

IMPORTS
      MODULE-IDENTITY,
      OBJECT-TYPE,
      Unsigned32, BITS FROM SNMPv2-SMI
      ifIndex FROM IF-MIB
      SnmpAdminString
            FROM SNMP-FRAMEWORK-MIB
      TruthValue
            FROM SNMPv2-TC
      OBJECT-GROUP,
      MODULE-COMPLIANCE
            FROM SNMPv2-CONF
      pktcEnhancements
            FROM CLAB-DEF-MIB
      pktcNcsEndPntConfigEntry
            FROM PKTC-SIG-MIB;


pktcEnSigMib  MODULE-IDENTITY
      LAST-UPDATED    "200508120000Z" -- August 12, 2005
      ORGANIZATION    "Cable Television Laboratories, Inc "
      CONTACT-INFO
            "Sumanth Channabasappa
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      DESCRIPTION
            "This MIB module enhances the basic management
            objects defined for PacketCable Signaling
            protocols by the MIB group pktcSigMib.

            Acknowledgements:
            Rodney Osborne - Arris Interactive
            Eugene Nechamkin - Broadcom Corporation
            Satish Kumar - Texas Instruments
            Jean-Francois Mule - CableLabs


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      REVISION "200508120000Z"

      DESCRIPTION
            "This revision is being published as part of the PacketCable
             Signaling MIBs enhancements for PacketCable 1.5."
      ::=  { pktcEnhancements 2 }



--
-- Enhanced MIB Objects and Divisions.
--
pktcEnSigMibObjects            OBJECT IDENTIFIER
```

```
                                        ::= { pktcEnSigMib 1 }
pktcEnSigDevConfigObjects      OBJECT IDENTIFIER
                                        ::= { pktcEnSigMibObjects 1 }
pktcEnNcsEndPntConfigObjects   OBJECT IDENTIFIER
                                        ::= { pktcEnSigMibObjects 2 }
pktcEnSigEndPntConfigObjects   OBJECT IDENTIFIER
                                        ::= { pktcEnSigMibObjects 3 }
pktcEnDcsEndPntConfigObjects   OBJECT IDENTIFIER
                                        ::= { pktcEnSigMibObjects 4 }



--
-- Enhanced Notification groups.
--
pktcEnSigNotificationPrefix OBJECT IDENTIFIER
                                      ::= { pktcEnSigMib 2 }
pktcEnSigNotification  OBJECT IDENTIFIER
                                      ::= { pktcEnSigNotificationPrefix 0 }
pktcEnSigConformance   OBJECT IDENTIFIER
                                      ::= { pktcEnSigMib 3 }
pktcEnSigCompliances   OBJECT IDENTIFIER
                                      ::= { pktcEnSigConformance 1 }
pktcEnSigGroups        OBJECT IDENTIFIER
                                      ::= { pktcEnSigConformance 2 }



pktcEnNcsMinimumDtmfPlayout   OBJECT-TYPE
       SYNTAX Unsigned32 (0 | 40..100)
       UNITS "milliseconds"
       MAX-ACCESS   read-write
       STATUS current
       DESCRIPTION
           "This object defines the minimum playout time for
            the DTMF digit when IETF RFC 2833 DTMF Relay is used
            for the egress gateway.
            If the value set via this pktcEnNcsMinimumDtmfPlayout
            object is different from that specified in RFC2833 packet,
            then the MTA MUST use the maximum of the two values.
            For example:
            If the RFC 2833 packet specifies 23ms and if the object
            pktcEnNcsMinimumDtmfPlayout is set to 40ms then
            the egress gateway must use a value of 40ms.
            Similarly if the RFC 2833 packet specifies
            60 ms and if the object pktcEnNcsMinimumDtmfPlayout
            is set to 40ms then the egress gateway must use a
            value of 60 ms."
       REFERENCE
            "PacketCable(tm) Codec Specification"
       DEFVAL  {0}
       ::= { pktcEnSigDevConfigObjects 1}


--
--    The following table enhances the NCS End Point Config Table
--    (pktcNcsEndPntConfigTable) defined in pktSigMib.
--
--
pktcEnNcsEndPntConfigTable   OBJECT-TYPE
       SYNTAX        SEQUENCE OF PktcEnNcsEndPntConfigEntry
       MAX-ACCESS    not-accessible
       STATUS        current
       DESCRIPTION
            "This table augments pktcNcsEndPntConfigTable."
      ::=  { pktcEnNcsEndPntConfigObjects 1 }
```

```
pktcEnNcsEndPntConfigEntry   OBJECT-TYPE
       SYNTAX        PktcEnNcsEndPntConfigEntry
       MAX-ACCESS    not-accessible
       STATUS        current
       DESCRIPTION
            "An enhancement to pktcNcEndPntConfigTable - where each
             entry describes endpoint characteristics."
      AUGMENTS { pktcNcsEndPntConfigEntry }
      ::=  { pktcEnNcsEndPntConfigTable 1 }


PktcEnNcsEndPntConfigEntry  ::=
       SEQUENCE {
                pktcEnNcsEndPntQuarantineState  INTEGER,
                pktcEnNcsEndPntHookState  INTEGER,
                pktcEnNcsEndPntFaxDetection  TruthValue,
                pktcEnNcsEndPntStatusReportCtrl INTEGER
        }


pktcEnNcsEndPntQuarantineState   OBJECT-TYPE
       SYNTAX INTEGER {
           normal           (1),
           notification     (2),
           lockstep         (3),
           extendedlockstep (4)
       }
       MAX-ACCESS   read-only
       STATUS       current
       DESCRIPTION
            "This object reflects the state of the Endpoint.
             When the endpoint is in notification, lockstep or
             'extended lockstep' states, the E-MTA MUST report
             the values of notification(2), lockstep(3) or extendedlockstep(
             4),respectively. Else, the endpoint MUST report a value of
           normal(1).
          'Extended Lockstep' is defined as the state when the
           E-MTA is in the lockstep state for longer than 2 minutes.
           For more description about the states refer
           to the PacketCable Network Based Call signaling
           specification."
       REFERENCE
            "PacketCable(tm) Network-Based Call Signaling Protocol
             Specification,"
      ::= { pktcEnNcsEndPntConfigEntry 1 }


pktcEnNcsEndPntHookState   OBJECT-TYPE
       SYNTAX INTEGER {
                  onHook                (1),
                  onHookPlusNCSActivity (2),
                  offHook               (3)
                }
       MAX-ACCESS   read-only
       STATUS  current
       DESCRIPTION
           "This object reflects the 'hook state' and 'NCS Activity'
            of an endpoint.
            'NCS Activity', by definition includes: an active
             timeout signal, active brief signal or existence of
             an NCS connection.
             The onHook(1) state indicates that the endpoint is
             'on hook' and the absence of 'NCS Activity' on that
             endpoint.
             The onHookPlusNCSActivity(2) indicates that the endpoint
```

```
            is 'on hook' and the presence of 'NCS Activity' on that
            endpoint.
            The offHook(3) state indicates that the endpoint is
            'off hook'."

       REFERENCE
            "PacketCable(tm) Network-Based Call Signaling Protocol
Specification"
       ::= { pktcEnNcsEndPntConfigEntry 2 }


pktcEnNcsEndPntFaxDetection      OBJECT-TYPE
      SYNTAX TruthValue
      MAX-ACCESS  read-create
      STATUS      current
      DESCRIPTION
            "This MIB object is used to configure
            the distinctive fax calling tone (CNG) detection feature
            on an MTA endpoint with reference to the analog interface.
            When set to true, the MTA MUST enable the detection
            of CNG tones on the specific endpoint.
            When set to false, the MTA MUST disable the detection
            of CNG tones on the specific endpoint.
            If a connection already exists on the endpoint when this
            MIB Object is modified, then the setting needs to take
            effect on the next connection."

       DEFVAL {false}
      ::= { pktcEnNcsEndPntConfigEntry 3}

pktcEnNcsEndPntStatusReportCtrl      OBJECT-TYPE
           SYNTAX INTEGER {
                 unsupported               (1),
                 reportActualStatus        (2),
                 reportEndPointAsActive    (3)
           }
       MAX-ACCESS  read-create
       STATUS      current
       DESCRIPTION
           "This MIB object is be used to control
            the Endpoint Status Reporting, if the feature is
            supported by the MTA and is configurable.
            The term 'Endpoint Status Reporting' refers to any
            information that the MTA may provide to External
            Systems for use in a particular reporting mechanism
            (Ex: Home Alarm Systems). The definition of the External
            Systems and reporting mechanism are beyond the scope
            of this definition (In the example of Home Alarm Systems,
            this MIB Object will allow Management Stations to
            temporarily disable outage reporting on an EndPoint
            during planned downtime).
            If supported, the MTA MUST:
            - reflect the actual Endpoint status when the value
              is set to 'reportActualStatus(2)'
             - reflect the EndPoint status as being active when the
              value is set to 'reportEndPointAsActive(3)',
              irrespective of the actual status.
            If unsupported, the MTA MUST set this value to
            'unsupported(1)' and reject any attempt to set
            this MIB object using SNMP SET to any other value."
      ::= { pktcEnNcsEndPntConfigEntry 4}


pktcEnEndPntInfoTable   OBJECT-TYPE
       SYNTAX        SEQUENCE OF PktcEnEndPntInfoTableEntry
       MAX-ACCESS    not-accessible
       STATUS        current
```

```
        DESCRIPTION
            "This table includes any additional information
             associated with PacketCable EndPoints.
             The number of entries in this table represents the
             number of available PacketCable EndPoints."
       ::=  { pktcEnNcsEndPntConfigObjects 2 }


pktcEnEndPntInfoTableEntry   OBJECT-TYPE
      SYNTAX        PktcEnEndPntInfoTableEntry
      MAX-ACCESS    not-accessible
      STATUS        current
      DESCRIPTION
           "An entry in this table MUST be created for each
            PacketCable EndPoint.
            The index needs to be the corresponding index in the ifTable
            for the associated PacketCable EndPoint."
      INDEX { ifIndex }
      ::=  { pktcEnEndPntInfoTable 1 }


PktcEnEndPntInfoTableEntry  ::=
        SEQUENCE {
                pktcEnEndPntFgnPotSupport   BITS,
                pktcEnEndPntFgnPotDescr     SnmpAdminString,
                pktcEnEndPntClrFgnPotTsts   BITS,
                pktcEnEndPntRunFgnPotTsts   BITS,
                pktcEnEndPntFgnTestValidity BITS,
                pktcEnEndPntFgnTestResults  BITS
        }


pktcEnEndPntFgnPotSupport  OBJECT-TYPE
      SYNTAX BITS {
           fgnPotDetection (0),
           hazardousFgnPotDetection (1)
      }
       MAX-ACCESS read-only
       STATUS current
       DESCRIPTION
           "This MIB object indicates the capabilities of the MTA to
            detect various conditions related to the presence of
            foreign potential on an endpoint.
            The MTA MUST set a value of '1' for each bit corresponding
            to a supported functionality and a value of '0' for each
            bit corresponding to an unsupported functionality."
       ::= {  pktcEnEndPntInfoTableEntry 1 }


pktcEnEndPntFgnPotDescr  OBJECT-TYPE
       SYNTAX SnmpAdminString
       MAX-ACCESS read-only
       STATUS current
       DESCRIPTION
           "This MIB object provides information related to the
            various tests for each detection mechanism supported by
            the MTA. While the actual contents are vendor-specific,
            the recommended format is:
            [<Capability>:<Test References>:<Other Info>]...
           Example:
           <fgnPotDetection>:<test XYZ, Reference 'Document'>:<NA>;
           <hazardousFngPotDetection>:<Test ABC, References>:<NA>
           "
       ::= { pktcEnEndPntInfoTableEntry 2 }


pktcEnEndPntClrFgnPotTsts     OBJECT-TYPE
```

```
        SYNTAX BITS {
            clrFgnPotentialResults (0),
            clrHazardousPotResults (1)
        }
        MAX-ACCESS     read-write
        STATUS         current
        DESCRIPTION
            "This MIB object is used to clear the current test
             results of supported conditions indicated by
             'pktcEnEndPntFgnPotSupport'.
             Setting a bit to a value of '1' clears the corresponding
             results in the MIB Object 'pktcEnEndPntFgnTestResults' and
             the validity as indicated  by the MIB object
             'pktcEnEndPntFgnTestValidity' for the supported
             conditions only (i.e, the MTA MUST set the corresponding
             bits to a value of '0' in the indicated tables).
             If an SNMP SET attempts to set a bit corresponding to an
             unsupported condition to a value of '1', then the MTA MUST
             reject the entire SNMP SET and report an 'inconsistent
             value' error.
            For all unsupported scenarios, the corresponding bits MUST
             be set to a value of '0'.
             Whenever one or more tests are enabled by the MIB Object
            'pktcEnEndPntRunFgnPotTests', the MTA MUST also reset the
             corresponding bits in this MIB Object to a value of '0'."
        ::= { pktcEnEndPntInfoTableEntry 3}


pktcEnEndPntRunFgnPotTsts     OBJECT-TYPE
        SYNTAX BITS {
            runFgnPotentialTsts (0),
            runHazardousPotTsts (1)
        }
        MAX-ACCESS     read-write
        STATUS         current
        DESCRIPTION
            "This MIB object is used to initiate one or more test cases
             associated with a supported foreign potential detection.
             Thus, whenever one or more BITS corresponding to supported
             foreign scenario potential detection mechanisms are set to
             a value of '1', the MTA MUST enable those tests.
             Once the tests are executed, the MTA MUST:
             - set the corresponding bit to a value of '0'
             - update the corresponding BITS in the MIB Objects
             'pktcEnEndPntFgnTestValidity' and
             'pktcEnEndPntFgnTestResults'.
             If an SNMP SET attempts to set a bit corresponding to an
             unsupported condition to a value of '1', then the MTA MUST
             reject the entire SNMP SET and report an 'inconsistent
             value' error.
             Whenever a test is being run on an EndPoint the MTA MUST
             set the corresponding 'ifOperStatus' MIB Object to a
             value of 'testing(3)' for the whole duration of the test.
             When the test is completed, the MTA MUST set the
             ifOperStatus to the value corresponding to the current
             state of the line.

            Note: Whenever multiple tests are run, the ordering of the
                  tests or the results is vendor dependent and need not
                  necessarily follow the ordering of BITS in this MIB
                  Object."
        ::= { pktcEnEndPntInfoTableEntry 4}

pktcEnEndPntFgnTestValidity   OBJECT-TYPE
        SYNTAX BITS {
            fgnPotTstValidity (0),
            hazardousPotTstValidity (1)
```

```
        }
        MAX-ACCESS     read-only
        STATUS         current
        DESCRIPTION
            "This MIB object is used to indicate the validity of the
             corresponding test cases that were initiated using the MIB
             Object 'pktcEnEndPntRunFgnPotTests'.
             An MTA MUST:
             - return a value of '1' if the tests were run successfully
               and the results are valid.
             - return a value of '0' if a particular test was not
               initiated or if the tests could not be run successfully
               and hence the results are invalid.
            Note: The MTA MUST set all the BITS to '0' as soon as one
                  or more test cases are initiated."
       ::= { pktcEnEndPntInfoTableEntry 5}


pktcEnEndPntFgnTestResults  OBJECT-TYPE
        SYNTAX BITS {
            fgnPotentialResults (0),
            hazardousPotResults (1)
        }
        MAX-ACCESS     read-only
        STATUS         current
        DESCRIPTION
            "This MIB object is used to indicate the results of the
             corresponding test cases that were initiated using the MIB
             Object 'pktcEnEndPntRunFgnPotTests'.
             An MTA MUST:
             - set the corresponding bit to a value of '1' if the tests
               indicated the presence of a foreign potential as per the
               associated test case.
             - set the corresponding bit to a value of '0' if the tests
               indicated the absence of a foreign potential as per the
               associated test case.
            Note: The MTA MUST set all the BITS to '0' as soon as one or
                  more test cases are initiated."
        ::= { pktcEnEndPntInfoTableEntry 6}


--
-- Compliance statements
--
pktcSigBasicCompliance  MODULE-COMPLIANCE
        STATUS     current
        DESCRIPTION
            "The compliance statement for devices that implement
             PacketCable defined Signaling on an MTA."

       MODULE  PKTC-EN-SIG-MIB


--
-- Mandatory groups
--
MANDATORY-GROUPS {
         pktcEnSigGroup
       }
        GROUP pktcEnNcsGroup
        DESCRIPTION
            "This group is mandatory for any MTA implementing
             PacketCable signaling."
        ::={ pktcEnSigCompliances 1 }
```

```
--
-- Conformance group for common Signaling.
--
pktcEnSigGroup  OBJECT-GROUP
       OBJECTS {
           pktcEnNcsMinimumDtmfPlayout
       }
       STATUS current
       DESCRIPTION
           "Enhanced group of objects for the common portion of the
            PacketCable Signaling MIB."
      ::= { pktcEnSigGroups 1 }

--
-- Conformance group for NCS Signaling.
--
pktcEnNcsGroup  OBJECT-GROUP
       OBJECTS {
           pktcEnNcsEndPntQuarantineState,
           pktcEnNcsEndPntHookState,
        pktcEnNcsEndPntFaxDetection,
        pktcEnNcsEndPntStatusReportCtrl,
        pktcEnEndPntFgnPotSupport,
        pktcEnEndPntFgnPotDescr,
        pktcEnEndPntClrFgnPotTsts,
        pktcEnEndPntRunFgnPotTsts,
        pktcEnEndPntFgnTestValidity,
        pktcEnEndPntFgnTestResults
       }
       STATUS current
       DESCRIPTION
           "Enhanced group of objects for the NCS portion of the
            PacketCable Signaling MIB.  This is mandatory for
            NCS signaling support."
       ::= { pktcEnSigGroups 2 }
END
```

Appendix A Acknowledgements

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Appendix B Revision History

The following ECN has been incorporated into PKT-SP-MIB-EXSIG1.5-I02-050812.

ECN	ECN Date	Summary
MIB-EXSIG1.5-N-05.0278-1	7/11/05	MAX-ACCESS alignment of the MIB Objects 'pktcEnNcsEndPntFaxDetection' and 'pktcEnNcsEndPntStatusReportCtrl'