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Dial Control Management Information Base using SMIv2

Status of this Memo

Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects used for managing demand access circuits, including ISDN.

This document specifies a MIB module in a manner that is compliant to the SNMPv2 SMI. The set of objects is consistent with the SNMP framework and existing SNMP standards.

This document is a product of the ISDN MIB working group within the Internet Engineering Task Force. Comments are solicited and should be addressed to the working group's mailing list at isdn-mib@cisco.com and/or the author.

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1. The SNMPv2 Network Management Framework

The SNMPv2 Network Management Framework presently consists of three major components. They are:

- the SMI, described in RFC 1902 [1] - the mechanisms used for describing and naming objects for the purpose of management.
- the MIB-II, STD 17, RFC 1213 [2] - the core set of managed objects for the Internet suite of protocols.
- the protocol, STD 15, RFC 1157 [3] and/or RFC 1905 [4], - the protocol for accessing managed objects.

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

1.1. 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.

2. Overview

2.1. Structure of MIB

Managing demand access circuits requires the following groups of information:

- General configuration information.
- Information to describe peer configuration and peer statistics. In this respect, peer configuration means information on how to connect to peers on outgoing calls, how to identify peers on incoming calls, and other call related configuration information.
- Information to store active call information.

- Information to retain call history.

The MIB, therefore, is structured into four groups.

- The dialCtlConfiguration group is used to specify general configuration information.

- The dialCtlPeer group is used to describe peer configuration and peer statistics.

- The callActive group is used to store active call information.

- The callHistory group is used to store call history information. These calls could be circuit switched or they could be virtual circuits. History of each and every call is stored, of successful calls as well as unsuccessful and rejected calls. An entry will be created when a call is cleared.

2.2. Relationship to the Interfaces MIB

This section clarifies the relationship of this MIB to the Interfaces MIB [8]. Several areas of correlation are addressed in the following subsections. The implementor is referred to the Interfaces MIB document in order to understand the general intent of these areas.

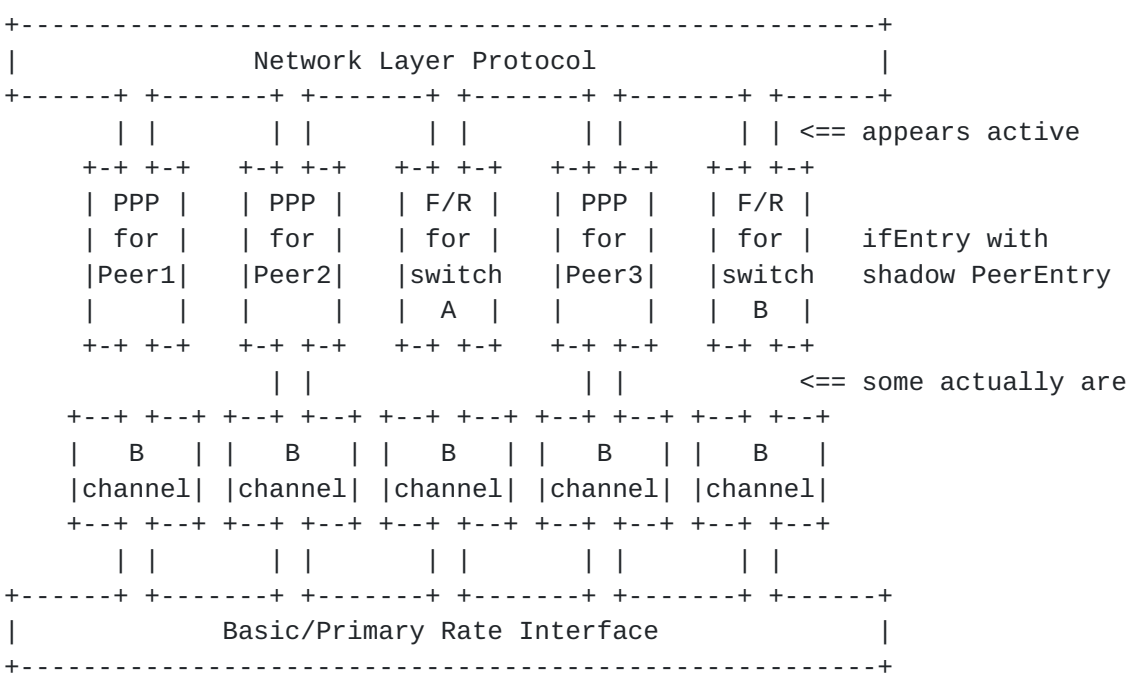
2.2.1. Layering Model and Virtual Circuits

On an occasional access channel, there are a number of peer systems that are permitted to call or be called, all of which need to be treated as active from a routing viewpoint, but most of which have no call in progress at any given time.

On dialup interfaces, this is further complicated by the fact that calls to a given peer float from channel to channel. One cannot definitively say "I call this peer on that interface." It is necessary, therefore, to provide a mapping algorithm between the low-level interfaces, and the various logical interfaces supporting the peers. This is solved by creating a logical interface (ifEntry) for each peer and a logical interface (ifEntry) for each low-level interface. These are then correlated using the ifStackTable.

The low-level interfaces are either physical interfaces, e.g. modem interfaces, or logical interfaces, e.g. ISDN B channels, which then in turn are layered on top of physical ISDN interfaces.

The model, therefore, looks something like this, taking ISDN as an example:



Mapping of IP interfaces to Called Peers to B Channels

IfEntries are maintained for each peer.

In this model, each peer is required to have an associated encapsulation layer interface. This interface can be of any kind, e.g. PPP or LAPB.

In order to specify the network address for a given peer, one would then usually add a routing/forwarding table entry, pointing to the encapsulation layer interface through which this peer can be reached.

2.2.2. ifTestTable

The ifTestTable usage is defined in the MIBs defining the encapsulation below the network layer. For example, if PPP encapsulation is being used, the ifTestTable is defined by PPP.

2.2.3. ifRcvAddressTable

The ifRcvAddressTable usage is defined in the MIBs defining the encapsulation below the network layer. For example, if PPP encapsulation is being used, the ifRcvAddressTable is defined by PPP.

2.2.3.1. ifEntry for a single peer

IfEntries are defined in the MIBs defining the encapsulation below the network layer. For example, if PPP encapsulation is being used, the ifEntry is defined by PPP.

ifEntries will never be created by the Dial Control MIB. The Dial Control MIB always depends on some other ifIndex of some set of ifTypes. That is, to create an entry in the Dial Control MIB, the base ifEntry must already have been created through some other mechanism.

The Dial Control entry does have its own RowStatus, permitting the Dial Control supplementary information to come and go, but not otherwise disturbing the ifIndex to which it is attached. If in a given implementation the two are tightly bound, deleting the ifEntry may have the side effect of deleting the Dial Control entry.

2.3. Multilink and backup line support

In order to support multilink and backup procedures, there may be several entries for a single peer in the dialCtlPeerCfgTable.

A single peer is identified using the dialCtlPeerCfgId object of the dialCtlPeerCfgTable. There may be several entries in dialCtlPeerCfgTable with the same value of dialCtlPeerCfgId, but different ifIndex values. Each of those entries will then describe a possible connection to the same peer. Such entries can then be used to handle multilink as well as backup procedures, e.g. by bundling the attached ifEntries using PPP multilink.

2.4. Support for generic peers

Generic peers can for example be supported by permitting wild-card characters (e.g., '?' or '*') in dialCtlPeerCfgAnswerAddress. A number to be accepted could then be defined as partly (e.g., '*1234') or entirely generic (e.g., '*').

A detailed specification of such a functionality is outside the scope of this document.

However, the implementor should be aware that supporting generic peers may cause a security hole. The user would not know where a call is from, which could potentially allow unauthorized access.

3. Definitions

3.1. Dial Control MIB

```
DIAL-CONTROL-MIB DEFINITIONS ::= BEGIN

IMPORTS
        MODULE-IDENTITY,
        NOTIFICATION-TYPE,
        OBJECT-TYPE,
        Unsigned32
                FROM SNMPv2-SMI
        TEXTUAL-CONVENTION,
        DisplayString,
        TimeStamp,
        RowStatus
                 FROM SNMPv2-TC
        MODULE-COMPLIANCE,
        OBJECT-GROUP,
        NOTIFICATION-GROUP
                FROM SNMPv2-CONF
        IANAifType
                FROM IANAifType-MIB
        ifOperStatus,
        ifIndex,
        InterfaceIndex,
        InterfaceIndexOrZero
                FROM IF-MIB
        transmission
                FROM RFC1213-MIB;

dialControlMib MODULE-IDENTITY
        LAST-UPDATED    "9609231544Z" -- Sep 23, 1996
        ORGANIZATION    "IETF ISDN Working Group"
        CONTACT-INFO
            "        Guenter Roeck
             Postal: cisco Systems
                     170 West Tasman Drive
                     San Jose, CA 95134
                     U.S.A.
             Phone:  +1 408 527 3143
             E-mail: groeck@cisco.com"
        DESCRIPTION
            "The MIB module to describe peer information for
             demand access and possibly other kinds of interfaces."
        ::= { transmission 21 }

AbsoluteCounter32 ::= TEXTUAL-CONVENTION
```

```
        STATUS      current
        DESCRIPTION
            "Represents a Counter32-like value that starts at zero,
             does not decrease, and does not wrap. This may be used
             only in situations where wrapping is not possible or
             extremely unlikely. Should such a counter overflow,
             it locks at the maxium value of 4,294,967,295.

             The primary use of this type of counter is situations
             where a counter value is to be recorded as history
             and is thus no longer subject to reading for changing
             values."
        SYNTAX      Unsigned32

-- Dial Control Mib objects definitions

dialControlMibObjects OBJECT IDENTIFIER ::= { dialControlMib 1 }

-- General configuration group

dialCtlConfiguration OBJECT IDENTIFIER ::= { dialControlMibObjects 1 }

-- general configuration data/parameters

dialCtlAcceptMode OBJECT-TYPE
        SYNTAX INTEGER {
            acceptNone(1),
            acceptAll(2),
            acceptKnown(3)
        }
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "The security level for acceptance of incoming calls.
             acceptNone(1)  - incoming calls will not be accepted
             acceptAll(2)   - incoming calls will be accepted,
                              even if there is no matching entry
                              in the dialCtlPeerCfgTable
             acceptKnown(3) - incoming calls will be accepted only
                              if there is a matching entry in the
                              dialCtlPeerCfgTable
            "
        ::= { dialCtlConfiguration 1 }

dialCtlTrapEnable OBJECT-TYPE
        SYNTAX      INTEGER {
            enabled(1),
            disabled(2)
```

```
        }
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "This object indicates whether dialCtlPeerCallInformation
             and dialCtlPeerCallSetup traps should be generated for
             all peers. If the value of this object is enabled(1),
             traps will be generated for all peers. If the value
             of this object is disabled(2), traps will be generated
             only for peers having dialCtlPeerCfgTrapEnable set
             to enabled(1)."
        DEFVAL      { disabled }
        ::= { dialCtlConfiguration 2 }


-- Peer group

dialCtlPeer OBJECT IDENTIFIER ::= { dialControlMibObjects 2 }

-- peer configuration table

dialCtlPeerCfgTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF DialCtlPeerCfgEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "The list of peers from which the managed device
             will accept calls or to which it will place them."
       ::= { dialCtlPeer 1 }

dialCtlPeerCfgEntry OBJECT-TYPE
        SYNTAX      DialCtlPeerCfgEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "Configuration data for a single Peer. This entry is
             effectively permanent, and contains information
             to identify the peer, how to connect to the peer,
             how to identify the peer and its permissions.
             The value of dialCtlPeerCfgOriginateAddress must be
             specified before a new row in this table can become
             active(1). Any writeable parameters in an existing entry
             can be modified while the entry is active. The modification
             will take effect when the peer in question will be
             called the next time.
             An entry in this table can only be created if the
             associated ifEntry already exists."
        INDEX       { dialCtlPeerCfgId, ifIndex }
```

```
      ::= { dialCtlPeerCfgTable 1 }

DialCtlPeerCfgEntry ::= SEQUENCE {
            dialCtlPeerCfgId                INTEGER,
            dialCtlPeerCfgIfType            IANAifType,
            dialCtlPeerCfgLowerIf           InterfaceIndexOrZero,
            dialCtlPeerCfgOriginateAddress  DisplayString,
            dialCtlPeerCfgAnswerAddress     DisplayString,
            dialCtlPeerCfgSubAddress        DisplayString,
            dialCtlPeerCfgClosedUserGroup   DisplayString,
            dialCtlPeerCfgSpeed             INTEGER,
            dialCtlPeerCfgInfoType          INTEGER,
            dialCtlPeerCfgPermission        INTEGER,
            dialCtlPeerCfgInactivityTimer   INTEGER,
            dialCtlPeerCfgMinDuration       INTEGER,
            dialCtlPeerCfgMaxDuration       INTEGER,
            dialCtlPeerCfgCarrierDelay      INTEGER,
            dialCtlPeerCfgCallRetries       INTEGER,
            dialCtlPeerCfgRetryDelay        INTEGER,
            dialCtlPeerCfgFailureDelay      INTEGER,
            dialCtlPeerCfgTrapEnable        INTEGER,
            dialCtlPeerCfgStatus            RowStatus
        }

dialCtlPeerCfgId OBJECT-TYPE
        SYNTAX      INTEGER (1..2147483647)
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This object identifies a single peer. There may
             be several entries in this table for one peer,
             defining different ways of reaching this peer.
             Thus, there may be several entries in this table
             with the same value of dialCtlPeerCfgId.
             Multiple entries for one peer may be used to support
             multilink as well as backup lines.
             A single peer will be identified by a unique value
             of this object. Several entries for one peer MUST
             have the same value of dialCtlPeerCfgId, but different
             ifEntries and thus different values of ifIndex."
        ::= { dialCtlPeerCfgEntry 1 }

dialCtlPeerCfgIfType OBJECT-TYPE
        SYNTAX      IANAifType
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The interface type to be used for calling this peer.
```

```
             In case of ISDN, the value of isdn(63) is to be used."
        DEFVAL      { other }
        ::= { dialCtlPeerCfgEntry 2 }

dialCtlPeerCfgLowerIf OBJECT-TYPE
        SYNTAX      InterfaceIndexOrZero
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "ifIndex value of an interface the peer will have to be
             called on. For example, on an ISDN interface, this can be
             the ifIndex value of a D channel or the ifIndex value of a
             B channel, whatever is appropriate for a given peer.
             As an example, for Basic Rate leased lines it will be
             necessary to specify a B channel ifIndex, while for
             semi-permanent connections the D channel ifIndex has
             to be specified.
             If the interface can be dynamically assigned, this object
             has a value of zero."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 3 }

dialCtlPeerCfgOriginateAddress OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Call Address at which the peer will be called.
             Think of this as the set of characters following 'ATDT '
             or the 'phone number' included in a D channel call request.

             The structure of this information will be switch type
             specific. If there is no address information required
             for reaching the peer, i.e., for leased lines,
             this object will be a zero length string."
        ::= { dialCtlPeerCfgEntry 4 }

dialCtlPeerCfgAnswerAddress OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Calling Party Number information element, as for example
             passed in an ISDN SETUP message by a PBX or switch,
             for incoming calls.
             This address can be used to identify the peer.
             If this address is either unknown or identical
             to dialCtlPeerCfgOriginateAddress, this object will be
```

```
            a zero length string."
        DEFVAL      { "" }
        ::= { dialCtlPeerCfgEntry 5 }

dialCtlPeerCfgSubAddress OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Subaddress at which the peer will be called.
             If the subaddress is undefined for the given media or
             unused, this is a zero length string."
        DEFVAL      { "" }
        ::= { dialCtlPeerCfgEntry 6 }

dialCtlPeerCfgClosedUserGroup OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Closed User Group at which the peer will be called.
             If the Closed User Group is undefined for the given media
             or unused, this is a zero length string."
        REFERENCE
            "Q.931, chapter 4.6.1."
        DEFVAL      { "" }
        ::= { dialCtlPeerCfgEntry 7 }

dialCtlPeerCfgSpeed OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The desired information transfer speed in bits/second
             when calling this peer.
             The detailed media specific information, e.g. information
             type and information transfer rate for ISDN circuits,
             has to be extracted from this object.
             If the transfer speed to be used is unknown or the default
             speed for this type of interfaces, the value of this object
             may be zero."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 8 }

dialCtlPeerCfgInfoType OBJECT-TYPE
        SYNTAX      INTEGER {
            other(1),
            speech(2),
```

```
            unrestrictedDigital(3),     -- 64k/s data
            unrestrictedDigital56(4),   -- with 56k rate adaption
            restrictedDigital(5),
            audio31(6),                 -- 3.1 kHz audio
            audio7(7),                  -- 7 kHz audio
            video(8),
            packetSwitched(9),
            fax(10)
        }
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The Information Transfer Capability to be used when
             calling this peer.

             speech(2) refers to a non-data connection, whereas
             audio31(6) and audio7(7) refer to data mode
             connections."
        DEFVAL      { other }
        ::= { dialCtlPeerCfgEntry 9 }

dialCtlPeerCfgPermission OBJECT-TYPE
        SYNTAX      INTEGER {
            originate(1),
            answer(2),
            both(3),               -- both originate & answer
            callback(4),
            none(5)
        }
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Applicable permissions. callback(4) either rejects the
             call and then calls back, or uses the 'Reverse charging'
             information element if it is available.
             Note that callback(4) is supposed to control charging, not
             security, and applies to callback prior to accepting a
             call. Callback for security reasons can be handled using
             PPP callback."
        DEFVAL      { both }
        ::= { dialCtlPeerCfgEntry 10 }

dialCtlPeerCfgInactivityTimer OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        UNITS       "seconds"
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
```

```
            "The connection will be automatically disconnected
             if no longer carrying useful data for a time
             period, in seconds, specified in this object.
             Useful data in this context refers to forwarding
             packets, including routing information; it
             excludes the encapsulator maintenance frames.
             A value of zero means the connection will not be
             automatically taken down due to inactivity,
             which implies that it is a dedicated circuit."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 11 }

dialCtlPeerCfgMinDuration OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Minimum duration of a call in seconds, starting from the
             time the call is connected until the call is disconnected.
             This is to accomplish the fact that in most countries
             charging applies to units of time, which should be matched
             as closely as possible."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 12 }

dialCtlPeerCfgMaxDuration OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Maximum call duration in seconds. Zero means 'unlimited'."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 13 }

dialCtlPeerCfgCarrierDelay OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        UNITS       "seconds"
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The call timeout time in seconds. The default value
             of zero means that the call timeout as specified for
             the media in question will apply."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 14 }

dialCtlPeerCfgCallRetries OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
```

```
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The number of calls to a non-responding address
             that may be made. A retry count of zero means
             there is no bound. The intent is to bound
             the number of successive calls to an address
             which is inaccessible, or which refuses those calls.

             Some countries regulate the number of call retries
             to a given peer that can be made."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 15 }

dialCtlPeerCfgRetryDelay OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        UNITS       "seconds"
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The time in seconds between call retries if a peer
             cannot be reached.
             A value of zero means that call retries may be done
             without any delay."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 16 }

dialCtlPeerCfgFailureDelay OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        UNITS       "seconds"
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The time in seconds after which call attempts are
             to be placed again after a peer has been noticed
             to be unreachable, i.e. after dialCtlPeerCfgCallRetries
             unsuccessful call attempts.
             A value of zero means that a peer will not be called
             again after dialCtlPeerCfgCallRetries unsuccessful call
             attempts."
        DEFVAL      { 0 }
        ::= { dialCtlPeerCfgEntry 17 }

dialCtlPeerCfgTrapEnable OBJECT-TYPE
        SYNTAX      INTEGER {
            enabled(1),
            disabled(2)
        }
```

```
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "This object indicates whether dialCtlPeerCallInformation
             and dialCtlPeerCallSetup traps should be generated for
             this peer."
        DEFVAL      { disabled }
        ::= { dialCtlPeerCfgEntry 18 }

dialCtlPeerCfgStatus OBJECT-TYPE
        SYNTAX      RowStatus
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Status of one row in this table."
        ::= { dialCtlPeerCfgEntry 19 }

-- Peer statistics table

dialCtlPeerStatsTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF DialCtlPeerStatsEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "Statistics information for each peer entry.
             There will be one entry in this table for each entry
             in the dialCtlPeerCfgTable."
       ::= { dialCtlPeer 2 }

dialCtlPeerStatsEntry OBJECT-TYPE
        SYNTAX      DialCtlPeerStatsEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "Statistics information for a single Peer. This entry
             is effectively permanent, and contains information
             describing the last call attempt as well as supplying
             statistical information."
        AUGMENTS    { dialCtlPeerCfgEntry }
      ::= { dialCtlPeerStatsTable 1 }

DialCtlPeerStatsEntry ::=
        SEQUENCE {
            dialCtlPeerStatsConnectTime          AbsoluteCounter32,
            dialCtlPeerStatsChargedUnits         AbsoluteCounter32,
            dialCtlPeerStatsSuccessCalls         AbsoluteCounter32,
            dialCtlPeerStatsFailCalls            AbsoluteCounter32,
            dialCtlPeerStatsAcceptCalls          AbsoluteCounter32,
```

```
            dialCtlPeerStatsRefuseCalls          AbsoluteCounter32,
            dialCtlPeerStatsLastDisconnectCause  OCTET STRING,
            dialCtlPeerStatsLastDisconnectText   DisplayString,
            dialCtlPeerStatsLastSetupTime        TimeStamp
        }

dialCtlPeerStatsConnectTime OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Accumulated connect time to the peer since system startup.
             This is the total connect time, i.e. the connect time
             for outgoing calls plus the time for incoming calls."
        ::= { dialCtlPeerStatsEntry 1 }

dialCtlPeerStatsChargedUnits OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The total number of charging units applying to this
             peer since system startup.
             Only the charging units applying to the local interface,
             i.e. for originated calls or for calls with 'Reverse
             charging' being active, will be counted here."
        ::= { dialCtlPeerStatsEntry 2 }

dialCtlPeerStatsSuccessCalls OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Number of completed calls to this peer."
        ::= { dialCtlPeerStatsEntry 3 }

dialCtlPeerStatsFailCalls OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Number of failed call attempts to this peer since system
             startup."
        ::= { dialCtlPeerStatsEntry 4 }

dialCtlPeerStatsAcceptCalls OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
```

```
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Number of calls from this peer accepted since system
             startup."
        ::= { dialCtlPeerStatsEntry 5 }

dialCtlPeerStatsRefuseCalls OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Number of calls from this peer refused since system
             startup."
        ::= { dialCtlPeerStatsEntry 6 }

dialCtlPeerStatsLastDisconnectCause OBJECT-TYPE
        SYNTAX      OCTET STRING (SIZE (0..4))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The encoded network cause value associated with the last
             call.
             This object will be updated whenever a call is started
             or cleared.
             The value of this object will depend on the interface type
             as well as on the protocol and protocol version being
             used on this interface. Some references for possible cause
             values are given below."
        REFERENCE
            "- Bellcore SR-NWT-001953, Generic Guidelines for
               ISDN Terminal Equipment On Basic Access Interfaces,
               chapter 5.2.5.8.
             - Bellcore SR-NWT-002343, ISDN Primary Rate Interface
               Generic Guidelines for Customer Premises Equipment,
               chapter 8.2.5.8.
             - ITU-T Q.931, Appendix I.
             - ITU-T X.25, CAUSE and DIAGNOSTIC field values.
             - German Telekom FTZ 1TR6, chapter 3.2.3.4.4.4."
        ::= { dialCtlPeerStatsEntry 7 }

dialCtlPeerStatsLastDisconnectText OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "ASCII text describing the reason for the last call
             termination.
```

```
            This object exists because it would be impossible for
            a management station to store all possible cause values
            for all types of interfaces. It should be used only if
            a management station is unable to decode the value of
            dialCtlPeerStatsLastDisconnectCause.

            This object will be updated whenever a call is started
            or cleared."
        ::= { dialCtlPeerStatsEntry 8 }

dialCtlPeerStatsLastSetupTime OBJECT-TYPE
        SYNTAX      TimeStamp
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of sysUpTime when the last call to this peer
             was started.
             For ISDN media, this will be the time when the setup
             message was received from or sent to the network.
             This object will be updated whenever a call is started
             or cleared."
        ::= { dialCtlPeerStatsEntry 9 }

--
-- the active call group
--

callActive OBJECT IDENTIFIER ::= { dialControlMibObjects 3 }

-- callActiveTable
-- Table to store active call information.
-- These calls could be circuit switched or they could
-- be virtual circuits.
-- An entry will be created when a call is started and deleted
-- when a call is cleared.

callActiveTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF CallActiveEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "A table containing information about active
             calls to a specific destination."
        ::= { callActive 1 }

callActiveEntry OBJECT-TYPE
        SYNTAX      CallActiveEntry
        MAX-ACCESS  not-accessible
```

```
        STATUS      current
        DESCRIPTION
            "The information regarding a single active Connection.
             An entry in this table will be created when a call is
             started. An entry in this table will be deleted when
             an active call clears."
        INDEX       { callActiveSetupTime, callActiveIndex }
        ::= { callActiveTable 1 }


CallActiveEntry ::=
        SEQUENCE {
            callActiveSetupTime                 TimeStamp,
            callActiveIndex                     INTEGER,
            callActivePeerAddress               DisplayString,
            callActivePeerSubAddress            DisplayString,
            callActivePeerId                    INTEGER,
            callActivePeerIfIndex               INTEGER,
            callActiveLogicalIfIndex            InterfaceIndexOrZero,
            callActiveConnectTime               TimeStamp,
            callActiveCallState                 INTEGER,
            callActiveCallOrigin                INTEGER,
            callActiveChargedUnits              AbsoluteCounter32,
            callActiveInfoType                  INTEGER,
            callActiveTransmitPackets           AbsoluteCounter32,
            callActiveTransmitBytes             AbsoluteCounter32,
            callActiveReceivePackets            AbsoluteCounter32,
            callActiveReceiveBytes              AbsoluteCounter32
        }

callActiveSetupTime OBJECT-TYPE
        SYNTAX      TimeStamp
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "The value of sysUpTime when the call associated to this
             entry was started. This will be useful for an NMS to
             retrieve all calls after a specific time. Also, this object
             can be useful in finding large delays between the time the
             call was started and the time the call was connected.
             For ISDN media, this will be the time when the setup
             message was received from or sent to the network."
        ::= { callActiveEntry 1 }

callActiveIndex OBJECT-TYPE
        SYNTAX      INTEGER (1..'7fffffff'h)
        MAX-ACCESS  not-accessible
        STATUS      current
```

```
        DESCRIPTION
            "Small index variable to distinguish calls that start in
             the same hundredth of a second."
        ::= { callActiveEntry 2 }

callActivePeerAddress OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number this call is connected to. If the number is
             not available, then it will have a length of zero."
        ::= { callActiveEntry 3 }

callActivePeerSubAddress OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The subaddress this call is connected to. If the subaddress
             is undefined or not available, this will be a zero length
             string."
        ::= { callActiveEntry 4 }

callActivePeerId OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This is the Id value of the peer table entry
             to which this call was made. If a peer table entry
             for this call does not exist or is unknown, the value
             of this object will be zero."
        ::= { callActiveEntry 5 }

callActivePeerIfIndex OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This is the ifIndex value of the peer table entry
             to which this call was made. If a peer table entry
             for this call does not exist or is unknown, the value
             of this object will be zero."
        ::= { callActiveEntry 6 }

callActiveLogicalIfIndex OBJECT-TYPE
        SYNTAX      InterfaceIndexOrZero
```

```
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This is the ifIndex value of the logical interface through
             which this call was made. For ISDN media, this would be
             the ifIndex of the B channel which was used for this call.
             If the ifIndex value is unknown, the value of this object
             will be zero."
        ::= { callActiveEntry 7 }

callActiveConnectTime OBJECT-TYPE
        SYNTAX      TimeStamp
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of sysUpTime when the call was connected.
             If the call is not connected, this object will have a
             value of zero."
        ::= { callActiveEntry 8 }

callActiveCallState OBJECT-TYPE
        SYNTAX      INTEGER {
            unknown(1),
            connecting(2),
            connected(3),
            active(4)
        }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The current call state.
             unknown(1)     - The call state is unknown.
             connecting(2)  - A connection attempt (outgoing call)
                              is being made.
             connected(3)   - An incoming call is in the process
                              of validation.
             active(4)      - The call is active.
            "
        ::= { callActiveEntry 9 }

callActiveCallOrigin OBJECT-TYPE
        SYNTAX      INTEGER {
            originate(1),
            answer(2),
            callback(3)
        }
        MAX-ACCESS  read-only
        STATUS      current
```

```
        DESCRIPTION
            "The call origin."
        ::= { callActiveEntry 10 }

callActiveChargedUnits OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number of charged units for this connection.
             For incoming calls or if charging information is
             not supplied by the switch, the value of this object
             will be zero."
        ::= { callActiveEntry 11 }

callActiveInfoType OBJECT-TYPE
        SYNTAX      INTEGER {
            other(1),                   -- e.g. for non-isdn media
            speech(2),
            unrestrictedDigital(3),     -- 64k/s data
            unrestrictedDigital56(4),   -- with 56k rate adaption
            restrictedDigital(5),
            audio31(6),                 -- 3.1 kHz audio
            audio7(7),                  -- 7 kHz audio
            video(8),
            packetSwitched(9),
            fax(10)
        }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The information type for this call."
        ::= { callActiveEntry 12 }

callActiveTransmitPackets OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS     current
        DESCRIPTION
            "The number of packets which were transmitted for this
             call."
        ::= { callActiveEntry 13 }

callActiveTransmitBytes OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
```

```
            "The number of bytes which were transmitted for this
             call."
        ::= { callActiveEntry 14 }

callActiveReceivePackets OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number of packets which were received for this
             call."
        ::= { callActiveEntry 15 }

callActiveReceiveBytes OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number of bytes which were received for this call."
        ::= { callActiveEntry 16 }

--
-- the call history group
--

callHistory OBJECT IDENTIFIER ::= { dialControlMibObjects 4 }

callHistoryTableMaxLength OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "The upper limit on the number of entries that the
             callHistoryTable may contain.  A value of 0
             will prevent any history from being retained. When
             this table is full, the oldest entry will be deleted
             and the new one will be created."
        ::= { callHistory 1 }

callHistoryRetainTimer OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        UNITS       "minutes"
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "The minimum amount of time that an callHistoryEntry
             will be maintained before being deleted. A value of
             0 will prevent any history from being retained in the
```

```
             callHistoryTable, but will neither prevent callCompletion
             traps being generated nor affect other tables."
        ::= { callHistory 2 }

-- callHistoryTable
-- Table to store the past call information. The Destination number
-- and the call connect and disconnect time, the disconnection cause
-- are stored. These calls could be circuit switched or they could
-- be virtual circuits. History of each and every call is stored,
-- of successful calls as well as of unsuccessful and rejected calls.
-- An entry will be created when a call is cleared.

callHistoryTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF CallHistoryEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "A table containing information about specific
             calls to a specific destination."
        ::= { callHistory 3 }

callHistoryEntry OBJECT-TYPE
        SYNTAX      CallHistoryEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "The information regarding a single Connection."
        INDEX       { callActiveSetupTime, callActiveIndex }
        ::= { callHistoryTable 1 }


CallHistoryEntry ::=
        SEQUENCE {
            callHistoryPeerAddress              DisplayString,
            callHistoryPeerSubAddress           DisplayString,
            callHistoryPeerId                   INTEGER,
            callHistoryPeerIfIndex              INTEGER,
            callHistoryLogicalIfIndex           InterfaceIndex,
            callHistoryDisconnectCause          OCTET STRING,
            callHistoryDisconnectText           DisplayString,
            callHistoryConnectTime              TimeStamp,
            callHistoryDisconnectTime           TimeStamp,
            callHistoryCallOrigin               INTEGER,
            callHistoryChargedUnits             AbsoluteCounter32,
            callHistoryInfoType                 INTEGER,
            callHistoryTransmitPackets          AbsoluteCounter32,
            callHistoryTransmitBytes            AbsoluteCounter32,
            callHistoryReceivePackets           AbsoluteCounter32,
```

```
            callHistoryReceiveBytes             AbsoluteCounter32
        }

callHistoryPeerAddress OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number this call was connected to. If the number is
             not available, then it will have a length of zero."
        ::= { callHistoryEntry 1 }

callHistoryPeerSubAddress OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The subaddress this call was connected to. If the subaddress
             is undefined or not available, this will be a zero length
             string."
        ::= { callHistoryEntry 2 }

callHistoryPeerId OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This is the Id value of the peer table entry
             to which this call was made. If a peer table entry
             for this call does not exist, the value of this object
             will be zero."
        ::= { callHistoryEntry 3 }

callHistoryPeerIfIndex OBJECT-TYPE
        SYNTAX      INTEGER (0..2147483647)
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This is the ifIndex value of the peer table entry
             to which this call was made. If a peer table entry
             for this call does not exist, the value of this object
             will be zero."
        ::= { callHistoryEntry 4 }

callHistoryLogicalIfIndex OBJECT-TYPE
        SYNTAX      InterfaceIndex
        MAX-ACCESS  read-only
        STATUS      current
```

```
        DESCRIPTION
            "This is the ifIndex value of the logical interface through
             which this call was made. For ISDN media, this would be
             the ifIndex of the B channel which was used for this call."
        ::= { callHistoryEntry 5 }

callHistoryDisconnectCause OBJECT-TYPE
        SYNTAX      OCTET STRING (SIZE (0..4))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The encoded network cause value associated with this call.

             The value of this object will depend on the interface type
             as well as on the protocol and protocol version being
             used on this interface. Some references for possible cause
             values are given below."
        REFERENCE
            "- Bellcore SR-NWT-001953, Generic Guidelines for
               ISDN Terminal Equipment On Basic Access Interfaces,
               chapter 5.2.5.8.
             - Bellcore SR-NWT-002343, ISDN Primary Rate Interface
               Generic Guidelines for Customer Premises Equipment,
               chapter 8.2.5.8.
             - ITU-T Q.931, Appendix I.
             - ITU-T X.25, CAUSE and DIAGNOSTIC field values.
             - German Telekom FTZ 1TR6, chapter 3.2.3.4.4.4."
        ::= { callHistoryEntry 6 }

callHistoryDisconnectText OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "ASCII text describing the reason for call termination.

             This object exists because it would be impossible for
             a management station to store all possible cause values
             for all types of interfaces. It should be used only if
             a management station is unable to decode the value of
             dialCtlPeerStatsLastDisconnectCause."
        ::= { callHistoryEntry 7 }

callHistoryConnectTime OBJECT-TYPE
        SYNTAX      TimeStamp
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
```

```
            "The value of sysUpTime when the call was connected."
        ::= { callHistoryEntry 8 }

callHistoryDisconnectTime OBJECT-TYPE
        SYNTAX      TimeStamp
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of sysUpTime when the call was disconnected."
        ::= { callHistoryEntry 9 }

callHistoryCallOrigin OBJECT-TYPE
        SYNTAX      INTEGER {
            originate(1),
            answer(2),
            callback(3)
        }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The call origin."
        ::= { callHistoryEntry 10 }

callHistoryChargedUnits OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number of charged units for this connection.
             For incoming calls or if charging information is
             not supplied by the switch, the value of this object
             will be zero."
        ::= { callHistoryEntry 11 }

callHistoryInfoType OBJECT-TYPE
        SYNTAX      INTEGER {
            other(1),                   -- e.g. for non-isdn media
            speech(2),
            unrestrictedDigital(3),     -- 64k/s data
            unrestrictedDigital56(4),   -- with 56k rate adaption
            restrictedDigital(5),
            audio31(6),                 -- 3.1 kHz audio
            audio7(7),                  -- 7 kHz audio
            video(8),
            packetSwitched(9),
            fax(10)
        }
        MAX-ACCESS  read-only
```

```
        STATUS      current
        DESCRIPTION
            "The information type for this call."
        ::= { callHistoryEntry 12 }

callHistoryTransmitPackets OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS     current
        DESCRIPTION
            "The number of packets which were transmitted while this
             call was active."
        ::= { callHistoryEntry 13 }

callHistoryTransmitBytes OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number of bytes which were transmitted while this
             call was active."
        ::= { callHistoryEntry 14 }

callHistoryReceivePackets OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number of packets which were received while this
             call was active."
        ::= { callHistoryEntry 15 }

callHistoryReceiveBytes OBJECT-TYPE
        SYNTAX      AbsoluteCounter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The number of bytes which were received while this
             call was active."
        ::= { callHistoryEntry 16 }

-- Traps related to Connection management

dialControlMibTrapPrefix OBJECT IDENTIFIER ::= { dialControlMib 2 }
dialControlMibTraps OBJECT IDENTIFIER ::= { dialControlMibTrapPrefix 0 }

dialCtlPeerCallInformation NOTIFICATION-TYPE
        OBJECTS {
```

```
            callHistoryPeerId,
            callHistoryPeerIfIndex,
            callHistoryLogicalIfIndex,
            ifOperStatus,
            callHistoryPeerAddress,
            callHistoryPeerSubAddress,
            callHistoryDisconnectCause,
            callHistoryConnectTime,
            callHistoryDisconnectTime,
            callHistoryInfoType,
            callHistoryCallOrigin
        }
        STATUS      current
        DESCRIPTION
            "This trap/inform is sent to the manager whenever
             a successful call clears, or a failed call attempt
             is determined to have ultimately failed. In the
             event that call retry is active, then this is after
             all retry attempts have failed. However, only one such
             trap is sent in between successful call attempts;
             subsequent call attempts result in no trap.
             ifOperStatus will return the operational status of the
             virtual interface associated with the peer to whom
             this call was made to."
     ::= { dialControlMibTraps 1 }

dialCtlPeerCallSetup NOTIFICATION-TYPE
        OBJECTS {
            callActivePeerId,
            callActivePeerIfIndex,
            callActiveLogicalIfIndex,
            ifOperStatus,
            callActivePeerAddress,
            callActivePeerSubAddress,
            callActiveInfoType,
            callActiveCallOrigin
        }
        STATUS      current
        DESCRIPTION
            "This trap/inform is sent to the manager whenever
             a call setup message is received or sent.
             ifOperStatus will return the operational status of the
             virtual interface associated with the peer to whom
             this call was made to."
     ::= { dialControlMibTraps 2 }

-- conformance information
```

```
dialControlMibConformance OBJECT IDENTIFIER ::=
                                { dialControlMib 3 }
dialControlMibCompliances OBJECT IDENTIFIER ::=
                                { dialControlMibConformance 1 }
dialControlMibGroups      OBJECT IDENTIFIER ::=
                                { dialControlMibConformance 2 }

-- compliance statements

dialControlMibCompliance MODULE-COMPLIANCE
        STATUS      current
        DESCRIPTION
            "The compliance statement for entities which
             implement the DIAL CONTROL MIB"
        MODULE      -- this module
        MANDATORY-GROUPS
            { dialControlGroup, callActiveGroup, callHistoryGroup,
              callNotificationsGroup }
        ::= { dialControlMibCompliances 1 }

-- units of conformance

dialControlGroup OBJECT-GROUP
        OBJECTS {
            dialCtlAcceptMode,
            dialCtlTrapEnable,
            dialCtlPeerCfgIfType,
            dialCtlPeerCfgLowerIf,
            dialCtlPeerCfgOriginateAddress,
            dialCtlPeerCfgAnswerAddress,
            dialCtlPeerCfgSubAddress,
            dialCtlPeerCfgClosedUserGroup,
            dialCtlPeerCfgSpeed,
            dialCtlPeerCfgInfoType,
            dialCtlPeerCfgPermission,
            dialCtlPeerCfgInactivityTimer,
            dialCtlPeerCfgMinDuration,
            dialCtlPeerCfgMaxDuration,
            dialCtlPeerCfgCarrierDelay,
            dialCtlPeerCfgCallRetries,
            dialCtlPeerCfgRetryDelay,
            dialCtlPeerCfgFailureDelay,
            dialCtlPeerCfgTrapEnable,
            dialCtlPeerCfgStatus,
            dialCtlPeerStatsConnectTime,
            dialCtlPeerStatsChargedUnits,
            dialCtlPeerStatsSuccessCalls,
            dialCtlPeerStatsFailCalls,
```

```
            dialCtlPeerStatsAcceptCalls,
            dialCtlPeerStatsRefuseCalls,
            dialCtlPeerStatsLastDisconnectCause,
            dialCtlPeerStatsLastDisconnectText,
            dialCtlPeerStatsLastSetupTime
        }
        STATUS      current
        DESCRIPTION
            "A collection of objects providing the DIAL CONTROL
             capability."
        ::= { dialControlMibGroups 1 }

callActiveGroup OBJECT-GROUP
        OBJECTS {
            callActivePeerAddress,
            callActivePeerSubAddress,
            callActivePeerId,
            callActivePeerIfIndex,
            callActiveLogicalIfIndex,
            callActiveConnectTime,
            callActiveCallState,
            callActiveCallOrigin,
            callActiveChargedUnits,
            callActiveInfoType,
            callActiveTransmitPackets,
            callActiveTransmitBytes,
            callActiveReceivePackets,
            callActiveReceiveBytes
        }
        STATUS      current
        DESCRIPTION
            "A collection of objects providing the active call
             capability."
        ::= { dialControlMibGroups 2 }

callHistoryGroup OBJECT-GROUP
        OBJECTS {
            callHistoryTableMaxLength,
            callHistoryRetainTimer,
            callHistoryPeerAddress,
            callHistoryPeerSubAddress,
            callHistoryPeerId,
            callHistoryPeerIfIndex,
            callHistoryLogicalIfIndex,
            callHistoryDisconnectCause,
            callHistoryDisconnectText,
            callHistoryConnectTime,
            callHistoryDisconnectTime,
```

```
            callHistoryCallOrigin,
            callHistoryChargedUnits,
            callHistoryInfoType,
            callHistoryTransmitPackets,
            callHistoryTransmitBytes,
            callHistoryReceivePackets,
            callHistoryReceiveBytes
        }
        STATUS      current
        DESCRIPTION
            "A collection of objects providing the Call History
             capability."
        ::= { dialControlMibGroups 3 }

callNotificationsGroup NOTIFICATION-GROUP
    NOTIFICATIONS { dialCtlPeerCallInformation, dialCtlPeerCallSetup }
    STATUS        current
    DESCRIPTION
            "The notifications which a Dial Control MIB entity is
             required to implement."
    ::= { dialControlMibGroups 4 }


END
```

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5. References

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[2] 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.

[3] Case, J., Fedor, M., Schoffstall, M., and J. Davin, "A Simple Network Management Protocol (SNMP)", STD 15, RFC 1157, SNMP Research, Performance Systems International, MIT Lab for Computer Science, May 1990.

[4] SNMPv2 Working Group, Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1905, January 1996.

[5] ITU-T Recommendation "Digital subscriber Signalling System No. 1 (DSS 1) - ISDN user-network interface layer 3 specification for basic call control", Rec. Q.931(I.451), March 1993.

[6] ITU-T Recommendation "Generic procedures for the control of ISDN supplementary services ISDN user-network interface layer 3 specification", Rec. Q.932(I.452).

[7] ITU-T Recommendation "Digital subscriber Signalling System No. 1 (DSS 1) - Signalling specification for frame-mode basic call control", Rec. Q.933.

[8] McCloghrie, K. and F. Kastenholz, "Evolution of the Interfaces Group of MIB-II", RFC 1573, Hughes LAN Systems, FTP Software, January 1994.

6. Security Considerations

Information in this MIB may be used by upper protocol layers for security purpose.

The implementor should be aware that supporting generic peers as described in section 3.4 may cause a security hole. The user would not know where a call is from, which could potentially allow unauthorized access if there is no other authentication scheme, e.g. PPP authentication, available.

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