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MANAGEMENT INFORMATION MODEL FOR THE MANAGEMENT OF THE DATA LINK AND NETWORK LAYER OF THE ISDN D-CHANNEL

ITU-T Recommendation M.3641

(Previously "CCITT Recommendation")

FOREWORD

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NOTE

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ABSTRACT

This Recommendation provides the management information model of the Q3-interface in a TMN [8] for the management of the D-channels in an ISDN switch. In particular, it focuses on the fault and performance management of the data link and network layer of ISDN D-channels. Managed objects are specified by using the OSI-management templates of Recommendation X.722 [5]. These specifications are based on the prosaic description of the D-channel management aspects as provided by Recommendation M.3640.

KEYWORDS

Fault Management, Management of ISDN D-channel, Performance Management.

Recommendation M.3641

MANAGEMENT INFORMATION MODEL FOR THE MANAGEMENT OF THE DATA LINK AND NETWORK LAYER OF THE ISDN D-CHANNEL

(Geneva, 1994)

1 Overview of the Model

This clause provides a conceptual framework for understanding how the various managed object classes are used to provide the performance monitoring services described in this Recommendation. The managed objects defined in this Recommendation are derived from the managed object class definitions in Recommendations Q.822 [2] and M.3100 [6]. They are based on the prosaic description of the D-channel management aspects as provided by Recommendation M.3640 [1] and supersedes the definitions as contained in the appendix of M.3640 [1].

The naming schema for the management of the ISDN D-channel data link and network layer is shown in Figure 1.

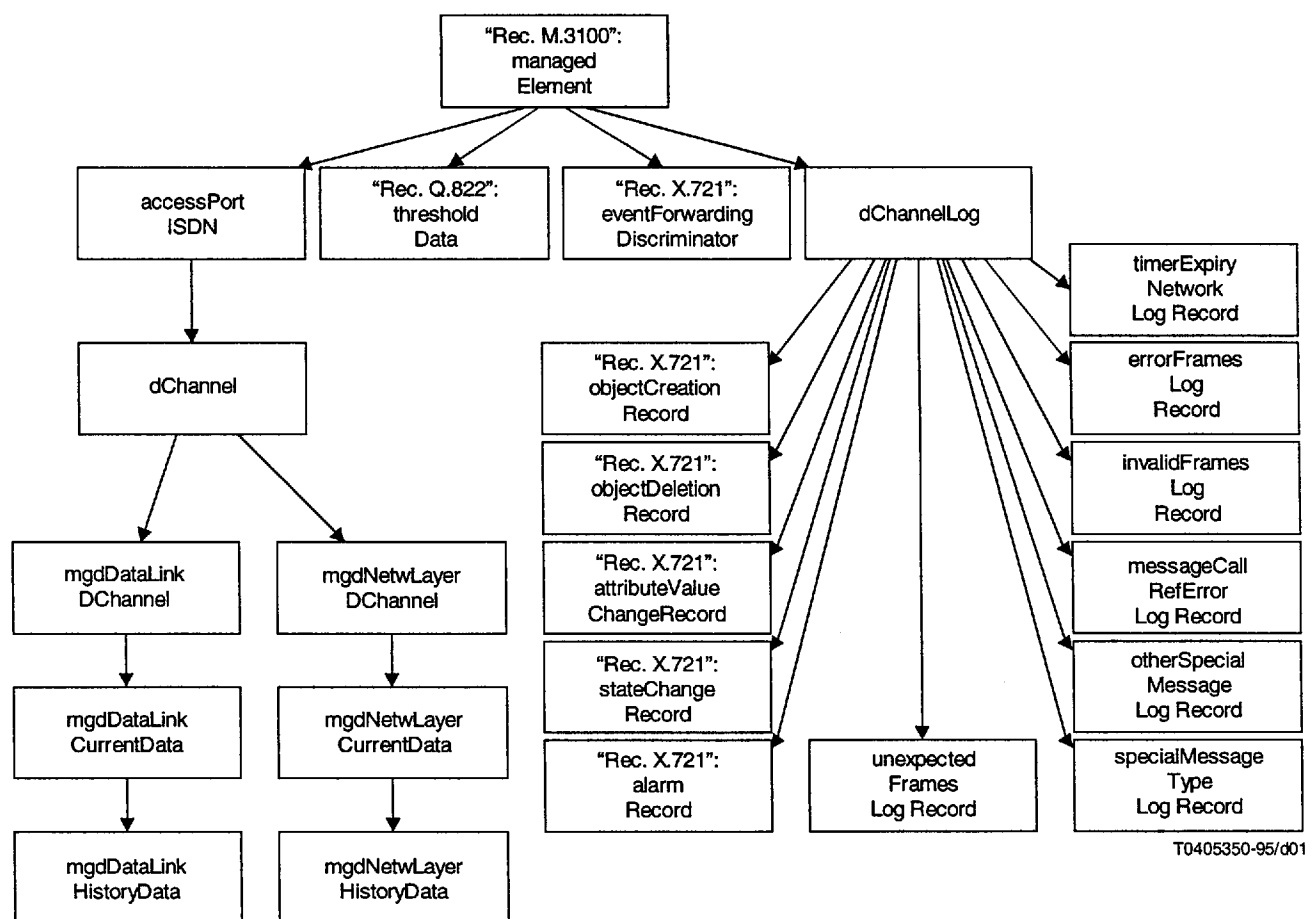


FIGURE 1/M.3641

Illustration of the naming schema
(Arrows point from superior to subordinate object classes)

The monitored entities are the protocol machine objects `mgdDataLinkDChannel` for layer 2 and `mgdNetwLayerDChannel` for layer 3 contained in the D-channel objects.

The inheritance hierarchy for the management of the ISDN D-channel data link and network layer is shown in Figure 2.

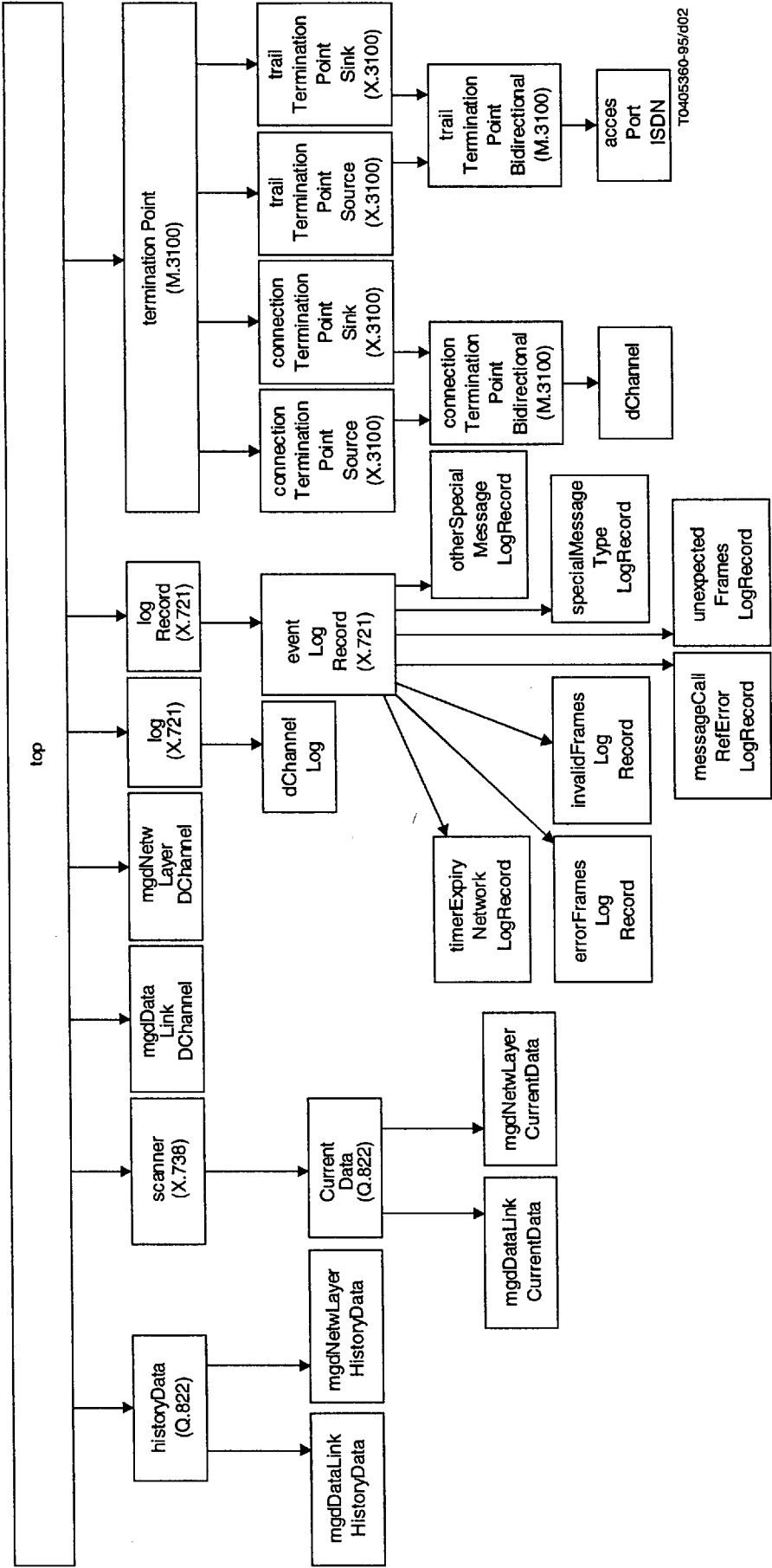


FIGURE 2/M.3641
Illustration of the inheritance hierarchy
(Arrows point from superclasses to their subclasses)

The Current PM data is collected for the Monitored Objects by instances of `mgdDataLinkCurrentData` and `mgdNetwLayerCurrentData` object classes. Instances of the current data object classes are contained by the monitored object. The details on the behaviour of the current data objects regarding the collection and emission of reports are defined in Recommendation Q.822 [2]. `mgdDataLink` and `mgdNetwLayer` history data objects, defined as subclasses of `historyData` in Q.822 [2] are contained in the respective current data objects. The history objects store the information collected during the performance interval.

The specific objects in the model are:

- `accessPortISDN` Object – This object reflects the management view of an ISDN access port in a switch and is used for naming the D-channel objects¹⁾.
- `dChannel` Object – This object reflects the management view of an ISDN D channel in a switch and is used for naming the `mgdDataLinkDChannel` and `mgdNetwLayerDChannel` objects¹⁾.
- `dChannelLog` Object – This object is the managed object for logging in case the protocol machine has detected one of the following events which are defined in clause 7: an operational state change, the receipt of an invalid, error or unexpected frame, the receipt of a special message or other special message, a message call reference error or a timer expiry.
- `errorFramesLogRecord` Object – This object represents the logged information in the `dChannelLog` object in case of detection of the receipt of error frames.
- `invalidFramesLogRecord` Object – This object represents the logged information in the `dChannelLog` object in case an invalid frame other than a frame with an FCS error was received.
- `messageCallReferenceErrorLogRecord` Object – This object represents the logged information in the `dChannelLog` object in case a message with a call reference error was detected.
- `mgdDataLinkDChannel` Object – This object is the managed object for which the performance measurements are being collected. It represents the resource Layer 2 protocol machine.
- `mgdNetwLayerDChannel` Object – This object is the managed object for which the performance measurements are being collected. It represents the resource Layer 3 protocol machine.
- `mgdDataLinkCurrentData` Object – This object contains the measurements for the layer 2 protocol machine being monitored for a specified time interval (e.g. 15 minutes).
- `mgdNetwLayerCurrentData` Object – This object contains the measurements for the layer 3 protocol machine being monitored for a specified time interval (e.g. 15 minutes).
- `mgdDataLinkHistoryData` Object – This object will contain a copy of the performance attributes that are present in the `mgdDataLinkCurrentData` object at the end of the current interval (e.g. 15 minutes). A new instance of this object class is created at the end of each interval.
- `mgdNetwLayerHistoryData` Object – This object will contain a copy of the performance attributes that are present in the `mgdnetwlayerCurrentData` object at the end of the current interval (e.g. 15 minutes). A new instance of this object class is created at the end of each interval.
- `other Special MessageTypeLogRecord` Object – This object represents the logged information in the `dChannelLog` object in case a STATUS or RESTART message was received or transmitted.
- `specialMessageTypeLogRecord` Object – This object represents the logged information in the `dChannelLog` object in case of the receipt or transmission of a DISCONNECT, RELEASE or RELEASE COMPLETE message.
- `timerExpiryNetworkLogRecord` Object – This object represents the logged information in the `dChannelLog` object in case of the expiry of timers T308, T309, T316 or T317.

¹⁾ The `accessPort ISDN` and `D-channel` objects are currently for further study and will be further specified in Q-Series Recommendations.

- unexpectedFramesLogRecord Object – This object represents the logged information in the dChannelLog object in case of the receipt of unexpected frames.

In addition, the generic thresholdData and scanner [X.738] support objects as defined in Recommendation Q.822 [2] and log and eventLogRecord support objects as defined in Recommendation X.721 [4] are included in the model.

2 Managed object classes

2.1 Access port ISDN²⁾

accessPortISDN MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation M.3100 : 1992": trailTerminationPointBidirectional;
 CHARACTERIZED BY accessPortISDN-package;
 REGISTERED AS { m3641ManagedObjectClass 1 };

2.2 D Channel²⁾

dChannel MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation M.3100 : 1992": connectionTerminationPointBidirectional;
 CHARACTERIZED BY dChannel-package;
 REGISTERED AS { m3641ManagedObjectClass 2 };

2.3 D-channel log

dChannelLog MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation X.721 : 1992":log;
 CHARACTERIZED BY dChannelLog-package;
 REGISTERED AS { m3641ManagedObjectClass 3 };

2.4 Error frames log record

errorFramesLogRecord MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation X.721 : 1992":eventLogRecord;
 CHARACTERIZED BY errorFramesLogRecord-package;
 REGISTERED AS { m3641ManagedObjectClass 4 };

2.5 Invalid frames log record

invalidFramesLogRecord MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation X.721 : 1992":eventLogRecord;
 CHARACTERIZED BY invalidFramesLogRecord-package;
 REGISTERED AS { m3641ManagedObjectClass 5 };

2.6 Managed data link D-channel

mgdDataLinkDChannel MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation X.721 : 1992":top;
 CHARACTERIZED BY mgdDataLinkDChannel-package;
 CONDITIONAL PACKAGES
 invalidFramesNotification-package PRESENT IF
 "the events of *invalid frame received* are to be logged³⁾."
 REGISTERED AS { m3641ManagedObjectClass 6 };

²⁾ The accessPort ISDN and D-channel objects are currently for further study and will be further specified in Q-Series Recommendations.

³⁾ This case is one of two alternatives (see Recommendation M.3640): the events of *invalid frame received* may be counted or logged.

2.7 Managed data link current data

mgdDataLinkCurrentData MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation Q.822 : 1993":currentData;
 CHARACTERIZED BY "Recommendation Q.822 : 1993":thresholdPkg,
 mgdDataLinkCurrentData-package;
 CONDITIONAL PACKAGES
 invalidFramesCurrentData-package PRESENT IF
 "the events of *invalid frame received* are to be counted⁴⁾.";

REGISTERED AS { m3641ManagedObjectClass 7 };

2.8 Managed data link history data

mgdDataLinkHistoryData MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation Q.822 : 1993":historyData;
 CHARACTERIZED BY mgdDataLinkHistoryData-package;
 CONDITIONAL PACKAGES
 invalidFramesHistoryData-package PRESENT IF
 "the events of *invalid frame received* are to be counted⁴⁾" ;

REGISTERED AS { m3641ManagedObjectClass 8};

2.9 Managed network layer D-channel

mgdNetwLayerDChannel MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation X.721 : 1992":top;
 CHARACTERIZED BY mgdNetwLayerDChannel-package;
 CONDITIONAL PACKAGES
 otherSpecialMessageNotification-package PRESENT IF
 "the events of *other special message received* are to be logged⁵⁾.",
 messageCallRefErrorNotification-package PRESENT IF
 "the events of *message Call Reference Error detected* are to be logged⁶⁾.";

REGISTERED AS { m3641ManagedObjectClass 9 };

2.10 Managed network layer current data

mgdNetwLayerCurrentData MANAGED OBJECT CLASS
 DERIVED FROM "Recommendation Q.822 : 1993":currentData;
 CHARACTERIZED BY "Recommendation Q.822 : 1993":thresholdPkg,
 mgdNetwLayerCurrentData-package;
 CONDITIONAL PACKAGES
 otherSpecialMessageCurrentData-package PRESENT IF
 "the events of *other special message received* are to be counted⁵⁾.",
 messageCallRefErrorCurrentData-package PRESENT IF
 "the events of *message Call Reference Error detected* are to be counted⁶⁾.";

REGISTERED AS { m3641ManagedObjectClass 10 };

2.11 Managed network layer history data

mgdNetwLayerHistoryDataMANAGED OBJECT CLASS
 DERIVED FROM "Recommendation Q.822 : 1993":historyData;
 CHARACTERIZED BY mgdNetwLayerHistoryData-package;
 CONDITIONAL PACKAGES
 otherSpecialMessageHistoryData-package PRESENT IF
 "the events of *other special message received* are to be counted⁵⁾.",

⁴⁾ This case is one of two alternatives (see Recommendation M.3640): the events of *invalid frame received* may be counted or logged.

⁵⁾ This case is one of two alternatives (see Recommendation M.3640): the events of *other special message received* may be counted or logged.

⁶⁾ This case is one of two alternatives (see Recommendation M.3640): the events of *message Call Reference Error detected* may be counted or logged.