INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.822

Amendment 1
(03/2003)

SERIES Q: SWITCHING AND SIGNALLING

Q3 interface

Stage 1, stage 2 and stage 3 description for the Q3 interface – Performance management

Amendment 1: **Generic transport performance management**

ITU-T Recommendation Q.822 (1994) – Amendment 1

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ITU-T Recommendation Q.822

Stage 1, stage 2 and stage 3 description for the Q3 interface – Performance management

Amendment 1

Generic transport performance management

Summary

This amendment provides new object classes to be used to represent performance management data for physical ports and endpoints of transport connections. These new Generic Transport PM object classes are intended to be applicable across different technologies, architectures and services. The information model describes the GenericTransportPmCD and GenericTransportPmHD object classes.

Source

Amendment 1 to ITU-T Recommendation Q.822 (1994) was prepared by ITU-T Study Group 4 (2001-2004) and approved under the WTSA Resolution 1 procedure on 29 March 2003.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Generic transport performance management

1 Scope

This amendment provides new object classes to be used to represent performance management data for physical ports and endpoints of transport connections. These new Generic Transport PM object classes are intended to be applicable across different technologies, architectures and services. The information model describes the GenericTransportPmCD and GenericTransportPmHD object classes.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[1] ITU-T Recommendation X.721 (1992), *Information technology – Open Systems Interconnection – Structure of management information: Definition of management information*.

[2] ITU-T Recommendation X.722 (1992), *Information technology – Open Systems Interconnection – Structure of management information: Guidelines for the definition of managed objects*.

[3] ITU-T Recommendation M.3100 (1995), *Generic network information model* plus Amendment 1 (1999).

[4] ITU-T Recommendation Q.822 (1994), *Stage 1, stage 2 and stage 3 description for the Q3 interface – Performance management*.

3 Overview of the Generic Transport PM data information model

This amendment provides the definition of new Generic Transport PM Data object classes. This new object classes are used for collection of performance data related to the GenericTransportTTP class (the termination of a generic transport connection). The Generic Transport TTP class is used to model physical ports or endpoints to underlying transport layers.

Two new objects are defined in this amendment: GenericTransportPmCD and GenericTransportPmHD contain placeholders for current data and history data values for counters within the physical transport protocol monitoring grouping respectively.

The GenericTransportPmCD object is subclassed from the CurrentData object defined in ITU-T Rec. Q.822. Inherited methods from CurrentData provide for retrieval of the SuspectFlag, retrieval of the ElapsedTime, activating or deactivating HistoryRetention, associating threshold data with a current data instance, and activating or deactivating the suppression of counters having all-zero counts. Additional inherited methods from Scanner provide for the setting of AdministrativeState, retrieval of OperationalState, and setting of Granularity Period.

Similarly, GenericTransportPmHD is subclassed from the HistoryData object defined in ITU-T Rec. Q.822. Inherited methods from HistoryData provide for retrieval of the SuspectFlag, retrieval of the ElapsedTime, activating or deactivating HistoryRetention, associating threshold data with a current data instance, and activating or deactivating the suppression of counters having all-zero counts.

For some digital signals, performance primitives in the incoming direction are reported to the far end via special messages embedded within the signal format. Examples include: the Performance Report Message (PRM) in DS1 ESF, Far-End Block Error (FEBE) indicators in DS3 CC-bit applications, and Remote Error Indicators (REI) in SDH. With such a capability built into a transmission signal, reporting of transmission performance parameters observed at the far end can be provided at the near-end. For this reason, the managed entity used to hold Generic Transport TTP performance management data contains placeholders for both near-end and far-end data.

The GenericTransportPmCD object attributes are classified into six packages: near-end path, near-end line, near-end section, far-end path, far-end line, and far-end section. Only the near-end path package attributes are mandatory. Other packages may be used whenever they are deemed relevant to the underlying transport technology.

Clause 4 of this amendment defines a set of managed objects for the GenericTransportPmCD and GenericTransportPmHD classes. Figures 1 and 2 show the inheritance, containment, and association relationships of the managed objects defined in this amendment.

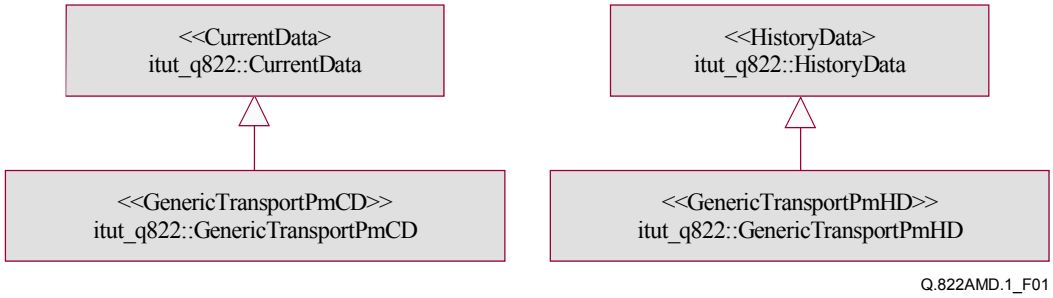

Figure 1/Q.822/Amd.1 – Inheritance relationship

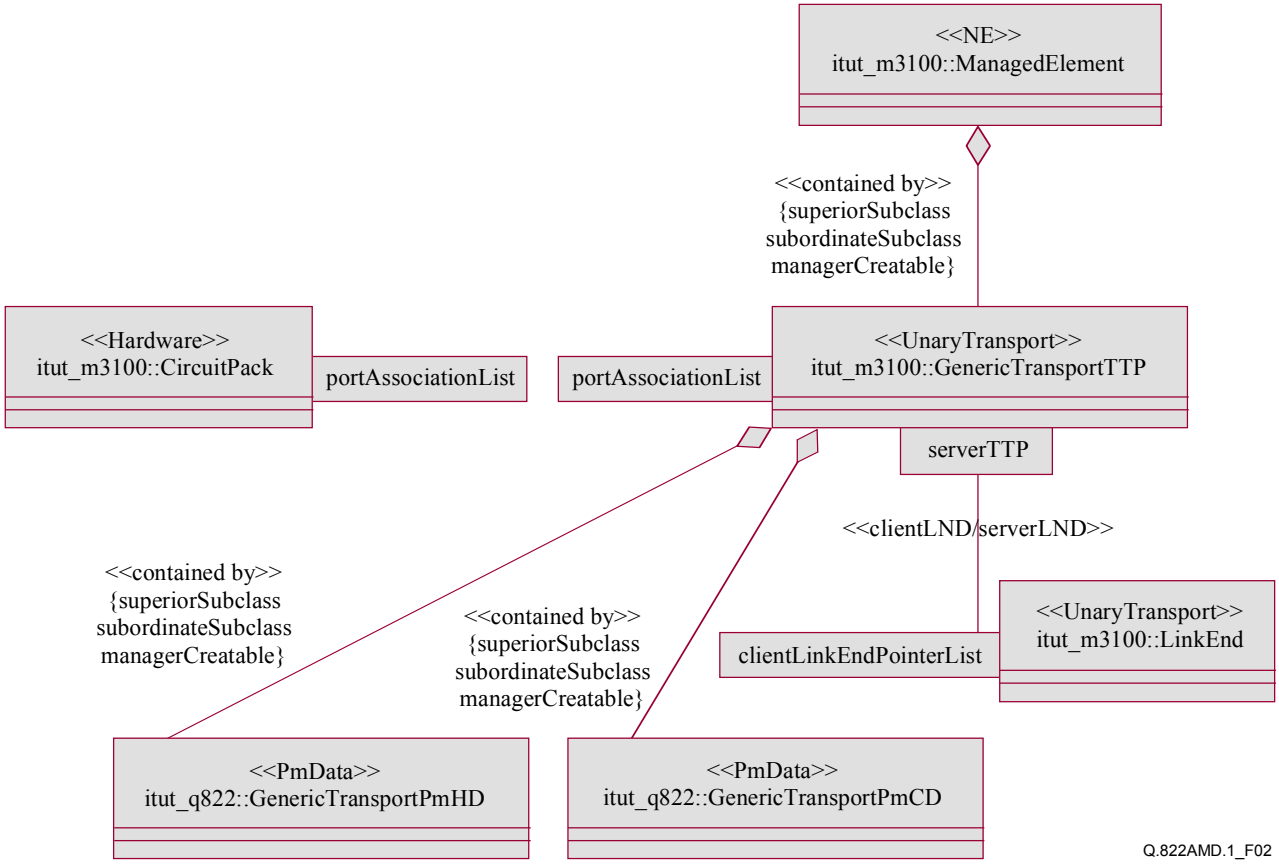

Figure 2/Q.822/Amd.1 – Containment and association relationships

4 Information model

4.1 Object classes

4.1.1 Generic Transport PM Current Data

```
genericTransportPmCD MANAGED OBJECT CLASS
     DERIVED FROM "Rec. Q.822":currentData;
     CHARACTERIZED BY
       genericTransportPmCDPackage PACKAGE
          BEHAVIOUR
              genericTransportPmCDBeh BEHAVIOUR
                 DEFINED AS
     "This object retrieves current data counter values for counters within the
     Physical Transport Protocol Monitoring grouping. The attributes defined in
     this object are intended for near-end path PM data. Line and section PM
     data, as well as far-end PM data, are defined in conditional packages that
     can be invoked based on whether the transport technology supports them.";;
     ATTRIBUTES
       codingViolations           GET,
       erroredSeconds             GET,
       severelyErroredSeconds     GET,
       unavailableSeconds         GET,
       failureCounter             GET;;;
```

```
     CONDITIONAL PACKAGES
       nearEndLinePmDataPackage PRESENT IF
          " the server TTP layer supports it",
       nearEndSectionPmDataPackage PRESENT IF
          " the server TTP layer supports it",
       farEndPathPmDataPackage PRESENT IF
          " the server TTP layer supports it",
       farEndLinePmDataPackage PRESENT IF
          " the server TTP layer supports it",
       farEndSectionPmDataPackage PRESENT IF
          " the server TTP layer supports it";

REGISTERED AS { q822ObjectClass 4};
```

4.1.2 Generic Transport PM History Data

```
genericTransportPmHD MANAGED OBJECT CLASS
     DERIVED FROM "Rec. Q.822":historyData;
     CHARACTERIZED BY
       genericTransportPmHDPackage PACKAGE
          BEHAVIOUR
              genericTransportPmHDBeh BEHAVIOUR
          DEFINED AS
        "This object contains history data values for counters within the Physical
        Transport Protocol Monitoring grouping. The attributes defined in this
        object are intended for near-end path PM data. Line and section PM data,
        as well as far-end PM data, are defined in conditional packages that can
        be invoked based on whether the transport technology supports them.";;

     ATTRIBUTES
       codingViolations           GET,
       erroredSeconds             GET,
       severelyErroredSeconds     GET,
       unavailableSeconds         GET,
       failureCounter             GET;;;

     CONDITIONAL PACKAGES
       nearEndLinePmDataPackage PRESENT IF
          " the server TTP layer supports it",
       nearEndSectionPmDataPackage PRESENT IF
          " the server TTP layer supports it",
       farEndPathPmDataPackage PRESENT IF
          " the server TTP layer supports it",
       farEndLinePmDataPackage PRESENT IF
          " the server TTP layer supports it",
       farEndSectionPmDataPackage PRESENT IF
          " the server TTP layer supports it";

REGISTERED AS { q822ObjectClass 5};
```

4.2 Packages

```
nearEndLinePmDataPackage     PACKAGE
     BEHAVIOUR
       nearEndLinePmDataPackageBehaviour BEHAVIOUR
          DEFINED AS
              "This package contains the near-end PM counters for the line.";;
     ATTRIBUTES
       codingViolations           GET,
       erroredSeconds             GET,
       severelyErroredSeconds     GET,
       unavailableSeconds         GET,
       failureCounter             GET;
```

```
REGISTERED AS {q822Package 16};

nearEndSectionPmDataPackage  PACKAGE
     BEHAVIOUR
       nearEndSectionPmDataPackageBehaviour BEHAVIOUR
          DEFINED AS
              "This package contains the near-end PM counters for the section.";;
     ATTRIBUTES
       codingViolations           GET,
       erroredSeconds             GET,
       severelyErroredSeconds     GET,
       unavailableSeconds         GET,
       failureCounter             GET;
REGISTERED AS {q822Package 17};

farEndPathPmDataPackage PACKAGE
     BEHAVIOUR
       farEndPathPmDataPackageBehaviour BEHAVIOUR
          DEFINED AS
              "This package contains the far-end PM counters for the path.";;
     ATTRIBUTES
       codingViolations           GET,
       erroredSeconds             GET,
       severelyErroredSeconds     GET,
       unavailableSeconds         GET,
       failureCounter             GET;
REGISTERED AS {q822Package 18};

farEndLinePmDataPackage PACKAGE
     BEHAVIOUR
       farEndLinePmDataPackageBehaviour BEHAVIOUR
          DEFINED AS
              "This package contains the far-end PM counters for the line.";;
     ATTRIBUTES
       codingViolations           GET,
       erroredSeconds             GET,
       severelyErroredSeconds     GET,
       unavailableSeconds         GET,
       failureCounter             GET;
REGISTERED AS {q822Package 19};

farEndSectionPmDataPackage  PACKAGE
     BEHAVIOUR
       farEndSectionPmDataPackageBehaviour BEHAVIOUR
          DEFINED AS
              "This package contains the far-end PM counters for the section.";;
     ATTRIBUTES
       codingViolations           GET,
       erroredSeconds             GET,
       severelyErroredSeconds     GET,
       unavailableSeconds         GET,
       failureCounter             GET;
REGISTERED AS {q822Package 20};
```

4.3 Attributes

```
codingViolations ATTRIBUTE
     WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Integer;
     MATCHES FOR EQUALITY;
     BEHAVIOUR
       codingViolationsBehaviour BEHAVIOUR
          DEFINED AS
              "This attribute is used as a count of certain error events
              occurring in the accumulation period.";;
```

```
REGISTERED AS {q822Attribute  17};

erroredSeconds ATTRIBUTE
     WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Integer;
     MATCHES FOR EQUALITY;
     BEHAVIOUR
       erroredSecondsBehaviour BEHAVIOUR
          DEFINED AS
             "This attribute is used as a count of 1-second intervals containing
             errors.";;
REGISTERED AS {q822Attribute  18};

severelyErroredSeconds ATTRIBUTE
     WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Integer;
     MATCHES FOR EQUALITY;
     BEHAVIOUR
       severelyErroredSecondsBehaviour BEHAVIOUR
          DEFINED AS
             "This attribute is used as a count of 1-second intervals with a
             certain number of error events.";;
REGISTERED AS {q822Attribute  19};

unavailableSeconds ATTRIBUTE
     WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Integer;
     MATCHES FOR EQUALITY;
     BEHAVIOUR
       unavailableSecondsBehaviour BEHAVIOUR
          DEFINED AS
             "This attribute is used as a count of 1-second intervals during
             which the service is unavailable.";;
REGISTERED AS {q822Attribute  20};

failureCounter ATTRIBUTE
     WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Integer;
     MATCHES FOR EQUALITY;

REGISTERED AS {q822Attribute  21};
```

4.4 Name bindings

```
genericTransportPmCD-genericTransportTTP NAME BINDING
     SUBORDINATE OBJECT CLASS    genericTransportPmCD AND SUBCLASSES;
     NAMED BY
        SUPERIOR OBJECT CLASS    genericTransportTTP AND SUBCLASSES;
     WITH ATTRIBUTE  genericTransportPmCDId;
     CREATE
        WITH-REFERENCE-OBJECT;
     DELETE
        ONLY-IF-NO-CONTAINED-OBJECTS;

REGISTERED AS {q822NameBinding 3};

genericTransportPmHD-genericTransportTTP NAME BINDING
     SUBORDINATE OBJECT CLASS    genericTransportPmHD AND SUBCLASSES;
     NAMED BY
        SUPERIOR OBJECT CLASS  genericTransportTTP    AND SUBCLASSES;
     WITH ATTRIBUTE  genericTransportPmHDId;
     CREATE
        WITH-REFERENCE-OBJECT;
     DELETE
        ONLY-IF-NO-CONTAINED-OBJECTS;

REGISTERED AS {q822NameBinding 4};
```

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