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X.435

Amendment 1
(12/97)

SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS

Message Handling Systems

Message handling systems: Electronic data interchange messaging system

Amendment 1: Compression extension

ITU-T Recommendation X.435 – Amendment 1
Superseded by a more recent version

(Previously CCITT Recommendation)

Superseded by a more recent version

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ITU-T RECOMMENDATION X.435

MESSAGE HANDLING SYSTEMS: ELECTRONIC DATA INTERCHANGE MESSAGING SYSTEM

AMENDMENT 1
Compression extension

Summary

This Amendment identifies the technical solution for integrating support for compression in EDI messaging. Additionally, it provides useful user requirements and background information to assist in understanding the motivation and objectives of this set of enhancements.

Source

Amendment 1 to ITU-T Recommendation X.435, was prepared by ITU-T Study Group 7 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 12th of December 1997.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 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, the 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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MESSAGE HANDLING SYSTEMS: ELECTRONIC DATA INTERCHANGE MESSAGING SYSTEM

AMENDMENT 1

Compression extension

(Geneva, 1997)

1) Subclause 8.2.19

Replace the ASN.1 definition and the third sentence as follows:

```
HeadingExtensionsField ::= SET OF HeadingExtensionsSubField
        CHOSEN FROM { primary-body-part-compression-indication, … }

HeadingExtensionsSubfield ::= ExtensionField
```

Some extensions are defined in the following subclauses.

2) New subclause 8.2.19.1

Insert a new subclause at the end of 8.2.19 as follows:

8.2.19.1 Compression extension

The following extension describes the parameters that need to be exchanged when the primary body part is transferred in a compressed mode. The absence of this parameter implies that the content of the primary body part is not compressed.

```
Primary-body-part-compression-indication EDIM-EXTENSION
        CompressionParameter  -- as defined for P22 File Tranfert Body Part
        CRITICAL FOR DELIVERY
        ::= id-edi-compression
```

The syntax of this parameter is that of the corresponding parameter in the file transfer-body-part defined in ITU-T Rec. X.420 | ISO/IEC 10021-7.

The following macro gives a notation to express an instance of the compression extension.

```
        COMPRESSION-ALGORITHM MACRO ::=
        BEGIN
                TYPE NOTATION ::= type | empty
                VALUE NOTATION ::= value ( VALUE OBJECT IDENTIFIER )
        END
```

Note – Although this specification identifies V.42 *bis* compression, other compression algrithms may be used.

8.2.19.1.1 V.42 *bis* compression

The following instance of the COMPRESSION-ALGORITHM macro defines the parameters needed to perform V42 *bis* compression.

```
V42BisCompression COMPRESSION-ALGORITHM V42BisCompressionParameter
        ::= id-edi-compression-v42bis

V42BisCompressionParameter ::= SEQUENCE {
        dictionary-size                 INTEGER DEFAULT 12,
        largest-compressed-chain        INTEGER DEFAULT 512,
        last-entries-to-delete          INTEGER DEFAULT 256 }
```

The **V42BisCompressionParameter** has the following components:

a) Dictionary-size (C): Gives the length of the index in bits. The default value, 12, allows 4096 entries in the dictionary.

b) Largest-compressed-chain (C): Defines the largest repetitive chain of bytes that can be compressed.

c) Last-entries-to-delete (C): Defines the number of last entries in the dictionary to be purged when full.

3) Subclause 9.3

Insert a new error code in the **NNUAMSDiagnosticField** *after* **proof-of-failure (34)**

compression-unsupported (35) -- **used when the received compression is not supported**

Insert a new error code in the **NNUserDiagnosticField** *as follows:*

NNUserDiagnosticField::= INTEGER {
compression-unsupported (1) -- *used when the received compression is not supported*
} (1..ub-reason-code)

4) Annex A

Insert a new section before the section beginning by -- Modules:

-- *Compression identifiers*
id-edi-compression ::= { id-edi 0 }
id-edi-compression-v42bis ::= { id-edi 1 }

5) Annex B

Replace the ASN.1 definition of **HeadingExtensionsField** *as follows:*

HeadingExtensionsField ::= SET OF HeadingExtensionsSubField
CHOSEN FROM { primary-body-part-compression-indication, … }

Insert a new section before the last **END** *of the ASN.1 module:*

-- *Compression extensions*

Primary-body-part-compression-indication EDIM-EXTENSION
CompressionParameter -- *as defined for P22 File Transfert Body Part*
CRITICAL FOR DELIVERY
::= id-edi-compression

COMPRESSION-ALGORITHM MACRO ::=
BEGIN
TYPE NOTATION ::= type | empty
VALUE NOTATION ::= value (VALUE OBJECT IDENTIFIER)
END

V42BisCompression COMPRESSION-ALGORITHM
V42BisCompressionParameter
::= id-edi-compression-v42bis

V42BisCompressionParameter ::= SEQUENCE {
dictionary-size INTEGER DEFAULT 12,
largest-compressed-chain INTEGER DEFAULT 512,
last-entries-to-delete INTEGER DEFAULT 256 }

Insert a new error code in the **NNUAMSDiagnosticField** *after* **proof-of-failure (34)**

compression-unsupported (35) -- *used when the received compression is not supported*

Replace the ASN.1 production for the **NNUserDiagnosticField** *as follows:*

NNUserDiagnosticField::= INTEGER {
compression-unsupported (1) -- *used when the received compression is not supported*
} (1..ub-reason-code)

User requirements and background information supportive of Amendment 1 to X.435 (1991) and PDAM 1 to ISO/IEC 10021-9:1995

Compression algorithms are becoming more and more efficient. Compression factors from 2 to 100 can be reached, according to the kind of files compressed. These capabilities compensate the growth of data exchanges.

1 Introduction

Two protocols have been defined to handle the content of X.400 messages:

- X.420 for Inter Personal Messages (often called IPM or P2).
- X.435 for EDI messages (often called PEDI).

X.420 allows users to exchange multiple body parts contents. One of the possible body parts is the File Transfert Body Part (FTBP) which is not reserved to word processor texts but can be used for EDI messages. Compression capabilities are offered for FTBP.

X.435 allows users to exchange multiple body parts contents. One of them, the Primary Body Part (PBP), carries an EDI interchange, the others are comments. No compression capability is offered for PBP.

It is proposed to add the same service of compression for PBP of X.435 as for FTBP of X.420.

2 Observations

For X.435 messages, compression of PBP is a lack because:

- PBP is generally the largest body part of X.435 messages.
- If some other body parts are large (photo, etc.) just choose FTBP for them.

3 Parameter(s) for standardization

Given the usefulness of V.42 *bis*: LEMPEL ZIV, we suggest that this compression scheme be represented in MHS to support the following aspects.

This clause identifies the parameters to be supported for compression using V.42 *bis* compression algorithm.

V.42 *bis* defines an algorithm of compression from the LEMPEL ZIV family. This algorithm is included in most modems. Modems negotiate at the connection time:

- Whether they will use compression or not.
- The size of the dictionary that stores repetitive sequences of characters.
- The size of the largest object that can be compressed.

The main characteristic of V.42 *bis* is that it recognizes the sequences of data at the sender side and at the receiver side, without exchanging any service information. Thanks to this characteristic, V.42 *bis* serves well to compress and decompress files in stations that communicate through MHS, without being connected directly together.

In that case, parameters that used to be negotiated by modems must be sent with each file.

Other parameters can be added to improve the efficiency of the algorithm when processed on powerful stations, e.g. partial reinitialization of the dictionary. Stations can erase the last entries of the dictionary to keep the most often used sequences.

For V.42 *bis* we use a sequence of four parameters with default values:

Parameter	Value
Algorithm_id (Note 1)	V.42 *bis*
Dictionary size (Note 2)	L1 (12)
Largest word compressed (Note 3)	L2 (512)
Purge mechanism (Note 4)	N (256)

Note 1 – No compression-algorithm-id means no compression.

Note 2 – The size is the length of an index in bits. The default value is 12, allowing 4096 entries in the dictionary.

Note 3 – This length limits the search of new unknown sequences of bytes. The default value, 512, allows compression of a large set of blank characters, often met in fixed length record files. For modems, the default value is only six.

Note 4 – The number of the last entries of the dictionary to be purged.

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