

International Telecommunication Union

**ITU-T**

**ITU-T T.38  
Implementors'  
Guide**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

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SERIES T: TERMINALS FOR TELEMATIC SERVICES  
Facsimile – Group 3 protocols

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**Implementors Guide for ITU-T T.38  
(Procedures for real-time Group 3 facsimile  
communication over IP network)**

ITU-T

## **Summary**

This document contains clarifications on the procedures, definitions and intentions pertaining to Recommendation ITU-T T.38.

This new Implementors' Guide contains all updates submitted up to and including those at Study Group 16 meeting in Geneva, 9-20 February 2015, after the corrections introduced by T.38 (2010) Amd.1 (2014-10) that superseded the earlier IG approved 11 May 2012.

This new Implementors' Guide was approved by ITU-T Study Group 16 on 20 February 2015 (TD 355/Plen).

## **Change Log**

Version 1 (2015-02) Clarification of the SIP-level signalling of multiple T.38 configurations using legacy SDP offer/answer

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# **Implementors' Guide for Recommendation ITU-T T.38**

## **1 Scope**

This guide resolves defects in the following categories:

- technical errors, such as omissions and inconsistencies
- ambiguities

In addition, the Implementors' Guide may include explanatory text found necessary as a result of interpretation difficulties apparent from the defect reports.

This Guide will not address proposed additions, deletions, or modifications to the Recommendations that are not strictly related to implementation difficulties in the above categories. Proposals for new features should be made through contributions to the ITU-T.

## **2 Introduction**

This Implementors Guide is a compilation of reported defects for all versions of the Rec. ITU-T T.38 of Recommendations. In this edition of the Guide, reported defects identified as of 2015-02 are given for ITU-T T.38 (2010) and its Amendment 1 (2014-10).

The Guide must be read in conjunction with the Recommendation ITU-T T.38 to serve as an additional source of information for implementors. The changes, clarifications and corrections defined herein are expected to be included in future versions of the affected Recommendations.

## **3 Defect Resolution Procedure**

Upon discovering technical defects with any components of the texts covered by this Implementors Guide, please provide a written description directly to the Rapporteur with a copy to the secretariat (See contact above on page iii). The template for a defect report is located at the end of this Guide. Return contact information should also be supplied so a dialogue can be established to resolve the matter and an appropriate reply to the defect report can be conveyed. This defect resolution process is open to any interested party. Formal membership in the ITU is not required to participate in this process.

## **4 References**

- Recommendation ITU-T T.38 (2010/09) *Procedures for real-time Group 3 facsimile communication over IP network*

## 5 Nomenclature

In addition to traditional revision marks, the following marks and symbols are used to indicate to the reader how changes to the text of a Recommendation should be applied:

Symbol	Description
<u>[Begin Correction]</u>	Identifies the start of revision marked text based on extractions from the published Recommendations affected by the correction being described.
<u>[End Correction]</u>	Identifies the end of revision marked text based on extractions from the published Recommendations affected by the correction being described.
...	Indicates that the portion of the Recommendation between the text appearing before and after this symbol has remained unaffected by the correction being described and has been omitted for brevity.
--- SPECIAL INSTRUCTIONS --- {instructions}	Indicates a set of special editing instructions to be followed.

## 6 Technical and Editorial Corrections

### 6.1 Annex D - clarification of the SIP-level signalling of multiple T.38 configurations using legacy SDP offer/answer

Problem statement:

Annex D/T.38 is mandatory when SIP/SDP is used for call establishment with support of T.38. The SDP supports two SDP offer/answer models for the declaration and negotiation of T.38 configurations:

#### **D.2.3.0 SDP Offer/Answer protocol for indication and negotiation of ITU-T T.38 configurations**

The SIP message shall provide an SDP Offer for the indication and negotiations of ITU-T T.38 configurations. The "revised SDP Offer/Answer" protocol (see clause 5.1.1) should be supported and is recommended due to its advantages, particularly concerning ITU-T T.38 (as a potential parallel media configuration to audio and as a possible later configuration after a speech call phase, due to multiple ITU-T T.38 transport variants, etc.). The "legacy SDP Offer/Answer" protocol (see clause 5.1.1) may be used as a minimum solution, permitting limited ITU-T T.38 services (e.g., increased call setup delays due to possible multiple SDP O/A cycles, no support of autonomous state transitioning).

The concept of a T.38 configuration is defined in clause D.2.2.4.1:

...a "ITU-T T.38 configuration" comprises the ITU-T T.38 transport variant and all ITU-T T.38 parameter settings.

A T.38 configuration relates in SDP to a subset of the SDP media description given by a single "m="-line (for the T.38 transport variant) plus a number of "a="-lines, one (SDP attribute) for each T.38 parameter.

The declaration of *multiple T.38 configurations* within a *single SDP offer* in case of the *revised SDP O/A model* is simple and straightforward. Annex D.2.4 provides a number of examples. See e.g. example 6 (clause D.2.4.2.5) where three T.38 configurations (concerning error correction) methods are subject of a single SDP offer.

The declaration of multiple T.38 configurations in a single SDP offer using *legacy SDP O/A* syntax is *not possible*, at least not in case within "a single "m=" line section" for T.38. E.g., it is not possible to insert just twice or three times the same SDP attribute in a single SDP media description in case of example 6, i.e.,

```
...
a=T38FaxUdpEC:t38UDPFEC
a=T38FaxUdpEC:t38UDPRedundancy
...
```

in order to describe a semantic that two error correction schemes are supported, preference is "FEC" and the remote side could select one out of two. Such a semantic is not supported in *legacy SDP O/A*. The desired behaviour is rather subject of multiple SDP O/A cycles by firstly trying to get the first preference, and if not, then a second cycle with the second preference etc.

However, there are implementations with incorrect legacy SDP O/A syntax for T.38 configurations. It is unclear what exactly causes such misinterpretations, but one issue might be the evolution of Annex D.2.3.5 over the timeline of T.38 versions:

E.g., contribution <http://www.itu.int/md/T09-SG16-C-0102/en> "ITU-T Rec. T.38 - Inconsistency with parameter T38FaxUdpEC - Clarifications required for clauses 9.1.3 and D.2.3.5" did lead to following updates:

**T.38 (04/2007):**

**T38FaxUdpEC** is negotiated only when using UDPTL as the transport. If the answering endpoint supports the offered error correction mode, then it shall return the same value in the answer, **otherwise the T38FaxUdpEC parameter shall not be present in the answer.**

**T.38 (09/2010):**

**T38FaxUdpEC** is negotiated only when using UDPTL as the transport. This parameter can have one of three values (see also Table D.2): *t38UDPNNoEC*, *t38UDPRedundancy*, or *t38UDPFEC*. If the answering endpoint supports the offered error correction mode, then it shall return the same value in the answer, **otherwise a different value shall be returned.** Based on this capability exchange, a choice may be made on which scheme is used for error correction as follows:

**Table D.2 – Value range for SDP parameter "T38FaxUdpEC"**

<b>T38FaxUdpEC</b>	<b>Description</b>
t38UDPNNoEC	No secondary IPF packets will be sent. The number of secondary messages is set to zero in UDPTL.
t38UDPRedundancy	Only redundant error correction messages may be sent.
t38UDPFEC	The endpoints can use either redundancy or FEC error correction scheme. (NOTE – this is consistent with clause 9.1.3)

There are actually just two options (in legacy SDP O/A) to signal a single T.38 parameter/value setting: either to include explicitly the correspondent T.38 SDP attribute or to omit it in the SDP offer (and when the default value is used), but not to insert the same SDP attribute multiple times.

## Annex D

### SIP/SDP call establishment procedures

(This annex forms an integral part of this Recommendation.)

...

#### D.2.3.0 SDP Offer/Answer protocol for indication and negotiation of ITU-T T.38 configurations

The SIP message shall provide an SDP Offer for the indication and negotiations of ITU-T T.38 configurations. The "*revised* SDP Offer/Answer" protocol (see clause 5.1.1) should be supported and is recommended due to its advantages, particularly concerning ITU-T T.38 (as a potential parallel media configuration to audio and as a possible later configuration after a speech call phase, due to multiple ITU-T T.38 transport variants, etc.). The "*legacy* SDP Offer/Answer" protocol (see clause 5.1.1) may be used as a minimum solution, permitting limited ITU-T T.38 services (e.g., increased call setup delays due to possible multiple SDP O/A cycles [\(NOTE 1\)](#), no support of autonomous state transitioning).

NOTE 1 – E.g., it is not possible to define multiple T.38 parameter settings for the same T.38 transport variant (i.e., multiple T.38 configurations) within a single "m="-line section for T.38.

...

#### D.2.3.5 SDP parameter usage in SIP/SDP Offer/Answer negotiations

This clause (see also summary in Annex H) describes the use of ITU-T T.38 SDP parameters when utilized with the SIP/SDP offer/answer model.

**T38MaxBitRate** is declarative and the answer is independent of the offer. The parameter simply indicates the maximum transmission bit rate supported by the endpoint.

**T38FaxFillBitRemoval** is negotiated. If the answering entity does not support this capability or if the capability was not in the offer, this parameter shall not be present in the answer. (NOTE: then default behaviour according semantic 'false' applies.)

**T38FaxTranscodingMMR** is negotiated. If the answering entity does not support this capability or if the capability was not in the offer, this parameter shall not be present in the answer. (NOTE: then default behaviour according semantic 'false' applies.)

**T38FaxTranscodingJBIG** is negotiated. If the answering entity does not support this capability or if the capability was not in the offer, this parameter shall not be present in the answer. (NOTE: then default behaviour according semantic 'false' applies.)

**T38FaxRateManagement** is declarative and the answer must contain the same value.

**T38FaxVersion** is negotiated. The entity answering the offer shall return the same or a lower version number.

**T38FaxMaxBuffer** is declarative and the answer is independent of the offer. This parameter simply signals the buffer space available on the offering endpoint and the answering endpoint. The answering endpoint may have more or less buffer space than the offering endpoint. Each endpoint should be considerate of the available buffer space on the opposite endpoint.

**T38FaxMaxDatagram** is declarative and the answer is independent of the offer. This parameter signals the largest acceptable datagram for the offering endpoint and the answering endpoint (i.e.,

the maximum size of the RTP payload). The answering endpoint may accept a larger or smaller datagram than the offering endpoint. Each endpoint should be considerate of the maximum datagram size of the opposite endpoint. If an offer includes the **T38FaxMaxIFP** parameter, then this parameter shall be included as well.

**T38FaxMaxIFP** is declarative and the answer is independent of the offer. This parameter signals the maximum IFP frame size that the offering endpoint is capable of accepting, exclusive of any framing, error correction or other overhead. The answerer may specify a larger or smaller maximum IFP size than the offerer. Each endpoint should consider the maximum IFP size specified by the opposite endpoint. If this parameter is included in an offer, then the **T38FaxMaxDatagram** parameter shall be included in the offer as well.

**T38FaxUdpEC** is negotiated only when using UDPTL as the transport ([NOTE 1](#)). This parameter can have one of three values (see also Table D.2): *t38UDPNoEC*, *t38UDPRedundancy*, or *t38UDPFEC*. If the answering endpoint supports the offered error correction mode, then it shall return the same value in the answer, otherwise a different value shall be returned. Based on this capability exchange, a choice may be made on which scheme is used for error correction as follows:

**Table D.2 – Value range for SDP parameter "T38FaxUdpEC"**

<b>T38FaxUdpEC</b>	<b>Description</b>
t38UDPNoEC	No secondary IPF packets will be sent. The number of secondary messages is set to zero in UDPTL.
t38UDPRedundancy	Only redundant error correction messages may be sent.
t38UDPFEC	The endpoints can use either redundancy or FEC error correction scheme. (NOTE – this is consistent with clause 9.1.3)

[NOTE 1 – The declaration of multiple T.38 error correction schemes is possible in a single SDP offer/answer cycle in case of revised SDP offer/answer \(see clause 5.1.1\), but implies multiple SDP offer/answer cycles in case of legacy SDP offer/answer \(because there might be not multiple appearances of the same T.38 SDP attribute\).](#)

**T38FaxUdpECDepth** is declarative and the answer is independent of the offer, and is relevant only when using UDPTL as the transport. If the parameter is specified, then the 'minred' value indicates that the offering endpoint wishes to receive **at least** that many redundancy frames per UDPTL datagram (when the answering endpoint chooses to use *t38UDPRedundancy* as the error correction mode), or that the offering endpoint wishes to receive **at least** that many FEC frames per UDPTL datagram when the answering endpoint chooses to use *t38UDPFEC* as the error correction mode). Additionally, if 'maxred' is specified, it indicates that the offering endpoint wishes to receive **no more** than that many redundancy frames or FEC frames per UDPTL datagram. The answerer may specify a larger or smaller minimum or maximum error correction depth than the offerer. Each endpoint should be considerate of the minimum and maximum error correction depth specified by the opposite endpoint.

**T38FaxUdpFECMaxSpan** is declarative and the answer is independent of the offer, and is relevant only when using UDPTL as the transport. If the parameter is specified, it indicates that offering endpoint may not be able to properly process FEC frames that span more than the specified number of IFP frames, and if the answering endpoint generates FEC frames spanning more than the specified number of IFP frames, the offering endpoint may have no option but to ignore them (resulting in no effective error correction for the session). The answerer may specify a larger or smaller maximum span than the offerer. Each endpoint should be considerate of the maximum span specified by the opposite endpoint.

**T38VendorInfo** is declarative and the answer is independent of the offer. The parameter merely indicates the manufacturer of the endpoint.

**T38ModemType** is negotiated. If the parameter is not present in the SIP/SDP negotiation, The Group 3 facsimile only (t38G3FaxOnly) is assumed.

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*[End Correction]*

**Annex: ITU-T T.38 Defect Report Form**

<b>DATE:</b>	
<b>CONTACT INFORMATION</b> <b>NAME:</b> <b>COMPANY:</b> <b>ADDRESS:</b> <b>TEL:</b> <b>FAX:</b> <b>EMAIL:</b>	
<b>AFFECTED RECOMMENDATIONS:</b>	
<b>DESCRIPTION OF PROBLEM:</b>	
<b>SUGGESTIONS FOR RESOLUTION:</b>	

NOTE - Attach additional pages if more space is required than is provided above.

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