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Amendment 2
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SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS

Open System Interconnection – Service definitions

Information technology – Open Systems Interconnection – Session service definition

Amendment 2: Nested connections functional unit

ITU-T Recommendation X.215 – Amendment 2

(Previously CCITT Recommendation)

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INTERNATIONAL STANDARD 8326

ITU-T RECOMMENDATION X.215

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – SESSION SERVICE DEFINITION

AMENDMENT 2
Nested connections functional unit

Summary

The Session service definition defined in ITU-T Rec. X.215 | ISO/IEC 8326 is enhanced to define an optional functional unit which permits additional, independent, nested session connections within an existing session connection. This enhancement will support the reusability of existing application layer standards (each making full, and possibly incompatible, use of the session synchronization services) as components of new application layer standards

Source

The ITU-T Recommendation X.215, Amendment 2 was approved on the 12th of December 1997. The identical text is also published as ISO/IEC International Standard 8326.

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.

INTELLECTUAL PROPERTY RIGHTS

The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

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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AMENDMENT 2
Nested connections functional unit

1) New Subclauses 3.3.12 and 3.3.13

Add after 3.3.11:

3.3.12 nested session connection: A session connection which is logically embedded within an existing session connection.

3.3.13 nested session exception: A condition which occurs if, as a result of discard by an enclosing session protocol machine, session protocol data units for a nested session connection are discarded.

2) New subclause 7.7

Add a new subclause 7.7:

7.7 Nested session connections

A pair of session service users may communicate using a single session connection, or may choose to establish additional session connections nested within the outermost connection (or within each other) to any depth.

The provisions of this Recommendation | International Standard apply independently to each such connection, except where stated otherwise, with each connection independently determining at connection establishment time the session functional units that are available on that connection.

The initiator of an outer-level session connection can initiate nested connections provided use of the nested connection functional unit has been negotiated on the immediately enclosing session connection, and provided there are no more than 126 nested session connections currently established (by the initiator) on this outer-level connection.

The acceptor of an outer-level session connection can initiate nested connections provided use of the nested connection functional unit has been negotiated on the immediately enclosing session connection, and provided there are no more than 127 nested session connections currently established (by the acceptor) on this outer-level connection.

Interactions between connections that are nested within an outermost connection are as follows:

a) All such connections are carried on a single transport connection, and the sequencing rules of 11.3 apply no matter what connection the primitives are issued on.

b) Services provided on connections that are nested (at any level) within a common parent, but are not nested within each other, never disrupt each others services. Flow on such connections can, however, be blocked by flow control exercised on other such connections.

c) Services provided on connections that contain nested connections can disrupt services on the nested connections, and may cause exception reports or aborting on those connections. Disrupting services on outer connections are not blocked by flow control exercised on an inner nested connection.

d) All services (including connection establishment) for a nested connection can be invoked only if all enclosing connections permit the invocation of the data transfer service.

e) If an outer connection is terminated (by orderly release or by an abort), any nested connection that has not yet been terminated receives a provider abort.

NOTE – The above rules give maximum choice to designers, providing a clear differentiation between use of wholly separate session connections (no sequencing), use of parallel nested connections (sequenced, potentially mutually blocking, but not disruptive), use of nested connections (sequenced, the outer is not blocked but can be disruptive, and retains control of all activity).

3) Clause 8

Add after the first paragraph:

The Session Connection service can also be used to establish nested session connections within an already established session connection.

4) Subclause 8.3

Add at the end of this subclause:

If a session connection is released, all nested connections are released by the provider-initiated abort service.

5) New subclause 9.1.15

Add after 9.1.14:

9.1.15 Nested connections functional unit

The nested connections functional unit supports the establishment of nested session connections. If this functional unit is not selected the connection establishment service cannot be used on an existing connection.

6) Subclause 11.3

Add at the end of this subclause:

The above sequencing rules apply to all primitives issued on any connection that is nested within the same outermost session connection, even if two such primitives occur on different connections in the set.

7) Subclause 12.1.1

Add at the end of this subclause:

This service also allows the establishment of nested session connections which may have different session connection parameters from those of the parent connection.

8) Subclause 12.1.2

In Table 9, *change the* M *for* Calling Session Address, Called Session Address, *and* Responding Session Address *to* C.

9) Subclauses 12.1.2.2, 12.1.2.3 and 12.1.2.4

Add at the end of each of 12.1.2.2, 12.1.2.3 and 12.1.2.4:

The parameter is mandatory except when the connect service is used to establish a nested session connection, when it shall be absent.

10) Subclause 12.1.2.7

Add a new item n) *to this subclause:*

n) nested connections functional unit.

11) Subclause 13.11.2

Add a new item c) *to this subclause:*

c) disrupted service (this only occurs on a nested connection).

12) Subclause 14.3.2

Add new items b) *and* c) *to this subclause and rename existing* b) *through* d) *as* d) *through* f)*:*

b) containing connection released (this only occurs on a nested connection);

c) disrupted service (this only occurs on a nested connection);

13) Subclause 15.2

Add at the end of the sentence in this subclause:

... except that services on a nested session connection can only be invoked if all enclosing connections permit the invocation of the data transfer service.

14) Subclause A.1

Add at the end of this subclause:

A request or response primitive on a nested session connection (including an S-CONNECT request or response establishing such a connection) can occur only if the following apply:

a) it is permitted by the state table for that connection; and

b) the state table for all enclosing connections permit an SDTreq event.

An indication or confirm primitive on a nested connection (including an S-CONNECT indication or confirm establishing such a connection) will occur only if the following apply:

a) it is permitted by the state table for that connection; and

b) the state table for all enclosing connections permit an SDTind event.

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