INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.1902.6
Amendment 1
(04/2004)

SERIES Q: SWITCHING AND SIGNALLING

Specifications of signalling related to Bearer Independent Call Control (BICC)

Bearer Independent Call Control protocol (Capability Set 2): Generic signalling procedures for the support of the ISDN User Part supplementary services and for bearer redirection

Amendment 1

ITU-T Recommendation Q.1902.6 (2001) – Amendment 1

ITU-T Recommendation Q.1902.6

Bearer Independent Call Control protocol (Capability Set 2): Generic signalling procedures for the support of the ISDN User Part supplementary services and for bearer redirection

Amendment 1

Summary

This amendment to the ISUP Specification Q.1902.6 (07/2001) contains several modifications in various chapters due to an update of the bearer redirection procedure.

CONTENTS

Page

ITU-T Recommendation Q.1902.6

Bearer Independent Call Control protocol (Capability Set 2): Generic signalling procedures for the support of the ISDN User Part supplementary services and for bearer redirection

Amendment 1

1)   Clause 6.3 Cut-through of new bearer connection

Modify clause 6.3 as follows:

~~Two~~ Three possibilities are provided for the cut-through of the new bearer connection at the BC-Anchor node:

•   Immediate Cut-Through.

•   Late Cut-Through.

•   Automatic cut-through.

In the case of Immediate Cut-Through, the new bearer connection is cut-through immediately it is established, according to the procedures for standard bearer setup.

In the case of Late Cut-Through, cut-through of the new bearer connection is under control of the CC_Anchor node which sends an explicit cut-through request to the BC-Anchor to trigger cut-through. A sub-case of "late cut-through" is "automatic cut-through". Cut-through of the backwards media path of the new bearer (and cut-off of the backwards path of the old bearer) is under the control of the BC-Anchor and is triggered when non-silent audio is detected on the backwards media path of the new bearer. In most cases, automatic cut-through of the backwards path of the new bearer is subsequently accompanied by an explicit cut-through request sent from the CC-An to the BC-An to complete full cut-through (forwards and backwards) of the new bearer and initiate tear-down of the old bearer.

2)   Clause 6.5.1 Indication of bearer redirection capability

Modify clause 6.5.1 as follows:

An SN that supports the Bearer Control Anchor node capabilities shall indicate this within the IAM and first backwards Call Control message (ACM or CON) of the original call by including the Bearer Redirection Capability Information element within the BAT APP within those messages.

In the case of ISNs and GSNs, this indication may be included only if the node itself supports the Bearer Redirection procedures for a BC-Anchor node. In the case of TSNs it may additionally be included if received from the preceding or succeeding node and if the procedures of 6.5.2.3 are supported. (A CMN has no Bearer Interworking Function and so cannot perform the Bearer Control Anchor function.)

If the Late Cut-Through option is supported, the Late Cut-Through Indicator shall be set to *"Late Cut-Through Supported"*, otherwise it shall be set to *"Late Cut-Through Not Supported"*.

If the conference option is supported, the conference indicator of the bearer redirection capability information element shall be set to *"Conference Supported"*, otherwise it shall be set to *"Conference Not Supported"*.

If the "Bi-Casting" option is supported, the bi-casting indicator of the bearer redirection capability information element shall be set to *"Bi-Casting Supported"*, otherwise it shall be set to *"Bi-Casting Not supported"*.

If the "Automatic cut-through" option is supported, the automatic cut-through indicator of the bearer redirection capability information element shall be set to *"Automatic cut-through supported"*, otherwise it shall be set to *"Automatic cut-through not supported"*.

The compatibility information of the bearer redirection capability shall be set so as to cause the information element to be discarded by nodes that do not support bearer redirection.

3)   Clause 6.5.2.1.1 Negotiation of bearer redirection capabilities

Modify clause 6.5.2.1.1 as follows:

When the CC-Anchor node has decided to invoke bearer redirection, an APM is sent to the preceding node with the action indicator in the BICC_Data request primitive set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"Redirect Backwards Request"* or *"Redirect Forwards Request"* as appropriate depending on the capability of the Redirecting-to node, i.e., the CC-Anchor node determines whether the Forward or Backward procedures are to be used towards the Redirecting-to node in a way similar to how a node initiating a new call determines whether the Forwards or Backwards procedure should be used towards that node. The Bearer Redirection Indicators are also included in the BICC_Data request primitive.

If Late Cut-Through is desired and the Late Cut-Through indicator received in the Bearer Redirection Capability Information Element in the IAM was set to *"Late Cut-Through Supported"*, then a Bearer Redirection Indicator *"Late Cut-Through Requested"* shall be included.

If conferencing of the new and old bearers (during the intermediate stage when both bearers have been created) is desired, and the conferencing indicator received in the bearer redirection capability information element in the IAM was set to *"Conferencing Supported"*, then a bearer redirection indicator *"Conference requested"* shall be included.

If bi-casting of media on the forwards media path of the old and new bearers (during the intermediate stage when both old and new bearers have been created) is desired, and the bi-casting indicator received in the bearer redirection capability information element in the IAM was set to *"Bi-casting supported"*, then a bearer redirection indicator *"Bi-casting requested"* shall be included.

If automatic cut-through of the backwards media path of the new bearer (when non-silent audio is detected) is required, and the automatic cut-through indicator of the bearer redirection capability information element in the IAM was set to *"Automatic cut-through supported"*, then a bearer redirection indicator *"Automatic cut-through requested"* shall be included.

On receipt of a BICC_Data indication primitive (corresponding to an APM received from the preceding node (BC-Anchor)) with action indicator set to *"Connect Backward"* or *"Connect Forward"*, CC-Anchor node, the procedures of 6.5.2.1.2 followed by 6.5.2.1.3 apply.

4)   Clause 6.5.2.1.2 Set-up of new call leg and bearer connection

Modify clause 6.5.2.1.2 as follows:

To initiate set-up of the new call leg and bearer connection the service at the CC-Anchor node uses the stored IAM information to construct an IAM to be sent to the Redirecting-to node. The APP with Application Context Identifier "BAT ASE" included in the IAM shall only include the information elements from the APP received by the CC-Anchor node in 6.5.2.1.1.

The CC-Anchor node subsequently behaves as follows:

- BAT ASE information received from the Redirecting-from node is passed on to the BC-Anchor according to standard CMN procedures.

- BAT ASE information received from the Redirecting-to node is passed on to the BC-Anchor according to standard CMN procedures but with a Bearer Redirection Indicator *"new connection identifier"* included.

- BAT ASE information received from the BC-Anchor node containing a Bearer Redirection Indicator *"new connection identifier"* is passed on to the Redirecting-to node according to standard CMN procedures but with the Bearer Redirection Indicator *"new connection identifier"* removed.

- BAT ASE information received from the BC-Anchor node not containing a Bearer Redirection Indicator *"new connection identifier"* is passed on to the Redirecting-from node according to standard CMN procedures.

The behaviour of the CC-Anchor node with respect to other messages/information depends on the application invoking Bearer redirection.

The CC-Anchor node waits for a BICC_Data indication primitive (corresponding to an APM) with Action Indicator set to *"Connected"* or with Action Indicator set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect bearer connected"* to be received from the BC-Anchor node. In the former case, this indication is passed onwards to the Redirecting-to node.

In the case of Late Cut-Through, when Cut-through of the new connection is required, the CC-Anchor node shall send a BICC_Data request primitive (in association with any suitable message) with Action indicator set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect cut-through request"* towards the BC-Anchor node.

Under the conferencing scenario, the endpoints (at the BC-An) of the old and new bearers will be conferenced together, however, the CC-An still controls the cut-through of the new bearer (and consequently the cut-over from the old bearer to the new bearer). To achieve cut-through under this scenario, the CC-An node shall send a BICC_Data request primitive (in association with any suitable message) with action indicator set to *"Bearer Redirect"* and including bearer redirection indicator *"redirect cut-through request"* towards the BC-Anchor node.

Similarly, when bi-casting of the forwards media path (at the BC-An) on the old and new bearers is being used, the CC-An still controls the "cut-over" point (this applies to both the "automatic cut-through" and "late cut-through" bi-casting scenarios). Under this scenario, to achieve cut-through (of the backwards media path of the new bearer (and subsequently cut-off of the old bearer)), the CC-Anchor node shall send a BICC_Data request primitive (in association with any suitable message) with action indicator set to *"Bearer Redirect"* and including bearer redirection indicator *"redirect cut-through request"* towards the BC-Anchor node.

The new bearer set-up procedure is now complete.

5)   Clause 6.5.2.1.3 Release of old call leg and bearer connection

Modify clause 6.5.2.1.3 as follows:

When the controlling application requires the release of the old call leg and bearer to the Redirecting-from node, the CC-Anchor node sends an APM to the preceding node with the action indicator in the BICC_Data request primitive set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect bearer release request"*.

On receipt of an APM from the preceding node with the action indicator in the BICC_Data indication primitive set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect bearer release proceed"*, a REL message is sent to the Redirecting-from node as per the normal

release procedures. The release cause value is determined by the application. The CC-Anchor node awaits receipt of the RLC from the Redirecting-from node.

In the case where the old call leg and bearer connection has already been released between CC-anchor and Redirect-from when starting the redirection procedure (e.g., in the case of the IN follow-on service), the *"redirect bearer release complete"* can be sent immediately, together with the bearer redirect request (no extra release-request-proceed-complete cycle is necessary).

On receipt of the RLC from the Redirecting-from node, an APM is sent to the preceding node with the action indicator in the BICC_Data request primitive set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect bearer release complete"*.

6) Clause 6.5.2.2.2.2 Confirmation and Cut-Through of the new bearer connection

Modify clause 6.5.2.2.2.2 as follows:

If the Bearer Redirection Indicators information element received with the bearer redirection request indication in 6.5.2.2.1 above did not include *"late cut-through requested"*, then the newly established bearer connection is cut-through immediately it is established, according to the normal connection setup procedures.

If the bearer redirect request is combined with a *"redirect bearer release complete"* indication only, immediate cut-through is possible.

On completion of the outgoing setup procedure then except in the case of Forward Setup with Connect Type set to *"Forwards Notify"*, the BC-Anchor node shall send a BICC_Data request primitive with Action Indicator set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect bearer connected"* to the CC-Anchor node.

In the case of Forward setup with Connect Type set to *"Forwards Notify"* the BC-Anchor node shall behave as described in the normal Forwards setup procedures.

If the Bearer Redirection Indicators information element received with the bearer redirection Request indication in 6.5.2.2.1 above indicated *"conferencing requested"* (either solely or in addition to another indicator) then the BC-Anchor shall conference the endpoints of the old and new bearers until the new bearer is cut-through.

If the Bearer Redirection Indicators information element received with the bearer redirection Request indication in 6.5.2.2.1 indicated *"Bi-casting requested"* (either solely or in addition to another indicator) then the BC-Anchor shall bi-cast media on the forwards path on both the old and new bearers until the new bearer is cut-through.

If the Bearer Redirection Indicators information element received with the bearer redirection Request indication in 6.5.2.2.1 indicated *"Automatic cut-through requested"* AND *"Bi-casting requested"* then the BC-Anchor shall bi-cast media on the forwards path on both the old and new bearers but shall only connect the backwards path of the new bearer when non-silent audio is detected.

In all cases, if the Bearer Redirection Indicators information element received with the bearer redirection Request indication in 6.5.2.2.1 above indicated *"late cut-through requested"*, (either by itself or in combination with another bearer redirection indicator) then, on receipt of a BICC_Data indication primitive (corresponding to any message) with action indicator set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect cut-through request"*, the BC-Anchor node cuts through the new bearer connection in both directions.

7)   Clause 6.5.2.2.3 Release of old bearer connection

Modify clause 6.5.2.2.3 as follows:

On receipt of an APM from the succeeding node with the action indicator in the BICC_Data indication primitive set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect release request"* the BC-Anchor requests the BCF to disconnect the internal through-connection of the old bearer path connection between the BC-Anchor and the Redirecting-from node. A normal cause value is passed from the CSF to the BCF.

At the same time as the start of the release of the switched path, the BC-Anchor sends an APM to the succeeding node with the action indicator in the BICC_Data request primitive set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect release proceed"*.

The BC-Anchor awaits receipt of an APM from the succeeding node with the action indicator in the BICC_Data indication primitive set to *"Bearer Redirect"* and including Bearer Redirection Indicator *"redirect release complete"*. On receipt of this indication, the BC-Anchor instructs the BCF to release remaining resources associated with the old bearer connection.

If the *"redirect bearer release complete"* indication is received, together with the redirect request, the internal through-connection of the old bearer path connection between the BC-Anchor and the Redirecting-from node is disconnected immediately, as well as all resources in the BCF are released for this call leg, before setting up the new call leg.

8)   Clause 6.5.4.2 Temporary reject

Modify clause 6.5.4.2 as follows:

If the request for Bearer Redirection cannot be honoured by the BC-Anchor node, it shall send to the CC-Anchor node a BICC-Data indication primitive (corresponding to an APM) with the Action Indicator set to *"bearer redirect"* and including a Bearer Redirection Indicator *"redirect temporary reject"*. If the bearer redirection cannot be honoured because the conferencing of endpoints requested by the CC-An cannot be implemented (due to (temporary) lack of conference resources), it shall send a BICC-Data indication primitive (corresponding to an APM) to the CC-Anchor node with the action indicator set to *"bearer redirect"* and including the bearer redirection indicators *"redirect temporary reject"* AND *"Conference resource unavailable"*.

A *"redirect temporary reject"* (and/or) *"Conference Resource unavailable"* indication received by an intermediate node shall be passed on unmodified.

If either the *"redirect temporary reject"* or the *"redirect temporary reject"* plus *"Conference Resource unavailable"* indications are received by the CC-Anchor node originating the request then the invoking application shall take appropriate action (which could involve requesting a different form of bearer redirection (e.g., where conferencing option was being used, trying bearer redirection without conferencing instead) or retrying the existing setup after a suitable period of time).

SERIES OF ITU-T RECOMMENDATIONS

Series A   Organization of the work of ITU-T

Series B   Means of expression: definitions, symbols, classification

Series C   General telecommunication statistics

Series D   General tariff principles

Series E   Overall network operation, telephone service, service operation and human factors

Series F   Non-telephone telecommunication services

Series G   Transmission systems and media, digital systems and networks

Series H   Audiovisual and multimedia systems

Series I   Integrated services digital network

Series J   Cable networks and transmission of television, sound programme and other multimedia signals

Series K   Protection against interference

Series L   Construction, installation and protection of cables and other elements of outside plant

Series M   TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits

Series N   Maintenance: international sound programme and television transmission circuits

Series O   Specifications of measuring equipment

Series P   Telephone transmission quality, telephone installations, local line networks

Series Q   Switching and signalling

Series R   Telegraph transmission

Series S   Telegraph services terminal equipment

Series T   Terminals for telematic services

Series U   Telegraph switching

Series V   Data communication over the telephone network

Series X   Data networks and open system communications

Series Y   Global information infrastructure, Internet protocol aspects and Next Generation Networks

Series Z   Languages and general software aspects for telecommunication systems