Telecommunication Standardization Sector
Study Group 15
Experts Group for Video Coding and Systems in
ATM and Other Network Environments

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SOURCE : JAPAN
TITLE : Comments on bi-directional logical channel signalling in H.245
PURPOSE : Discussion

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## 1. Introduction

The correction of bi-directional logical channel signalling procedure currently defined in white paper version of draft Rec. H.245 has been discussed through AVC and LBC e-mail reflectors.
This document describes the desirable approach for H.245 protocol method and also gives an example of bi-directional logical channel signalling protocol according to this approach.

## 2. Discussion

There are some opinions for the bi-directional logical channel signalling protocol. We think that they are originated from different concept of the protocol definition.
The followings are three approaches for general protocol design.

(1) Well-define the normal procedure. Irregular status and/or events should be prohibited or ignored.
(2) When an irregular situation occurs out of normal procedure, the procedure should be aborted and invoked again from the initial state. In this case, recovery from the error (re-initiation) is decided by the upper layer (H.324/H.310).
(3) Error recovery procedures are defined as part of protocol. Irregular status/events are resolved within the H.245 layer itself. For example, when both ends have issued Bi-directional Logical Channel Set-up Request at the same time, a bi-directional channel will eventually be established as the result of protocol processing, and the upper layers of both ends are not aware of collision of requests.

We think that above (3) is the most desirable approach for the H.245 protocol design, because H.324 or H.310 is not necessary to handle error recovery process and can become simple relying on H.245.
In addition to that, errors which logically never occurs, for example RELEASE-request in non-established state, should be indicated as error to the upper layer. Other errors which are expected in some probability, for example collision of requests, should be handled and recovered by the H.245 protocol procedure.
An example of state transition table of bi-directional logical channel signalling is attached to this document. That is based on the above approach (3) for reference.

## 3. Conclusions

This document has discussed the approach for H.245 protocol design and suggested that H.245 should be reliable with some possible error handling. An example of bi-directional logical channel signalling protocol according to this approach has also been shown.

**Reference**

[1] Draft Rec. H.245, July 6, 1995.
[2] AVC-817 "H.245 B-LCSE modifications and illustrations", September, 1995.
[3] AVC-818 "Informative appendix on H.245 procedures", September, 1995.

**END**

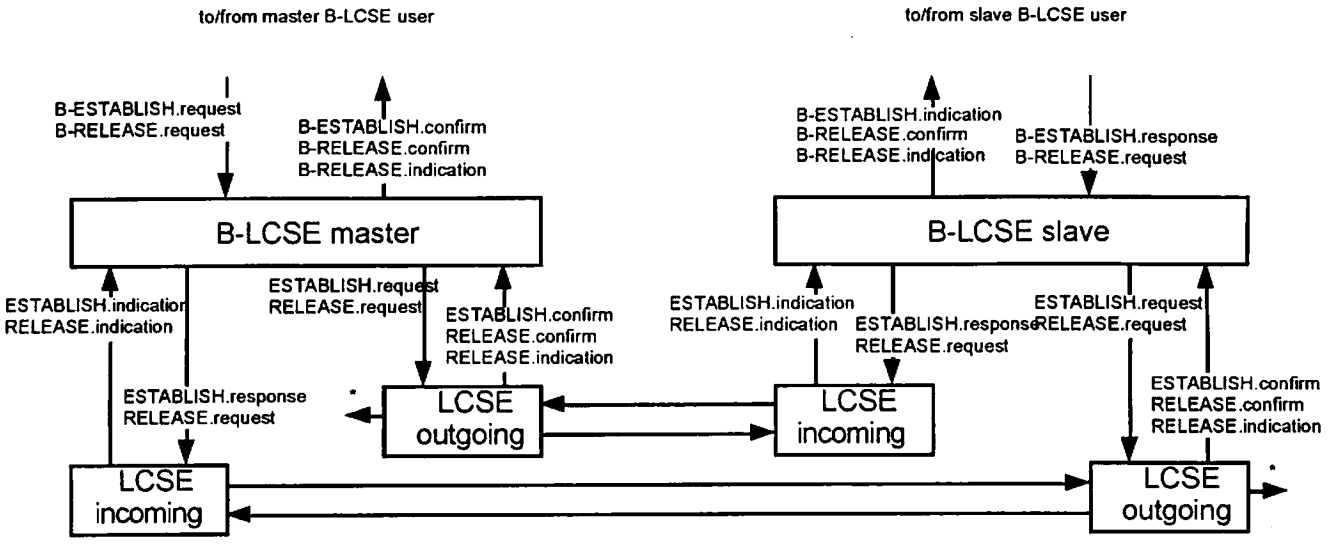


FIGURE 17 /H.245
**Primitives in the B-LCSE**

TABLE 35/H.245

**B-LCSE compound state transition table - master**

| event | compound state: in-coming LCSE/out-going LCSE | | | |
|---|---|---|---|---|
| | 0/0 | 0/1 | 0/2 | 0/3 |
| B-ESTABLISH.request | O: ESTABLISH.request<br>Next state: 0/1 | -<br>Note 1 | - | |
| B-RELEASE.request | B-RELEASE.confirm<br>Next state: 0/0 | O: RELEASE.request<br>Next state: 0/3 | O: RELEASE.request<br>Next state: 0/3 | |
| I: ESTABLISH.indication<br>Note 2 | I: RELEASE.request<br>Next state: 0/0 | I: ESTABLISH.response<br>Next state: 2/1 | B-ESTABLISH.confirm<br>Next state: 2/2 | I: RELEASE.request<br>Next state: 0/3 |
| I: RELEASE.indication | Note 5 | - | O: RELEASE.request<br>Next state: 0/3 | |
| O: ESTABLISH.confirm | O: RELEASE.request<br>Next state: 0/3 | Next state: 0/2 | | O: RELEASE.request<br>Next state: 0/3 |
| O: RELEASE.confirm | | O: ESTABLISH.request<br>Next state: 0/1 | O: ESTABLISH.request<br>Next state: 0/1 | B-RELEASE.confirm<br>Next state: 0/0 |
| O: RELEASE.indication | | B-RELEASE.indication<br>Next state: 0/0 | B-RELEASE.indication<br>Next state: 0/0 | B-RELEASE.confirm<br>Next state: 0/0 |

TABLE 35/H.245

**B-LCSE compound state transition table - master (concluded)**

| event | compound state: in-coming LCSE/out-going LCSE | |
|---|---|---|
| | 2/1 | 2/2 |
| B-ESTABLISH.request | - | - |
| B-RELEASE.request | O: RELEASE.request<br>I: RELEASE.request<br>Next state: 0/3 | O: RELEASE.request<br>I: RELEASE.request<br>Next state: 0/3 |
| I: ESTABLISH.indication | I: ESTABLISH.response<br>Next state: 2/1 | I: ESTABLISH.response<br>Next state: 2/2 |
| I: RELEASE.indication | O: RELEASE.request<br>Next state: 0/3 | O: RELEASE.request<br>Next state: 0/3 |
| O: ESTABLISH.confirm | B-ESTABLISH.confirm<br>Next state: 2/2 | |
| O: RELEASE.confirm | O: ESTABLISH.request<br>Next state: 2/1 | B-RELEASE.indication<br>I: RELEASE.request<br>Next state: 0/0 |
| O: RELEASE.indication | B-RELEASE.indication<br>I: RELEASE.request<br>Next state: 0/0 | B-RELEASE.indication<br>I: RELEASE.request<br>Next state: 0/0 |

TABLE 36/H.245

**B-LCSE compound state transition table - slave**

| event | compound state: in-coming LCSE/out-going LCSE | | |
|---|---|---|---|
| | 0/0 | 0/3 | 1/0 |
| B-ESTABLISH.response | B-RELEASE.indication<br>Next state: 0/0 | - | I: ESTABLISH.response<br>O: ESTABLISH.request<br>Next state: 2/1 |
| B-RELEASE.request | B-RELEASE.confirm<br>Next state: 0/0 | | I: RELEASE.request<br>B-RELEASE.confirm<br>Next state: 0/0 |
| I: ESTABLISH.indication Note 6. | B-ESTABLISH.indication<br>Next state: 1/0 | I: RELEASE.request<br>Next state: 0/3 | Next state: 1/0 |
| I: RELEASE.indication | | | B-RELEASE.indication<br>Next state: 0/0 |
| O: ESTABLISH.confirm | O: RELEASE.request<br>Next state: 0/3 | O: RELEASE.request<br>Next state: 0/3 | O: RELEASE.request<br>Next state: 1/3 |
| O: RELEASE.confirm | | B-RELEASE.confirm<br>Next state: 0/0 | |
| O: RELEASE.indication | | B-RELEASE.confirm<br>Next state: 0/0 | |

TABLE 36/H.245

**B-LCSE compound state transition table - slave (concluded)**

| event | compound state: in-coming LCSE/out-going LCSE | | | |
|---|---|---|---|---|
| | 1/3 | 2/1 | 2/2 | 2/3 |
| B-ESTABLISH.response | I: ESTABLISH.response<br>Next state: 2/3 | | | |
| B-RELEASE.request | I: RELEASE.request<br>Next state: 0/3 | I: RELEASE.request<br>O: RELEASE.request<br>Next state: 0/3 | I: RELEASE.request<br>O: RELEASE.request<br>Next state: 0/3 | I: RELEASE.request<br>Next state: 0/3 |
| I: ESTABLISH.indication Note 6. | Next state: 1/3 | I: ESTABLISH.response<br>Next state: 2/1 | I: ESTABLISH.response<br>Next state: 2/2 | I: ESTABLISH.response<br>Next state: 2/3 |
| I: RELEASE.indication | I: RELEASE.request<br>Next state: 0/3 | O: RELEASE.request<br>Next state: 0/3 | O: RELEASE.request<br>Next state: 0/3 | Next state: 0/3 |
| O: ESTABLISH.confirm | O: RELEASE.request<br>Next state: 0/3 | Next state: 2/2 | | O: RELEASE.request<br>Next state: 2/3 |
| O: RELEASE.confirm | Next state: 1/0 | I: RELEASE.request<br>B-RELEASE.indication<br>Next state: 0/0 | I: RELEASE.request<br>B-RELEASE.indication<br>Next state: 0/0 | O: ESTABLISH.request<br>Next state: 2/1 |
| O: RELEASE.indication | Next state: 1/0 | I: RELEASE.request<br>B-RELEASE.indication<br>Next state: 0/0 | I: RELEASE.request<br>B-RELEASE.indication<br>Next state: 0/0 | O: ESTABLISH.request<br>Next state: 2/1 |

Notes:

1. "-" means that this event in this compound state is illegal.
2. LCSE primitives are qualified with "O:" or "I:" to indicate whether they relate to the in-coming LCSE or the out-going LCSE.
3. Compound states not shown are illegal.
4. LCSE states:

| | | | |
|---|---|---|---|
| In-coming: | 0 RELEASED | Out-going: | 0 RELEASED |
| | 1 AWAITING ESTABLISHMENT | | 1 AWAITING ESTABLISHMENT |
| | 2 ESTABLISHED | | 2 ESTABLISHED |
| | | | 3 AWAITING RELEASE |

5. A blank cell means that this event in this compound state is ignored.
6. When an in-coming ESTABLISH.indication primitive is received at the slave B-LCSE, the slave side state variables are set as shown in Table 37.