



ESBC Application Notes

Interworking of SIP Response Codes and ISDN Q.931 Cause Codes

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Table of Content

INTERWORKING OF SIP RESPONSE CODES AND ISDN Q.931 CAUSE CODES	1
DOCUMENT INFORMATION	1
TABLE OF CONTENT.....	2
1. MAPPING OF Q.931 CAUSE CODES TO SIP RESPONSE CODES	3
THE ESBC SYSTEM DEFINED TABLE.....	3
RULES OF USER DEFINED RECORDS	5
2. MAPPING OF SIP RESPONSE CODES TO Q.931 CAUSE CODES	6
THE ESBC SYSTEM DEFINED TABLE.....	6
RULES OF USER DEFINED RECORDS	8

1. Mapping of Q.931 Cause Codes to SIP Response Codes

When the ESBC receives a SIP INVITE request but has not sent a SIP final response, ESBC will send a selected SIP response mapped from the cause code value received in the Q.931 DISCONNECT message. A SIP response 500 (Server internal error) will be used if the received cause code value not defined in the table.

Some cause code values are not necessarily mapped to SIP messages because they are only applicable to the PRI domain. Such as the cause value 44, "Requested circuit or channel not available" identifies the B-channel not acceptable to PSTN.

The ESBC System Defined Table

- If a received Q.931 cause code is not found in the user defined table, the ESBC uses the following table.
- If a Q.931 cause value is neither listed in the default mapping nor in the configurable mapping, the ESBC responses with '500 Server internal error' to the SIP Trunk side.

Table 1. Mapping of Q.931 to SIP Response Codes

Received Q.931 Cause Code	Transmitted SIP Response Code
0 Uninitialized	500 Internal server error
1 Unallocated number	404 Not found
2 No route to network	404 Not found
3 No route to destination	404 Not found
6 Channel unacceptable	406 Not acceptable
7 Call awarded and being delivered in an established channel	500 Server internal error
16 Normal call clearing	BYE or CANCEL
17 user busy	486 Busy here
18 no user responding	408 Request Timeout
19 no answer from the user	480 Temporarily unavailable
20 subscriber absent	480 Temporarily unavailable

21 call rejected	403 Forbidden
22 number changed	410 Gone
23 redirection to new destination	410 Gone
26 non-selected user clearing	404 Not Found
27 destination out of order	502 Bad Gateway
28 address incomplete	484 Address incomplete
29 facility rejected	501 Not implemented
30 Response to status enquiry	501 Not implemented
31 normal unspecified	480 Temporarily unavailable
34 no circuit available	503 Service unavailable
38 network out of order	503 Service unavailable
41 temporary failure	503 Service unavailable
42 switching equipment congestion	503 Service unavailable
43 Access information discarded	502 Bad Gateway
44 Requested channel not available	503 Service unavailable
47 resource unavailable	503 Service unavailable
49 QoS unavailable	503 Service unavailable
50 Facility not subscribed	503 Service unavailable
55 incoming calls barred within CUG	403 Forbidden
57 bearer capability not authorized	403 Forbidden
58 bearer capability not presently available	503 Service unavailable
63 Service/option not available	503 Service unavailable
65 bearer capability not implemented	501 Not implemented
69 Requested facility not implemented	501 Not implemented
70 only restricted digital avail	488 Not Acceptable Here
79 service or option not implemented	501 Not implemented
81 Invalid call reference value	502 Bad Gateway

82 Identified channel does not exist	502 Bad Gateway
83 Suspended call exists, but this call identity does not	503 Service unavailable
84 Call identity in use	503 Service unavailable
85 No call suspended	503 Service unavailable
86 Call having the requested call identity has been cleared	408 Request Timeout
87 user not member of CUG	503 Service unavailable
88 incompatible destination	503 Service unavailable
91 Invalid transit network selection	502 Bad Gateway
95 Invalid message	503 Service unavailable
96 Mandatory information element is missing	409 Conflict
97 Message type non-existent or not implemented	480 Temporarily unavailable
98 Message not compatible with call state or message type non-existent or not implemented	409 Conflict
99 Information element non-existent or not implemented	480 Not found
100 Invalid information elements contents	501 Not implemented
101 Message not compatible with call state	503 Service unavailable
102 recovery of timer expiry	408 Request timeout
111 protocol error	500 Server internal error
127 Interworking unspecified	500 Server internal error

Rules of User defined records

The user defined records should follow rules below:

1. PRI Q.931 Cause Code: 1-127, must be unique
2. SIP Response Code: 400-699

TAG

MAPPING_PRI_CAUSE_TO_SIP_RESPONSE = pri_cause_code1/sip_response_code1

2. Mapping of SIP Response Codes to Q.931 Cause Codes

On the receipt of a SIP final response (4xx-6xx) to an outbound SIP INVITE request, unless ESBC is able to retry the INVITE request to avoid the problem (e.g., by supplying authentication in the case of a 401 or 407 response), ESBC transmits a Q.931 DISCONNECT message, in which the cause value is derived from the SIP 4xx-6xx response according to the values in Table 2.

- On the receipt of a SIP 4xx-6xx response to an outbound INVITE request, the cause code value 31 (Normal, unspecified) is used as the default for SIP responses not shown in Table 2.
- On the receipt of an **SIP BYE request** from the SIP Trunk side, the ESBC sends a Q.931 DISCONNECT message with the cause code value 16 (normal call clearing)
- On the receipt of a **SIP CANCEL** request from the SIP Trunk side to clear a call for which ESBC has not sent a SIP final response to the received SIP INVITE request, ESBC sends a Q.931 DISCONNECT message with cause value 16 (normal call clearing).

The ESBC System Defined Table

Table 2. Mapping of SIP Response Codes to Q.931 Cause Codes

Response Code	Q.931 Cause Code
400 Bad request	41 Temporary Failure
401 Unauthorized	21 Call Rejected (NOTE 1)
402 Payment required	21 Call Rejected
403 Forbidden	21 Call Rejected
404 Not found	1 Unallocated number
405 Method not allowed	63 Service or option unavailable
406 Not acceptable	79 Service or option not implemented
407 Proxy authentication required	21 Call Rejected (NOTE 1)

408 Request timeout	102 Recovery on timer expiry
409 Conflict	41 Temporary failure
410 Gone	22 Number changed (without diagnostic)
413 Request Entity too long	127 Interworking, , unspecified
414 Request-URI too long	127
415 Unsupported media type	79 Service or option not implemented
416 Unsupported URI Scheme	127
420 Bad extension	127
421 Extension required	127
423 Interval Too Brief	127
480 Temporarily unavailable	18 No user responding
481 Call leg/transaction does not exist	41 Temporary failure
482 Loop detected	25 Exchange - routing error
483 Too many hoops	25 Exchange - routing error
484 Address incomplete	28 Invalid Number Format
485 Ambiguous	1 Unallocated number
486 Busy here	17 User busy
487 Request Cancelled	- (no mapping)
488 Not acceptable here	31 Normal, unspecified
500 Internal server error	41 Temporary Failure
501 Not implemented	79 Not implemented, unspecified
502 Bad gateway	38 Network out of order
503 Service unavailable	16 Normal clearing
504 Server time-out	102 Recovery on timer expiry
505 Version not supported	127
513 Message Too Large	127

600 Busy everywhere	17 User busy
603 Decline	21 Call rejected
604 Does not exist anywhere	1 Unallocated number
606 Not acceptable	31 Normal, unspecified

Note:

- Only if ESBC cannot authorize itself, the call is cleared by a DISCONNECT message with this cause value.

Rules of User defined records

The user defined records should follow rules below:

1. SIP Response codes consist of digits (range 400-699) denoting the response code of the mapped SIP error response.
2. PRI Cause Code consists of digits (range 1-127) denoting the cause code of the mapping PRI Q.931 cause.

TAG:

PRI_MAPPING_SIP_RESPONSE_TO_PRI_CAUSE = sip_response_code 1/ pri_cause_code 1, sip_response_code 2/
pri_cause_code 2