

MTP LEVEL 3

TEST NUMBER: 3.16

PAGE:1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover to another linkset with adjacent SP accessible

PURPOSE:To check that the system performs changeover to an alternative route when the last link of a linkset becomes unavailable

PRE-TEST CONDITIONS:

Linkset 1 and link 3 – 1 unavailable

CONFIGURATION:

B

TYPE OF TEST:
VAT, CPT

TYPE OF SP: ALL

MESSAGE SEQUENCE:

SP

A

SP

B

SP C SP .

Link

Link Link

Link

:Start traffic

3 - 2 TRAFFIC
----->

7 - 1
-----> SP E

8 - 1
<----- SP D

3-2 <----->
 <----- 7-1 SP
 E

2-1, 2 TRAFFIC ----->
 6-1
 -----> SP E

5-1
 -----> SP D

<----- 2-1, 2
 <----->
 5-1
 SP D

3-2 :Deactivate (MML command or failure)

2-X COO, SLC ----->
 4-1
 3-2
 ----->

<----- 2-X
 <-----4-1 COA, SLC 3-2

2-1, 2 TRAFFIC ----->
 6-1
 -----> SP
 E

(from 3-2) 5-1
 -----> SP
 D

<----- 2 - 1, 2
<----- 5 - 1 SP
D

<----- 2 - 1, 2
<----- 6 - 1 SP
E

:Wait

:Stop traffic

TEST DESCRIPTION

1.

Start traffic to E (and D in VAT).

2.

Deactivate link 3 – 2 and check that a COO (for 3 – 2) is sent from A to C via B and that a COA (from 3 – 2) is sent from C to A via B within T2.

3.

Stop traffic and check that it has been shared on the alternative links 2 – 1 and 2 – 2 according to the load sharing rules of linkset 2.

4.

Check that, for each SLS, there was no lost messages, no duplication and no missequencing.

5.

Repeat the test but replace COO with ECO (some messages may have been lost).

MTP LEVEL 3

TEST NUMBER:
3.17

PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover to another linkset with adjacent SP inaccessible

PURPOSE: To check that the system responds correctly when there is no path between the ends of an unavailable link.

PRE-TEST CONDITIONS:
Linkset 4 unavailable

CONFIGURATION:
B

TYPE OF TEST:
VAT, CPT

TYPE OF SP:
ALL

MESSAGE SEQUENCE:

SP A

SP

B

SP

C

SP

E

Link

Link Link

Link

:Start traffic

2 – 1

TRAFFIC

----->
6 - 1
----->

2 - 2

TRAFFIC

----->
6 - 1
----->

3 - 1

TRAFFIC

----->
7 - 1
----->

<-----
3 - 1
<-----

7 - 1

TRAFFIC

3 - 2

TRAFFIC

----->
7 - 1
----->

<-----
3 - 2

<-----

7 - 1

TRAFFIC

2 - 1

:Deactivate (MML command or failure)

2 - 2

:Deactivate (MML command or failure)

½

½

½T1

½

½

3 - 1

TRAFFIC

----->

(from 2 - 1, 2)

7 - 1

----->

<-----

3 - 1

<-----

7 - 1

TRAFFIC

3 - 2

TRAFFIC

----->

(from 2 - 1, 2)

7 - 1

----->

<-----

3 - 2

<-----

7 - 1

TRAFFIC

:Wait

:Stop traffic

TEST DESCRIPTION

1.

Start traffic to E on linkset 2 and 3.

2.

Deactivate the linkset 2.

3.

Check that traffic continues on linkset 3 at the expiration of T1.

4.

Stop traffic and check that it has been shared on links 3 – 1 and 3 – 2 according to the load sharing rules of the linkset 3.

5.

Check that the traffic has been received correctly. Some messages may have been lost but none should be missequenced or duplicated..

6.

Check that the duration of T1 is inside the specified range.

MTP LEVEL 3

TEST NUMBER:

3.18

PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover to two linksets

PURPOSE: To check the changeover procedure when it is performed to several links pertaining to two linksets

PRE-TEST CONDITIONS:

Link 1 – 1 unavailable, all other available

CONFIGURATION:
B

TYPE OF TEST:
VAT

TYPE OF SP:
ALL

MESSAGE SEQUENCE:

SP

A

SP

B

SP

C

SP

D

Link

Link

Link

Link

:Start traffic

1 - 2 TRAFFIC

----->

<-----

1 - 2 TRAFFIC

1 - 2 :Deactivate (MML command or failure)

2 - X COO,
SLC 1 - 2

-----> 5 - 1 ----->

or 3 - X

-----> 8 - 1 ----->

<----- 2 - X <-----

5 - 1 COA,
SLC 1 - 2

2 - 1 TRAFIC
(from 1 - 2)

-----> 5 - 1 ----->

<----- 2 - X <-----

5 - 1 TRAFIC
(from 1 - 2)

2 - 2 TRAFIC

(from 1 – 2)
-----> 5 – 1 ----->

3 – 1 TRAFFIC
(from 1 – 2)
-----> 8 – 1 ----->

3 – 2 TRAFFIC
(from 1 – 2)
-----> 8 – 1 ----->

:Wait

:Stop traffic

TEST DESCRIPTION

1.
Start traffic to D.

2.

Deactivate the link 1 – 2 and check that a COO for 1 – 2 is sent to D via B or C and that a COA is sent from D to A via B or C inside T2.

3.

Stop traffic and check that it has been shared on the alternative links 2 – 1, 2 – 2, 3 – 1 and 3 – 2 according to the load sharing rules in A.

4.

Check that, for each SLS, there were no lost messages, no duplication and no missequencing.

5.

Repeat the test but replace COO with ECO (some messages may have been lost).

MTP LEVEL 3

TEST NUMBER: 3.19

PAGE:1 of 1

REFERENCE: Q.704 § 5 ; 3.2.2

TITLE: Changeover

SUBTITLE:
Changeover due to various reasons

PURPOSE: To check the interface L2-L3

PRE-TEST CONDITIONS:
Linkset with two available links

CONFIGURATION:
A

TYPE OF TEST: VAT

TYPE OF SP: ALL

MESSAGE SEQUENCE:

SP

A

SP

B

Link

Link

:Start traffic

1 - 1 TRAFFIC

----->

<-----

1 – 1 TRAFFIC

1 – 2 TRAFFIC

----->

<-----

1 – 2 TRAFFIC

1 – 1 :Deactivation due to various reasons (see Note)

CHANGEOVER

1 – 2 TRAFFIC
(from 1 – 1)

----->

<-----

1 – 2 TRAFFIC (from 1 – 1)

:Wait

:Stop traffic

Note – The object of this test is to check the interface L2–L3 by invoking a changeover by the different means listed in Q.704 (§ 3.2.2). These reasons are: high error rate, expiration of timer T1, T2, T6 and T7 of L2, equipment failure, erroneous BSN or FIB, reception of SIOS, SIN, SIE, SIO and SIPO of L2, and management request. The goal of this test is not to check the changeover procedure itself, but only that the COO is generated for each of these reasons.

TEST DESCRIPTION

1.

Start traffic to B and C on all links.

2.

Invoke the deactivation of the link 1 – 1 (see Note above).

3.

Check that traffic is changed over from 1 – 1 to 1 – 2.

4.

Stop traffic and check that it has been received correctly.

5.

Repeat the test for each reason.

MTP LEVEL 3

TEST NUMBER:
3.20

PAGE: 1 of 1

REFERENCE: Q.704 § 5, Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUB TITLE: Changeover as compatibility test

PURPOSE: To check the changeover procedure as compatibility test

PRE-TEST CONDITIONS:

Linkset with two available links

CONFIGURATION:

A

TYPE OF TEST:

CPT

TYPE OF SP: ALL

MESSAGE SEQUENCE:

SP

A

SP

B

Link

Link

:Start traffic

1 – 1 TRAFFIC

----->

<-----

1 – 1 TRAFFIC

1 – 2 TRAFFIC

----->

<-----

1 – 2 TRAFFIC

1 – 1 :Deactivate (MML command or failure)

CHANGEOVER

1 – 2 TRAFFIC (from 1 – 1)

----->

<-----

1 – 2 TRAFFIC (from 1 – 1)

:Wait

:Stop traffic

Note – In a compatibility test it is impossible to describe precisely the exchanges of changeover messages because the description depends of the type of deactivation of the link and of the time necessary to detect the deactivation.

TEST DESCRIPTION

1.

Start traffic to B on links 1 – 1 and 1 – 2.

2.

Deactivate link 1 – 1 and check that the changeover is performed.

3.

Check that the sequence of changeover messages conforms to one of the descriptions 3.1 to 3.12.
Stop traffic.

4.

Repeat the test by invoking the different reasons listed in the note in test 3.19.

MTP LEVEL 3

TEST NUMBER:
3.21

PAGE: 1 of 1

REFERENCE: Q.704 § 5, Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUB TITLE: Reception of a changeover order on an available link

PURPOSE: To check the changeover procedure on reception of a COO or ECO for a link in service

PRE-TEST CONDITIONS:

Linkset with two available links

CONFIGURATION:

A

TYPE OF TEST: VAT

TYPE OF SP: ALL

MESSAGE SEQUENCE:

SP

A

SP

B

Link

Link

:Start traffic

1 - 1 TRAFFIC

----->

<-----

1 - 1 TRAFFIC

1 - 2 TRAFFIC

----->

<-----

1 - 2 TRAFFIC

<-----

1 - 2 COA, SLC 1 - 1
(FSN corresponding to the last
received message)

1 - 2 COA, SLC 1 - 1

----->

1 – 2 TRAFFIC (from 1 – 1)

----->

<-----

1 – 2 TRAFFIC (from 1 – 1)

:Wait

:Stop traffic

TEST DESCRIPTION

1.

Start traffic to B and C on all the links.

2.

Send a COO from B to A for 1 – 1 on link 1 – 2 and check that the COA is received.

3.

Check that the link 1 – 1 becomes unavailable.

4.

Stop traffic and check that the changeover procedure has been performed.

5.

Check that there was no loss of messages, no duplication and no missequencing.

6.

Repeat the test but send an ECO (instead of a COO) and check that an ECA is received (instead of a COA). Some messages may be lost.

MTP LEVEL 3

TEST NUMBER:
4.1

PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Changeback within a linkset

PURPOSE: To check that the changeback procedure is correctly performed on restoration of a link in a linkset

PRE-TEST CONDITIONS:

Linkset with one available link (end of test 3.1)

CONFIGURATION: A

TYPE OF TEST:

VAT, CPT

TYPE OF SP: ALL

MESSAGE SEQUENCE:

SP

A

SP

B

Link

Link

:Start traffic

1 – 2 TRAFFIC

----->

<-----

1 – 2 TRAFFIC

1 – 1 :Activate (depending of the deactivation mean previously used)

1 – 2 CBD, SLC 1 – 1

----->

<-----

1 – X CBA, SLC 1 – 1

1 – 1 TRAFFIC (from 1 – 2)

----->

<-----

1 – 2 CBD, SLC 1 – 1

1 – X CBA, SLC 1 – 1

----->

<-----
1 - 1 TRAFFIC (from 1 - 2)

1 - 2 TRAFFIC

----->

<-----
1 - 2 TRAFFIC

:Wait

:Stop traffic

TEST DESCRIPTION

1.

Start traffic to B (and C in VAT) on link 1 - 2.

2.

Activate the link 1 – 1 and check that it enters the correct in service state.

3.

Check that a CBD for SLC 1 – 1 is received and that traffic for link 1 – 1 is switched back after a CBA is sent.

4.

Stop traffic and check that it has been received correctly, no lost messages, no duplication and no missequencing.

5.

Continue the test by activating the link 1 – 3, then 1 – 4.

6.

As a compatibility test, repeat the test for several reasons chosen among those listed in test 4.10.

MTP LEVEL 3

TEST NUMBER:

4.2

PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Additional CBA

PURPOSE: To check the actions of the system on reception of an additional CBA

PRE-TEST CONDITIONS:

Linkset with all links available

CONFIGURATION: A

TYPE OF TEST: VAT

TYPE OF SP:
ALL

MESSAGE SEQUENCE:

SP

A

SP

B

Link

Link

:Start traffic

ALL TRAFFIC

----->

<-----

ALL TRAFFIC

<-----

1 - X CBA, SLC 1 - X

ALL
TRAFFIC

----->

<-----

ALL TRAFFIC

:Wait

:Stop traffic

TEST DESCRIPTION

1.

Start traffic to B and C on all links.

2.

Send an unexpected CBA to A and check that this message is discarded without action on the traffic.

3.

Stop traffic.