43 RLC Test Cases

Default conditions and messages

The default conditions, message contents and macros not specified in this subclause must be set as in clause 40.

Initial conditions

Unless otherwise indicated, the initial conditions for all acknowledged mode tests, as a minimum, are as follows. Other initial conditions may apply. In the event of conflict between initial conditions stated here and those stated in a test case, the test case shall take precedence.

- The MS is GPRS attached.
- A PDP context has been established with RLC acknowledged mode operation.

43.1 Acknowledged Mode

43.1.1 Acknowledged mode / Uplink TBF

43.1.1.1 Acknowledged mode / Uplink TBF / Send state variable V(S)

43.1.1.1.1 Conformance requirements

1. The send state variable, V(S), can take on the values 0 through 127. Each RLC data block contains a block sequence number (BSN) field that is 7 bits in length. At the time that an in-sequence RLC data block is designated for transmission, the value of BSN is set equal to the value of the send state variable.
2. V(S) shall be set to the value 0 at the beginning of each TBF in which the RLC endpoint is the transmitter.
3. The value of V(S) shall be incremented by 1 after transmission of the RLC data block with BSN = V(S).

References

3GPP TS 04.60, subclause 9.1.1.

43.1.1.1.2 Test purpose

1. To verify that the mobile station sets the V(S) to 0 at the beginning of each TBF.
2. To verify that the mobile station increases the V(S) by 1 after transmission of the RLC data block with BSN set to V(S).
3. To verify that the mobile station wraps the V(S) to 0 after 127.

43.1.1.1.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is made to send RLC data blocks. SS checks that the BSN in the RLC data block:

1. is set to the value 0 at the beginning of each TBF in which the mobile station is the transmitter;
2. is incremented by 1 in each subsequent RLC data block in the TBF; and
3. takes on all values in the range 0 to 127 and then back to 0.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{ Uplink dynamic allocation two phase access}	n = 3500 octets, USF_GRANULARITY = 1 block CHANNEL_CODING_COMMAND: cs1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0.
4	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges each RLC data block, RBB set to 1, containing USF assigned to the MS
5	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN is updated according to BSN(n) = (BSN(n-1) + 1) mod 128
6	-	Steps 4 & 5 are repeated at least 128 times	The PACCH of the PDCH assigned in step 2, containing USF assigned to the MS.
7		{ Completion of uplink RLC data block transfer}	

43.1.1.2 Acknowledged mode / Uplink TBF / Transmit window size

43.1.1.2.1 Conformance requirements

1. V(S) shall not exceed V(A) modulo 128 by more than the maximum allowed number of outstanding RLC data blocks k (window size k is defined in 3GPP TS 04.60 subclause 9.1.9).
2. If V(S) = V(A) + k modulo 128 (i.e., the transmit window is stalled), the mobile station shall set the stall indicator to 1 in each RLC data block transmitted and transmit the oldest RLC data block whose corresponding element in V(B) has the value PENDING_ACK, then the next oldest RLC data block whose corresponding element in V(B) has the value PENDING_ACK, etc.

References

3GPP TS 04.60, subclauses 9.1.1, 9.1.3 and 9.1.9.

43.1.1.2.2 Test purpose

1. To verify that the mobile station sets the stall indicator to 1 in each RLC data block transmitted once the transmit window is stalled.
2. To verify that the mobile station retransmits data blocks that are pending acknowledgment.
3. To verify that the mobile station retransmits unacknowledged RLC data blocks in correct order while the transmit window is stalled.

43.1.1.2.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS transmits k (window size) blocks without acknowledgement from SS. Confirm that the MS:

a) sets the stall indicator bit once the window is stalled; and

b) retransmits blocks that are pending acknowledgement, oldest first.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{ Uplink dynamic allocation two phase access}	n = 1500 octets USF_GRANULARITY = 1 block CHANNEL_CODING_COMMAND: cs1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
3	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SI=0
4			Repeat steps 2 and 3 for BSN=1 to 63. SS doesn't acknowledge any of the data blocks with BSN from 0 to 63
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
6	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SI=1
7			Repeat steps 5 & 6 for BSN = 1 to 63 until all unacknowledged blocks are retransmitted. SS verifies that the unacknowledged data blocks are retransmitted with SI field set to 1. SS verifies that in the retransmitted blocks the BSN is from 0 to 63
8	SS->MS	Packet Uplink Ack/Nack	SS acknowledges all the data blocks USF not assigned to the MS
9			Wait for 6 blocks with no assigned USF
10	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
A11 (optional step)	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH, BSN = 0 Repeat step 10
11	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
12	SS		Verify that MS is not retransmitting any acknowledged blocks Verify transmitted data blocks are BSNs 64 and higher
13		{ Completion of uplink RLC data block transfer}	

43.1.1.3 Acknowledged mode / Uplink TBF / Acknowledge state variable V(A)

43.1.1.3.1 Conformance requirements

1. The Acknowledge state variable V(A) contains the BSN value of the oldest RLC data block that has not been positively acknowledged by its peer. V(A) can take on the values 0 through 127.

2. V(A) shall be set to the value 0 at the beginning of each TBF in which the RLC endpoint is the transmitter.

3. The value of V(A) shall be updated from the values received from its peer in the received block bitmap (RBB) of the Packet Ack/Nack message (see subclause 9.1.8).

References

3GPP TS 04.60, subclauses 9.1.2 and 9.1.8.

43.1.1.3.2 Test purpose

1. To verify that the mobile station correctly decodes the RBB and updates the values of V(A).

43.1.1.3.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

1. The mobile station transmits k (window size) blocks without acknowledgement from SS. SS then acknowledges the first N blocks. The MS retransmits the negatively acknowledged data blocks with BSN from N to 63 and then it transmits N more new data blocks (from 64 to N+63).

2. The test is performed for the values of N = 10,15 and 20.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{ Uplink dynamic allocation two phase access}	n = 3000 octets USF_GRANULARITY = 1 block CHANNEL_CODING_COMMAND: cs1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
3	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SI=0
4			Repeat steps 2 and 3 for BSN=1 to 63. SS doesn't acknowledge any of the data blocks with BSN from 0 to 63
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
6	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SI=1
7			Repeat steps 5 and 6 until unacknowledged data blocks (BSN = 0 to 30) are retransmitted with SI field set to 1
8			Wait BS_CV_MAX periods without granting USF.
9	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges first N (=10) RLC data blocks, RBB set to 1 and negatively acknowledges all the other data blocks from BSN=N to BSN=63 with RBB set to 0 USF not assigned to the MS
10			Wait for 6 blocks with no USF
11	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
A12 (optional step)	MS -> SS	UPLINK RLC DATA BLOCK	MS may retransmit block BSN = 31 if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
A13 (optional step)	SS->MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
12	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = N & SI = 0
13	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
14	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
15	SS		Repeat steps 13 and 14 until all negatively acknowledged data blocks are retransmitted followed by new data blocks SS verifies that the negatively acknowledged data blocks are retransmitted before new data blocks are sent, by verifying that RLC data blocks with BSN from N to 63 are received subsequently first, then RLC data blocks with BSN from 64 to 63+N are received.
16		{ Completion of uplink RLC data block transfer}	
17	-	-	The procedure is repeated for different values of N

43.1.1.4 Acknowledged mode / Uplink TBF / Negatively acknowledged RLC data blocks

43.1.1.4.1 Conformance requirements

1. The transmitter shall transmit the oldest RLC data block whose corresponding element in V(B) indexed relative to V(A) has the value NACKED.
2. If [V(S) < V(A) + k] modulo 128 and no RLC data blocks have a corresponding element in V(B) with the value NACKED, the RLC data block with BSN = V(S) shall be transmitted.
3. As each RLC data block is transmitted the corresponding element in V(B) shall be set to the value PENDING_ACK.

References

3GPP TS 04.60, subclause 9.1.3.

43.1.1.4.2 Test purpose

1. To verify that the mobile station retransmits Nacked data blocks before transmission of new information.
2. To verify that the mobile station retransmits Nacked blocks in order of age, older first.
3. To verify that the mobile station only retransmit Nacked blocks once per negative acknowledgment.

43.1.1.4.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, , PBCCH not present, BS_CV_MAX = 0.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is made to transmit RLC data blocks. The SS randomly negatively acknowledges RLC data blocks. The MS retransmits the negatively acknowledged RLC data blocks, oldest first before transmitting new RLC data blocks.

The SS does not send further acknowledgements. The MS does not retransmit the previously negatively acknowledged RLC data blocks.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{ Uplink dynamic allocation two phase access}	n = 3000 octets USF_GRANULARITY = 1 block CHANNEL_CODING_COMMAND: cs1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
3	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
4			Repeat steps 2 and 3 until received data block BSN = 30
5	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data blocks with BSN 10 to 30, RBB set to 1 and negatively acknowledges the rest with RBB set to 0 USF not assigned to the MS
6			Wait for 6 blocks with no USF
7	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
A8 (optional step)	MS -> SS	UPLINK RLC DATA BLOCK	MS may retransmit block BSN = 31 if it has already been scheduled while Packet Uplink Ack/Nack is being processed. In this case repeat step 7
8	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 0..9
9	SS		Repeat steps 7 & 8 ten (11 in case mobile sends BSN = 31 in step A8) times SS verifies that the Nacked data blocks are received before new data block once per negative acknowledgment. After these data blocks new data block BSN=31 (32 if MS sends BSN = 31 earlier in step A8) should be received
10	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges retransmitted (BSN 0..9) RLC data blocks, RBB set to 1
11	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
12	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
13	SS		Repeat steps 11 and 12 until the stall indication bit is set in the data block received in step 12. SS verifies that acknowledged blocks are not retransmitted
14	SS -> MS	PACKET UPLINK ACK/NACK	SS negatively acknowledges RLC data blocks with BSN 55 to 60, RBB set to 0 and acknowledges the rest with RBB set to 1 USF not assigned to the MS
15			Wait for 6 blocks with no USF.
16	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
A17	MS -> SS	UPLINK RLC DATA BLOCK	MS may retransmit block BSN = 32 (or 33) if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
A18	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
17	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 55..60
18	SS		Repeat steps 16 & 17 until all Nacked blocks are received SS verifies that the Nacked data blocks are received before new data blocks once per negative acknowledgment.
19		{Completion of uplink RLC data block transfer}	

43.1.1.5 Acknowledged mode / Uplink TBF / Invalid Negative Acknowledgment

43.1.1.5.1 Conformance requirements

For a R97 and R98 MS only:

1. If the mobile station is the transmitter, it shall set an instance of timer T3198 for each RLC data block sent (subclause 9.1.3 3GPP TS 04.60).
2. The timer T3198 shall have the expiry value set to BS_CV_MAX block periods (subclause 9.1.3 3GPP TS 04.60).
3. The mobile station shall not modify the element in the acknowledge state array, V(B), corresponding to an RLC data block that cannot be validly negatively acknowledged (subclause 9.1.8 3GPP TS 04.60).

For a R99 or later MS only:

If the RLC transmitter is on the mobile station side, the bit contains the value '0' and the number of block periods between the end of the block period used for the last transmission of the corresponding RLC data block and the beginning of the block period containing the Packet Uplink Ack/Nack message is less than (max(BS_CV_MAX,1) – 1) (i.e., the RLC data block was recently (re)transmitted and thus can not be validly negatively acknowledged in this particular Packet Uplink Ack/Nack message), the element in V(B) shall not be modified.

References

3GPP TS 04.60, subclauses 9.1.3 and 9.1.8.

43.1.1.5.2 Test purpose

To verify the correct response of the mobile station to an invalid negative acknowledgement.

43.1.1.5.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, , PBCCH not present, BS_CV_MAX = 15.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

- GPRS Release (TSPC_MS_GPRS_RELEASE)

PIXIT Statements

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Test Procedure

The MS is made to send RLC data blocks. The SS negatively acknowledges some RLC data blocks within BS_CV_MAX block periods. The MS shall not retransmit the RLC data blocks that were negatively acknowledged.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{ Uplink dynamic allocation two phase access}	n = 440 octets USF_GRANULARITY = 1 block CHANNEL_CODING_COMMAND: cs1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
3	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 0
4	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
5	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 1
6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
7	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 2
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
9	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN =3
10	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
11	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN =4
			Wait for BS_CV_MAX block period of Block BSN = 0 to expire
12	SS -> MS	PACKET UPLINK ACK/NACK	SS negatively acknowledges blocks BSN = 0 and BSN =3, RBB = 0 and acknowledges blocks BSN = 1, BSN = 2 and BSN = 4, RBB = 1, SSN = 5. USF not assigned to the MS
13			Wait for 6 blocks with no USF.
14	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
A15 (optional step)	MS -> SS	UPLINK RLC DATA BLOCK	MS may transmit block BSN = 5 if it has already been scheduled while Packet Uplink Ack/Nack is being processed. In this case repeat step 14
15	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that data block BSN = 0 is retransmitted
16	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
17	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that data block BSN = 3 is not retransmitted New data block received with BSN = 5 (6 if mobile sends BSN=5 earlier in step A15)
18		{ Completion of uplink RLC data block transfer}	

43.1.1.6 Acknowledged mode / Uplink TBF / Decoding of Received Block Bitmap

43.1.1.6.1 Conformance requirements

For each bit in the RBB whose corresponding BSN value is within the transmit window, if the bit contains the value '1', the corresponding element in V(B) indexed relative to SSN shall be set to the value ACKED. If the bit contains the value '0', the element in V(B) shall be set to the value NACKED. A bit within the RBB whose corresponding BSN is not within the transmit window, shall be ignored.

References

3GPP TS 04.60, subclause 9.1.8.

43.1.1.6.2 Test purpose

1. To verify the decoding of the received block bitmap of the Packet Uplink Ack/Nack message.

43.1.1.6.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is made to send RLC data blocks. The SS negatively acknowledges one or more RLC data blocks after BS_CV_MAX block periods. The MS retransmits these blocks.

The SS negatively acknowledges data blocks outside the transmit window. The MS ignores these negative acknowledgments.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{ Uplink dynamic allocation two phase access}	n = 4000 octets USF_GRANULARITY = 1 block CHANNEL_CODING_COMMAND: cs1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
3	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
4			Repeat steps 2 and 3 until received data block BSN = 19 SS doesn't acknowledge any of the data blocks with BSN from 0 to 19
5			Wait BS_CV_MAX periods without granting USF.
6	SS -> MS	PACKET UPLINK ACK/NACK	SS negatively acknowledges RLC data block with BSN 0, RBB set to 0 and acknowledges data blocks with BSN from 1 to 19, RBB set to 1 USF not assigned to the MS
7			Wait for 6 blocks with no USF.
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
A9 (optional step)	MS -> SS	UPLINK RLC DATA BLOCK	MS may transmit block BSN = 20 if it has already been scheduled while Packet Uplink Ack/Nack is being processed. In this case repeat step 8
9	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the Nacked data block (BSN = 0) is received before new data blocks
10	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
11	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH

Step	Direction	Message	Comments
12			Repeat steps 10 and 11 until BSN=63 SS doesn't acknowledge any of the data blocks until BSN = 63
13	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges all RLC data blocks with RBB set to 1
14			Wait for 6 blocks with no USF.
15	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
A16 (optional step)	MS -> SS	UPLINK RLC DATA BLOCK	MS may transmit block BSN = 0 (or BSN = 20 if step A09 was performed) if it has already been scheduled while Packet Uplink Ack/Nack is being processed. In this case repeat step 15
16	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS receives new data block with BSN = 64
17	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
18	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
19			Repeat steps 17 and 18 until BSN=80 SS doesn't acknowledge any of the data blocks
20			Wait BS_CV_MAX periods without granting USF.
21	SS -> MS	PACKET UPLINK ACK/NACK	SS negatively acknowledges RLC data block with bit corresponding to BSN 50 in RBB set to 0 and all other bits set to 1 USF not assigned to the MS
22			Wait for 6 blocks with no USF.
23	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
24	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
25	SS		Repeat steps 23 and 24 until BSN=127 SS verifies that the MS ignored negative acknowledgment outside the window and sends new data blocks BSN=81 to 127
26		{ Completion of uplink RLC data block transfer}	

43.1.2 Acknowledged mode / Downlink TBF

43.1.2.1 Acknowledged mode / Downlink TBF / Receive state variable V(R)

43.1.2.1.1 Conformance requirements

1. In RLC acknowledged mode, each RLC endpoint receiver shall have an associated receive state variable V(R). The receive state variable denotes the BSN of the next in-sequence RLC data block expected to be received.

2. The mobile station shall set V(R) to the value 0 at the beginning of each TBF in which the RLC endpoint is the receiver.

References

3GPP TS 04.60, subclause 9.1.5.

43.1.2.1.2 Test purpose

1. To verify correct initialisation of the receive state variable, V(R).

2. To verify the receive state variable, V(R) is set to the next in sequence RLC data block expected to be received.

43.1.2.1.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

SS establishes a downlink TBF and sends RLC data blocks with BSN values between 0 to N in sequence. The MS is polled in each RLC data block by setting the S/P bit. SS verifies that the SSN in the Packet Downlink Ack/Nack messages sent by the MS are set to [BSN+1] modulo 128. SS then sends RLC data block with random BSN N1 that holds a value between [N+1] modulo 128 and [N+64] modulo 128. The MS is polled in the last RLC data block by setting the S/P bit. SS verifies that the SSN in the Packet Downlink Ack/Nack message sent by the MS is set to [N1+1] modulo 128.

The test is performed for the values of N = 1, 10, 63, 64, 126, 127.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Macro parameters: **Acknowledged mode**
2	SS -> MS	DOWNLINK RLC DATA BLOCK	MS is polled S/P bit '1' RRBP 00
3	MS -> SS	Packet Downlink Ack/ Nack	SS verifies that SSN = [BSN + 1] modulo 128
4			Repeat steps 2 and 3 until BSN = N
5	SS -> MS	DOWNLINK RLC DATA BLOCK	BSN = N1 a random number between [N+1] mod 128 and [N+64] modulo 128 MS is polled S/P bit '1' RRBP 00
6	MS -> SS	Packet Downlink Ack/ Nack	SS verifies that SSN = [N1+1] modulo 128.

43.1.2.2 Acknowledged mode / Downlink TBF / Receive window state variable V(Q)

43.1.2.2.1 Conformance requirements

In RLC acknowledged mode, each RLC endpoint receiver shall have an associated receive window state variable, V(Q). The mobile station shall set V(Q) to the value 0 at the beginning of each TBF in which the RLC endpoint is the receiver.

The value of V(Q) shall be updated when the RLC receiver receives the RLC data block whose BSN is equal to V(Q).

References

3GPP TS 04.60, subclause 9.1.6.

43.1.2.2.2 Test purpose

1. To verify that V(Q) is not updated when data blocks with BSN not equal to V(Q) are received.

43.1.2.2.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

SS establishes a downlink TBF and sends an RLC data block with BSN value N (N in the range 1..63) and polls the MS. The MS shall accept the block and sends a Packet Downlink Ack/Nack message. SS verifies that SSN is set to [N+1] and RBB bit corresponding to N is set to 1. SS sends another RLC data block to the MS with BSN value 64 and polls the MS. SS verifies that the SSN and RBB fields in the Packet Downlink Ack/Nack message sent by the MS are not updated.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Macro parameters: **Acknowledged mode**
2	SS -> MS	DOWNLINK RLC DATA BLOCK	BSN = N (N is in the range of [1..63]) polls the MS
3	MS -> SS	Packet Downlink Ack/ Nack	SSN value should be [N+1] RBB set for block N
4	SS -> MS	DOWNLINK RLC DATA BLOCK	BSN = 64, polls the MS
5	MS -> SS	Packet Downlink Ack/ Nack	SSN value should be [N+1]. No change in RBB
6	SS -> MS	DOWNLINK RLC DATA BLOCK	BSN = 0, polls the MS
7	MS -> SS	Packet Downlink Ack/ Nack	SSN value should be [N+1]. RBB updated
8	SS -> MS	DOWNLINK RLC DATA BLOCK	BSN = 64, polls the MS
9	MS -> SS	Packet Downlink Ack/ Nack	SSN value should be 65.

43.1.2.3 Acknowledged mode / Downlink TBF / Re-assembly of RLC data blocks

43.1.2.3.1 Conformance requirements

RLC data blocks shall be collected at the receiver until all RLC data blocks comprising an LLC PDU have been received. The RLC headers shall be removed from each RLC data block at this time and the RLC data units re-assembled into an LLC PDU and passed to the next higher layer.

References

3GPP TS 04.60, subclause 9.1.11.

43.1.2.3.2 Test purpose

To verify the correct re-assembly of the RLC data blocks.

43.1.2.3.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and PDP Context 12 is activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

SS establishes a downlink TBF and sends several data blocks in random sequence , but within the range of transmit and receive window.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	**Macro parameters: Acknowledged mode**
2	SS -> MS	DOWNLINK RLC DATA BLOCK	A bit set (A=1) in LLC frame SS sends datablocks in random sequence
3			Repeat step 2 until all the data blocks in one LLC frame is transmitted
4	MS -> SS	Packet Downlink Ack/ Nack	
5		{Uplink dynamic allocation two phase access}	USF_GRANULARITY = 1 block
6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
7	MS -> SS	UPLINK RLC DATA BLOCK	LLC Supervisory frame (RR) acknowledging a valid LLC frame
8		{ Completion of uplink RLC data block transfer}	

43.1.2.4 Acknowledged mode / Downlink TBF / Re-assembly / Length Indicator

43.1.2.4.1 Conformance requirements

1. The Extension (E) bit is used to indicate the presence of an optional extension octet in the RLC data block header. The More (M) bit is used to indicate the presence of an LLC frame following the current LLC frame. The M bit, the E bit, and the Length Indicator, are used to delimit LLC frames within a TBF.

2. The Length Indicator (LI) field is six bits in length and shall be encoded as a binary number. The value 0 shall indicate that no LLC frame boundary does exist, that the M bit shall be ignored and that the E bit shall be interpreted as having the value 1.

3 A singular case occurs when the end of the LLC PDU would fit within the RLC data block but the addition of the Length Indicator octet (to indicate the LLC PDU boundary) causes the LLC PDU to extend into the next RLC data block. In this case, this additional LI field shall take the value 0 whatever is the length of the last but one LLC PDU segment.

References

3GPP TS 04.60, subclause 9.1.11 and clause B.2.

43.1.2.4.2 Test purpose

To verify the correct decoding of RLC data block length indication, more(M) and extension(E) bit fields during re-assembly of LLC frames into RLC data blocks.

43.1.2.4.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and PDP Context 12 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

SS establishes a downlink TBF and sends data blocks containing two LLC frames (A bit set) with length indicator encoded. The MS is expected to decode these fields and re-assemble LLC frames correctly.

The size of the first LLC frame is 15 octets and second is 24 octets.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Macro parameters: **Acknowledged mode**
2	SS -> MS	DOWNLINK RLC DATA BLOCK	15 octets of first LLC frame and 4 octets of second LLC frame Length Indicator = 15,M =1, E = 1 A bit set (A = 1) in both LLC frames
3	SS -> MS	DOWNLINK RLC DATA BLOCK	19 octets from second LLC frame Length indicator = 0, M = 0, E = 1
4	SS -> MS	DOWNLINK RLC DATA BLOCK	1 octet from second LLC frame Length indicator = 1, M = 0, E = 1, FBI = 1
5	MS -> SS	PACKET DOWNLINK ACK/NACK	Optionally Including channel request description
6		{Uplink dynamic allocation two phase access}	USF_GRANULARITY = 1 block
7	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
8	MS -> SS	UPLINK RLC DATA BLOCK	LLC Supervisory frame (RR) acknowledging first LLC frame. If this UPLINK RLC DATA BLOCK contains a second RR frame acknowledging the second LLC frame steps A9 and B9 should be skipped.
A9 (Optional)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
B9 (Optional)	MS -> SS	UPLINK RLC DATA BLOCK	LLC Supervisory frame (RR) acknowledging second LLC frame
9		{Completion of uplink RLC data block transfer}	

Note: If the negotiated window size is less than 2, the testcase ends at the PDP context activation and link establishment.

43.2 Control Blocks

43.2.1 Control Blocks Re-assembly

43.2.1.1 Conformance requirements

The network may segment RLC/MAC control messages into one or two RLC/MAC control blocks depending on the length of the RLC/MAC control message.

RLC/MAC control blocks shall be collected at the receiver until all RLC/MAC control blocks comprising a RLC/MAC control message have been received. The receiving side shall determine the length of the RLC/MAC control message contents by interpreting the RLC/MAC control block contents.

References

3GPP TS 04.60, subclauses 9.1.11a, 9.1.11b and 9.1.2.

43.2.1.2 Test purpose

To verify that the MS re-assembles a RLC control message If it spans across more than one RLC control block.

43.2.1.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting, PBCCH not present.

Mobile Station:

The MS is switched off.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is switched on and triggered to perform a GPRS attach. The SS sends a PACKET UPLINK ASSIGNMENT message that spans more than one RLC control block. The PACKET UPLINK ASSIGNMENT message contains Dynamic Allocation struct (Timeslot allocation with power control parameters included) and frequency parameters with direct encoding 2 struct information fields. The SS verifies that RLC data blocks containing Attach Request message are received from the MS.. Switch off the MS.

Maximum Duration of Test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is switched on and triggered to perform a GPRS attach.
2	MS -> SS	CHANNEL REQUEST	
3	SS -> MS	IMMEDIATE ASSIGNMENT	Indicating two phase access
4	MS -> SS	PACKET RESOURCE REQUEST	
5	SS -> MS	PACKET UPLINK ASSIGNMENT	Frequency Parameter direct encoding 2 information element. Dynamic Allocation struct information element (Timeslot allocation and Power Control parameters included) Payload type = 10, Sent on PACCH.(See section below)
6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS
7	MS -> SS	UPLINK RLC DATA BLOCKS	Attach Request received on PDTCH assigned in step 5

Specific Message Contents

PACKET UPLINK ASSIGNMENT message in step 5:

MESSAGE_TYPE	001010
PAGE_MODE	Normal Paging
Referenced Address	
-	10 (TLLI)
CHANNEL_CODING_COMMAND	CS-1 coding
TLLI_BLOCK_CHANNEL_CODING	use value indicated in CHANNEL_CODING_COMMAND
Packet Timing Advance	
-	1 (timing advance value)
- TIMING_ADVANCE_VALUE	30 bit periods
-	0 (no timing advance index)
{L|H<Frequency Parameters>}	H (Frequency Parameters present)
- Frequency Parameters	
- TSC	5
	11 (Direct Encoding Struct 2)
Direct Encoding Struct 2	
MAIO	arbitrarily chosen
HSN	arbitrarily chosen
Length of MA Frequency list contents	Length of frequency list chosen according to length of MA Frequency list contents
MA Frequency list contents	For GSM 900, in bitmap 0 format, (10, 30, 40, 50, 60, 70) For DCS 1800 and PCS 1900, in range 512, (520, 530, 540, 550, 560, 570, 580, 600, 610) For GSM 700, T-GSM 810 in Range 512, (447, 462, 467,475, 477, 480,485, 492,498, 504) For GSM 850, in Range 512, (137, 157, 167, 177, 187, 197, 207, 217, 227) 0 (Dynamic Allocation)
Dynamic Allocation	
- Extended_Dynamic_Allocation	0
P0 Bit	0 (off)
USF Granularity	0 (one block)
{L|H<UPLINK_TFI_ASSIGNMENT>}	1 (assign an uplink TFI)
- UPLINK_TFI_ASSIGNMENT	00000 (uplink TBF identifier)
{0|1 RLC Data Blocks Granted}	0
{0|1 TBF Starting time description}	1
TBF Starting time	arbitrarily chosen
TIMESLOT_ALLOCATION with Power Control Parameters	1
ALPHA	0.5
-{0|1 USF_TN0 GAMMA_TN0}	0 (timeslot 0 not assigned)
-{0|1 USF_TN1 GAMMA_TN0}	0 (timeslot 1 not assigned)
-{0|1 USF_TN2 GAMMA_TN0}	0 (timeslot 2 not assigned)
-{0|1 USF_TN3 GAMMA_TN0}	0 (timeslot 3 not assigned)
- USF_TN4	1 (timeslot 4 assigned)
USF_TN4	000
- GAMMA_TN4	00100
-{0|1 USF_TN5 GAMMA_TN0}	0 (timeslot 5 not assigned)
-{0|1 USF_TN6 GAMMA_TN0}	0 (timeslot 6 not assigned)
-{0|1 USF_TN7 GAMMA_TN0}	0 (timeslot 7 not assigned)
For R99 network simulation:	
Additions for Rel.99	1
- Packet Extended TA flag	0 not present
spare padding	Spare Padding

43.3 Default Message Contents and Macros

43.3.1 Message Contents

none

43.3.2 Macros

43.3.2.1 Macro for uplink dynamic allocation two phase access (PBCCH not present)

Step	Direction	Message	Comments
		{Uplink dynamic allocation two phase access}	Macro parameters: n: the number of data octets to be transferred, USF_GRANULARITY: 1 or 4 blocks, RLC_DATA_BLOCKS_GRANTED: 9-261 (close-end), or absent (open-end) CHANNEL_CODING_COMMAND: CS-1, -2, -3, -4 TBF_STARTING_TIME
0	MS		Trigger the MS initiating uplink transfer **n** octets data according to the test PDP context activated
1	MS -> SS	CHANNEL REQUEST	Received on RACH.
2	SS -> MS	IMMEDIATE ASSIGNMENT	Single block assignment, to order the MS to follow the two phase access procedure. Sent on AGCH.
3	MS -> SS	PACKET RESOURCE REQUEST	Two phase access procedure. Received on the single block assigned in step 2. Check that the PEAK_THROUGHPUT, RADIO_PRIORITY and RLC_MODE are compliant with the PDP context used.
4	SS -> MS	PACKET UPLINK ASSIGNMENT	uplink dynamic allocation, no starting time (as default, otherwise use TBF_STARTING_TIME), Sent on PACCH of the same PDCH assigned in step 2.

43.3.2.2 Macro for downlink TBF establishment (PBCCH not present)

Step	Direction	Message	Comments
		{Downlink TBF establishment}	Macro parameters: TBF_STARTING_TIME
1	SS -> MS	PAGING REQUEST	Page info contains P-TMSI of the MS. Sent on PCH.
2	MS -> SS	CHANNEL REQUEST	Establishment cause = "One phase access". Received on RACH.
3	SS -> MS	IMMEDIATE ASSIGNMENT	Random Reference = pertaining to the message received in step 2. Dynamic allocation for RLC data blocks, Sent on AGCH.
4	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating paging response, containing TLLI in the RLC/MAC header. Received on uplink PDTCH assigned in step 3.
5	SS -> MS	PACKET UPLINK ACK/NACK	Acknowledge the received RLC data block. Sent on uplink PACCH.
6	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Acknowledge the RLC control message. Received on uplink PACCH.
7	SS -> MS	IMMEDIATE ASSIGNMENT	Downlink Assignment, TLLI value as received. Sent on PCH. Macro parameter as assigned in the test case.

44 Test case requirements for GPRS mobility management

44.1 Default conditions and default messages

Note that only the layer 3 messages are described in the document. The mapping of the layer 3 messages to lower layers and the use of logical channels is not described in the present document.

The default conditions and default message contents not specified in this clause must be set as in "GPRS default conditions".

Below is a list of the RAI values and the corresponding RAC, LAC and MCC used in the test cases:

RAI-1: MCC1/MNC1/LAC1/RAC1 (Used if only one cell);

RAI-2: MCC2/MNC1/LAC1/RAC1;

RAI-3: MCC1/MNC1/LAC2/RAC1;

RAI-4: MCC1/MNC1/LAC1/RAC2;

RAI-5: MCC1/MNC1/LAC1/RAC3;

RAI-6: MCC2/MNC1/LAC2/RAC1;

RAI-7: MCC2/MNC1/LAC1/RAC2;

RAI-8: MCC1/MNC2/LAC1/RAC1;

RAI-9: MCC1/MNC2/LAC2/RAC1;

RAI10: MCC1/MNC2/LAC1/RAC2.

If the mobile station initial condition specifies that the mobile has a valid IMSI but the initial condition does not mention P-TMSI, than that shall be interpreted as that the mobile has no valid P-TMSI.

44.2 Elementary procedures of GPRS mobility management

The tests are based on 3GPP TS 04.08 / 3GPP TS 24.008.

44.2.1 GPRS attach procedure

This procedure is used to indicate for the network that the IMSI is available for traffic by establishment of a GMM context.

44.2.1.1 Normal GPRS attach

The normal GPRS attach procedure is a GMM procedure used by GPRS MSs of MS operation mode B or C to IMSI attach for GPRS services only.

44.2.1.1.1 GPRS attach / accepted

44.2.1.1.1.1 Conformance requirement

1) If the network accepts the GPRS attach procedure (signalled by an IMSI) and allocates a P-TMSI, the MS shall acknowledge the P-TMSI and continue communication with the P-TMSI.

2) If the network accepts the GPRS attach procedure (signalled by P-TMSI) and reallocates a new P-TMSI, the MS shall acknowledge the new P-TMSI and continue communication with the new P-TMSI.

3) If the network accepts the GPRS attach procedure (signalled by a P-TMSI) from the MS without reallocation of the old P-TMSI, the MS shall continue communication with the old P-TMSI.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.1.2 Test purpose

To test the behaviour of the MS if the network accepts the GPRS attach procedure.

The following cases are identified:

1) P-TMSI / P-TMSI signature is allocated;

2) P-TMSI / P-TMSI signature is reallocated;

3) Old P-TMSI / P-TMSI signature is not changed.

44.2.1.1.1.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

1) The MS sends an ATTACH REQUEST message with identity IMSI. The SS allocates a P-TMSI and returns ATTACH ACCEPT message with a P-TMSI. The MS acknowledge the P-TMSI by sending ATTACH COMPLETE message. Further communication MS - SS is performed by the new P-TMSI.

2) The MS sends an ATTACH REQUEST message with identity P-TMSI. The SS reallocates a new P-TMSI and returns ATTACH ACCEPT message with the new P-TMSI. The MS acknowledge the P-TMSI by sending ATTACH COMPLETE message. Further communication MS - SS is performed by the new P-TMSI. The MS will not answer signalling addressed to the old P-TMSI.

3) The MS sends an ATTACH REQUEST message with identity P-TMSI. The SS accepts the P-TMSI and returns ATTACH ACCEPT message without any P-TMSI. Further communication MS - SS is performed by the old P-TMSI.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 26.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS -> MS		SS pages the MS with Mobile identity = P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
7	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC Data Block as a paging response.

Step	Direction	Message	Comments
8	MS		The MS is switched off or power is removed (see PICS).
9	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
10	MS		The MS is powered up or switched on and initiates an attach (see PICS).
11	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-2 Routing area identity = RAI-1
12	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
13	MS -> SS	ATTACH COMPLETE	
14	SS ->MS	GMM INFORMATION	Message sent with P-TMSI-1
14b	MS -> SS	GMM STATUS	Message sent in case the MS does not support reception of GMM information message Cause #97
15	SS -> MS		SS pages the MS with Mobile identity = P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
16	MS		No response from the MS to the request. This is checked for 10 s.
17	MS		The MS is switched off or power is removed (see PICS).
18	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
19	MS		The MS is powered up or switched on and initiates an attach (see PICS).
20	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
21	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI and P-TMSI signature not included. Routing area identity = RAI-1 Attach result = 'GPRS only attached' Negotiated Ready timer value IE should not be included. Force to standby indicator set
22	SS -> MS		SS pages the MS with Mobile identity = P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
23	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC Data Block as a paging response.
24	MS		The MS is switched off or power is removed (see PICS).
25	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
26	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 2 to step 25.

Specific message contents

None.

44.2.1.1.1a GPRS attach / accepted / Attach with IMSI

44.2.1.1.1a.1 Conformance requirement

1) If the MS is configured for "AttachWithIMSI" and the selected PLMN is neither the registered PLMN nor in the list of equivalent PLMNs, the MS shall include the IMSI in the Mobile identity IE in the ATTACH REQUEST message

2) If the network accepts the GPRS attach procedure (signalled by an IMSI) and allocates a P-TMSI, the UE shall acknowledge the P-TMSI and continue communication with the P-TMSI.

Reference(s):

3GPP TS 24.008 clause 4.7.3.1 and 4.4.4.1

44.2.1.1.1a.2 Test purpose

To test the behaviour of the MS if the network accepts the GPRS attach procedure.

The following cases are identified:

1) To verify that the Attach with IMSI indicator can be set in the MS

2. To verify that the MS registers with IMSI (not Temporary ID) when registering with a new PLMN if the selected PLMN is neither the registered PLMN nor in the list of equivalent PLMNs44.2.1.1.1a.3 Method of test

Initial conditions

System Simulator:

Two cells; cell A with MCC1/MNC1/LAC1/RAC1 (RAI-1) and cell B in MCC2/MNC1/LAC2/RAC1 (RAI-6).

Both cells are operating in network operation mode II (in case of MS operation mode A).

The PLMN that contains Cell B is not equivalent to the PLMN that contains Cell A.

Mobile Station:

The MS has a valid IMSI.

The MS has been registered in the CS domain.

The MS is configured for "AttachWithIMSI"

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

1) The MS sends an ATTACH REQUEST message with identity IMSI. The SS allocates a P-TMSI and returns ATTACH ACCEPT message with a P-TMSI. The MS acknowledge the P-TMSI by sending ATTACH COMPLETE message. Further communication MS - SS is performed by the new P-TMSI.

2) The SS changes the serving cell to a cell that belongs to a new PLMN. When the MS selects the new cell it sends an ATTACH REQUEST message with identity IMSI. The SS allocates a P-TMSI and returns ATTACH ACCEPT message with a P-TMSI. The MS acknowledge the P-TMSI by sending ATTACH COMPLETE message. Further communication MS - SS is performed by the new P-TMSI.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		Make cell A available and cell B not available
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 26.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS -> MS		SS pages the MS with Mobile identity = P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
7	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC Data Block as a paging response.
			The following messages are sent and shall be received on cell B.
8	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
9	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
10	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-6
11	MS -> SS	ATTACH COMPLETE	
12	SS -> MS		SS pages the MS with Mobile identity = P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
13	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC Data Block as a paging response.
14	MS		The MS is switched off or power is removed (see PICS).
15	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
16	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 2 to step 18.

Specific message contents

None.

44.2.1.1.2 GPRS attach / rejected / IMSI invalid / illegal MS

44.2.1.1.2.1 Conformance requirements

1) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'Illegal MS', the Mobile Station shall consider SIM invalid for GPRS services until power is switched off or SIM is removed.

2) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'Illegal MS' the Mobile Station shall delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature.

3) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'Illegal MS' the Mobile Station shall delete the LAI.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.2.2 Test purpose

To test the behaviour of the MS if the network rejects the GPRS attach procedure of the MS with the cause 'illegal MS'.

44.2.1.1.2.3 Method of test

Initial conditions

System Simulator:

Three cells (not simultaneously activated), cell A with MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC2/RAC1, cell C in MCC2/MNC1/LAC1/RAC1.

All three cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

SpecificPICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a GPRS attach with the cause value 'Illegal MS'. The SS checks that the MS does not perform GPRS attach in the same or another PLMN.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH REJECT	GMM cause = 'Illegal MS'.
			The following messages are sent and shall be received on cell B.
6	SS		The SS deactivates cell A and activates cell B.
7	MS		Cell B is preferred by the MS.
8	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
9	MS		The MS initiates an attach by MMI or by AT command.
10	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell C.
11	SS		The SS deactivates cell B and activates cell C.
12	MS		Cell C is preferred by the MS.
13	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
14	MS		The MS initiates an attach by MMI or by AT command.
15	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
16	MS		If possible (see PICS) switch off is performed. Otherwise the power is removed.
17	MS		The MS is powered up or switched on. Step 18 is only performed for MS Operation Mode B.
18		**{Location Update Procedure}**	Macro. Location Update Procedure initiated from the MS. Parameter mobile identity is IMSI.
19	MS		The MS initiates an attach (see PICS).
20	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
21	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2
22	MS -> SS	ATTACH COMPLETE	
23	MS		The MS is switched off or power is removed (see PICS).
24	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.1.3 GPRS attach / rejected / IMSI invalid / GPRS services not allowed

44.2.1.1.3.1 Conformance requirement

1) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'GPRS services not allowed', the Mobile Station shall consider SIM invalid for GPRS services until power is switched off or SIM is removed.

2) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'GPRS services not allowed' the Mobile Station shall delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.3.2 Test purpose

To test the behaviour of the MS if the network rejects the GPRS attach procedure of the MS with the cause 'GPRS services not allowed' (no valid GPRS-subscription for the IMSI).

44.2.1.1.3.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1 (HPLMN) and cell B in MCC2/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- SIM removal possible without powering down (TSPC_AddInfo_SIMRmv).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The SS rejects a normal attach with the cause value 'GPRS services not allowed'. The SS checks that the MS does not perform GPRS attach in another PLMN.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 19.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH REJECT	GMM cause = 'GPRS services not allowed'
			The following messages are sent and shall be received on cell B.
6	SS		The SS deactivates cell A and activates cell B.
7	MS		Cell B is preferred by the MS. Step 8 is only performed for NW Mode II / MS Operation Mode B.
8		{Location Update Procedure}	Macro. MOBILE_IDENTITY set to IMSI. Location Update Procedure initiated from the MS.
9			The MS initiates an attach automatically (see PICS), by MMI or AT commands.
10	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
11	MS		If possible (see PICS) SIM removal is performed. Otherwise if possible (see PICS) switch off is performed. Otherwise the power is removed.
12	MS		The MS gets the SIM replaced, is powered up or switched on and initiates an attach (see PICS).
13	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
14	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2
15	MS -> SS	ATTACH COMPLETE	
16	MS		The MS is switched off or power is removed (see PICS).
17	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
18			The SS deactivates cell B and activates cell A.
19	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 17.

Specific message contents

None.

44.2.1.1.4 GPRS attach / rejected / PLMN not allowed

44.2.1.1.4.1 Conformance requirement

1) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'PLMN not allowed' the Mobile Station shall:

   1.1 not perform GPRS attach when switched on in the same routing area or location area;

   1.2 not perform GPRS attach when in the same PLMN and when that PLMN is not selected manually;

   1.3 delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature;

   1.4 store the PLMN in the 'forbidden PLMN' list.

2) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'PLMN not allowed' the Mobile Station shall perform GPRS attach when a new PLMN is entered.

3) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'PLMN not allowed' and if after that the PLMN from which this rejection was received, is manually selected, the Mobile Station shall perform a GPRS attach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.4.2 Test purpose

To test the behaviour of the MS if the network rejects the GPRS attach procedure of the MS with the cause 'PLMN not allowed'.

44.2.1.1.4.3 Method of test

44.2.1.1.4.3.1 Test procedure 1

Initial conditions

System Simulator:

Four cells (not simultaneously activated), cell A in MCC1/MNC2/LAC1/RAC1, cell B in MCC1/MNC2/LAC1/RAC1, cell C in MCC1/MNC2/LAC2/RAC1 and cell D in MCC2/MNC1/LAC1/RAC1.

- All four cells are operating in network operation mode II. The PLMN of the four cells should NOT be that of the Mobile Station Home PLMN.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-8. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The SS rejects a GPRS attach with the cause value 'PLMN not allowed'. The SS checks that the MS does not perform GPRS attach if activated in the same routing area or location area and performs GPRS attach only when a new PLMN is entered.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-8
5	SS -> MS	ATTACH REJECT	GMM cause = 'PLMN not allowed'
6	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell B.
7	SS		The SS deactivates cell A and activates cell B.
8	MS		Cell B is preferred by the MS.
9	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell C.
10	SS		The SS deactivates cell B and activates cell C.
11	MS		Cell C is preferred by the MS.
12	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell D.
13	SS		The SS deactivates cell C and activates cell D.
14	MS		Cell D is preferred by the MS. Step 15 is only performed for MS Operation Mode B.
15		**{Location Update Procedure}**	Macro. MOBILE_IDENTITY set to IMSI. Location Update Procedure initiated from the MS.
16	MS		The MS initiates an attach automatically, by MMI or by AT command.
17	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
18	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2
19	MS -> SS	ATTACH COMPLETE	
20	MS		The MS is switched off or power is removed (see PICS).
21	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.1.4.3.2 Test procedure 2

Initial conditions

System Simulator:

One cell operating in network operation mode II: MCC2/MNC1/LAC1/RAC1. The PLMN of the cell should NOT be that of the Mobile Station Home PLMN.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-2. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The SS rejects a GPRS attach with the cause value 'PLMN not allowed'. The subscribers access rights is changed to allow GPRS attach. Then the PLMN from which this rejection was received is manually selected and the SS check that a GPRS attach is performed.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-2
4	SS -> MS	ATTACH REJECT	GMM cause = 'PLMN not allowed'
5	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds)
6	MS		The current PLMN is selected manually. Step 7 is only performed for MS Operation Mode B.
7		**{Location Update Procedure}**	Macro. MOBILE IDENTITY set to IMSI. Location Update Procedure initiated from the MS.
8	MS		The MS initiates an attach automatically, by MMI or by AT command.
9	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
10	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2
11	MS -> SS	ATTACH COMPLETE	
12	MS		The MS is switched off or power is removed (see PICS).
13	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.1.5 GPRS attach / rejected / roaming not allowed in this location area

44.2.1.1.5.1 Conformance requirement

1) If the network rejects a GPRS attach procedure from the Mobile Station with the cause 'roaming not allowed in this location area' the Mobile Station shall:

   1.1 not perform GPRS attach when in the same location area;

   1.2 delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature;

   1.3 store the LA in the 'forbidden location areas for roaming' list;

   1.4 perform GPRS attach when a new location area is entered;

   1.5 Periodically search for its HPLMN.

2) The mobile station shall reset the list of 'Forbidden location areas for roaming' when switched off or when the SIM is removed.

3) The MS shall be capable of storing at least 6 entries in the list of 'Forbidden location areas for roaming'.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.5.2 Test purpose

Test purpose 1

To test that on receipt of a rejection using the 'roaming not allowed in this location area' cause code, the MS ceases trying to attach on that location area. Successful GPRS attach procedure is possible in other location areas.

Test purpose 2

To test that if the MS is switched off or the SIM is removed the list of 'forbidden location areas for roaming' is cleared.

Test purpose 3

To test that at least 6 entries can be held in the list of 'forbidden location areas for roaming' (the requirement in 3GPP TS 04.08 / 3GPP TS 24.008 is to store at least 10 entries. This is not fully tested by the third procedure).

Test purpose 4

To test that if a cell of the Home PLMN is available then the MS returns to it in preference to any other available cell.

44.2.1.1.5.3 Method of test

44.2.1.1.5.3.1 Test procedure 1

Initial conditions

System Simulator:

Three cells (not simultaneously activated), cell A in MCC2/MNC1/LAC1/RAC1 (Not HPLMN), cell B in MCC2/MNC1/LAC2/RAC1 (Not HPLMN) and cell C in MCC2/MNC1/LAC1/RAC2 (Not HPLMN).

All three cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-2. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a GPRS attach with the cause value 'Roaming not allowed in this area'. A new attempt for a GPRS attach is not possible. Successful GPRS attach / detach procedures are performed in another location area. A new attempt for a GPRS attach is performed in the 1st location area. This attempt shall not succeed, as the LA is on the forbidden list.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, go to step 21.
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-2
5	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'
6	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell B.
7	SS		The SS Deactivates cell A and activates cell B.
8	MS		Cell B is preferred by the MS. Step 9 is only performed for NW Mode II / MS Operation Mode B.
9		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
10	MS		The MS initiates an attach automatically, by MMI or by AT command.
11	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
12	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-6
13	MS -> SS	ATTACH COMPLETE	
14	MS		The MS initiates a GPRS detach (without power off) by MMI or by AT command .
15	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
16	SS -> MS	DETACH ACCEPT	
			The following messages are sent and shall be received on cell C.
17	SS		The SS deactivates cell B and activates cell C.
18	MS		Cell C is preferred by the MS.
19	MS		No LOCATION UPDATE REQUEST sent to SS (SS waits 30 seconds). Initiate GPRS Attach by MMI or AT command. Check that the No ATTACH REQUEST is sent to the SS (SS waits for 30 seconds). The MS is switched off or power is removed (see PICS).
20	SS		The SS deactivates cell C.
21	MS		The MS is set in MS operation mode B, if supported (see PICS) and the test is repeated from step 2 to step 20.

Specific message contents

None.

44.2.1.1.5.3.2 Test procedure 2

Initial conditions

System Simulator:

One cell in MCC2/MNC1/LAC1/RAC1 (Not HPLMN) operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-2. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).

  Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a GPRS attach updating with the cause value 'Roaming not allowed in this area'. The MS is switched off for 10 s and switched on again. The SS check that a GPRS attach is possible on the cell on which the GPRS attach had been rejected.

If SIM removal is possible without switching off: The SS rejects a GPRS attach with the cause value 'Roaming not allowed in this area'. The SIM is removed and inserted in the MS. The SS check that a GPRS attach is possible on the cell on which the GPRS attach had been rejected.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		If MS operation mode C is supported, the MS is set in MS operation mode C (see PICS). If MS operation mode C is not supported, the MS is set in MS operation mode B.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-2
4	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'
5	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
6	MS		If possible (see PICS) switch off is performed. Otherwise the power is removed.
7	MS		The MS is powered up or switched on and initiates an attach (see PICS). Step 8 is only performed for NW Mode II / MS Operation Mode B.
8		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
9	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
10	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2
11	MS -> SS	ATTACH COMPLETE	
12	MS		The MS is switched off or power is removed (see PICS).
13	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.1.5.3.3 Test procedure 3

Initial conditions

System Simulator:

Six cells (not simultaneously activated), cell A in MCC2/MNC1/LAC1/RAC1 (Not HPLMN), cell B in MCC2/MNC1/LAC2/RAC1 (Not HPLMN), cell C in MCC2/MNC1/LAC3/RAC1 (Not HPLMN), cell D in MCC2/MNC1/LAC4/RAC1 (Not HPLMN), cell E in MCC2/MNC1/LAC5/RAC1 (Not HPLMN), cell F in MCC2/MNC1/LAC6/RAC1 (Not HPLMN).

All six cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-2. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).

- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a GPRS attach with the cause value 'Roaming not allowed in this area'. This is done for 6 different location areas. Then the SS checks that the MS does not attempt to perform an attach procedure on the non-allowed location areas.

Different types of MS may use different methods to periodically clear the list of forbidden areas (e.g. every day at 12 am) for roaming. If the list is cleared while the test is being run, it may be necessary to re-run the test.

Maximum duration of test

20 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C or B (see PICS).
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-2
5	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'
6	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds)
			The following messages are sent and shall be received on cell B.
7	SS		The SS deactivates cell A and activates cell B.
8	MS		Cell B is preferred by the MS.
9		**{Location Update Procedure}**	Step 9 is only performed for MS Operation Mode B. Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
10	MS		The MS initiates an attach automatically, by MMI or by AT command.
11	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
12	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'
13	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell C.
14	SS		The SS deactivates cell B and activates cell C.
15	MS		Cell C is preferred by the MS.
16		**{Location Update Procedure}**	Step 16 is only performed for NW Mode II / MS Operation Mode B. Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
17	MS		The MS initiates an attach automatically, by MMI or by AT command.
18	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
19	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'

Step	Direction	Message	Comments
20	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell D.
21	SS		The SS deactivates cell C and activates cell D.
22	MS		Cell D is preferred by the MS.
			Step 23 is only performed for MS Operation Mode B.
23		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
24	MS		The MS initiates an attach automatically, by MMI or by AT command.
25	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
26	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'
27	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell E.
28	SS		The SS deactivates cell D and activates cell E.
29	MS		Cell E is preferred by the MS.
			Step 30 is only performed for MS Operation Mode B.
30		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
31	MS		The MS initiates an attach automatically, by MMI or by AT command.
32	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
33	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'
34	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell F.
35	SS		The SS deactivates cell E and activates cell F.
36	MS		Cell F is preferred by the MS.
			Step 37 is only performed for MS Operation Mode B.
37		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
38	MS		The MS initiates an attach automatically, by MMI or by AT command.
39	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
40	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'
41	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds)
			The following messages are sent and shall be received on cell E.
42	SS		The SS deactivates cell F and activates cell E.
43	SS		Cell E is preferred by the MS.
44	MS		The MS initiates an attach automatically, by MMI or by AT command.
45	MS		No ATTACH REQUEST or LOCATION UPDATE REQUEST is sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell C.
46	SS		The SS deactivates cell E and activates cell C.
47	SS		Cell C is preferred by the MS.
48	MS		The MS initiates an attach automatically, by MMI or by AT command.

Step	Direction	Message	Comments
49	MS		No ATTACH REQUEST or LOCATION UPDATE REQUEST is sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell A.
50	SS		The SS deactivates cell C and activates cell A.
51	SS		Cell A will be preferred by the MS.
52	MS		The MS initiates an attach automatically, by MMI or by AT command.
53	MS		No ATTACH REQUEST or LOCATION UPDATE REQUEST is sent to SS (SS waits 30 seconds).

Specific message contents

None.

44.2.1.1.5.3.4 Test procedure 4

Initial conditions

System Simulator:

Two cells, cell A in MCC2/MNC1/LAC1/RAC1 (not HPLMN) and cell B in MCC1/MNC1/LAC1/RAC1 (HPLMN).

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-2. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a GPRS attach with the cause value 'Roaming not allowed in this area'. Two cells are then available. The cell with the weakest level belongs to the HPLMN. It is checked that the MS returns to its HPLMN.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-2
5	SS -> MS	ATTACH REJECT	GMM cause = 'Roaming not allowed in this area'
6	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
			The following messages are sent and shall be received on cell B.
7	SS		Activate cell B with a lower signal strength than cell A.
8	MS		The RF level of cell A is lowered until cell B is preferred by the MS. Step 9 is only performed for MS Operation Mode B
9		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
10	MS		The MS initiates an attach automatically, by MMI or by AT command.
11	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
12	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
13	MS -> SS	ATTACH COMPLETE	
14	MS		The MS is switched off or power is removed (see PICS).
15	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.1.6 GPRS attach / abnormal cases / access barred due to access class control

44.2.1.1.6.1 Conformance requirement

1) The MS shall not perform GPRS attach procedure, but stays in the current serving cell and applies normal cell reselection process.

2) The Mobile Station shall perform the GPRS attach procedure when:

   2.1 Access is granted.

   2.2 Cell is changed.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.6.2 Test purpose

Test purpose 1

To test the behaviour of the MS in case of access class control (access is granted).

Test purpose 2

To test the behaviour of the MS in case of access class control (cell is changed).

44.2.1.1.6.3 Method of test

44.2.1.1.6.3.1 Test procedure 1

Initial conditions

An access class x (0-15) is arbitrarily chosen. The SIM is programmed with this access class x. Communication with mobile stations using access class x is initially indicated to be barred.

System Simulator:

One cell operating in network operation mode II.

Access class x barred.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The SS indicates access class x barred. A GPRS attach procedure is not performed.

The SS indicates that access class x is not barred. A GPRS attach procedure is performed.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The SIM is programmed with access class x.
2	MS		The MS is set in MS operation mode C or B (see PICS). If MS operation mode C not supported, goto step 12.
3	MS		The MS is powered up or switched on and attempts to initiate an attach (see PICS).
4	MS		No ATTACH REQUEST sent to SS, as access class x is barred (SS waits 30 seconds).
5	SS		The access class x is not barred anymore.
6	MS		The MS initiates a GPRS attach either automatically or manually (see PICS).
7	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
8	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
9	MS -> SS	ATTACH COMPLETE	
10	MS		The MS is switched off or power is removed (see PICS).
11	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
12	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 11.

Specific message contents

None.

44.2.1.1.6.3.2 Test procedure 2

Initial conditions

An access class x (0-15) is arbitrarily chosen. The SIM is programmed with this access class x. Communication with mobile stations using access class x is indicated to be barred on cell A.

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1 has access class x barred, cell B in MCC1/MNC1/LAC1/RAC1 has access class x not barred.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-2 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The SS indicates access class x barred. A GPRS attach procedure is not performed.

A cell change is performed into a cell where access class x is not barred. A GPRS attach procedure is performed.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The SIM is programmed with access class x.
	SS		The following messages are sent and shall be received on cell A.
2	SS		The SS activates cell A.
3	MS		The MS is set in MS operation mode C or B (see PICS).
4	MS		The MS is powered up or switched on and attempts to initiate an attach (see PICS).
5	MS		No ATTACH REQUEST sent to SS, as access class x is barred (SS waits 30 seconds).
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		The MS initiates an attach either automatically or manually (see PICS).
8	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-2 Routing area identity = RAI-1
9	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
10	MS -> SS	ATTACH COMPLETE	
11	MS		The MS is switched off or power is removed (see PICS).
12	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.1.7 GPRS attach / abnormal cases / change of cell into new routing area

44.2.1.1.7.1 Conformance requirement

When a change of cell into a new routing area is performed before ATTACH ACCEPT message is received by the MS, the MS shall abort the GPRS attach procedure and re-initiate it immediately.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.7.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.1.1.7.3 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1 and cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

If the MS automatically performs a GPRS Attach on power on, is the attach procedure performed and then is the MS triggered to perform a normal GPRS Detach.

Sufficient time is given for the MS to identify the neighbour cell before the MS is triggered to initiate a GPRS attach procedure. The ATTACH ACCEPT message is delayed from the SS. The MS performs a cell reselection to a cell in a new routing area. The MS shall re-initiate a GPRS attach procedure in the new routing area.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	SS		The SS activates cell A and B. The RF level of cell A is –50 dBm and cell B – 60 dBm.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4			Go to step 10 if the MS not automatically performs a GPRS attach when switched on.
5	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
6	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI and P-TMSI signature not included. Attach result = 'GPRS only attached' Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included Force to standby indicator set
7	MS		Trigger the MS to perform a GPRS detach
8	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
9	SS -> MS	DETACH ACCEPT	
10			Wait 20 sec.
11	MS		The MS is triggered to initiate a GPRS Attach.
12	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
13	SS		No response to the ATTACH REQUEST message is given by the SS.
			The following messages are sent and shall be received on cell B.
14	SS		The RF level of cell A is lowered to –100 dBm.
15	MS		The MS automatically re-initiates the attach in the new cell.
16	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
17	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI and P-TMSI signature not included. Attach result = 'GPRS only attached' Routing area identity = RAI-4 Negotiated Ready timer value IE should not be included Force to standby indicator set
18	MS		The MS is switched off or power is removed (see PICS).
19	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.1.8 GPRS attach / abnormal cases / power off

44.2.1.1.8.1 Conformance requirement

When power is switched off before ATTACH ACCEPT message is received by the MS, the MS shall abort the GPRS attach procedure and perform a GPRS detach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.8.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.1.1.8.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).-
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS is switched off after initiating an attach procedure. A GPRS detach is automatically performed by the MS before power is switched off.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 7.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
4	SS		No response to the ATTACH REQUEST message is given by the SS.
5	MS		The MS is powered off and initiates a GPRS detach (with power off)
6	MS -> SS	DETACH REQUEST	Detach type = 'power switched off, GPRS detach'
7	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 2 to step 6.

Specific message contents

None.

44.2.1.1.9 GPRS attach / abnormal cases / GPRS detach procedure collision

44.2.1.1.9.1 Conformance requirement

1) When a DETACH REQUEST message is received by the MS (Detach type 're-attach not required') while waiting for an ATTACH ACCEPT message, the MS shall terminate the GPRS attach procedure and continue with the GPRS detach procedure.

2) When a DETACH REQUEST message is received by the MS (Detach type 're-attach required') while waiting for an ATTACH ACCEPT message, the MS shall ignore the GPRS detach procedure and continue with the GPRS attach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.9.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.1.1.9.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Re-attach automatically when the network commands a detach with no cause value (TSPC_AddInfo_GPRS_Attach_on_NW_Detach_NoCause).

PIXIT statements:

-

Test procedure

The MS initiates a GPRS attach procedure. The SS does not answer the GPRS attach procedure, but initiates a GPRS detach procedure (Detach type 're-attach not required'). The MS shall terminate the GPRS attach procedure and continue with the GPRS detach procedure.

The MS initiates a GPRS attach procedure. The SS does not answer the GPRS attach procedure, but initiates a GPRS detach procedure (Detach type 're-attach required'). The MS shall ignore the GPRS detach procedure and continue with the GPRS attach.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
4	SS		The SS ignores the ATTACH REQUEST message and initiates a detach procedure.
5	SS -> MS	DETACH REQUEST	Detach type = 're-attach not required'
6	MS -> SS	DETACH ACCEPT	
7	MS		The MS is attached by MMI or AT command if the MS does not re-attach automatically upon receiving a network initiated detach with no cause value, (See PICS).
8	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
9	SS		The SS ignores the ATTACH REQUEST message and initiates a detach procedure.
10	SS-> MS	DETACH REQUEST	Detach type = 're-attach required'
11	MS		The MS ignores the DETACH REQUEST message and continue with the attach procedure.
12	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
13	MS -> SS	ATTACH COMPLETE	
14	MS		The MS is switched off or power is removed (see PICS).
15	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.1.10 GPRS attach / rejected / GPRS services not allowed in this PLMN

44.2.1.1.10.1 Conformance requirement

If the network rejects a GPRS attach procedure from the Mobile Station with the cause ' GPRS services not allowed in this PLMN':

1. The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to section 4.1.3.2) and shall change to state GMM-DEREGISTERED.

2. The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list. A GPRS MS operating in MS operation mode C shall perform a PLMN selection instead of a cell selection.

3. A GPRS MS operating in MS operation mode A or B in network operation mode II, is still IMSI attached for CS services in the network.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.1.

44.2.1.1.10.2 Test purpose

To test the behaviour of the MS if the network rejects the GPRS attach procedure of the MS with the cause 'GPRS services not allowed in this PLMN'.

44.2.1.1.10.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC2/LAC1/RAC1, cell B in MCC2/MNC1/LAC1/RAC1.

All two cells are operating in network operation mode II.. The PLMN of the two cells should NOT be that of the Mobile Station Home PLMN.

Mobile Station:

The MS has a valid TMSI-1, P-TMSI-1 and RAI-8. MS is Idle Updated on Cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode C (TSPC_operation_mode_C). (only if mode B not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The SS rejects a GPRS attach with the cause value 'GPRS services not allowed in this PLMN'. The SS checks that the MS does not perform GPRS attach if activated in the same PLMN and performs GPRS attach only when a new PLMN is entered.

Maximum duration of test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode B or C (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-8
5	SS -> MS	ATTACH REJECT	GMM cause = ' GPRS services not allowed in this PLMN '
6	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds) Steps 7, 8 and 9 are only performed for MS Operation Mode B.
7	MS		SS pages the MS with mobile identity of TMSI-1 and paging order for RR connection according to the channel combination of the cell.
8			Verify that the MS initiates a RR connection and sends a PAGING RESPONSE
9	SS		SS releases the RR connection.
10	SS		SS pages the MS with Mobile identity = P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
11	MS		No response from the MS to the request. This is checked for 10 seconds.
			The following messages are sent and shall be received on cell B.
12	SS		The SS deactivates cell A and activates cell B.
13	MS		Cell B is preferred by the MS. Step 14 is only performed MS Operation Mode B.
14		**{Location Update Procedure}**	Location Update Procedure initiated from the MS.
15	MS		The MS initiates an attach automatically, by MMI or by AT command.
16	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
17	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-2
18	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell A.
19	SS		The SS deactivates cell B and activates cell A again.
20	MS		Cell A is preferred by the MS. Step 21 is only performed for MS Operation Mode B.
21		**{Location Update Procedure}**	Location Update Procedure initiated from the MS.
22			Verify No ATTACH REQUEST sent to SS (SS waits 30 seconds) in case auto attach
23	MS		The MS initiates an attach by MMI or by AT command.
24			Verify No ATTACH REQUEST sent to SS (SS waits 30 seconds)
25	MS		The MS is switched off or power is removed (see PICS).

Specific message contents

None.

44.2.1.2 Combined GPRS attach

The combined GPRS attach procedure is a GMM procedure used by GPRS MSs of MS operation mode A or B to IMSI attach for GPRS or non-GPRS services. In order to use the combined GPRS attach procedure, the network must be in network operation mode I. All Combined GPRS test case are only applicable when the MS operates in Class - A or B mode.

44.2.1.2.1 Combined GPRS attach / GPRS and non-GPRS attach accepted

44.2.1.2.1.1 Conformance requirement

1) If the network accepts the combined GPRS attach procedure (signalled by an IMSI) and allocates a P-TMSI, the MS shall acknowledge the P-TMSI and continue communication with the P-TMSI.

2) If the network accepts the combined GPRS attach procedure (signalled by P-TMSI) and reallocates a new P-TMSI, the MS shall acknowledge the new P-TMSI and continue communication with the new P-TMSI.

3) If the network accepts the combined GPRS attach procedure (signalled by a P-TMSI) from the MS without reallocation of the previously used P-TMSI, the MS shall continue communication with the previously used P-TMSI.

4) If the network accepts the combined GPRS attach procedure and determines that IMSI shall be used in CS operations, the MS shall continue communication with the IMSI for CS operations.

5) If the network accepts the combined GPRS attach procedure and determines that a TMSI shall be used in CS operations, the MS shall continue communication with the TMSI for CS operations.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.1.2 Test purpose

To test the behaviour of the MS if the network accepts the GPRS attach procedure.

The following cases are identified:

1) P-TMSI / P-TMSI signature is allocated;

2) P-TMSI / P-TMSI signature is reallocated;

3) Old P-TMSI / P-TMSI signature is not changed;

4) Mobile terminating CS call is allowed with IMSI;

5) Mobile terminating CS call is not allowed with TMSI.

44.2.1.2.1.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)

- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

1) The MS sends an ATTACH REQUEST message with identity IMSI. The SS allocates a P-TMSI and returns ATTACH ACCEPT message with a P-TMSI. The MS acknowledge the P-TMSI by sending ATTACH COMPLETE message. Further communication MS - SS is performed by the new P-TMSI. For CS calls, the IMSI is used.
2) The MS is CS paged in order to verify that the IMSI is used for CS calls.
3) The MS is GPRS paged in order to verify that the new P-TMSI is used for GPRS services.
4) The MS sends an ATTACH REQUEST message with identity P-TMSI. The SS allocates a new P-TMSI and returns ATTACH ACCEPT message with the new P-TMSI and a new TMSI. The MS acknowledge the P-TMSI and the TMSI by sending ATTACH COMPLETE message. Further communication MS - SS is performed by the new P-TMSI. For CS calls, the new TMSI is used. The MS is CS paged in order to verify that the new TMSI is used for CS services.
5) The MS is GPRS paged in order to verify that the new P-TMSI is used for GPRS services. The MS will not answer signalling addressed to the old P-TMSI.
6) The MS sends an ATTACH REQUEST message with identity P-TMSI. The SS accepts the P-TMSI and returns ATTACH ACCEPT message without any P-TMSI. Further communication MS - SS is performed by the previously used P-TMSI.
7) The MS is GPRS paged in order to verify that the previously used P-TMSI is used for GPRS services.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity =IMSI Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS		SS pages the MS with mobile identity of IMSI and paging order for RR connection according to the channel combination of the cell.
7	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity with IMSI.

Step	Direction	Message	Comments
8	SS		SS releases the RR connection, indicating a successful resumption of GPRS services and pages the MS with mobile identity of P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell. Comment: A TBF will be established on lower layers.
9	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request. Comment: The TBF will be released on lower layers.
10	MS		The MS is switched off or power is removed (see PICS).
11	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'
12	MS		The MS is powered up or switched on and initiates an attach (see PICS).
13	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 TMSI status = no valid TMSI available Routing area identity = RAI-1
14	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Mobile identity = TMSI-1 Routing area identity = RAI-1
15	MS -> SS	ATTACH COMPLETE	
16	SS ->MS	GMM INFORMATION	Message sent with P-TMSI-2
16b	MS -> SS	GMM STATUS	Message sent in case the MS does not support reception of GMM information message Cause #97
17	SS		SS pages the MS with mobile identity of TMSI-1 and paging order for RR connection according to the channel combination of the cell.
18	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity with TMSI-1.
19	SS		SS releases the RR connection, indicating a successful resumption of GPRS services and pages the MS with mobile identity of P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
20	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
21	SS		SS pages the MS with mobile identity of P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
22	MS		No response from the MS to the request. This is checked for 10 s.
23	MS		The MS is switched off or power is removed (see PICS).
24	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'
25	MS		The MS is powered up or switched on and initiates an attach (see PICS).

Step	Direction	Message	Comments
26	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-2 Routing area identity = RAI-1
27	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. TMSI and P-TMSI not included. Attach result = 'Combined GPRS / IMSI attached' P-TMSI-3 signature Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included Force to standby indicator set
28	SS		SS pages the MS with mobile identity of P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
29	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
30	MS		The MS is switched off or power is removed (see PICS).
31	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.1.2.2 Combined GPRS attach / GPRS only attach accepted

44.2.1.2.2.1 Conformance requirement

1) If the network accepts the combined GPRS attach procedure, but GMM cause code 'IMSI unknown in HLR' is sent to the MS the Mobile Station shall delete the stored TMSI, LAI and CKSN. The Mobile Station shall consider SIM invalid for non-GPRS services until power is switched off or SIM is removed.

2) If the network accepts the combined GPRS attach procedure, but GMM cause code 'MSC temporarily not reachable', or 'Network failure' is sent to the MS, an MS operation mode B MS may perform an MM IMSI attach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.2.2 Test Purpose

Test purpose 1

To test the behaviour of the MS if the network accepts the GPRS attach procedure with indication GPRS only, GMM cause 'IMSI unknown in HLR'.

Test purpose 2

To test the behaviour of the MS if the network accepts the GPRS attach procedure with indication GPRS only, GMM cause 'MSC temporarily not reachable', or 'Network failure'.

44.2.1.2.2.3 Method of test

44.2.1.2.2.3.1 Test Procedure 1

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS sends an ATTACH REQUEST message with identity IMSI. The SS allocates a P-TMSI and returns ATTACH ACCEPT message with a P-TMSI. GMM cause 'IMSI unknown in HLR' is indicated from SS. Further communication MS - SS is performed by the P-TMSI. CS services are not possible.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature GMM cause = 'IMSI unknown in HLR' Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS -> MS		SS pages MS with Mobile identity = IMSI according to the channel combination of the cell. Paging order is for RR-connection.
7	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
8	MS		The MS is switched off or power is removed (see PICS).
9	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.1.2.2.3.2 Test Procedure 2

Initial conditions

System Simulator:

One cell operating in network operation mode I. T3212 is set to 6 minutes.

Mobile Station:

The MS has a valid TMSI, P-TMSI and RAI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Automatic MM IMSI attach procedure at switch-on/power-on (TSPC_AddInfo_auto_MM_IMSI_AP_on_off).
- Switch off on button Yes/No (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS sends an ATTACH REQUEST message. The SS allocates a P-TMSI and returns ATTACH ACCEPT message with a P-TMSI. GMM cause 'MSC temporarily not reachable', or 'Network failure' is indicated from SS. The cause code is arbitrarily chosen. The MS sends a ROUTING AREA UPDATE REQUEST message. The SS returns a ROUTING AREA UPDATE ACCEPT message. GMM cause 'MSC temporarily not reachable', or 'Network failure' is indicated from SS. The cause code is arbitrarily chosen. The ROUTING AREA UPDATE procedure is repeated four times. An MS operation mode B MS may then perform an MM IMSI attach procedure (according to the PICS statement). Further communication MS - SS is performed by the P-TMSI. The existence of a signalling channel is verified by a request for mobile identity.

Maximum duration of test

15 minutes.

Expected sequence

Dependent whether the option ' Automatic MM IMSI attach procedure at switch-on/power-on' is supported or not, the steps 1-19 or 20-39 apply depending on manufacturer (see PICS).

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B and no automatic MM IMSI attach procedure is indicated (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =P-TMSI-1 Routing area identity = RAI-1 TMSI status = valid TMSI available or IE is omitted
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
5	MS -> SS	ATTACH COMPLETE	
7	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA / LA updating with IMSI attach' P-TMSI-2 signature Routing area identity = RAI-1

Step	Direction	Message	Comments
8	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-3 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Force to standby indicator set.
10	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA / LA updating with IMSI attach' P-TMSI-3 signature Routing area identity = RAI-1
11	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-4 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Force to standby indicator set.
12	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA / LA updating with IMSI attach' P-TMSI-4 signature Routing area identity = RAI-1
13	SS		The SS verifies that the time between the previous routing area update accept and routing area update request is T3311 (+/- 10%)
14	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-5 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Force to standby indicator set.
16	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA / LA updating with IMSI attach' P-TMSI-5 signature Routing area identity = RAI-1
17	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-6 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Force to standby indicator set.
18	MS		The MS is switched off or power is removed (see PICS).
19	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'. Stop the sequence.
20	MS		Automatic MM IMSI attach procedure is indicated (see PICS).
21	MS		The MS is powered up or switched on and initiates an attach (see PICS).
22	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1 TMSI status = valid TMSI available or IE is omitted

Step	Direction	Message	Comments
23	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI not included. Attach result = 'GPRS only attached' P-TMSI-2 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Negotiated Ready timer value IE should not be included. Force to standby indicator set.
24	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA / LA updating with IMSI attach' P-TMSI-2 signature Routing area identity = RAI-1
25	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-3 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Force to standby indicator set.
26	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA / LA updating with IMSI attach' P-TMSI-3 signature Routing area identity = RAI-1
27	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-4 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Force to standby indicator set.
28	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA / LA updating with IMSI attach' P-TMSI-4 signature Routing area identity = RAI-1
29	SS		The SS verifies that the time between the previous routing area update accept and routing area update request is T3311 (+/- 10%)
30	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-5 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Force to standby indicator set.
31	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA / LA updating with IMSI attach' P-TMSI-5 signature Routing area identity = RAI-1
32	SS		The SS verifies that the time between the previous routing area update accept and routing area update request is T3311 (+/- 10%)
33	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-6 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen) Force to standby indicator set.
34 (optional step)		**{Location Update Procedure}**	Macro. Location Update Procedure may be initiated from the MS. Parameter is TMSI-1.

Step	Direction	Message	Comments
			Steps 35, 36 and 37 are only performed if the MS has performed the Location Update Procedure in step 34.
35	SS -> MS		SS pages MS with Mobile identity = TMSI-1 and Paging order is for RR-connection.
36	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with Mobile identity = TMSI-1
37	SS		SS releases the RR connection and indicate the successfully resumption of GPRS services.
38	MS		The MS is switched off or power is removed (see PICS).
39	MS -> SS	DETACH REQUEST	Message not sent if power is removed.

Specific message contents

SYSTEM INFORMATION TYPE 3 (Cell A) in Test Procedure 2:

Information element	Value/remark
As default message contents except:	
Control Channel Description T3212 timeout value	 6 min

Note: An R97 MS will use this value to set T3302.

ATTACH ACCEPT and ROUTING AREA UPDATE ACCEPT in Test Procedure 2:

Information Element	Value/remark
As default message contents except: T3302 value	 6 min

Note: This IE is only read by MSs supporting R99 and onwards.

44.2.1.2.3 Combined GPRS attach / GPRS attach while IMSI attach

44.2.1.2.3.1 Void

44.2.1.2.3.2 Conformance requirement

If the GPRS MS is already attached for non-GPRS services by the MM specific attach procedure, but wants to perform an attach for GPRS services, the combined GPRS attach procedure is performed.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.3.3 Test Purpose

To test the behaviour of the MS if GPRS attach performed while IMSI attached.

44.2.1.2.3.4 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I. ATT flag is set.

Mobile Station:

The MS has a valid TMSI-1, P-TMSI-1 and RAI-1.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS attaches for non-GPRS services. The MS does not answer to paging orders for GPRS. The MS attaches for GPRS services. Paging orders for GPRS are answered.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS) and configured not to perform a GPRS attach.
2	MS		The MS is powered up or switched on. No GPRS attach is performed (see PICS).
3	MS	**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is TMSI-1.
4	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
5	MS		No response from the MS to the request. This is checked for 10 s.
6	MS		The MS is triggered to perform a GPRS attach (in combination with IMSI attach).
7	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach while IMSI attached' or 'Combined GPRS/IMSI attach' Mobile identity =P-TMSI-1 Routing area identity = RAI-1
8	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' No new mobile identity assigned. TMSI and P-TMSI not included P-TMSI-2 signature Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included. Force to standby indicator set.
9	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
10	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
11	MS		The MS is switched off or power is removed (see PICS).
12	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.1.2.3a Combined GPRS attach / NMO-I enabled in MS

44.2.1.2.3a.1 Conformance requirement

1) The network operation mode (mode I, II, or III) shall be indicated as system information to MSs. Additional system information can indicate that MSs configured to use the extended NMO I system information (see TS 24.368 [111]) shall use NMO I, regardless of what NMO is indicated by system information for other MSs. If this additional system information is absent, MSs configured to use the extended NMO I system information shall use the system information that represents the network operation mode for other MSs. From these indications, the MS determines which mode applies to it. That mode shall be used when using the procedures described in other clauses of this specification.

2) If the parameter "NMO_I_Behaviour" in the NAS configuration Management Object or USIM is set to the value of "1", the bit 2 "NMO I" of system information is applied

3) If the network accepts the combined PS attach procedure (signalled by an IMSI) and allocates a P-TMSI, the UE shall acknowledge the P-TMSI and continue communication with the P-TMSI.

Reference(s):

3GPP TS 24.008 clauses 4.7.3.2 and 4.1.1.4.2. 3GPP TS 23.060 clause 5.3.13.2

44.2.1.2.3a.2 Test Purpose

To verify that if "Network mode of operation I" is set in the MS, the MS performs a combined attach when the extended NMO-I system information is broadcast from the network

44.2.1.2.3a.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II. ATT flag is set to 0.

System Information Type 13: The GPRS Cell Info IE has the NMO_I_ALTERNATE bit set to "1"

Mobile Station:

The MS has a valid IMSI.

The MS has the parameter "NMO_I_Behaviour" set to "1"

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

1) The MS reads the NMO_I_ALTERNATE bit in the GPRS Cell Info IE, received in the System Information Type 13 message.

2) The MS sends an ATTACH REQUEST message with identity IMSI and type 'Combined GPRS/IMSI attach'. The SS allocates a P-TMSI and returns ATTACH ACCEPT message with a P-TMSI. The MS acknowledge the

P-TMSI by sending ATTACH COMPLETE message. Further communication MS - SS is performed by the new P-TMSI. For CS calls, the IMSI is used.

2) The MS is CS paged in order to verify that the IMSI is used for CS calls.

3) The MS is PS paged in order to verify that the new P-TMSI is used for PS services.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS)
2	MS		The MS is powered up or switched on and initiates attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS/IMSI attach' Mobile identity =IMSI TMSI status = no valid TMSI available
7	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS/IMSI attached' Allocated P-TMSI = P-TMSI-1 P-TMSI Signature = P-TMSI-1 signature MS identity =IMSI Routing area identity = RAI-1
8	MS -> SS	ATTACH COMPLETE	
9	SS		The SS releases the signalling connection and waits 5s to allow the MS to read system information.
10	SS		SS pages the MS with mobile identity of IMSI and paging order for RR connection according to the channel combination of the cell.
11	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity with IMSI.
12	SS		The SS releases the signalling connection and waits 5s to allow the MS to read system information.
13	SS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
14	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
15	MS		The MS is switched off or power is removed (see PICS).
16	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.1.2.4 Combined GPRS attach / rejected / IMSI invalid / illegal ME

44.2.1.2.4.1 Conformance requirement

1) If the network rejects a combined GPRS attach procedure from the Mobile Station with the cause 'Illegal ME', the Mobile Station shall consider SIM invalid for GPRS and non-GPRS services until power is switched off or SIM is removed.

2) If the network rejects a combined GPRS attach procedure from the Mobile Station with the cause 'Illegal ME', the Mobile Station shall delete the stored TMSI, LAI, CSKN, RAI, GPRS-CKSN, P-TMSI and P-TMSI signature.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.4.2 Test purpose

To test the behaviour of the MS if the network rejects the combined GPRS attach procedure of the MS with the cause 'Illegal ME'.

44.2.1.2.4.3 Method of test

Initial conditions

System Simulator:

Three cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2, cell C in MCC2/MNC1/LAC1/RAC1.

All three cells are operating in network operation mode I.

Mobile Station:

The MS has a valid TMSI-1, P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- SIM removal possible without powering down (TSPC_AddInfo_SIMRmv).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on Yes/No (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a GPRS attach with the cause value 'Illegal ME'. The SS checks that the MS does not perform GPRS attach in the same or another PLMN. CS services are not possible as the SIM is blocked for CS services. GPRS services are not possible as the SIM is blocked for GPRS services.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode B (see PICS).
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1 TMSI status = valid TMSI available or IE is omitted
5	SS -> MS	ATTACH REJECT	GMM cause 'Illegal ME'.
6	SS -> MS		SS pages the MS with mobile identity of TMSI-1 and paging order for RR connection according to the channel combination of the cell.
7	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
8	SS -> MS		SS pages the MS with mobile identity of IMSI and paging order for RR connection according to the channel combination of the cell.
9	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
10	SS -> MS		SS pages the MS with mobile identity of P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
11	MS		No response from the MS to the request. This is checked for 10 s.
			The following messages are sent and shall be received on cell B.
12	SS		The SS deactivates cell A and activates cell B.
13	MS		Cell B is preferred by the MS.
14	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
15	SS -> MS		SS pages the MS with mobile identity of IMSI and paging order for RR connection according to the channel combination of the cell.
16	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
			The following messages are sent and shall be received on cell C.
17	SS		The SS deactivates cell B and activates cell C.
18	MS		Cell C is preferred by the MS.
19	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
20	SS -> MS		SS pages the MS with mobile identity of IMSI and paging order for RR connection according to the channel combination of the cell.
21	MS		No response from the MS to the request. This is checked for 10seconds.
22	MS		If possible (see PICS) SIM removal is performed. Otherwise if possible (see PICS) switch off is performed. Otherwise the power is removed.

Step	Direction	Message	Comments
23	MS		The MS gets the SIM replaced, is powered up or switched on. Step 22 is only performed for non-auto attach MS.
24		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter Mobile identity is IMSI.
25	MS		MS initiates an attach automatically (see PICS), via MMI or AT commands.
26	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
27	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-1 Routing area identity = RAI-2
28	MS -> SS	ATTACH COMPLETE	
29	SS -> MS		SS pages the MS with mobile identity of TMSI-1 and paging order for RR connection according to the channel combination of the cell.
30	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity with TMSI-1.
31	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
32	MS		The MS is switched off or power is removed (see PICS).
33	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.1.2.5 Combined GPRS attach / rejected / GPRS services and non-GPRS services not allowed

44.2.1.2.5.1 Conformance requirement

1) If the network rejects a combined GPRS attach procedure from the Mobile Station with the cause 'GPRS services and non-GPRS services not allowed', the Mobile Station shall consider SIM invalid for GPRS and non-GPRS services until power is switched off or SIM is removed.

2) If the network rejects a combined GPRS attach procedure from the Mobile Station with the cause 'GPRS services and non-GPRS services not allowed', the Mobile Station shall delete the stored TMSI, LAI, CSKN, RAI, GPRS-CKSN, P-TMSI and P-TMSI signature.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.5.2 Test purpose

To test the behaviour of the MS if the network rejects the combined GPRS attach procedure of the MS with the cause 'GPRS services and non-GPRS services not allowed'.

44.2.1.2.5.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1 and cell B in MCC2/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode I.

Mobile Station:

The MS has a valid TMSI, P-TMSI and RAI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a GPRS attach with the cause value 'GPRS services and non-GPRS services not allowed'. The SS checks that the MS does not perform GPRS attach in the same or another PLMN. CS services are not possible as the SIM is blocked for CS services. GPRS services are not possible as the SIM is blocked for GPRS services.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode B (see PICS).
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =P-TMSI-1 Routing area identity = RAI-1 TMSI status = valid TMSI available or IE is omitted
5	SS -> MS	ATTACH REJECT	GMM cause 'GPRS services and non-GPRS services not allowed'
6	MS		No LOCATION UPDATING REQ with type 'IMSI attach' is sent to the SS (SS waits 30 seconds).
7	SS -> MS		SS pages the MS with mobile identity IMSI and paging order for RR connection according to the channel combination of the cell.
8	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
9	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
10	MS		No response from the MS to the request. This is checked for 10 s
11	SS MS		The SS deactivates cell A and activates cell B. Cell B is preferred by the MS.
12	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
13	MS		No LOCATION UPDATING REQ with type 'IMSI attach' is sent to the SS (SS waits 30 seconds).
14	SS -> MS		SS pages the MS with mobile identity IMSI and paging order for RR connection according to the channel combination of the cell.
15	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
16	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
17	MS		No response from the MS to the request. This is checked for 10seconds.
18	MS		If possible (see PICS) switch off is performed. Otherwise the power is removed.

Step	Direction	Message	Comments
19	MS		The MS is powered up or switched on. Step 20 is only performed for non-auto attach MS.
20		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
21	MS		MS initiates an attach automatically (see PICS), via MMI or AT commands.
22	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
23	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-1 Routing area identity = RAI-2
24	MS -> SS	ATTACH COMPLETE	
25	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
26	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity with TMSI-1.
27	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
28	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
29	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
30	MS		The MS is switched off or power is removed (see PICS).
31	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.1.2.6 Combined GPRS attach / rejected / GPRS services not allowed

44.2.1.2.6.1 Conformance requirement

1) If the network rejects a combined GPRS attach procedure from the Mobile Station with the cause 'GPRS services not allowed', the Mobile Station shall consider SIM invalid for GPRS services until power is switched off or SIM is removed.

2) If the network rejects a combined GPRS attach procedure from the Mobile Station with the cause 'GPRS services not allowed' the Mobile Station shall delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature.

3) A GPRS class B MS shall perform an MM IMSI attach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.6.2 Test purpose

To test the behaviour of the MS if the network rejects the GPRS attach procedure of the MS with the cause 'GPRS services not allowed'.

44.2.1.2.6.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1 and cell B in MCC2/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode I.

ATT flag set to 1.

Mobile Station:

The MS has a valid TMSI, P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a normal attach with the cause value 'GPRS services not allowed'. The SS checks that the MS does not perform GPRS attach. GPRS services are not possible. After receiving the ATTACH REJECT message from the SS the mobile can react in several ways, due to an ambiguity in the core specification. Part 3 of the conformance requirements can be interpreted in the following ways:

1. The MS shall in any case perform a Location Update with the update type set to IMSI attach.
2. The MS shall perform the IMSI attach by means of a explicit Location update procedure only if the conditions specified for the IMSI attach procedure in 3GPP TS 04.08 / 3GSPP TS 24.008, subclause 4.4.3 are fulfilled.
3. The MS shall perform a Location Update with the update type set either to IMSI attach or normal updating.

Because all three options are allowed a GPRS class B MS may perform an MM IMSI attach. Therefore step 8 in the expected sequence is an optional step.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode B (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on. Step 4 is only performed for non-auto attach MS.
4	MS	**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is TMSI-1.
5			MS initiates an attach automatically (see PICS), via MMI or AT commands.
6	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =P-TMSI-1 Routing area identity = RAI-1
7	SS -> MS	ATTACH REJECT	GMM cause 'GPRS services not allowed'
8 (optional step)	MS	**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is TMSI-2.
9	SS -> MS		SS pages the MS with mobile identity of TMSI-2 or TMSI-1 for MS which did not perform step 8 and paging order for RR connection on CCCH.
10	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-2 or TMSI-1 for MS which did not perform step 8.
11	SS		SS releases the RR connection.
			The following messages are sent and shall be received on cell B.
12	SS		The SS deactivates cell A and activates cell B.
13	MS		Cell B is preferred by the MS.
14		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is TMSI-1.
15	SS -> MS		SS pages the MS with mobile identity of TMSI-1 and paging order for RR connection according to the channel combination of the cell.
16	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
17			SS releases the RR connection.
18	SS -> MS		SS pages the MS with mobile identity of P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
19	MS		No response from the MS to the request. This is checked for 10seconds.
20	MS		If possible (see PICS) switch off is performed. Otherwise the power is removed.
21	MS	{IMSI Detach}	Macro. If switch off is performed then MS performs IMSI detach.

Step	Direction	Message	Comments
22	MS		The MS is powered up or switched on. Step 23 is only performed for non-auto attach MS.
23	MS	**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is TMSI-1.
24			MS initiates an attach automatically (see PICS), via MMI or AT commands.
25	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI
26	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-2 Routing area identity = RAI-2
27	MS -> SS	ATTACH COMPLETE	
28	SS -> MS		SS pages the MS with mobile identity of TMSI-2 and paging order for RR connection according to the channel combination of the cell.
29	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-2
30	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
31	MS		The MS is switched off or power is removed (see PICS).
32	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.1.2.7 Combined GPRS attach / rejected / location area not allowed

44.2.1.2.7.1 Conformance requirement

1) If the network rejects a combined GPRS attach procedure from the Mobile Station with the cause 'location area not allowed' the Mobile Station shall:

   1.1 not perform combined GPRS attach when in the same location area;

   1.2 delete the stored LAI, CKSN, TMSI, RAI, GPRS-CKSN, P-TMSI and P-TMSI signature;

   1.3 store the LA in the 'forbidden location areas for regional provision of service'.

2) If the network rejects a combined GPRS attach procedure from the Mobile Station with the cause 'location area not allowed' the Mobile Station shall:

   2.1 perform combined GPRS attach when a new location area is entered;

   2.2 delete the list of forbidden LAs when power is switched off.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclauses 4.7.3.2.

44.2.1.2.7.2 Test purpose

To test the behaviour of the MS if the network rejects the combined GPRS attach procedure with the cause 'Location Area not allowed'.

To test that the MS deletes the list of forbidden LAs when power is switched off.

44.2.1.2.7.3 Method of test

Initial conditions

System Simulator:

Three cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2, cell C in MCC1/MNC1/LAC2/RAC1.

All cells are operating in network operation mode I.

Mobile Station:

The MS has a valid TMSI, P-TMSI and RAI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- GPRS attach attempted automatically due to outstanding request (TSPC_AddInfo_GPRS_Attach_Attempt_Outstanding).

PIXIT statements:

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Test procedure

The SS rejects a combined GPRS attach with the cause value 'Location Area not allowed'. The SS checks that the MS does not perform combined GPRS attach while in the location area, performs GPRS attach when a new location area is entered and deletes the list of forbidden LAs when switched off. CS services are not possible unless an IMSI attach procedure is performed.

Different types of MS may use different methods to periodically clear the list of forbidden location areas (e.g. every day at 12 am). If the list is cleared while the test is being run, it may be necessary to re-run the test.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode B (see PICS).
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH REJECT	GMM cause 'Location Area not allowed'
6	MS		No LOCATION UPDATING REQ with type 'IMSI attach' is sent to the SS (SS waits 30 seconds).
7	SS -> MS		SS pages the MS with mobile identity TMSI and paging order for RR connection according to the channel combination of the cell.

Step	Direction	Message	Comments
8	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
9	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
10	MS		No response from the MS to the request. This is checked for 10 s
			The following messages are sent and shall be received on cell B.
11	SS		The SS deactivates cell A and activates cell B.
12	MS		Cell B is preferred by the MS.
13	MS		No ATTACH REQUEST or LOCATION UPDATING REQ is sent to SS (SS waits 60 seconds)
14	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
15	MS		No response from the MS to the request. This is checked for 10seconds.
16	MS		The MS initiates an attach by MMI or AT command.
17			No attach is performed by the MS. This is checked for 10 s.
			The following messages are sent and shall be received on cell C.
18	SS		The SS deactivates cell B and activates cell C.
19	MS		Cell C is preferred by the MS. Steps 20 and 21 are only performed by an MS which will not initiate a GPRS attach automatically due to outstanding request (see PICS).
20 (conditional)		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter Mobile identity is IMSI.
21 (conditional)	MS		MS initiates an attach via MMI or AT commands.
22	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
23	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI1 P-TMSI-1 signature Mobile identity = TMSI-1 Routing area identity = RAI-3
24	MS -> SS	ATTACH COMPLETE	
25	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
26	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
27	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
28	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
29	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
30	MS		The MS is switched off or power is removed (see PICS).

Step	Direction	Message	Comments
31	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'
			The following messages are sent and shall be received on cell B.
32	MS		The SS deactivates cell C and activates cell B. Cell B is preferred by the MS.
33	MS		The MS is powered up or switched on. Step 34 is only performed for non-auto attach MS.
34		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is TMSI-1.
35	MS		MS initiates an attach automatically (see PICS), via MMI or AT commands.
36	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-3
37	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Mobile identity = TMSI-2 Routing area identity = RAI-4
38	MS -> SS	ATTACH COMPLETE	
39	SS -> MS		SS pages the MS with mobile identity TMSI-2 and paging order for RR connection according to the channel combination of the cell.
40	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-2.
41	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
42	SS -> MS		SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
43	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
44	MS		The MS is switched off or power is removed (see PICS).
45	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.1.2.7a Combined GPRS attach / rejected / network reject with Extended Wait Timer

44.2.1.2.7a.1 Conformance requirement

If the attach request can neither be accepted by the network for GPRS nor for non-GPRS services, an ATTACH REJECT message is transferred to the MS. The MS receiving the ATTACH REJECT message stops timer T3310, and for all causes except #12, #14, #15, #22 and #25 deletes the list of "equivalent PLMNs".

If the attach request is rejected due to NAS level mobility management congestion control, the network shall set the MM cause value to #22 "congestion" and assign a back-off timer T3346.

22 (Congestion);

If the T3346 value IE is present in the ATTACH REJECT message and the value indicates that this timer is neither zero nor deactivated, the MS shall proceed as described below, otherwise it shall be considered as an abnormal case and the behaviour of the MS for this case is specified in subclause 4.7.3.1.5.

The MS shall abort the attach procedure, reset the attach attempt counter, set the GPRS update status to GU2 NOT UPDATED and enter state GMM-DEREGISTERED.ATTEMPTING-TO-ATTACH.

The MS shall stop timer T3346 if it is running.

If the ATTACH REJECT message is integrity protected, the MS shall start timer T3346 with the value provided in the T3346 value IE.

If the ATTACH REJECT message is not integrity protected, the MS shall start timer T3346 with a random value from the default range specified in table 11.3a.

The MS stays in the current serving cell and applies the normal cell reselection process. The attach procedure is started, if still necessary, when timer T3346 expires or is stopped.

A GPRS MS operating in MS operation mode A or B which is already IMSI attached for CS services in the network is still IMSI attached for CS services in the network.

If S1 mode is supported in the MS, the MS shall handle the EMM parameters EMM state, EPS update status, and attach attempt counter as specified in 3GPP TS 24.301 [120] for the case when the attach procedure is rejected with the EMM cause with the same value.

Reference(s):

3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.7a.2 Test purpose

To verify that the MS uses the extended back-off timer if the network reject a request with the Extended Wait Timer.

44.2.1.2.7a.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II MCC1/MNC1/LAC1/RAC1

Mobile Station:

The MS has a valid TMSI-1, P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on Yes/No (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a combined GPRS attach with the cause value #22 'Congestion'. The SS includes the T3346 timer in the reject message. The SS checks that the MS does not perform GPRS attach before the timer T3346 has expired.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1 TMSI status = valid TMSI available or IE is omitted Device properties = 'MS is configured for NAS signalling low priority'
4	SS -> MS	ATTACH REJECT	GMM cause #22 'Congestion' T3346 value = 2 min
5	SS		The SS verifies that the MS does not initiate the attach procedure before timer T3346 has expired
6	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
7	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-1 Routing area identity = RAI-1
8	MS -> SS	ATTACH COMPLETE	
9	SS -> MS		SS pages the MS with mobile identity of TMSI-1 and paging order for RR connection according to the channel combination of the cell.
10	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity with TMSI-1.
11	SS		SS releases the RR connection indicating a successful resumption of GPRS services.

Specific message contents

None.

44.2.1.2.8 Combined GPRS attach / abnormal cases / attempt counter check / miscellaneous reject causes

44.2.1.2.8.1 Conformance requirement

1) When a combined GPRS attach procedure is rejected with the attach attempt counter less than five, the Mobile Station shall repeat the combined GPRS attach procedure after T3311 timeout.

2) When a combined GPRS attach procedure is rejected with the attach attempt counter five, the Mobile Station shall delete the stored TMSI, LAI, CKSN, P-TMSI, P-TMSI signature, GPRS CKSN and RAI and start T3302.

3) When the T3302 expire, a new combined GPRS attach procedure shall be initiated.

   - GMM cause codes that can be selected are:

     - 'IMSI unknown in HLR';

     - 'MS identity cannot be derived by the network';

     - 'Network failure';

     - 'Congestion';

- 'retry upon entry into a new cell';
- 'Message type not compatible with the protocol state';
- 'Conditional IE error';
- 'Message not compatible with the protocol state';

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.8.2 Test purpose

To test the behaviour of the MS with respect to the attach attempt counter.

44.2.1.2.8.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I. T3302 is set to 12 minutes.

Mobile Station:

The MS has a valid TMSI, P-TMSI and RAI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Switch off on button (TSPC_Feat_OnOff).

PIXIT statements:

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Test procedure

The MS initiates a combined GPRS attach procedure (attach attempt counter zero). The SS rejects the attach with an arbitrarily chosen cause code. The attach attempt counter is incremented and T3311 is started.

The MS initiates a new combined GPRS attach procedure (attach attempt counter one) after T3311 expires. The SS rejects the attach with an arbitrarily chosen cause code. The attach attempt counter is incremented and T3311 is started.

The MS initiates a new combined GPRS attach procedure (attach attempt counter two) after T3311 expires. The SS rejects the attach with an arbitrarily chosen cause code. The attach attempt counter is incremented and T3311 is started.

The MS initiates a new combined GPRS attach procedure (attach attempt counter three) after T3311 expires The SS rejects the attach with an arbitrarily chosen cause code. The attach attempt counter is incremented and T3311 is started.

The MS initiates a new combined GPRS attach procedure (attach attempt counter four) after T3311 expires The SS rejects the attach with an arbitrarily chosen cause code. The attach attempt counter is incremented and T3311 is not started, as the attach attempt counter is five. T3302 is started.

The MS initiates a combined GPRS attach procedure with attach attempt counter zero after T3302 expires without P-TMSI, P-TMSI signature, GPRS CKSN and RAI.

Maximum duration of test

20 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =P-TMSI-1 Routing area identity = RAI-1
4	SS -> MS	ATTACH REJECT	Arbitrarily chosen GMM cause
5	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
6	SS		The SS verifies that the time between the attach reject and attach request is T3311 (+/- 10%)
7	SS -> MS	ATTACH REJECT	Arbitrarily chosen GMM cause
8	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
9	SS		The SS verifies that the time between the attach reject and attach request is T3311 (+/- 10%)
10	SS -> MS	ATTACH REJECT	Arbitrarily chosen GMM cause
11	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
12	SS		The SS verifies that the time between the attach reject and attach request is T3311 (+/- 10%)
13	SS -> MS	ATTACH REJECT	Arbitrarily chosen GMM cause
14	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =P-TMSI-1 Routing area identity = RAI-1
15	SS		The SS verifies that the time between the attach reject and attach request is T3311 (+/- 10%)
16	SS -> MS	ATTACH REJECT	Arbitrarily chosen GMM cause
17 (optional step)	MS	**{Location Update Procedure}**	Macro. Location Update Procedure may be initiated from the MS. Parameter mobile identity is IMSI.
18	SS -> MS		SS pages the MS with mobile identity of P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
19	MS		No response from the MS to the request. This is checked for 10seconds.
20	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS/IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status =no valid TMSI available
21	SS		The SS verifies that the MS does not attempt to attach for T3302 (+/- 10%).

Step	Direction	Message	Comments
22	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity P-TMSI-1 P-TMSI signature Mobile identity = TMSI-1 Routing area identity = RAI-1
23	MS -> SS	ATTACH COMPLETE	
24	SS -> MS		SS pages the MS with mobile identity of TMSI-1 and paging order for RR connection according to the channel combination of the cell.
25	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity with TMSI-1.
26	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
27	SS -> MS		SS pages the MS with mobile identity of P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
28	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
29	MS		The MS is switched off or power is removed (see PICS).
30	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.1.2.9 Combined GPRS attach / abnormal cases / GPRS detach procedure collision

44.2.1.2.9.1 Conformance requirement

44.2.1.2.9.1 Conformance requirement

1) When a DETACH REQUEST message is received by the MS (Detach type 're-attach not required') while waiting for an ATTACH ACCEPT message or ATTACH REJECT message, the MS shall terminate the combined GPRS attach procedure and continue with the combined GPRS detach procedure.

2) When a DETACH REQUEST message is received by the MS (Detach type 're-attach required') while waiting for an ATTACH ACCEPT message or ATTACH REJECT message, the MS shall ignore the combined GPRS detach procedure and continue with the combined GPRS attach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.3.2.

44.2.1.2.9.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.1.2.9.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid TMSI, P-TMSI and RAI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Re-attach automatically when the network commands a detach with no cause value (TSPC_AddInfo_GPRS_Attach_on_NW_Detach_NoCause).

PIXIT statements:

-

Test procedure

The MS initiates a combined GPRS attach procedure. The SS does not answer the combined GPRS attach procedure, but initiates a combined GPRS detach procedure (Detach type 're-attach not required'). The MS shall terminate the combined GPRS attach procedure and continue with the combined GPRS detach procedure.

The MS initiates a combined GPRS attach procedure. The SS does not answer the combined GPRS attach procedure, but initiates a combined GPRS detach procedure (Detach type 're-attach required'). The MS shall ignore the combined GPRS detach procedure and continue with the combined GPRS attach. CS services are also possible.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
4	SS		The SS ignores the ATTACH REQUEST message and initiates a detach procedure.
5	SS -> MS	DETACH REQUEST	Detach type = 're-attach not required'
6	MS -> SS	DETACH ACCEPT	
7	MS		The MS is attached by MMI or AT command if the MS does not re-attach automatically upon receiving a network initiated detach with no cause value, (see PIXIT).
8	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
9	SS		The SS ignores the ATTACH REQUEST message and initiates a detach procedure.
10	SS -> MS	DETACH REQUEST	Detach type = 're-attach required'
11	MS		The MS ignores the DETACH REQUEST message and continue with the attach procedure
12	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Mobile identity = TMSI-2 Routing area identity = RAI-1
13	MS -> SS	ATTACH COMPLETE	
14	SS -> MS		SS pages the MS with mobile identity of TMSI-2 and paging order for RR connection according to the channel combination of the cell.
15	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity with TMSI-2.
16	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
17	SS -> MS		SS pages the MS with mobile identity of P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
18	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
19	MS		The MS is switched off or power is removed (see PICS).
20	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.2 GPRS detach procedure

This procedure is used to indicate for the network that the IMSI is not available for traffic. The GMM context is removed.

44.2.2.1 MS initiated GPRS detach procedure

44.2.2.1.1 GPRS detach / power off / accepted

44.2.2.1.1.1 Conformance requirement

The MS detaches the IMSI for GPRS services if the MS is switched off.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

44.2.2.1.1.2 Test purpose

To test the behaviour of the MS for the detach procedure.

44.2.2.1.1.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS performs a GPRS attach procedure.

The MS sends a DETACH REQUEST message to the SS.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 8.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	MS		The MS is switched off (see PICS).
7	MS -> SS	DETACH REQUEST	Detach type = 'power switched off, GPRS detach'
8	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 2 to step 7.

Specific message contents

None.

44.2.2.1.2 GPRS detach / accepted

44.2.2.1.2.1 Conformance requirement

1) The MS detaches the IMSI for GPRS services if the MS is ordered to do so with MMI or AT commands.

2) (For R99 or after MS only) Upon completion of the subsequent attach, routing area update, service request or detach procedure the used P-TMSI signature shall be deleted.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

3GPP TS 24.008 subclause 4.7.1.3 (additional reference for R99 or after MS only)

44.2.2.1.2.2 Test purpose

To test the behaviour of the MS for the detach procedure, including treatment of P-TMSI signature by R99 and after MS.

44.2.2.1.2.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).

- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- MS Higher Layer release(TSPC_MS_HIGHER_LAYER_RELEASE)

PIXIT statements:

-

Test procedure

The MS performs a GPRS attach procedure.

The MS sends a DETACH REQUEST message to the SS.

The SS signal to the MS, but no response is received, as the signalling link is disconnected.

The MS performs a GPRS attach procedure.

The MS sends a DETACH REQUEST message to the SS.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 17.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included Force to standby indicator set
5	MS->SS	ATTACH COMPLETE	
6	MS		The MS initiates a GPRS detach (without power off) by MMI or AT command.
7	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
8	SS -> MS	DETACH ACCEPT	
9	SS -> MS		SS pages the MS with Mobile identity = P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
10	MS		No response from the MS to the request. This is checked for 10 s.
11	MS		The MS initiates an attach by MMI or AT commands
12	MS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 (If MS is to R99 or after then P-TMSI-1 signature shall not be present) Routing area identity = RAI-1
13	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned Attach result = 'GPRS only attached' Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included Force to standby indicator set
14	MS		The MS initiates a GPRS detach (without power off) by MMI or AT command.

15	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
16	SS -> MS	DETACH ACCEPT	
17	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 2 to step 16.

Specific message contents

None.

44.2.2.1.3 GPRS detach / abnormal cases / attempt counter check / procedure timeout

44.2.2.1.3.1 Conformance requirement

1) When a T3321 timeout has occurred during a GPRS detach procedure with the retransmission counter less than five, the Mobile Station shall repeat the GPRS detach procedure.

2) When a T3321 timeout has occurred during a GPRS detach procedure with the retransmission counter five, the Mobile Station shall not repeat the procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

44.2.2.1.3.2 Test purpose

To test the behaviour of the MS with respect to the retransmission counter.

44.2.2.1.3.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Switch off on button (TSPC_Feat_OnOff).

PIXIT statements:

-

Test procedure

The MS initiates a GPRS detach procedure. The SS does not answer with DETACH ACCEPT message before T3321 timeout. The retransmission counter is set to one.

The MS initiates a new GPRS detach procedure (retransmission counter one) after T3321 expires. The SS does not answer with DETACH ACCEPT message before T3321 timeout. The retransmission counter is incremented.

The MS initiates a new GPRS detach procedure (retransmission counter two) after T3321 expires. The SS does not answer with DETACH ACCEPT message before T3321 timeout. The retransmission counter is incremented.

The MS initiates a new GPRS detach procedure (retransmission counter three) after T3321 expires. The SS does not answer with DETACH ACCEPT message before T3321 timeout. The retransmission counter is incremented.

The MS initiates a new GPRS detach procedure (retransmission counter four) after T3321 expires. The SS does not answer with DETACH ACCEPT message before T3321 timeout. The retransmission counter is incremented.

The MS then deletes the logical link since the retransmission has been repeated four times.

The MS performs a new GPRS attach procedure.

Maximum duration of test

8 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 25.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
4	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI and P-TMSI signature not included. Attach result = 'GPRS only attached' Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included Force to standby indicator set
5	MS		The MS initiates a GPRS detach (without power off) by MMI or AT command.
6	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
7	SS		No response is given from the SS.
8	SS		The SS verifies that the time between the detach requests is T3321 seconds (+/- 10%)
9	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
10	SS		No response is given from the SS.
11	SS		The SS verifies that the time between the detach requests is T3321 seconds (+/- 10%)
12	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
13	SS		No response is given from the SS.
14	SS		The SS verifies that the time between the detach requests is T3321 seconds (+/- 10%)
15	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
16	SS		No response is given from the SS.
17	SS		The SS verifies that the time between the detach requests is T3321 seconds (+/- 10%)
18	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
19	SS		No response is given from the SS within 40 seconds and SS verifies that the MS will not send a DETACH REQUEST again.
20	MS		Initiate a GPRS attach
21	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
22	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI and P-TMSI signature not included. Attach result = 'GPRS only attached' Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included Force to standby indicator set
23			MS is switched off or power is removed (see PICS)
24	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
25	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 2 to step 24.

Specific message contents

None.

44.2.2.1.4 GPRS detach / abnormal cases / GMM common procedure collision

44.2.2.1.4.1 Conformance requirement

When any of the GMM common messages P-TMSI REALLOCATION COMMAND, GMM STATUS or GMM INFORMATION is received by the MS while waiting for a DETACH ACCEPT message with detach cause different from "power off", the MS shall ignore the GMM common message.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

44.2.2.1.4.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.2.1.4.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The following test procedure is repeated for sequence counter k = 1, 2, 3:

- The MS performs a GPRS attach.
- The MS initiates a GPRS detach. The SS initiates a P-TMSI REALLOCATION COMMAND message (k = 1), a GMM STATUS message (k = 2) and a GMM INFORMATION message (k = 3). The MS shall ignore the GMM common messages and continue with the GPRS detach procedure. The sending of the P-TMSI REALLOCATION COMMAND message (k = 1), the GMM STATUS message (k = 2), the GMM INFORMATION message (k = 3) and the DETACH ACCEPT message shall be completed within Timer T3321 -10%.
- The SS signal to the MS, but no response is received, as the signalling link is disconnected.

Maximum duration of test

5 minutes.

Expected sequence

The test sequence is repeated for k = 1 … 3

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	MS		The MS initiates a detach (without power off) by MMI or AT command.
7	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
8A (k=1)	SS		The SS sends a P-TMSI REALLOCATION COMMAND message
9A (k=1)	SS -> MS	P-TMSI REALLOCATION COMMAND	
10A (k=1)	MS		The MS ignores the message. This is verified for 10 seconds.
8B (k=2)	SS		The SS sends a GMM STATUS message
9B (k=2)	SS -> MS	GMM STATUS	
10B (k=2)	MS		The MS ignores the message. This is verified for 10 seconds.
8C (k=3)	SS		The SS sends a GMM INFORMATION message
9C (k=3)	SS -> MS	GMM INFORMATION	
10C (k=3)	MS		The MS ignores the message which is verified for 10 seconds or, if GMM INFORMATION message not implemented, sends a GMM STATUS with GMM Cause 'Message type non-existent or not implemented'.
11	SS -> MS	DETACH ACCEPT	The SS responds to the DETACH REQUEST
12	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-1 Paging order is for TBF establishment.
13	MS		No response from the MS to the request. This is checked for 10 s.
NOTE: Steps 8x, 9x, 10x and 11 shall be completed within Timer T3321 -10%.			

Specific message contents

None.

44.2.2.1.5 GPRS detach / power off / accepted

44.2.2.1.5.1 Conformance requirement

The MS detach the IMSI for GPRS and non-GPRS services.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

44.2.2.1.5.2 Test purpose

To test the behaviour of the MS for the detach procedure.

44.2.2.1.5.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode A (TSPC_operation_mode_A).
- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS performs a combined GPRS attach procedure (for GPRS and non-GPRS services).

The MS sends a DETACH REQUEST message to the SS. The MS then deletes the logical link.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	MS		The MS is switched off (see PICS).
7a	MS -> SS	DETACH REQUEST	Detach type = 'power switched off, combined GPRS / IMSI detach'. If MS supports TSPC_Feat_OnOff
7b	SS		It is verified that the MS does not send DETACH REQUEST, if the MS does not support TSPC_Feat_OnOff

Specific message contents

None.

44.2.2.1.6 GPRS detach / accepted / GPRS/IMSI detach

44.2.2.1.6.1 Conformance requirement

The MS detach the IMSI for GPRS and non-GPRS services.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

44.2.2.1.6.2 Test purpose

To test the behaviour of the MS for the detach procedure.

44.2.2.1.6.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS performs a combined GPRS attach procedure (for GPRS and non-GPRS services).

The MS sends a DETACH REQUEST message to the SS. When the MS receives the DETACH ACCEPT, the MS then deletes the logical link.

The SS signal to the MS, but no response is received, as the signalling link is disconnected.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-1 Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	MS		The MS initiates a detach (without power off) by MMI or AT command.
7	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, combined GPRS / IMSI detach'
8	SS -> MS	DETACH ACCEPT	
9	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
10	MS		No response from the MS to the request. This is checked for 10 s.
11	SS -> MS		SS pages the MS with mobile identity IMSI and paging order for RR connection according to the channel combination of the cell.
12	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.

Specific message contents

None.

44.2.2.1.7 GPRS detach / accepted / IMSI detach

44.2.2.1.7.1 Conformance requirement

The MS shall detach for CS services.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

44.2.2.1.7.2 Test purpose

To test the behaviour of the MS for the detach procedure.

44.2.2.1.7.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS performs a combined GPRS attach procedure (for GPRS and non-GPRS services).

The MS performs an GPRS detach (for non-GPRS services).

CS services are not possible.

The MS attach for non-GPRS services by a routing area update procedure and CS services are again possible.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-1 Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	MS		The MS initiates a detach for non-GPRS services without power off.
7	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, IMSI detach'
8	SS -> MS	DETACH ACCEPT	
9	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
10	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
11	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
12	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
13	MS		The MS initiates an attach for non-GPRS services by a RA update procedure.
14	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = "combined RA/LA updating with IMSI attach" Routing area identity = RAI-1
15	SS -> MS	ROUTING AREA UPDATE ACCEPT	Update result = 'Combined RA/LA updated" Mobile identity = P-TMSI-2 P-TMSI-2 signature Mobile identity = TMSI-1 Routing area identity = RAI-1
16	MS -> SS	ROUTING AREA UPDATE COMPLETE	
17	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
18	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
19	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
20	MS		The MS is switched off or power is removed (see PICS).
21	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.2.1.8 GPRS detach / abnormal cases / change of cell into new routing area

44.2.2.1.8.1 Conformance requirement

When a change of cell into a new routing area is performed before DETACH ACCEPT message is received by the MS, the MS shall abort the GPRS detach procedure and re-initiate it after the routing area update procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

44.2.2.1.8.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.2.1.8.3 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1 and cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS performs a GPRS attach procedure.

Sufficient time is given for the MS to identify the neighbour cell before the MS is triggered to initiate a GPRS detach procedure. The DETACH ACCEPT message is delayed from the SS. The MS performs a cell reselection to a cell in a new routing area and performs a routing area update procedure.

The Ms shall re-initiate a GPRS detach procedure when the routing area update procedure is finished.

The MS deletes the logical link.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A and B. The RF level of cell A is -50 dBm and cell B -60 dBm.
2	MS		The MS is set in MS operation mode B (see PICS) or mode C if mode B is not supported.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
3A	MS	**{Location Update Procedure}**	Macro for Class B MS. Location Update Procedure initiated from the MS. Parameter mobile identity is TMSI-1.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
7	SS		Wait 30 sec
8	MS		The MS initiates a GPRS detach (without power off) by MMI or AT command.
9	MS -> SS	DETACH REQUEST	Detach type = 'normal detach, GPRS detach'
10	SS		No response to the DETACH REQUEST message is given by the SS
			The following messages are sent and shall be received on cell B.
11	SS		The RF level of cell A is lowered to -100 dBm.
12	MS		The MS performs a RA update in the new cell.
13	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = "RA updating' P-TMSI-1 signature Routing area identity = RAI-1 TMSI status = valid TMSI available or IE omitted
14	SS -> MS	ROUTING AREA UPDATE ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-4
15	MS -> SS	ROUTING AREA UPDATE COMPLETE	
16	MS -> SS	DETACH REQUEST	The detach is automatically re-attempted. Detach type = 'normal detach, GPRS detach'
17	SS -> MS	DETACH ACCEPT	

Specific message contents

None.

44.2.2.1.9 GPRS detach / abnormal cases / GPRS detach procedure collision

44.2.2.1.9.1 Conformance requirement

When a DETACH REQUEST is received by the MS while waiting for a DETACH ACCEPT message, the MS shall answer the network initiated GPRS detach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.1.

44.2.2.1.9.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.2.1.9.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS performs a combined GPRS attach procedure for Class B devices and a normal GPRS attach for Class C devices The MS initiates a GPRS detach. The SS does not answer the detach procedure, but initiates a detach procedure (cause re-attach not required). The MS shall continue with the network initiated detach procedure.

The MS deletes the logical link.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS) or mode C if mode B is not supported.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = For Class B: 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' For Class C: ' GPRS Attach' Mobile identity = IMSI TMSI status (Class B) = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result for Class B = 'Combined GPRS / IMSI attached' Attach result for Class C: 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity (Class B)= TMSI-1 Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	MS		The MS initiates a GPRS detach (without power off) by MMI or AT command.
7	MS -> SS	DETACH REQUEST	Detach type for Class B = 'normal detach, combined GPRS / IMSI detach' Detach type for Class C = 'normal detach, GPRS detach'
8	SS -> MS	DETACH REQUEST	Detach type = 're-attach not required', GMM cause = 'GPRS services and non-GPRS services not allowed'
9	MS -> SS	DETACH ACCEPT	The MS answers the network initiated detach.
10	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
11	MS		No response from the MS to the request. This is checked for 10 s. For Class C MS, test is over.
12	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
13	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.

Specific message contents

None.

44.2.2.2 Network initiated GPRS detach procedure

44.2.2.2.1 GPRS detach / re-attach not required / accepted

44.2.2.2.1.1 Conformance requirement

The MS detach the IMSI for GPRS services.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.2.

44.2.2.2.1.2 Test purpose

To test the behaviour of the MS for the detach procedure.

44.2.2.2.1.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS performs a GPRS attach procedure.

The SS sends a DETACH REQUEST message to the MS. The MS then deletes the logical link.

The SS signal to the MS, but no response is received, as the signalling link is disconnected.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	SS		The SS is set in network operation mode II.
2	MS		The MS is set in MS operation mode B or C (see PICS).
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
7	SS -> MS	DETACH REQUEST	Detach type = 're-attach not required'
8	MS -> SS	DETACH ACCEPT	
9	SS -> MS		SS pages MS with Mobile identity = P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
10 optional	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS Attach' Mobile identity = P–TMSI-1
11	MS		No response from the MS to the request of step 9. This is checked for 10 s.

Specific message contents

None.

44.2.2.2.2 GPRS detach / rejected / IMSI invalid / GPRS services not allowed

44.2.2.2.2.1 Conformance requirement

1) If the network performs a GPRS detach procedure with the cause 'GPRS services not allowed', the Mobile Station shall consider SIM invalid for GPRS services until power is switched off or SIM is removed.

2) If the network performs a GPRS detach procedure with the cause 'GPRS services not allowed' the Mobile Station shall delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.2.

44.2.2.2.2.2 Test purpose

To test the behaviour of the MS if the network orders a GPRS detach procedure with the cause 'GPRS services not allowed' (no valid GPRS-subscription for the IMSI).

44.2.2.2.2.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1 (HPLMN) and cell B in MCC2/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- SIM removal possible without powering down (TSPC_AddInfo_SIMRmv).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The SS performs a detach with the cause value 'GPRS services not allowed'. The SS checks that the MS does not perform GPRS attach in another PLMN.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 22.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
7	SS -> MS	DETACH REQUEST	Detach type = 're-attach not required' Cause = 'GPRS services not allowed'
8	MS -> SS	DETACH ACCEPT	
			The following messages are sent and shall be received on cell B.
9	SS		The SS deactivates cell A and activates cell B.
10	MS		Cell B is preferred by the MS.
			Step 11 is only performed for MS Operation Mode B.
11		{Location Update Procedure}	Macro. Location Update Procedure initiated from the MS. Parameter mobile identity is IMSI.
12			The MS initiates an attach automatically (see PICS), by MMI or AT commands.
13	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
14	MS		If possible (see PICS) SIM removal is performed. Otherwise if possible (see PICS) switch off is performed. Otherwise the power is removed.
15	MS		The MS gets the SIM replaced, is powered up or switched on and initiates an attach (see PICS).
16	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
17	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2
18	MS -> SS	ATTACH COMPLETE	
19	MS		The MS is switched off or power is removed (see PICS).
20	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
21			The SS deactivates cell B and activates cell A.
22	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 20.

Specific message contents

None.

44.2.2.2.3 GPRS detach / IMSI detach / accepted

44.2.2.2.3.1 Conformance requirement

The MS detach the IMSI for GPRS services.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.2.

44.2.2.2.3.2 Test purpose

To test the behaviour of the MS for the detach procedure.

44.2.2.2.3.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS performs a combined GPRS attach procedure (for GPRS and non-GPRS services).

The SS sends a DETACH REQUEST message to the MS. The MS then performs an IMSI detach (detach for non-GPRS services).

The SS signal to the MS, but no response is received, as the signalling link is disconnected.

The MS attach for non-GPRS services by a routing area update procedure. Both GPRS and CS services are possible.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = IMSI Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS		The SS initiates a detach for non-GPRS services.
7	SS -> MS	DETACH REQUEST	Detach type = 'IMSI detach'
8	MS -> SS	DETACH ACCEPT	
9	MS		The MS initiates an attach for non-GPRS services (see PICS).
10	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'Combined RA/LA updating with IMSI attach' P-TMSI-1 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
11	SS -> MS	ROUTING AREA UPDATE ACCEPT	Update result = 'Combined RA/LA updating' Mobile identity = P-TMSI-2 P-TMSI-2 signature Mobile identity = TMSI-1 Routing area identity = RAI-1
12	MS -> SS	ROUTING AREA UPDATE COMPLETE	
13	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
14	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
15	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
16	MS		The MS is switched off or power is removed (see PICS).
17	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.2.2.4 GPRS detach / re-attach requested / accepted

44.2.2.2.4.1 Conformance requirement

When receiving the DETACH REQUEST message and the detach type IE indicates "re-attach required", the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The MS shall then send a DETACH ACCEPT message to the network and shall change state to GMM-DEREGISTERED. The MS shall, after the completion of the GPRS detach procedure, initiate a GPRS attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

A GPRS MS operating in MS operation mode A or B in network operation mode I, which receives an DETACH REQUEST message with detach type indicating "re-attach required" or "re-attach not required" and no cause code, is only detached for GPRS services in the network.

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Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.2.2.

44.2.2.2.4.2 Test purpose

To test the behaviour of the MS for the detach procedure in case automatic re-attach.

44.2.2.2.4.3 Method of test

Initial conditions

System Simulator:

One cell in operating in network operation mode I.

Mobile Station:

The MS has a valid TMSI(for Class B MS), P-TMSI and RAI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode C (TSPC_operation_mode_C)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS performs a combined GPRS attach procedure for Class B devices and a normal GPRS attach for Class C devices.

The SS sends a DETACH REQUEST message to the MS with cause re-attach. The MS then detaches for GPRS services. The MS automatically performs a new combined GPRS attach procedure with Attach Type “GPRS attach while IMSI attached” (for Class B) or normal GPRS Attach procedure for Class C devices. GPRS and CS (only for Class B) services are again possible.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS) or mode C if mode B is not supported.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = For Class B: 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' For Class C: ' GPRS Attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
4	SS -> MS	ATTACH ACCEPT	Attach result = For Class B: 'Combined GPRS / IMSI attached' For Class C: 'GPRS only attached' Mobile identity (for Class B) = TMSI-1 Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS		The SS initiates a detach with re-attach.
7	SS -> MS	DETACH REQUEST	Detach type = 're-attach required', GMM cause omitted
8	MS -> SS	DETACH ACCEPT	
9	MS -> SS	ATTACH REQUEST	Attach type = For Class B: 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' For Class C: ' GPRS Attach' Mobile identity = P-TMSI-2 Routing area identity = RAI-1
10	SS -> MS	ATTACH ACCEPT	Attach result = For Class B: 'Combined GPRS / IMSI attached' For Class C: 'GPRS only attached' Mobile identity (for Class B) = TMSI-1 Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
11	MS -> SS	ATTACH COMPLETE	
12	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
13	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request. For Class C MS, go to Step 17
14	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
15	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
16	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
17	MS		The MS is switched off or power is removed (see PICS).
18	MS -> SS	DETACH REQUEST	Message not sent if power is removed.

Specific message contents

None.

44.2.2.2.5 GPRS detach / rejected / location area not allowed

44.2.2.2.5.1 Conformance requirement

44.2.2.2.5.1.1 Conformance requirement for a R97 and R98 MS

1) If the network performs a GPRS detach procedure with the cause 'location area not allowed' the Mobile Station shall:

   1.1 not perform combined GPRS attach when in the same location area;

   1.2 delete any RAI or LAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number;

   1.3 store the LAI in the list of in the 'forbidden location areas for regional provision of service';

   1.4 delete any TMSI, LAI and ciphering key sequence number for GPRS MS operating in MS operation mode A or B.

2) If the network performs a GPRS detach procedure with the cause 'location area not allowed' the Mobile Station shall:

   2.1 perform combined GPRS attach when a new location area is entered;

   2.2 delete the list of forbidden LAs when power is switched off.

Reference(s):

3GPP TS 04.08 subclauses 4.7.4.2.

44.2.2.2.5.1.2 Conformance requirement for a R99 or later MS

1) If the network performs a GPRS detach procedure with the cause 'location area not allowed' the Mobile Station shall:

   1.1 not perform combined GPRS attach when in the same location area;

   1.2 delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number;

   1.3 store the LAI in the list of 'forbidden location areas for regional provision of service';

   1.4 delete any TMSI, LAI and ciphering key sequence number if the MS is IMSI attached and if no RR connection exists or if the MS is operating in MS operation mode A and an RR connection exists when the RR connection is subsequently released.

2) If the network performs a GPRS detach procedure with the cause 'location area not allowed' the Mobile Station shall:

   2.1 perform combined GPRS attach when a new location area is entered;

   2.2 delete the list of forbidden LAs when power is switched off.

Reference(s):

3GPP TS 24.008 subclauses 4.7.4.2.

44.2.2.2.5.2 Test purpose

To test the behaviour of the MS if the network orders the GPRS detach procedure with the cause 'Location Area not allowed'.

To test that the MS deletes the list of forbidden LAs when power is switched off.

44.2.2.2.5.3 Method of test

Initial conditions

System Simulator:

Three cells (not simultaneously activated), cell A in MCC2/MNC1/LAC1/RAC1 (Not HPLMN), cell B in MCC2/MNC1/LAC1/RAC2 (Not HPLMN), cell C in MCC2/MNC1/LAC2/RAC1 (Not HPLMN).

All cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode C (TSPC_operation_mode_C)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- GPRS attach attempted automatically due to outstanding request (TSPC_AddInfo_GPRS_Attach_Attempt_Outstanding).

PIXIT statements:

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Test procedure

The SS orders a GPRS detach with the cause value 'Location Area not allowed'. The SS checks that the MS does not perform (combined) GPRS attach while in the location area, performs GPRS attach when a new location area is entered and deletes the list of forbidden LAs when switched off. For Class B MS, CS services are not possible unless an IMSI attach procedure is performed.

Different types of MS may use different methods to periodically clear the list of forbidden location areas (e.g. every day at 12am). If the list is cleared while the test is being run, it may be necessary to re-run the test.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode B, or mode C if mode B is not supported (see PICS)
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type for Class B = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Attach type for Class C = ‘GPRS attach’ Mobile identity = IMSI TMSI status = no valid TMSI available (Class B Only)
5	SS -> MS	ATTACH ACCEPT	Attach result for Class B = 'Combined GPRS / IMSI attached' Attach Result for Class C = ‘GPRS Only attached’ Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-1 (Class B Only) Routing area identity = RAI-2
6	MS -> SS	ATTACH COMPLETE	

Step	Direction	Message	Comments
7	SS -> MS	DETACH REQUEST	Detach type = 're-attach not required' Cause 'Location Area not allowed'
8	MS -> SS	DETACH ACCEPT	
			For Class C MS, go to Step 12
9	MS		No LOCATION UPDATING REQ with type 'IMSI attach' is sent to the SS (SS waits 30 seconds).
10	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
11	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
12	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
13	MS -> SS		No response from the MS to the request. This is checked for 10 s
			The following messages are sent and shall be received on cell B.
14	SS		The SS deactivates cell A and activates cell B.
15	MS		Cell B is preferred by the MS.
16	MS		The MS initiates an attach automatically, by MMI or by AT command.
17	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds) For Class C MS, go to Step 21
18	MS		No LOCATION UPDATING REQ with type 'IMSI attach' is sent to the SS (SS waits 30 seconds).
19	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
20	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
21	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
22			No response from the MS to the request. This is checked for 10 s
			The following messages are sent and shall be received on cell C.
23	SS		The SS deactivates cell B and activates cell C.
24	MS		Cell C is preferred by the MS. Steps 25 and 26 are only performed by an MS which will not initiate a GPRS attach automatically due to outstanding request (see PICS) For Class C MS, go to Step 26
25 (conditional)		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is IMSI.
26 (conditional)	MS		MS initiates an attach via MMI or AT command.
27	MS -> SS	ATTACH REQUEST	Attach type for Class B = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Attach type for Class C = ‘GPRS attach’ Mobile identity = IMSI TMSI status = no valid TMSI available (Class B Only)

Step	Direction	Message	Comments
28	SS -> MS	ATTACH ACCEPT	Attach result for Class B = 'Combined GPRS / IMSI attached' Attach Result for Class C = ‘GPRS Only attached’ Mobile identity = P-TMSI1 P-TMSI-1 signature Mobile identity (for Class B)= TMSI-1 Routing area identity = RAI-6
29	MS -> SS	ATTACH COMPLETE	For Class C MS, go to Step 33
30	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
31	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
32	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
33	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
34	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
35	MS		The MS is switched off or power is removed (see PICS).
36	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type for Class B = 'power switched off, combined GPRS / IMSI detach' Detach type for Class C = 'power switched off, GPRS detach'
			The following messages are sent and shall be received on cell B.
37	MS		The SS deactivates cell C and activates cell B. Cell B is preferred by the MS.
38	MS		The MS is powered up or switched on. Step 39 is only performed for non-auto attach Class B MS.
39		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS. Parameter mobile identity is TMSI-1.
40	MS		MS initiates an attach automatically (see PICS), via MMI or AT commands.
41	MS -> SS	ATTACH REQUEST	Attach type for Class B = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Attach type for Class C = ‘GPRS attach’ Mobile identity = P-TMSI-1 Routing area identity = RAI-6
42	SS -> MS	ATTACH ACCEPT	Attach result for Class B = 'Combined GPRS / IMSI attached' Attach Result for Class C = ‘GPRS only attached Mobile identity = P-TMSI-2 P-TMSI-2 signature Mobile identity (for Class B)= TMSI-2 Routing area identity = RAI-7
43	MS -> SS	ATTACH COMPLETE	
			For Class C MS, go to Step 47
44	SS -> MS		SS pages the MS with mobile identity TMSI-2 and paging order for RR connection according to the channel combination of the cell.
45	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-2.

Step	Direction	Message	Comments
46	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
47	SS -> MS		SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
48	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
49	MS		The MS is switched off or power is removed (see PICS).
50	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type for Class B = 'power switched off, combined GPRS / IMSI detach' Detach type for Class C = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.2.2.6 GPRS detach / rejected / GPRS services not allowed in this PLMN

44.2.2.2.6.1 Conformance requirement

If the network performs a GPRS detach procedure with the cause 'GPRS services not allowed in this PLMN' the Mobile Station shall:

1. The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to section 4.1.3.2) and shall change to state GMM-DEREGISTERED.

2. The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list.

3. A GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

4. A GPRS MS operating in MS operation mode A or B, is still IMSI attached for CS services in the network.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.4.2.2

44.2.2.2.6.2 Test purpose

To test the behaviour of the MS if the network orders the GPRS detach procedure with the cause ' GPRS services not allowed in this PLMN.

44.2.2.2.6.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC2/LAC1/RAC1, cell B in MCC2/MNC1/LAC1/RAC1.

All two cells are operating in network operation mode.. The PLMN of the two cells should NOT be that of the Mobile Station Home PLMN.

Mobile Station:

The MS has a valid TMSI-1, P-TMSI-1 and RAI-8. MS is Idle Updated on Cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode C (TSPC_operation_mode_C) (only if mode B not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS orders a GPRS detach with the cause value ' GPRS services not allowed in this PLMN‘. The SS checks that the MS responds to RR paging (in case of MS operation mode B) and does not respond to packet paging, does not perform periodic ROUTING AREA UPDATE procedure in this PLMN and performs periodic ROUTING AREA UPDATE procedure when new PLMN is entered.

T3312: set to 6 minutes.

Maximum duration of test

20 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode B or C (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-8
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-8 T3312 = 6 minutes
6	MS -> SS	ATTACH COMPLETE	
7	SS -> MS	DETACH REQUEST	Cause = 'GPRS services not allowed in this PLMN'
8	MS -> SS	DETACH ACCEPT	
			Steps 9, 10 and 11 are only performed for MS Operation Mode B.
9	SS -> MS		SS pages the MS with mobile identity of TMSI-1 and paging order for RR connection according to the channel combination of the cell.
10	MS -> SS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
11	SS		SS releases the RR connection.
12			SS pages the MS with Mobile identity = P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
13			No response from the MS to the request. This is checked for 10 seconds.
14			No ROUTING AREA UPDATE REQUEST sent to the SS (SS waits Ready Timer Period (T3314) + Periodic Routing Area Updating timer (T3312) (+10%)).
			The following messages are sent and shall be received on cell B.
15	SS		The SS deactivates cell A and activates cell B.
16	MS		Cell B is preferred by the MS. Step 17 is only performed for MS Operation Mode B.
17		**{Location Update Procedure}**	Location Update Procedure initiated from the MS.
	MS		The MS initiates an attach automatically, by MMI or by AT command.
18	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
19	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-2 T3312 = 6 minutes
20	MS -> SS	ATTACH COMPLETE	
21	SS		The SS verifies that the time between the Attach and the periodic RA updating is Ready Timer Period (T3314) + Periodic Routing Area Updating timer (T3312) (+/- 10%)
22	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Periodic updating' P-TMSI-2 signature Routing area identity = RAI-2

23	SS -> MS	ROUTING AREA UPDATING ACCEPT	No new mobile identity assigned. P-TMSI and TMSI not included. Update result = 'RAupdated' Negotiated Ready timer value IE should not be included. Force to standby indicator set
24	MS		The MS is switched off or power is removed (see PICS).
25	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off,

Specific message contents

None.

44.2.3 Routing area updating procedure

This procedure is used to update the actual routing area of an MS in the network.

44.2.3.1 Normal routing area updating

The routing area updating procedure is a GMM procedure used by GPRS MSs of MS operation mode B or C that are IMSI attached for GPRS services only.

44.2.3.1.1 Routing area updating / accepted

44.2.3.1.1.1 Conformance requirement

1) If the network accepts the routing area updating procedure and reallocates a P-TMSI, the MS shall acknowledge the new P-TMSI and continue communication with the new P-TMSI.

2) If the network accepts the routing area updating procedure from the MS without reallocation of the old P-TMSI, the MS shall continue communication with the old P-TMSI.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.1.

44.2.3.1.1.2 Test purpose

To test the behaviour of the MS if the network accepts the routing area updating procedure.

The following cases are identified:

1) P-TMSI / P-TMSI signature is reallocated;

2) Old P-TMSI / P-TMSI signature is not changed.

44.2.3.1.1.3 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).

- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

1) The MS sends a ROUTING AREA UPDATE REQUEST message. The SS reallocates the P-TMSI and returns ROUTING AREA UPDATE ACCEPT message with a new P-TMSI. The MS acknowledge the new P-TMSI by sending ROUTING AREA UPDATING COMPLETE message. Further communication MS - SS is performed by the new P-TMSI. The MS will not answer signalling addressed to the old P-TMSI.

2) The MS sends a ROUTING AREA UPDATING REQUEST message. The SS accepts the P-TMSI and returns ROUTING AREA UPDATING ACCEPT message without any P-TMSI. Further communication MS - SS is performed by the P-TMSI.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A but not cell B.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 22.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
7	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
9	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
10	MS -> SS	ROUTING AREA UPDATING COMPLETE	
11	SS->MS	GMM INFORMATION	
11b	MS->SS	GMM STATUS	Message sent in case the MS does not support reception of GMM information message. Cause #97
12	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-2 Paging order is for TBF establishment.
13	MS		No response from the MS to the request. This is checked for 10 s.
			The following messages are sent and shall be received on cell A.
14	SS		The RF level of cell B is lowered until cell A is preferred by the MS.
15	MS		Cell A is preferred by the MS.
16	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-1 signature Routing area identity = RAI-4
17	SS -> MS	ROUTING AREA UPDATING ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-2 signature Routing area identity = RAI-1
18	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-1 Paging order is for TBF establishment.
19	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating paging response.
20	MS		The MS is switched off or power is removed (see PICS).
21	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
22	MS		The MS is set in MS operation mode B (see PICS), reset the RF level of Cell A to default state, deactivate Cell B and the test is repeated from step 3 to step 21.

Specific message contents

None.

44.2.3.1.1a Routing area updating / accepted / old P-TMSI

44.2.3.1.1a.1 Conformance requirement

Upon receipt of a GMM message containing a new P-TMSI the MS shall consider the new P-TMSI and new RAI and also the old P-TMSI and old RAI as valid in order to react to paging requests and downlink transmission of LLC frames.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.1.5.1.

44.2.3.1.1a.2 Test purpose

To test the validity of old and new P-TMSI the network accepts the routing area updating procedure.

44.2.3.1.1a.3 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS sends a ROUTING AREA UPDATE REQUEST message. The SS reallocates the P-TMSI and returns ROUTING AREA UPDATE ACCEPT message with a new P-TMSI. The MS acknowledge the new P-TMSI by sending ROUTING AREA UPDATING COMPLETE message. The MS will answer signalling addressed to the old P-TMSI and to the new P-TMSI. The SS sends a GMM INFORMATION MESSAGE. The MS will answer signalling addressed only to the new P-TMSI.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A but not cell B.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 23.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
7	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
9	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
10	MS -> SS	ROUTING AREA UPDATING COMPLETE	
11	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-2 Paging order is for TBF establishment.
12	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request. Message not ciphered
13	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-1 Paging order is for TBF establishment.
14	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request. Message not ciphered
15	SS->MS	GMM INFORMATION	
16	MS->SS	GMM STATUS	Message sent in case the MS does not support reception of GMM information message. Cause #97
17	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-2 Paging order is for TBF establishment.
18	MS		No response from the MS to the request. This is checked for 10 s.
19	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-1 Paging order is for TBF establishment.
20	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request. Message not ciphered
21	MS		The MS is switched off or power is removed (see PICS).
22	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

23	MS		The MS is set in MS operation mode B (see PICS), reset the RF level of Cell A to default state, deactivate Cell B and the test is repeated from step 3 to step 22.

Specific message contents

None.

44.2.3.1.2 Routing area updating / rejected / IMSI invalid / illegal ME

44.2.3.1.2.1 Conformance requirement

1) If the network rejects a routing area updating procedure from the Mobile Station with the cause 'Illegal ME', the Mobile Station shall consider SIM invalid for GPRS services until power is switched off or SIM is removed.

2) If the network rejects a routing area updating procedure from the Mobile Station with the cause 'Illegal ME', the Mobile Station shall delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.1.

44.2.3.1.2.2 Test purpose

To test the behaviour of the MS if the network rejects the routing area updating procedure of the MS with the cause 'Illegal ME'.

44.2.3.1.2.3 Method of test

Initial conditions

System Simulator:

Three cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2, cell C in MCC2/MNC1/LAC1/RAC1.

All three cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- SIM removal possible without powering down (TSPC_AddInfo_SIMRmv).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a routing area updating with the cause value 'Illegal ME'. The SS checks that the MS does not perform GPRS attach in the same or another PLMN.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI and P-TMSI signature not included. Attach result = 'GPRS only attached' Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included Force to standby indicator set
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		Cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' Routing area identity = RAI-1
9	SS -> MS	ROUTING AREA UPDATE REJECT	GMM cause = 'Illegal ME'
10	SS -> MS		SS page MS with Mobile identity = P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
11	MS		No response from the MS to the request. This is checked for 10 s.
			The following messages are sent and shall be received on cell C.
12	SS		The SS deactivates both cell A and cell B. The SS activates cell C.
13	MS		Cell C is preferred by the MS.
14	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
15	MS		If possible (see PICS) SIM removal is performed. Otherwise if possible (see PICS) switch off is performed. Otherwise the power is removed.
16	MS		The MS gets the SIM replaced, is powered up or switched on and initiates an attach (see PICS). Step 17 is only performed by MS in operation mode B
17		{Location Update Procedure}	Macro. Location Update Procedure initiated from the MS. Parameter mobile identity is IMSI.

Step	Direction	Message	Comments
18	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
19	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2
20	MS -> SS	ATTACH COMPLETE	
21	MS		The MS is switched off or power is removed (see PICS).
22	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.3.1.3 Routing area updating / rejected / MS identity cannot be derived by the network

44.2.3.1.3.1 Conformance requirement

If the network rejects a routing area updating procedure from the Mobile Station with the cause 'MS identity cannot be derived by the network', the Mobile Station shall delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature.

Depending on the manufacturer the MS may or may not perform a GPRS attach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.1.

44.2.3.1.3.2 Test purpose

To test the behaviour of the MS if the network rejects the routing area updating procedure of the MS with the cause 'MS identity cannot be derived by the network'.

44.2.3.1.3.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Automatic attach procedure when MS identity cannot be derived by the network (TSPC_AddInfo_auto_AP_no_MS ID).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a normal routing area updating with the cause value 'MS identity cannot be derived by the network'. The MS detach locally. A new GPRS attach may be performed.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C or B (see PICS).
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity =P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
7	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
8	MS		Cell B is preferred by the MS.
9	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
10	SS -> MS	ROUTING AREA UPDATE REJECT	GMM cause = 'MS identity cannot be derived by the network'
11	MS		If an automatic attach procedure by the MS is not possible when the MS identity cannot be derived by the network (see PICS) goto step 19.
12	MS		An Automatic GPRS attach procedure is initiated (see PICS).
13	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
14	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
15	MS -> SS	ATTACH COMPLETE	
16	MS		The MS is switched off or power is removed (see PICS).
17	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
18			Stop the sequence
19	SS -> MS		SS page MS with Mobile identity = P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
20	MS		No response from the MS to the request, as the MS has detached locally. This is checked for 10 s.

Specific message contents

None.

44.2.3.1.4 Routing area updating / rejected / location area not allowed

44.2.3.1.4.1 Conformance requirement

1) If the network rejects a routing area updating procedure from the Mobile Station with the cause 'location area not allowed' the Mobile Station shall:

   1.1 not perform GPRS attach when in the same location area;

   1.2 delete the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature;

   1.3 store the LA in the 'forbidden location areas for regional provision of service'.

2) If the network rejects a routing area updating procedure from the Mobile Station with the cause 'location area not allowed' the Mobile Station shall:

   2.1 perform GPRS attach when a new location area is entered;

   2.2 delete the list of forbidden LAs after switch off (power off).

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclauses 4.7.5.1.

44.2.3.1.4.2 Test purpose

To test the behaviour of the MS if the network rejects the routing area updating procedure of the MS with the cause 'Location Area not allowed'.

To test that the MS deletes the list of forbidden LAs when power is switched off.

44.2.3.1.4.3 Method of test

Initial conditions

System Simulator:

Three cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2, cell C in MCC1/MNC1/LAC2/RAC1.

All cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell C.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- SIM removal possible without powering down (TSPC_AddInfo_SIMRmv).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The SS rejects a routing area updating with the cause value 'Location Area not allowed'. The SS checks that the MS does not perform GPRS attach while in the location area, performs GPRS attach when a new location area is entered and deletes the list of forbidden LAs when switched off.

Different types of MS may use different methods to periodically clear the list of forbidden location areas (e.g. every day at 12 am). If the list is cleared while the test is being run, it may be necessary to re-run the test.

Maximum duration of test

15 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell C.
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 42.
2	SS		The SS activates cell C.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell C is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-3
6	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
7	SS		The SS deactivates cell C and activates cell B.
8	SS		Cell B is preferred by the MS.
9			The following step is only performed for MS Operation Mode B.
10		{Location Update Procedure}	Macro. Location Update Procedure initiated from the MS. Parameter mobile identity is IMSI.
11	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-1 signature Routing area identity = RAI-3
12	SS -> MS	ROUTING AREA UPDATE REJECT	GMM cause = 'Location Area not allowed'
13	SS -> MS		SS pages MS with Mobile identity = P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
14	MS		No response from the MS to the request. This is checked for 10 s.
15			The following messages are sent and shall be received on cell A.
16	SS		The SS deactivates cell B and activates cell A.
17	MS		Cell A is preferred by the MS.
18	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds)

Step	Direction	Message	Comments
19			The following messages are sent and shall be received on cell C.
20	SS		The SS deactivates cell A and activates cell C.
21	MS		Cell C is preferred by the MS.
22			The following step is only performed for MS Operation Mode B.
23		{Location Update Procedure}	Macro. Location Update Procedure initiated from the MS. Parameter mobile identity is IMSI.
	MS		The MS initiates a GPRS attach either automatically or manually (see PICS).
24	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
25	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-3
26	MS -> SS	ATTACH COMPLETE	If SIM removal is possible (see PICS), perform steps 27A, 28A-1, 28A-2. Otherwise if switch off is possible (see PICS) perform steps 27B, 28B. Otherwise perform step 27C.
27A	MS		SIM removal is performed.
28A-1	MS -> SS	DETACH REQUEST	Detach type = Normal Detach, 'GPRS detach' or ‘power switched off, GPRS detach’
28A-2	SS -> MS	DETACH ACCEPT	
27B	MS		Switch off is performed.
28B	MS -> SS	DETACH REQUEST	Detach type = 'power switched off, GPRS detach'
27C	MS		Power is removed.
29	MS		The MS gets the SIM replaced, is powered up or switched on and initiates an attach (see PICS).
30	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-2 Routing area identity = RAI-3
31	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-3
32	MS -> SS	ATTACH COMPLETE	
33	SS		The following messages are sent and shall be received on cell A.
34			The SS deactivates cell C and activates cell A.
35			Cell A is preferred by the MS.
36			The following step is only performed for MS Operation Mode B.
37		{Location Update Procedure}	Macro. Location Update Procedure initiated from the MS. Parameter mobile identity is IMSI.
38	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-1 signature Routing area identity = RAI-3
39	SS -> MS	ROUTING AREA UPDATE ACCEPT	No new mobile identity assigned. P-TMSI and P-TMSI signature not included. Update result = 'RA updated' Routing area identity = RAI-1 Negotiated Ready Timer IE is not included Force to standby indicator set
40	MS		The MS is switched off or power is removed (see PICS).
41	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
42	MS		The MS is set in MS operation mode B (see PICS), cell A is switched off and the test is repeated from step 2 to step 41.

Specific message contents

None.

44.2.3.1.5 Routing area updating / abnormal cases / attempt counter check / miscellaneous reject causes

44.2.3.1.5.1 Conformance requirement

1) When a routing area updating procedure is rejected with the routing area updating attempt counter less than five, the Mobile Station shall repeat the routing area updating procedure after T3311 timeout.

2) When a routing area updating procedure is rejected with the routing area updating attempt counter five, the Mobile Station shall start timer T3302.

3) When the T3302 expires, a new routing area updating procedure shall be initiated.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.1.

44.2.3.1.5.2 Test purpose

To test the behaviour of the MS with respect to the routing area updating attempt counter.

44.2.3.1.5.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2. T3302 is set to 12 minutes. The ATT-flag shall indicate that the MS should use IMSI attach/detach procedures.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS has a valid IMSI and is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS initiates a routing area updating procedure (routing area updating attempt counter zero). The SS rejects the routing area updating procedure with a GMM cause 'congestion' code. The routing area updating attempt counter is incremented and T3311 is started.

The MS initiates a new routing area updating procedure (routing area updating attempt counter one) after T3311 expires. The SS rejects the routing area updating procedure with a GMM cause 'congestion' code. The routing area updating attempt counter is incremented and T3311 is started.

The MS initiates a new routing area updating procedure (attempt counter two) after T3311 expires. The SS rejects the routing area updating procedure with a GMM cause 'congestion' code. The routing area updating attempt counter is incremented and T3311 is started.

The MS initiates a new routing area updating procedure (attempt counter three) after T3311 expires. The SS rejects the routing area updating procedure with a GMM cause 'congestion' code. The routing area updating attempt counter is incremented and T3311 is started.

The MS initiates a new routing area updating procedure (attempt counter four) after T3311 expires. The SS rejects the routing area updating procedure with a GMM cause 'congestion' code. The routing area updating attempt counter is incremented but T3311 is not started, as the routing area updating attempt counter is five. T3302 is started.

The MS initiates a routing area updating procedure with routing area updating attempt counter zero after T3302 expires with the stored P-TMSI, P-TMSI signature, GPRS CKSN and RAI.

Maximum duration of test

15 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4			The following step is only performed for MS Operation Mode B.
5		{Location Update Procedure}	Macro. Location Update Procedure initiated from the MS. Location updating type = "IMSI Attach". Parameter mobile identity is IMSI. T3212 is started at the end of the procedure.
6	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
7	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI not included. Attach result = 'GPRS only attached' P-TMSI-2 signature Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included. Force to standby indicator set
8			The following messages are sent and shall be received on cell B.
9	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
10	SS		Cell B is preferred by the MS.
11	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
12	SS -> MS	ROUTING AREA UPDATE REJECT	GMM cause = 'Congestion'
13	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
14	SS		The SS verifies that the time between the routing area update reject and the routing area update request is T3311 (+/- 10%)
15	SS -> MS	ROUTING AREA UPDATE REJECT	GMM cause = 'Congestion'
16	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1

Step	Direction	Message	Comments
17	SS		The SS verifies that the time between the previous routing area update reject and the previous routing area update request is T3311 (+/- 10%)
18	SS -> MS	ROUTING AREA UPDATE REJECT	GMM cause = 'Congestion'
19	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
20	SS		The SS verifies that the time between the previous routing area update reject and the previous routing area update request is T3311 (+/- 10%)
21	SS -> MS	ROUTING AREA UPDATE REJECT	GMM cause = 'Congestion'
22	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
23	SS		The SS verifies that the time between the previous routing area update reject and the previous routing area update request is T3311 (+/- 10%)
24	SS -> MS	ROUTING AREA UPDATE REJECT	GMM cause = 'Congestion'
25	SS		The SS verifies that the MS does not attempt to initiate a RAU procedure for T3302 (+/- 10%).
26			The following step is only performed for MS Operation Mode B.
27		{Location Update Procedure}	Macro. Location Update Procedure initiated from the MS when T3212 expires. Location updating type Periodic Updating". Parameter mobile identity is IMSI.
28	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
29	SS -> MS	ROUTING AREA UPDATE ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-2 P-TMSI-3 signature Routing area identity = RAI-4
30	MS -> SS	ROUTING AREA UPDATE COMPLETE	
31	MS		The MS is switched off or power is removed (see PICS).
32	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach' An IMSI Detach must be performed for an MS in Operation Mode B either before or after the GPRS Detach. If an IMSI Detach is performed before the GPRS Detach then the following also applies: - The MS performs a GPRS Suspension Procedure in order to send the IMSI Detach while still attached for GPRS Services. - The SS must include the Resumption IE in the subsequent Channel Release to allow resumption of the GMM context so GPRS Detach can be performed

Specific message contents

SYSTEM INFORMATION TYPE 3 (Cell A):

Information element	Value/remark
As default message contents except:	
Control Channel Description T3212 timeout value	 12 min

Note: An R97 MS will use this value to set T3302.

ATTACH ACCEPT and ROUTING AREA UPDATE REJECT:

Information Element	Value/remark
As default message contents except: T3302 value	 12 min

Note: This IE is only read by MS's supporting R99 and onwards.

44.2.3.1.6 Routing area updating / abnormal cases / change of cell into new routing area

44.2.3.1.6.1 Conformance requirement

When a change of cell into a new routing area is performed before the routing area updating procedure is finished, the MS shall abort the routing area updating procedure and re-initiate it in the new routing area.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.1.

44.2.3.1.6.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.3.1.6.3 Method of test

Initial conditions

System Simulator:

Three cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2 and cell C In MCC1/MNC1/LAC1/RAC3.

All cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS initiates a routing area updating procedure. The ROUTING AREA UPDATE ACCEPT message is delayed from the SS. The MS performs a cell update into a new routing area. The MS shall re-initiate a routing area updating procedure in the new routing area.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 18.
2	SS		The SS activates cell A, B and C. The RF level of cell A is –50 dBm, cell B – 60 dBm and cell C – 70 dBm.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
7			Wait 30 sec to let the MS identify the neighbour cells B and C.
			The following messages are sent and shall be received on cell B.
8	SS		The RF level of cell A is lowered to –100 dBm.
9	SS		Cell B is preferred by the MS.
10	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
11	SS		No response to the ROUTING AREA UPDATING REQUEST message is given by the SS
			The following messages are sent and shall be received on cell C.
12	SS		The RF level of cell B is lowered to –100 dBm.
			The following message may be sent and shall be received on cell B.
13 Optional step	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
14	SS		Cell C is preferred by the MS.
15	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
16	SS -> MS	ROUTING AREA UPDATE ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-2 P-TMSI-3 signature Routing area identity = RAI-5
17	MS -> SS	ROUTING AREA UPDATE COMPLETE	
18	MS		The MS is switched off or power is removed (see PICS).
19	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
20	SS		The SS is set in network operation mode II.
21	MS		The MS is set in MS operation mode B (see PICS), and the test is repeated from step 2 to step 19.

Specific message contents

None.

44.2.3.1.7 Routing area updating / abnormal cases / change of cell during routing area updating procedure

44.2.3.1.7.1 Conformance requirement

When a change of cell within a new routing area is performed before the routing area updating procedure is finished, the MS shall perform the cell update before the routing area updating procedure is finished.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.1.

44.2.3.1.7.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.3.1.7.3 Method of test

Initial conditions

System Simulator:

Three cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2 and cell C in MCC1/MNC1/LAC1/RAC2.

All three cells are operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C) (only if mode B not supported).
- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS initiates a routing area updating procedure. The ROUTING AREA UPDATE ACCEPT message is delayed from the SS. The MS performs a cell update within the routing area. The MS then waits for the ROUTING AREA UPDATE ACCEPT message.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	SS		The SS activates cell A, B and C. The RF level of cell A is –50 dBm, cell B – 60 dBm and cell C – 70 dBm.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach result = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI-1 included. Attach result = 'GPRS only attached' P-TMSI-2 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
7			Wait 30 sec to let the MS identify the neighbour cells B and C.
			The following messages are sent and shall be received on cell B.
8	SS		The RF level of cell A is lowered to –100 dBm.
9	SS		Cell B is preferred by the MS.
10	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
11	SS		No response to the ROUTING AREA UPDATE REQUEST message is given by the SS
			The following messages are sent and shall be received on cell C.
12	SS		The RF level of cell B is lowered to –100 dBm.
			The following message may be sent and shall be received on cell B.
13 Optional step	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
14	SS		Cell C is preferred by the MS.
15	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating cell update.
16 Optional step	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1
17	SS -> MS	ROUTING AREA UPDATE ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-2 P-TMSI-3 signature Routing area identity = RAI-4
18	MS -> SS	ROUTING AREA UPDATE COMPLETE	
19	MS		The MS is switched off or power is removed (see PICS).
20	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.3.1.8 Routing area updating / abnormal cases / P-TMSI reallocation procedure collision

44.2.3.1.8.1 Conformance requirement

When a P-TMSI REALLOCATION COMMAND message is received by the MS while waiting for a ROUTING AREA UPDATE ACCEPT message, the MS shall ignore the P-TMSI reallocation procedure and continue with the routing area updating procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.1.

44.2.3.1.8.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.3.1.8.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1 and cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS initiates a routing area updating procedure. The SS does not answer the routing area updating procedure, but initiates a P-TMSI reallocation procedure. The MS shall ignore the P-TMSI reallocation procedure and continue with the routing area updating procedure.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C or B (see PICS).
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS). Cell A is preferred by the MS.
4	MS -> SS	ATTACH REQUEST	Attach result = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
6	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
7	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
8	SS		Cell B is preferred by the MS.
9	MS -> SS	ROUTING AREA UPDATE REQUEST	Update type = 'RA updating' P-TMSI-1 signature Routing area identity = RAI-1
10	SS -> MS	P-TMSI REALLOCATION COMMAND	Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
11	MS		The MS ignores the P-TMSI reallocation command.
12	SS -> MS	ROUTING AREA UPDATE ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-4
13	MS -> SS	ROUTING AREA UPDATE COMPLETE	
14	MS		The MS is switched off or power is removed (see PICS).
15	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.3.2 Combined routing area updating

The combined routing area updating procedure is a GMM procedure used by GPRS MSs of MS operation mode A or B that are IMSI attached for GPRS and non-GPRS services. In order to use the combined routing area updating procedure, the network must operate in network operation mode I.

44.2.3.2.1 Combined routing area updating / combined RA/LA accepted

44.2.3.2.1.1 Conformance requirement

1) If the network accepts the combined routing area updating procedure and reallocates a P-TMSI, the MS shall acknowledge the new P-TMSI and continue communication with the new P-TMSI.

2) If the network accepts the combined routing area updating procedure from the MS without reallocation of the old P-TMSI, the MS shall continue communication with the old P-TMSI.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.1.2 Test purpose

To test the behaviour of the MS if the network accepts the combined routing area updating procedure.

The following cases are identified:

1) P-TMSI / P-TMSI signature is reallocated;

2) Old P-TMSI / P-TMSI signature is not changed;

3) Mobile terminating CS call is allowed with IMSI;

4) Mobile terminating CS call is allowed with TMSI.

44.2.3.2.1.3 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

1) A combined GPRS attach procedure is performed. The MS sends a ROUTING AREA UPDATE REQUEST message. The SS reallocates the P-TMSI, unassigns the TMSI and returns ROUTING AREA UPDATE ACCEPT message with a new P-TMSI and IMSI. The MS acknowledge the new P-TMSI by sending ROUTING AREA UPDATING COMPLETE message. Further communication MS - SS is performed by the new P-TMSI. For CS calls, the IMSI is used.

2) The MS is CS paged in order to verify that the IMSI is used for CS calls.

3) The MS sends an ROUTING AREA UPDATING REQUEST message. The SS accepts the P-TMSI signature and returns ROUTING AREA UPDATING ACCEPT message without any P-TMSI and with a new TMSI. The MS acknowledge the new TMSI by sending ROUTING AREA UPDATING COMPLETE message. Further communication MS-SS is performed by the old P-TMSI. For CS calls, the new TMSI is used.

4) The MS is CS paged in order to verify that the TMSI is used for CS calls.

Maximum duration of test

15 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
8	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = IMSI Routing area identity = RAI-4
9	MS -> SS	ROUTING AREA UPDATING COMPLETE	
10	SS->MS	GMM INFORMATION	Message sent with P-TMSI-1
10b Optional	MS->SS	GMM STATUS	Message sent in case the MS does not support reception of GMM information message. Cause #97
11	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
12	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
13	SS -> MS		SS pages the MS with mobile identity IMSI and paging order for RR connection according to the channel combination of the cell.
14	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity IMSI.
15	SS		SS releases the RR connection indicating a successful resumption of GPRS services.

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
16	SS		The RF level of cell A is increased and the RF level of cell B is lowered until cell A is preferred by the MS.
17	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-1 signature Routing area identity = RAI-4 TMSI status = no valid TMSI available
18	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' No P-TMSI Mobile identity = TMSI-1 Routing area identity = RAI-1
19	MS -> SS	ROUTING AREA UPDATING COMPLETE	
20	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
21	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
22	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
23	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
24	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
25	SS -> MS		SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
26	MS		No response from the MS to the request. This is checked for 10 s.
27	MS		The MS is switched off or power is removed (see PICS).
28	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.3.2.2 Combined routing area updating / MS in CS operation at change of RA

44.2.3.2.2.1 Conformance requirement

GPRS MS that is in an ongoing CS transaction at change of routing area shall initiate the routing area updating procedure only after the CS transaction has been released.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.2.2 Test purpose

To test the behaviour of the MS when using the combined routing area updating procedure in cases where the MS is CS connected at change of RA.

44.2.3.2.2.3 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

A combined GPRS attach procedure is performed. The MS initiates a CS call. The routing area change. MS will not send a ROUTING AREA UPDATE REQUEST message until the CS operation is terminated.

Maximum duration of test

15 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	MS		A CS call is initiated.
7	SS		Activate cell B with the same signal strength as cell A.
8	SS -> MS		Handover commanded by SS on to DCCH of cell B The following messages are sent and shall be received on cell B.
9	MS		No RA updating procedure is initiated. This is checked for 60 seconds.
10	MS		The CS call is terminated
11	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating ~~with IMSI attach'~~ P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
12	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = IMSI Routing area identity = RAI-4
13	MS -> SS	ROUTING AREA UPDATING COMPLETE	
14	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
15	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
16	SS -> MS		SS pages the MS with mobile identity IMSI and paging order for RR connection according to the channel combination of the cell.
17	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity IMSI.
18	SS		SS releases the RR connection.
19	MS		The MS is switched off or power is removed (see PICS).
20	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.3.2.3 Combined routing area updating / RA only accepted

44.2.3.2.3.1 Conformance requirement

1) If the network accepts the combined routing area updating procedure, but GMM cause code 'IMSI unknown in HLR' is sent to the MS the Mobile Station shall delete the stored TMSI, LAI and CKSN. The Mobile Station shall consider SIM invalid for non-GPRS services until power is switched off or SIM is removed.

2) If the network accepts the combined routing area updating procedure, but GMM cause code 'MSC temporarily not reachable', or 'Network failure' is sent to the MS, an MS operation mode B MS may perform an MM IMSI attach procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.3.2 Test Purpose

Test purpose 1

To test the behaviour of the MS if the network accepts the routing area updating procedure with indication RA only, GMM cause 'IMSI unknown in HLR'.

Test purpose 2

To test the behaviour of the MS if the network accepts the routing area updating procedure with indication RA only, GMM cause 'MSC temporarily not reachable', or 'Network failure'.

44.2.3.2.3.3 Method of test

44.2.3.2.3.3.1 Test Procedure 1

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

After attach, the MS sends an ROUTING AREA UPDATE REQUEST message. The SS allocates a P-TMSI and returns ROUTING AREA UPDATE ACCEPT message with a P-TMSI. GMM cause 'IMSI unknown in HLR' is indicated from SS. Further communication MS - SS is performed by the P-TMSI. CS services are not possible.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
8	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 GMM cause = 'IMSI unknown in HLR'
9	MS -> SS	ROUTING AREA UPDATING COMPLETE	
10	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
11	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
12	SS -> MS		SS pages the MS with mobile identity IMSI and paging order for RR connection according to the channel combination of the cell.
13	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
14	MS		The MS is switched off or power is removed (see PICS).
15	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.3.2.3.3.2 Test Procedure 2

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells operating in network operation mode I. T3212 is set to 6 minutes.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode A (TSPC_operation_mode_A).
- Automatic MM IMSI attach procedure at switch-on/power-on (TSPC_AddInfo_auto_MM_IMSI_AP_on_off).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

After attach, the MS sends an ROUTING AREA UPDATE REQUEST message . The SS allocates a new P-TMSI signature and returns ROUTING AREA UPDATE ACCEPT message. GMM cause 'MSC temporarily not reachable', or 'Network failure' is indicated from SS. The cause code is arbitrarily chosen. This procedure is repeated until the routing area updating attempt counter is equal to five. An MS operation mode B MS may perform an MM IMSI attach procedure (according to the PICS statement). Further communication MS - SS is performed by the P-TMSI. The existence of a signalling channel is verified by a request for mobile identity. It is further verified that the MS after a successful IMSI attach procedure can perform CS services.

Maximum duration of test

10 minutes.

Expected sequence

Dependent whether the option Automatic MM IMSI attach procedure at switch-on/power-on ' is supported or not, the steps 1-28 or 29-62 apply depending on manufacturer (see PICS).

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A
1	MS		The MS is set in MS operation mode B and no automatic MM IMSI attach procedure is indicated (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
8	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
9	MS -> SS	ROUTING AREA UPDATING COMPLETE	
10			The routing area updating attempt counter =1. The combined routing area updating procedure is reinitialized at the expiry of T3311
11	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI Attach' P-TMSI-1 signature Routing area identity = RAI-4 TMSI status = no valid TMSI available
12	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
13	MS -> SS	ROUTING AREA UPDATING COMPLETE	
14			The routing area updating attempt counter =2. The combined routing area updating procedure is reinitialized at the expiry of T3311
15	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI Attach' P-TMSI-1 signature Routing area identity = RAI-4 TMSI status = no valid TMSI available
16	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
17	MS -> SS	ROUTING AREA UPDATING COMPLETE	

Step	Direction	Message	Comments
18			The routing area updating attempt counter =3. The combined routing area updating procedure is reinitialized at the expiry of T3311
19	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI Attach' P-TMSI-1signature Routing area identity = RAI-4 TMSI status = no valid TMSI available
20	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
21	MS -> SS	ROUTING AREA UPDATING COMPLETE	
22			The routing area updating attempt counter =4. The combined routing area updating procedure is reinitialized at the expiry of T3311
23	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI Attach' P-TMSI-1 signature Routing area identity = RAI-4 TMSI status = no valid TMSI available
24	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
25	MS -> SS	ROUTING AREA UPDATING COMPLETE	
26			The routing area updating attempt counter =5. It is verified for 30 seconds that the combined routing area updating procedure is not reinitialized.
27	MS		The MS is switched off or power is removed (see PICS).
28	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Stop the sequence.
29			The following messages are sent and shall be received on cell B
30	MS		The MS is set in MS operation mode B and Automatic MM IMSI attach procedure is indicated (see PICS).
31	MS		The MS is powered up or switched on and initiates an attach (see PICS).
32	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI TMSI status = no valid TMSI available
33	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-4
34	MS -> SS	ATTACH COMPLETE	
35			The following messages are sent and shall be received on cell A.
36	SS		Activate cell A with a lower signal strength than cell B. The RF level of cell B is lowered until cell A is preferred by the MS.
37	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-4 TMSI status = no valid TMSI available

Step	Direction	Message	Comments
38	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
39	MS -> SS	ROUTING AREA UPDATING COMPLETE	
40			The routing area updating attempt counter =1. The combined routing area updating procedure is reinitialized at the expiry of T3311
41	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI Attach' P-TMSI-1 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
42	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
43	MS -> SS	ROUTING AREA UPDATING COMPLETE	
44			The routing area updating attempt counter =2. The combined routing area updating procedure is reinitialized at the expiry of T3311
45	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI Attach' P-TMSI-1 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
46	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
47	MS -> SS	ROUTING AREA UPDATING COMPLETE	
48			The routing area updating attempt counter =3. The combined routing area updating procedure is reinitialized at the expiry of T3311
49	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI Attach' P-TMSI-1 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
50	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
51	MS -> SS	ROUTING AREA UPDATING COMPLETE	
52			The routing area updating attempt counter =4. The combined routing area updating procedure is reinitialized at the expiry of T3311
53	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI Attach' P-TMSI-1 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available

Step	Direction	Message	Comments
54	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' No new P-TMSI is assigned Routing area identity = RAI-1 GMM cause = 'MSC temporarily not reachable', or 'Network failure' (arbitrarily chosen)
55			The routing area updating attempt counter =5.
56 (optional step)	MS	**{Location Update Procedure}**	Macro. Location Update Procedure may be initated from the MS. Parameter mobile identity is TMSI-1. Steps 57, 58 and 59 are only performed if the MS has performed the Location Update Procedure in step 56.
57	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
58	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
59	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
60	MS		The MS is switched off or power is removed (see PICS).
61	MS -> SS	DETACH REQUEST	Message not sent if power is removed.

Specific message contents

SYSTEM INFORMATION TYPE 3 (Cell A) in Test Procedure 2:

Information element	Value/remark
As default message contents except:	
Control Channel Description T3212 timeout value	 6 min

Note: An R97 MS will use this value to set T3302.

ATTACH ACCEPT and ROUTING AREA UPDATE ACCEPT in Test Procedure 2:

Information Element	Value/remark
As default message contents except: T3302 value	 6 min

Note: This IE is only read by MS's supporting R99 and onwards.

44.2.3.2.4 Combined routing area updating / rejected / PLMN not allowed

44.2.3.2.4.1 Conformance requirement

1) If the network rejects a combined routing area updating procedure from the Mobile Station with the cause 'PLMN not allowed' the Mobile Station shall:

   1.1. not perform combined GPRA attach when switched on in the same location area or PLMN;

   1.2. delete the stored RAI, GPRS-CKSN, P-TMSI, P-TMSI signature, TMSI CKSN and LAI;

   1.3. store the PLMN in the 'forbidden PLMN list'.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.4.2 Test purpose

To test the behaviour of the MS if the network rejects the combined routing area updating procedure of the MS with the cause 'PLMN not allowed'.

44.2.3.2.4.3 Method of test

Initial conditions

System Simulator:

Four cells (not simultaneously activated), cell A in MCC1/MNC2/LAC1/RAC1, cell B in MCC1/MNC2/LAC1/RAC2, cell C in MCC1/MNC2/LAC2/RAC1 and cell D in MCC2/MNC1/LAC1/RAC1.

All four cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- GPRS attach attempted automatically due to outstanding request (TSPC_AddInfo_GPRS_Attach_Attempt_Outstanding).

PIXIT statements:

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Test Procedure

The SS rejects a combined routing area updating with the cause value 'PLMN not allowed'. The SS checks that the MS does not perform GPRS attach if activated in the same PLMN. The SS checks that the MS does not perform IMSI attach if activated in the same PLMN.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS.
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-8 Mobile identity = TMSI-1
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		Cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-8
9	SS -> MS	ROUTING AREA UPDATING REJECT	GMM cause = 'PLMN not allowed'
10	MS		The MS initiates an attach by MMI or AT command.
11	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
12	SS -> MS		SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
13	MS		No response from the MS to the request. This is checked for 10 s.
			The following messages are sent and shall be received on cell C.
14	SS		The SS deactivates cell B and activates cell C.
15	MS		Cell C is preferred by the MS.
16	MS		The MS initiates an attach by MMI or by AT command.
17	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
18	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
19	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
			The following messages are sent and shall be received on cell A.
20	SS		The SS deactivates cell C and activates cell A.
21	MS		Cell A is preferred by the MS.
22	MS		The MS initiates an attach by MMI or by AT command.
23	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
24	SS -> MS		SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
25	MS		No response from the MS to the request. This is checked for 10 s.

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell D.
26	SS		The SS deactivates cell A and activates cell D.
27	MS		Cell D is preferred by the MS.
			Steps 28 and 29 are only performed by an MS which will not initiate a GPRS attach automatically due to outstanding request (see PICS)
28 (conditional)		**{Location Update Procedure}**	Macro. Location Update Procedure initated from the MS.
29 (conditional)	MS		MS initiates an attach via MMI or AT commands.
30	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
31	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2 Mobile identity = IMSI
32	MS -> SS	ATTACH COMPLETE	
33	MS		The MS is switched off or power is removed (see PICS).
34	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.3.2.5 Combined routing area updating / rejected / roaming not allowed in this location area

44.2.3.2.5.1 Conformance requirement

For a R97 and R98 MS only:

1) If the network rejects a combined routing area updating procedure from the Mobile Station with the cause 'roaming not allowed in this location area' the Mobile Station:

   1.1 shall not perform combined GPRS attach when in the same location area;

   1.2 shall delete the stored RAI, GPRS-CKSN, P-TMSI P-TMSI signature, TMSI, CKSN and LAI;

   1.3 shall store the LA in the 'forbidden location areas for roaming';

   1.4 may perform combined GPRS attach when a new location area is entered.

2) The mobile station shall reset the list of 'Forbidden location areas for roaming' when switched off or when the SIM is removed.

For a R99 or later MS only:

1) If the network rejects a combined routing area updating procedure from the Mobile Station with the cause 'roaming not allowed in this location area' the Mobile Station:

   1.1 shall not perform combined GPRS attach when in the same location area;

   1.2 shall store the LA in the 'forbidden location areas for roaming';

1.3 shall perform a routing area update when entering in a new location area if the LAI or the PLMN identity is not contained in any of the lists "forbidden LAs for roaming", "forbidden LAs for regional provision of service", "forbidden PLMNs for GPRS service" or "forbidden PLMNs" and the current update status is different from "IDLE NO IMSI".

2) The mobile station shall reset the list of 'Forbidden location areas for roaming' when switched off or when the SIM is removed.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

Additional references for R99 or after MS only, TS 23.122 subclause 4.5.2.

44.2.3.2.5.2 Test purpose

Test purpose 1

To test that on receipt of a rejection using the 'Roaming not allowed in this area' cause code, the MS ceases trying a routing area updating procedure on that location area. Successful combined routing area updating procedure is possible in other location areas.

Test purpose 2

To test that if the MS is switched off or the SIM is removed the list of 'forbidden location areas for roaming' is cleared.

44.2.3.2.5.3 Method of test

44.2.3.2.5.3.1 Test procedure 1

Initial conditions

System Simulator:

Two cells, cell A in MCC2/MNC1/LAC1/RAC1 (RAI-2), cell B in MCC2/MNC1/LAC2/RAC1 (RAI-6).

Both cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- GPRS attach attempted automatically due to outstanding request (TSPC_AddInfo_GPRS_Attach_Attempt_Outstanding).
- MS Higher Layer release (TSPC_MS_HIGHER_LAYER_RELEASE)

PIXIT statements:

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Test procedure

The SS rejects a combined routing area updating with the cause value 'Roaming not allowed in this area'. A new attempt for a combined GPRS attach is not possible.

For a R97 and R98 MS only, successful combined GPRS attach procedure is performed in another location area.

For a R99 or after MS only, successful combined routing area updating procedure is performed in another location area.

The MS is moved back to the 1st location area. A combined routing area updating shall not be performed, as the LA is on the forbidden list.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS.
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-2 Mobile identity = TMSI-1
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		Cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-2 The RF level of cell A is lowered until cell A is no more suitable.
9	SS -> MS	ROUTING AREA UPDATING REJECT	GMM cause = 'Roaming not allowed in this area'
10	MS		The MS initiates an attach by MMI or by AT command. This step is only performed for a R97 and R98 mobile.
11	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds). This step is only performed for a R97 and R98 mobile.
12	SS -> MS		SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
13	MS		No response from the MS to the request. This is checked for 10 s.
14	SS -> MS		SS pages the MS with mobile identity TMSI and paging order for RR connection according to the channel combination of the cell.
15	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
			The following messages are sent and shall be received on cell A.
16	SS		The RF level of cell A is increased and the RF level of cell B is lowered until cell A is preferred by the MS.
17	MS		Cell A is preferred by the MS.
18 (optional)		**{Location Update Procedure}**	Macro. Location Update Procedure initiated from the MS. Step 19 is performed by an MS which will not initiate a GPRS attach automatically due to outstanding request (see PICS).
A19 (conditional)	MS		MS initiates an attach via MMI or AT commands. This step is only performed for a R97 and R98 mobile.

Step	Direction	Message	Comments
A20	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available (See note)
A21	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2 Mobile identity = TMSI-1
A22	MS -> SS	ATTACH COMPLETE	
B20	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' or 'Combined RA/LA updating with IMSI attach' P-TMSI-2 signature Routing area identity = RAI-2 (See note)
B21	SS -> MS	ROUTING AREA UPDATE ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-2 Mobile identity = TMSI-1
B22	MS -> SS	ROUTING AREA UPDATE COMPLETE	
23	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
24	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
25	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
26	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
27	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
			The following messages are sent and shall be received on cell B.
28	SS		The RF level of cell B is increased and the RF level of cell A is lowered until cell B is preferred by the MS.
29	MS		No ROUTING AREA UPDATING REQUEST sent to SS (SS waits 30 seconds).
30	SS -> MS		SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
31	MS		No response from the MS to the request. This is checked for 10 s.
NOTE: An R97 and R98 MS follows the steps in the order specified as A. An R99 or later MS follows the steps in the order specified as B.			

Specific message contents

None.

44.2.3.2.5.3.2 Test procedure 2

Initial conditions

System Simulator:

Two cells, cell A in MCC2/MNC1/LAC1/RAC1, cell B in MCC2/MNC1/LAC2/RAC1.

Both cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- SIM removal possible without powering down (TSPC_AddInfo_SIMRmv).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- MS Higher Layer release (TSPC_MS_HIGHER_LAYER_RELEASE).

PIXIT statements:

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Test procedure

The SS rejects a combined routing area updating with the cause value 'Roaming not allowed in this area'. The MS is switched off for 10 s and switched on again. The SS checks that a combined GPRS attach is possible on the cell on which the previous combined routing area updating had been rejected.

For a R97 and R98 MS only, the Mobile identity is IMSI for the combined GPRS attach.

For a R99 or after MS only, the Mobile identity is either IMSI or P-TMSI for the combined GPRS attach.

If SIM removal is possible without switching off: The SS rejects a routing area updating with the cause value 'Roaming not allowed in this area'. The SIM is removed and inserted in the MS. The SS checks that a GPRS attach procedure and routing area updating procedure is possible on the cell on which the routing area updating had previously been rejected.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS.
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-2 Mobile identity = TMSI-1
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		Cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-2 The RF level of cell A is lowered until cell A is no more suitable.
9	SS -> MS	ROUTING AREA UPDATING REJECT	GMM cause = 'Roaming not allowed in this area'
10	MS		The MS initiates an attach by MMI or by AT command.
11	MS		No ATTACH REQUEST sent to SS (SS waits 30 seconds).
12	SS -> MS		SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell.
13	MS		No response from the MS to the request. This is checked for 10 s.
14	SS -> MS		SS pages the MS with mobile identity TMSI and paging order for RR connection according to the channel combination of the cell.
15	MS		The MS shall not initiate an RR connection. This is checked during 3 seconds.
16	MS		If possible (see PICS) SIM removal is performed. Otherwise if possible (see PICS) switch off is performed. Otherwise the power is removed.
17	MS		The MS gets the SIM replaced, is powered up or switched on. Step 18 is only performed for non-auto attach MS.
18		**{Location Update Procedure}**	Macro. Location Update Procedure initiated from the MS.
19	MS		MS initiates an attach automatically (see PICS), via MMI or AT commands.
A20	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available (See note)
B20	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI or P-TMSI (See note)

Step	Direction	Message	Comments
21	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-6 Mobile identity = TMSI-1
22	MS -> SS	ATTACH COMPLETE	
23	SS -> MS		SS pages the MS with mobile identity TMSI-1 and paging order for RR connection according to the channel combination of the cell.
24	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity TMSI-1.
25	SS		SS releases the RR connection indicating a successful resumption of GPRS services.
26	SS -> MS		SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
27	MS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request.
28	MS		The MS is switched off or power is removed (see PICS).
29	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS/IMSI detach'
NOTE: An R97 and R98 MS shall perform step A20. An R99 or later MS shall perform step B20.			

Specific message contents

None.

44.2.3.2.6 Combined routing area updating / abnormal cases / access barred due to access class control

44.2.3.2.6.1 Conformance requirement

1) The MS shall not perform combined routing area updating procedure, but stays in the current serving cell and applies normal cell reselection process.

2) The Mobile Station shall perform the combined routing area updating procedure when:

   2.1 Access is granted.

   2.2 Cell is changed.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.6.2 Test purpose

Test purpose 1

To test the behaviour of the MS in case of access class control (access is granted).

Test purpose 2

To test the behaviour of the MS in case of access class control (cell is changed).

44.2.3.2.6.3 Method of test

44.2.3.2.6.3.1 Test procedure 1

Initial conditions

An access class x (0-15) is arbitrarily chosen. The SIM is programmed with this access class x. Communication with mobile stations using access class x is initially indicated to be barred on Cell B.

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1 has Access Class x not barred, cell B in MCC1/MNC/LAC1/RAC2 has Access Class x barred.

Both cells are operating in network operation mode I.

Access class x barred.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

A GPRS attach procedure is performed. The routing area is changed. The SS indicates access class x barred. A routing area updating procedure is not performed.

The SS indicates that access class x is not barred. A routing area updating procedure is performed.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	Mobile identity = IMSI
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		No ROUTING AREA UPDATE REQUEST sent to SS, as access class x is barred (SS waits 30 seconds).
8	SS		The access class x is not barred anymore. The value of the BCCH_CHANGE_MARK in the SI13 is altered to indicate the access class change.
9	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
10	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-1 Routing area identity = RAI-4
11	MS -> SS	ROUTING AREA UPDATING COMPLETE	
12	MS		The MS is switched off or power is removed (see PICS).
13	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS/IMSI detach'

Specific message contents

None.

44.2.3.2.6.3.2 Test procedure 2

Initial conditions

An access class x (0-15) is arbitrarily chosen. The SIM is programmed with this access class x. Communication with mobile stations using access class x is indicated to be barred on cell B.

System Simulator:

Three cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1 has access class x not barred, cell B in MCC1/MNC1/LAC1/RAC2 has access class x barred, cell C in MCC1/MNC1/LAC1/RAC2 has access class x not barred.

All three cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

A GPRS attach procedure is performed. The routing area is changed. The SS indicates access class x barred. A routing area updating procedure is not performed.

A cell change is performed into a cell where access class x is not barred. A routing area updating procedure is performed.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Mobile identity = IMSI
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		No ROUTING AREA UPDATING REQUEST sent to SS, as access class x is barred (SS waits 30 seconds).
			The following messages are sent and shall be received on cell C.
8	SS		Activate cell C with a lower signal strength than cell B. The RF level of cell B is lowered until cell C is preferred by the MS.
9	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
10	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = TMSI-1 Routing area identity = RAI-4
11	MS -> SS	ROUTING AREA UPDATING COMPLETE	
12	MS		The MS is switched off or power is removed (see PICS).
13	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS/IMSI detach'

Specific message contents

None.

44.2.3.2.7 Combined routing area updating / abnormal cases / attempt counter check / procedure timeout

44.2.3.2.7.1 Conformance requirement

1) When a T3330 timeout has occurred during a routing area updating procedure, the Mobile Station shall repeat the routing area updating procedure after T3330 timeout until the procedure is repeated five times.

2) When a routing area updating procedure is repeated five times, the routing area updating attempt counter is incremented and five more routing area updating procedures are performed. This procedure is repeated until the routing area updating attempt counter is five, the Mobile Station shall then start timer T3302.

3) When the T3302 expire, a new routing area updating procedure shall be initiated.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.7.2 Test purpose

To test the behaviour of the MS with respect to the routing area updating attempt counter.

44.2.3.2.7.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC/LAC1/RAC2. T3302 is set to 12 minutes.

Both cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS initiates a routing area updating procedure (routing area updating attempt counter zero). The SS does not answer with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. The MS restarts the routing area updating procedure four times. The SS never answers with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. After five consecutive routing area update procedures, the routing area updating attempt counter is incremented and T3311 is started.

The MS initiates a new routing area updating procedure (routing area updating attempt counter one) after T3311 expires. The SS does not answer with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. The MS restarts the routing area updating procedure four times. The SS never answers with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. After five consecutive routing area update procedures, the routing area updating attempt counter is incremented and T3311 is started.

The MS initiates a new routing area updating procedure (routing area updating attempt counter two) after T3311 expires. The SS does not answer with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. The MS restarts the routing area updating procedure four times. The SS never answers with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. After five consecutive routing area update procedures, the routing area updating attempt counter is incremented and T3311 is started.

The MS initiates a new routing area updating procedure (routing area updating attempt counter three) after T3311 expires. The SS does not answer with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. The MS restarts the routing area updating procedure four times. The SS never answers with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. After five consecutive routing area update procedures, the routing area updating attempt counter is incremented and T3311 is started.

The MS initiates a new routing area updating procedure (routing area updating attempt counter four) after T3311 expires. The SS does not answer with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. The MS restarts the routing area updating procedure four times. The SS never answers with ROUTING AREA UPDATE ACCEPT message before T3330 timeout. After five consecutive routing area update procedures, the routing area updating attempt counter is incremented and as the routing area updating attempt counter is five. T3302 is started.

The MS may perform a Location Update procedure.

The MS initiates a routing area updating procedure with routing area updating attempt counter zero after T3302 expires with the stored P-TMSI, P-TMSI signature, GPRS CKSN and RAI.

Maximum duration of test

30 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Mobile identity = IMSI
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		The SS deactivates cell A and activates cell B.
7	MS		Cell B is preferred by the MS. k= 1
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available routing area updating attempt counter = k (k is not visible. It is only used for clarifying the sequence.) Retransmission counter = 0
9	SS		No response is given from the SS.
10	SS		The SS verifies that the time between the RA update requests is T3330 seconds (+/- 10%)
11	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available routing area updating attempt counter = k Retransmission counter = 1
12	SS		No response is given from the SS.
13	SS		The SS verifies that the time between the RA update requests is T3330 seconds (+/- 10%)
14	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available routing area updating attempt counter = k Retransmission counter = 2

Step	Direction	Message	Comments
15	SS		No response is given from the SS.
16	SS		The SS verifies that the time between the RA update requests is T3330 seconds (+/- 10%)
17	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available routing area updating attempt counter = k Retransmission counter = 3
18	SS		No response is given from the SS.
19	SS		The SS verifies that the time between the RA update requests is T3330 seconds (+/- 10%)
20	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available routing area updating attempt counter = k Retransmission counter = 4
21	SS		No response is given from the SS.
22	SS		The SS verifies that the time between the RA update requests is T3311 + T3330 seconds (+/- 10%)
23	SS		Step 8 - 22 is repeated four times with k = 2, k = 3, k = 4 and k = 5
24	MS	**{Location Update Procedure}**	Optional step: The MS may perform a normal location updating procedure.
25	SS		The SS verifies that the time between the RA update requests is T3302 minutes + T3330 seconds (+/- 10%)
26	MS -> SS	ROUTING AREA UPDATING REQUEST	P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
27	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = IMSI Routing area identity = RAI-4
28	MS -> SS	ROUTING AREA UPDATING COMPLETE	
29	MS		The MS is switched off or power is removed (see PICS).
30	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS/IMSI detach'

Specific message contents

SYSTEM INFORMATION TYPE 3 (Cell A):

Information element	Value/remark
As default message contents except:	
Control Channel Description T3212 timeout value	 12 min

Note: An R97 MS will use this value to set T3302.

ATTACH ACCEPT:

Information Element	Value/remark
As default message contents except: T3302 value	 12 min

Note: This IE is only read by MS's supporting R99 and onwards.

44.2.3.2.8 Combined routing area updating / abnormal cases / change of cell into new routing area

44.2.3.2.8.1 Conformance requirement

When a change of cell into a new routing area is performed before the routing area updating procedure is finished, the MS shall abort the routing area updating procedure and re-initiate it in the new routing area.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.8.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.3.2.8.3 Method of test

Initial conditions

System Simulator:

Three cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2, cell C in MCC1/MNC1/LAC1/RAC3.

All three cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS initiates a routing area updating procedure. The ROUTING AREA UPDATE ACCEPT message is delayed from the SS. The MS performs a cell update into a new routing area. The Ms shall re-initiate a routing area updating procedure in the new routing area. The MS shall not increment the attempt counter.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A, B and C. The RF level of cell A is –50 dBm, cell B – 60 dBm and cell C – 70 dBm.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS.
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Mobile identity = IMSI
5	MS -> SS	ATTACH COMPLETE	
6			Wait 30 sec to let the MS identify the neighbour cells B and C.
			The following messages are sent and shall be received on cell B.
7	SS		The RF level of cell A is lowered to –100 dBm.
8	MS		Cell B is preferred by the MS.
9	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
10	SS		No response id given from the SS.
			The following messages are sent and shall be received on cell C.
11	MS		The RF level of cell B is lowered to –100 dBm.
12 Optional step	MS -> SS	ROUTING AREA UPDATE REQUEST	The following message may be sent and shall be received on cell B. Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
13	MS		Cell C is preferred by the MS.
14	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
15	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = IMSI Routing area identity = RAI-5
16	MS -> SS	ROUTING AREA UPDATING COMPLETE	
17	MS		The MS is switched off or power is removed (see PICS).
18	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS/IMSI detach'

Specific message contents

None.

44.2.3.2.9 Combined routing area updating / abnormal cases / change of cell during routing area updating procedure

44.2.3.2.9.1 Conformance requirement

When a change of cell within new routing area is performed before the routing area updating procedure is finished, the MS shall perform the cell update before the routing area updating procedure is finished.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.9.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.3.2.9.3 Method of test

Initial conditions

System Simulator:

Three cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2, cell C in MCC1/MNC1/LAC1/RAC2.

All three cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS initiates a routing area updating procedure. The ROUTING AREA UPDATE ACCEPT message is delayed from the SS. The MS performs a cell update within the routing area. The MS then waits for the ROUTING AREA UPDATE ACCEPT message.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A, B and C. The RF level of cell A is –50 dBm, cell B – 60 dBm and cell C – 70 dBm.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS.
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Mobile identity = IMSI
5	MS -> SS	ATTACH COMPLETE	
6			Wait 30 sec to let the MS identify the neighbour cells B and C.
			The following messages are sent and shall be received on cell B.
7	SS		The RF level of cell A is lowered to –100 dBm.
8	MS		Cell B is preferred by the MS.
9	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
10	SS		No response is given from the SS.
			The following messages are sent and shall be received on cell C.
11	MS		The RF level of cell B is lowered to –100 dBm.
			The following message may be sent and shall be received on cell B.
12 Optional step	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
13	MS		Cell C is preferred by the MS.
14	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating cell update.
15 Optional step	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
16	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = IMSI Routing area identity = RAI-4
17	MS -> SS	ROUTING AREA UPDATING COMPLETE	
18	MS		The MS is switched off or power is removed (see PICS).
19	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS/IMSI detach'

Specific message contents

None.

44.2.3.2.10 Combined routing area updating / abnormal cases / GPRS detach procedure collision

44.2.3.2.10.1 Conformance requirement

1) When a detach request is received with cause 'GPRS detach' or 'combined GPRS/IMSI detach' by the MS while waiting for a ROUTING AREA UPDATE ACCEPT message, the MS shall terminate the routing area updating procedure and continue with the GPRS detach procedure.

2) When a detach request is received with cause 'IMSI detach' by the MS while waiting for a ROUTING AREA UPDATE ACCEPT message, the MS shall ignore the detach request and continue with the routing area updating procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.5.2.

44.2.3.2.10.2 Test purpose

To test the behaviour of the MS in case of procedure collision.

44.2.3.2.10.3 Method of test

44.2.3.2.10.3.1 Test procedure 1

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS initiates a routing area updating procedure. The SS does not answer the routing area updating procedure, but initiates a GPRS detach procedure with cause 'GPRS detach' or 'combined GPRS/IMSI detach'. The MS shall terminate the routing area updating procedure and continue with the GPRS detach procedure.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS.
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Mobile identity = IMSI
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		Cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
9	SS		The SS ignores the ROUTING AREA UPDATING REQUEST message and initiates a detach procedure.
10	SS -> MS	DETACH REQUEST	Detach type = 're-attach not required'
11	MS -> SS	DETACH ACCEPT	

Specific message contents

None.

44.2.3.2.10.3.2 Test procedure 2

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)- MS operation mode A (TSPC_operation_mode_A).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS initiates a routing area updating procedure. The SS does not answer the routing area updating procedure, but initiates a GPRS detach procedure with cause 'IMSI detach'. The MS shall ignore the detach procedure and continue with the routing area updating procedure.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity =IMSI TMSI status = no valid TMSI available
4	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Mobile identity = IMSI
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS		Cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = no valid TMSI available
9	SS		The SS ignores the ROUTING AREA UPDATING REQUEST message and initiates a detach procedure.
10	SS -> MS	DETACH REQUEST	Detach type = 'IMSI detach'
11	MS		The MS ignores the DETACH REQUEST message and continue the routing area updating procedure.
12	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Mobile identity = IMSI Routing area identity = RAI-4
13	MS -> SS	ROUTING AREA UPDATING COMPLETE	
14	MS		The MS is switched off or power is removed (see PICS).
15	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS/IMSI detach'

Specific message contents

None.

44.2.3.3 Periodic routing area updating

44.2.3.3.1 Periodic routing area updating / accepted

44.2.3.3.1.1 Conformance requirement

The Mobile Station shall perform a periodic routing area update procedure after a T3312 timeout.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.2.2 and 4.7.5.1.

44.2.3.3.1.2 Test purpose

To test the behaviour of the MS with respect to the periodic routing area updating procedure.

44.2.3.3.1.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS initiates a GPRS attach procedure with identity P-TMSI. The SS reallocates the P-TMSI and returns ATTACH ACCEPT message with a new P-TMSI and timer T3312. The MS acknowledge the new P-TMSI by sending ATTACH COMPLETE message. A routing area updating procedure is performed at T3312 timeout.

T3312; set to 6 minutes.

Maximum duration of test

20 minutes.

Expected sequence

Step	Direction	Message	Comments
1	SS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 11.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3312 = 6 minutes
5	MS -> SS	ATTACH COMPLETE	
6	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Periodic updating' P-TMSI-2 signature Routing area identity = RAI-1
7	SS		The SS verifies that the time between the attach and the periodic RA updating is Ready Timer Period (T3314) + Periodic Routing Area Updating timer (T3312) (+/- 10%)
8	SS -> MS	ROUTING AREA UPDATING ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-3 signature Routing area identity = RAI-1 Negotiated Ready Timer IE is not included Force to standby indicator set
9	MS		The MS is switched off or power is removed (see PICS).
10	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
11	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 10.

Specific message contents

None.

44.2.3.3.2 Periodic routing area updating / accepted / T3312 default value

44.2.3.3.2.1 Conformance requirement

The Mobile Station shall perform a periodic routing area update procedure after a T3312 timeout.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.2.2 and 4.7.5.2.

44.2.3.3.2.2 Test purpose

To test the behaviour of the MS with respect to the periodic routing area updating procedure.

44.2.3.3.2.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode C (TSPC_operation_mode_C)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The MS initiates a (combined) GPRS attach procedure (see PICS). The SS reallocates the P-TMSI and returns ATTACH ACCEPT message with a new P-TMSI. The MS acknowledge the new P-TMSI by sending ATTACH COMPLETE message. After 54 minutes, a periodic routing area updating procedure is initiated by the MS.

T3312; default value 54 minutes.

Maximum duration of test

60 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is powered up or switched on and initiates an attach (see PICS).
2	MS -> SS	ATTACH REQUEST	Attach type for Class B = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Attach type for Class C = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
3	SS -> MS	ATTACH ACCEPT	Attach result for Class B = 'Combined GPRS /IMSI attached' Attach result for Class C = ' GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Mobile identity for Class B = TMSI-1 Routing area identity = RAI-1 T3312 = 54 min
4	MS -> SS	ATTACH COMPLETE	
5	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Periodic updating' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = valid TMSI available or IE not present
6	SS		The SS verifies that the time between the attach and the periodic RA updating is Ready Timer Period (T3314) + Periodic Routing Area Updating timer (T3312) (+/- 10%)
7	SS -> MS	ROUTING AREA UPDATING ACCEPT	No new mobile identity assigned. P-TMSI and TMSI not included. Update result = 'RAupdated' P-TMSI-3 signature Routing area identity = RAI-1 Negotiated Ready Timer IE is not included Force to standby indicator set
8	MS		The MS is switched off or power is removed (see PICS).
9	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type for Class B = 'power switched off, combined GPRS/IMSI detach' Detach type for Class C= 'power switched off, GPRS detach'

Specific message contents

None.

44.2.3.3.2a Periodic routing area updating / accepted / per-device value

44.2.3.3.2a.1 Conformance requirement

Periodic routing area updating is used to periodically notify the availability of the MS to the network. The procedure is controlled in the MS by timer T3312. The value of timer T3312 is sent by the network to the MS in the messages ATTACH ACCEPT and ROUTING AREA UPDATE ACCEPT. The value of timer T3312 shall be unique within a RA.

The network may include timer T3312 extended value IE in the ATTACH ACCEPT message or ROUTING AREA UPDATE ACCEPT message only if the MS indicates support of the timer T3312 extended value in the MS network feature support IE.

If the network includes the timer T3312 extended value IE in the ATTACH ACCEPT message or ROUTING AREA UPDATE ACCEPT message, the network shall use the timer T3312 extended value IE as the value of timer T3312.

The Mobile Station shall perform a periodic routing area update procedure after a T3312 timeout.

Reference(s):

3GPP TS 24.008 clauses 4.7.2.2 and 4.7.5.1

44.2.3.3.2a.2 Test purpose

To verify that the MS uses the per-device timer value for Periodic Routing Area Update received in an Attach Accept or RAU Accept message

44.2.3.3.2a.3 Method of test

Initial conditions

System Simulator:

- One cell operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- MS operation mode C (TSPC_operation_mode_C)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS initiates a GPRS attach procedure with identity P-TMSI. In the GPRS attach procedure the MS indicates support of the extended timer value. The SS reallocates the P-TMSI and returns ATTACH ACCEPT message with a new P-TMSI, timer T3312 and the extended value of T3312. The MS acknowledge the new P-TMSI by sending ATTACH COMPLETE message. A routing area updating procedure is performed when the extended value of timer T3312 times out.

Maximum duration of test

20 minutes.

Expected sequence

Step	Direction	Message	Comments
1	SS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 11.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1 MS network feature support = 1 (MS support of extended timer)
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3312 = 4 minutes T3312 extended value = 6 min
5	MS -> SS	ATTACH COMPLETE	
6	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Periodic updating' P-TMSI-2 signature Routing area identity = RAI-1
7	SS		The SS verifies that the time between the attach and the periodic RA updating is Ready Timer Period (T3314) + the extended value of the Periodic Routing Area Updating timer (T3312 extended value) (+/- 10%)
8	SS -> MS	ROUTING AREA UPDATING ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RA updated' P-TMSI-3 signature Routing area identity = RAI-1 Negotiated Ready Timer IE is not included Force to standby indicator set
9	MS		The MS is switched off or power is removed (see PICS).
10	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
11			The SS is set in network operation mode II.
12	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 10.

Specific message contents

None.

44.2.3.3.3 Periodic routing area updating / no cell available / network mode I

44.2.3.3.3.1 Conformance requirement

If the MS is both IMSI attached for GPRS and non-GPRS services, and if the MS lost coverage of the registered PLMN and timer T3312 expires; if the MS returns to coverage in a cell that supports GPRS and the network is in network operation mode I, then the MS shall perform a combined routing area update procedure indicating 'combined RA/LA updating with IMSI attach'.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclauses 4.7.2.2 and 4.7.5.1.

44.2.3.3.3.2 Test purpose

To test the behaviour of the MS with respect to the periodic routing area updating procedure.

44.2.3.3.3.3 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Cell A is operating in network operation mode II and cell B is in network operation mode I.

Mobile Station:

The MS has a valid TMSI-1, P-TMSI-1 and RAI-1. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B)
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS initiates a GPRS attach procedure. The SS reallocates the P-TMSI and returns ATTACH ACCEPT message with a new P-TMSI and timer T3312. The MS acknowledge the new P-TMSI by sending ATTACH COMPLETE message. GPRS radio contact is distorted before T3312 timeout. GPRS radio contact is established again (after T3312 timeout), and a routing area updating procedure is performed immediately.

T3312; set to 6 minutes.

Maximum duration of test

15 minutes.

Expected sequence

Step	Direction	Message	Comments
	SS		The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	SS		The MS is set in MS operation mode B (see PICS).
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
5	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3312 = 6 minutes
6	MS -> SS	ATTACH COMPLETE	
7	SS		After 5 minutes, the signal strength is lowered until the MS has lost contact with the SS.
8	SS		Wait 2 minutes.
			The following messages are sent and shall be received on cell B.
9	SS		The SS activates cell B.
10	MS		Cell B is preferred by the MS.
11	MS		The MS immediately starts a combined RA updating procedure
12	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating with IMSI attach' P-TMSI-2 signature Routing area identity = RAI-1 TMSI status = valid TMSI available or IE is omitted
13	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-3 P-TMSI-3 signature Mobile identity = TMSI-2 Routing area identity = RAI-4
14	MS -> SS	ROUTING AREA UPDATE COMPLETE	
15	MS		The MS is switched off or power is removed (see PICS).
16	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'

Specific message contents

None.

44.2.3.3.4 Periodic routing area updating / no cell available

44.2.3.3.4.1 Conformance requirement

If the MS is both IMSI attached for GPRS and non-GPRS services, and if the MS lost coverage of the registered PLMN and timer T3312 expires; if the MS returns to coverage in a cell that supports GPRS and the network is in network operation mode II, then the MS shall perform a periodic routing area update procedure and a periodic location update procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclauses 4.7.2.2 and 4.7.5.2.

44.2.3.3.4.2 Test purpose

To test the behaviour of the MS with respect to the periodic routing area updating procedure.

44.2.3.3.4.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid P-TMSI-1 and RAI-1. MS is Idle Updated.

Specific PICS statements:

- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The MS initiates a GPRS attach procedure. The SS reallocates the P-TMSI and returns ATTACH ACCEPT message with a new P-TMSI and timer T3312. The MS acknowledge the new P-TMSI by sending ATTACH COMPLETE message. GPRS radio contact is distorted before T3312 timeout. GPRS radio contact is established again (after T3312 timeout), and a periodic routing area updating procedure is performed immediately (no periodic location update procedure is performed as T3212=0).

T3312; set to 6 minutes.

Maximum duration of test

15 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is powered up or switched on and initiates an attach (see PICS).
2	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1 Routing area identity = RAI-1
3	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3312 = 6 minutes
4	MS -> SS	ATTACH COMPLETE	
5	SS		After 5 minutes, the signal strength is lowered until the MS have lost contact with the SS.
6	SS		After 2 minutes, the signal strength is increased until the MS have got contact with the SS.
7	MS		The MS immediately start the periodic RA updating procedure
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Periodic updating' P-TMSI-2 signature Routing area identity = RAI-1
9	SS -> MS	ROUTING AREA UPDATING ACCEPT	No new mobile identity assigned. P-TMSI not included. Update result = 'RAupdated' P-TMSI-3 signature Routing area identity = RAI-1 Negotiated Ready Timer IE is not included Force to standby indicator set
10	MS		The MS is switched off or power is removed (see PICS).
11	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.4 P-TMSI reallocation

44.2.4.1 Conformance requirement

1) A Mobile Station shall acknowledge a new P-TMSI when explicitly allocated.

2) The P-TMSI shall be updated on the SIM when the Mobile Station is correctly deactivated in accordance with the manufacturer's instructions.

3) A Mobile Station shall use the given P-TMSI in further communication with the network.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.6.

44.2.4.2 Test Purpose

To verify that the MS is able to receive and acknowledge a new P-TMSI by means of an explicit P-TMSI reallocation procedure.

To verify that the MS has stored the P-TMSI in a non-volatile memory.

The implicit reallocation procedure is tested in the attach procedure.

44.2.4.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C) (only if mode B not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

An explicit P-TMSI reallocation procedure is performed (P-TMSI reallocation command sent from the SS and acknowledged from the MS by P-TMSI reallocation complete). The MS is GPRS detached and switched off. Its power supply is interrupted for 10 s. The power supply is resumed and then the MS is switched on. A GPRS attach procedure is performed with the given P-TMSI as identity.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B (see PICS). If MS operation mode B not supported set the MS in operation mode C.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS -> MS	P-TMSI REALLOCATION COMMAND	Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
7	MS -> SS	P-TMSI REALLOCATION COMPLETE	
8	MS		The MS is switched off or power is removed (see PICS).
9	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
10	MS		Ensure the power is removed from the MS for at least 10 s
11	MS		The MS is powered up or switched on and initiates an attach (see PICS).
12	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-2 Routing area identity = RAI-1
13	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI not included. Attach result = 'GPRS only attached' P-TMSI-3 signature Routing area identity = RAI-1 Negotiated Ready timer value IE should not be included Force to standby indicator set
14	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-2 Paging order is for TBF establishment.
15	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating paging response.
16	MS		The MS is switched off or power is removed (see PICS).
17	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.5 GPRS authentication and ciphering

44.2.5.1 Test of authentication

The purpose of this procedure is to verify the user identity. A correct response is essential to guarantee the establishment of the connection. If not, the connection will drop.

44.2.5.1.1 Authentication accepted

44.2.5.1.1.1 Conformance requirement

A Mobile Station shall correctly respond in an authentication and ciphering procedure by sending a response with the SRES information field set to the same value as the one produced by the authentication and ciphering algorithm in the network.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.7.

44.2.5.1.1.2 Test purpose

To test the behaviour of the MS if the network accepts the authentication and ciphering procedure.

44.2.5.1.1.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

A GPRS attach is performed, and the SS initiates an authentication and ciphering procedure.

The SS checks the value SRES sent by the MS in the AUTHENTICATION AND CIPHERING RESPONSE message.

The MS initiates a routing area updating procedure and the SS checks the value of the GPRS Ciphering Key Sequence Number sent by the MS in the ROUTING AREA REQUEST message.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 18.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Set GPRS-CKSN-1 RAND
6	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	SRES
7	SS		The SS checks the SRES value.
8	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
9	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
10	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
11	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1 GPRS-CKSN-1
12	SS		The value of GPRS-CKSN is checked
13	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
14	MS -> SS	ROUTING AREA UPDATING COMPLETE	
15	MS		The MS is switched off or power is removed (see PICS).
16	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
17	SS		Reset the RF level of cell A to default state. Deactivate cell B.
18	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 16.

Specific message contents

None.

44.2.5.1.2 Authentication rejected

44.2.5.1.2.1 Conformance requirement

1. Upon receipt of an AUTHENTICATION AND CIPHERING REJECT message, the MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED and shall delete the P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number stored.

2. The SIM shall be considered as invalid until switching off or the SIM is removed.

3. If the AUTHENTICATION AND CIPHERING REJECT message is received, the MS shall abort any GMM procedure, shall stop the timers T3310 and T3330 (if running) and shall enter state GMM-DEREGISTERED.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.7.5.

44.2.5.1.2.2 Test purpose

To test the behaviour of the MS if the network rejects the authentication and ciphering procedure.

44.2.5.1.2.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

The test sequence is repeated for k = 1, 2.

A complete GPRS attach procedure is performed. The SS rejects the following authentication and ciphering procedure. The MS is paged with its former P-TMSI and shall not respond.

The Cell is changed into a new Routing Area.

The SS checks that the MS does not perform normal routing area updating.

The SS then checks that the MS does not perform a GPRS attach.

The SS checks that the MS does not perform a GPRS detach if switched off.

The MS is switched on or powered up. The SS checks that the MS performs a GPRS Attach procedure.

Maximum duration of test

10 minutes.

Expected sequence

The test sequence is repeated for k = 1, 2.

For k =1, the MS is set in MS operation mode C. If MS operation mode C not supported then k = 2.

For k = 2 the MS is set in MS operation mode B.

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Set GPRS-CKSN-1 RAND
7	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	SRES
8	SS -> MS	AUTHENTICATION AND CIPHERING REJECT	
9	SS -> MS		The SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell.
10	MS		No response from the MS to the request. This is checked for 10 s.
			The following messages are sent and shall be received on cell B.
11	SS		The SS deactivates cell A and activates cell B.
12	MS		Cell B is preferred by the MS.
13	MS		No ROUTING AREA UPDATING REQUEST sent to the SS (SS waits 30 seconds).
14	MS		If possible (see PICS) the MS initiates an attach by MMI or by AT command.
15	MS		No ATTACH REQUEST sent to the SS (SS waits 30 seconds).
16	MS		The MS is switched off (see PICS).
17	SS		No DETACH REQUEST sent to the SS (SS waits 30 seconds).
18			The MS is powered up or switched on. Step 19 is only performed for k =2
19		{Location Update Procedure}	Macro. Location Update Procedure initiated from the MS. Parameter mobile identity is IMSI.
19a			MS initiates an attach (see PICS).
20	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS only attached' Mobile identity = IMSI
21	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS attach' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
22	MS -> SS	ATTACH COMPLETE	
23	MS		The MS is switched off or power is removed. (see Pics)
24	MS -> SS	DETACH REQUEST	Message not sent if power is removed.
25	MS		If k=1 then the test is repeated for k=2.

Specific message contents

None.

44.2.5.1.3 Authentication accepted with USIM

44.2.5.1.1.1 Conformance requirement

A Mobile Station shall correctly respond in an authentication and ciphering procedure by sending a response with the SRES information field set to the same value as the one produced by the authentication and ciphering algorithm in the network.

In a UMTS authentication challenge, if the AUTHENTICATION_AND_CIPHERING REQUEST message includes the UMTS authentication parameters GPRS CKSN, RAND and AUTN, then upon receipt of the message, the MS verifies the AUTN parameter and if this is accepted, the MS processes the challenge information and sends an AUTHENTICATION_AND_CIPHERING RESPONSE message to the network.

Reference(s):

3GPP TS 24.008 subclause 4.7.7.2.

44.2.5.1.1.2 Test purpose

To verify that the MS is able to authenticate itself for GPRS transmission using the USIM application through an UMTS challenge.

44.2.5.1.1.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II, SGSN is R99

Mobile Station:

Test USIM is plugged into the MS.
The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

A GPRS attach is performed, and the SS initiates an authentication and ciphering procedure with an UMTS challenge request.

The SS checks the value RES sent by the MS in the AUTHENTICATION AND CIPHERING RESPONSE message (calculated with UMTS AKA algorithm).

The MS initiates a routing area updating procedure and the SS checks the value of the GPRS Ciphering Key Sequence Number sent by the MS in the ROUTING AREA REQUEST message.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 18.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request UMTS authentication. Set GPRS-CKSN-1 RAND & AUTN included (see specific message content)
6	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	RES
7	SS		The SS checks the RES value.
8	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
9	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
10	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
11	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1 GPRS-CKSN-1
12	SS		The value of GPRS-CKSN is checked
13	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
14	MS -> SS	ROUTING AREA UPDATING COMPLETE	
15	MS		The MS is switched off or power is removed (see PICS).
16	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
17	SS		Reset the RF level of cell A to default state. Deactivate cell B.
18	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 16.

Specific message contents

AUTHENTICATION AND CIPHERING REQUEST in step 5:

Same as default content except :

Information element	Value/remark
IE AUTN	Calculated as defined for Test USIM

44.2.5.2 Test of ciphering mode setting

The purpose of this procedure is to let the network to trigger the start and stop of stream ciphering.

The SS shall start and synchronise ciphering and deciphering according to 3GPP TS 03.20 / 3GPP TS 33.102, 3GPP TS 33.220. The bitstream shall be generated according to the commanded algorithm GEAx.

44.2.5.2.1 Ciphering mode / start ciphering

44.2.5.2.1.1 Conformance requirements

1. When the MS receives the AUTHENTICATION AND CIPHERING REQUEST message during the attach procedure, with Ciphering indicator information element set to 'ciphering mode off', the Mobile Station shall:

   1.1. responds with an AUTHENTICATION AND CIPHERING RESPONSE message;

   1.2. not start ciphering.

2. When the MS receives the AUTHENTICATION AND CIPHERING REQUEST message during the routing area updating procedure, with Ciphering indicator information element set to 'ciphering mode on', the Mobile Station shall:

   2.1. responds with an AUTHENTICATION AND CIPHERING RESPONSE message;

   2.2. start ciphering and deciphering with the algorithm indicated by the Ciphering algorithm information element;

   2.3. the ciphering uses the cipher key determined during the authentication procedure.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.7.

44.2.5.2.1.2 Test purpose

To test the behaviour of the MS if the network accepts the authentication and ciphering procedure with ciphering.

44.2.5.2.1.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

For execution counter K = 4 (GEA4) Test USIM has to be plugged into the MS
The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Supported encryption Algorithm : GEA1 (TSPC_Feat_GEA1)
- Supported encryption Algorithm : GEA2 (TSPC_Feat_GEA2)
- Supported encryption Algorithm : GEA3 (TSPC_Feat_GEA3)

- Supported encryption Algorithm : GEA 4 (TSPC_Feat_GEA 4)

PIXIT statements:

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Test procedure

A GPRS attach is performed. Authentication procedure without ciphering is performed.

The MS initiates a routing area updating procedure, and the SS initiates an authentication and ciphering procedure to start ciphering. GEA1, GEA2, GEA 3 or GEA 4 encryption is used depending on the execution counter K.

The test is performed for all GEA x encryption algorithm supported by the MS.

Maximum duration of test

15 minutes.

Expected sequence

The sequence is performed for execution counter K=1 when the MS supports GEA1, for K=2 when the MS supports GEA 2, for K=3 when the MS supports GEA 3 and for K=4 when the MS supports GEA4.

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 28.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI Message not ciphered
5	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Ciphering off Set GPRS-CKSN-1 RAND Message not ciphered
6	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	SRES Message not ciphered
7	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Message not ciphered
8	MS -> SS	ATTACH COMPLETE	Message not ciphered
9	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-2 Paging order is for TBF establishment. Message not ciphered
10	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating paging response. Message not ciphered
			The following messages are sent and shall be received on cell B.
11	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
12	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1 Message not ciphered

Step	Direction	Message	Comments
13	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Ciphering on with encryption: GEA1 for K=1, GEA2 for K=2, GEA3 for K=3. GEA4 for K=4. Set GPRS-CKSN-2 RAND Message not ciphered
14	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	SRES Message not ciphered
15	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 Message ciphered
16	MS -> SS	ROUTING AREA UPDATING COMPLETE	Message ciphered
17	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-1 Paging order is for TBF establishment. Message not ciphered
18	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating paging response. Message may be ciphered depending on the type of LLC PDU that are sent. The 'E' bit is therefore not checked.
19	SS -> MS	P-TMSI REALLOCATION COMMAND	Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-4 Message ciphered
20	MS -> SS	P-TMSI REALLOCATION COMPLETE	Message ciphered
21	SS -> MS	IDENTITY REQUEST	Identity type = IMEI Message not ciphered
22	MS -> SS	IDENTITY RESPONSE	Mobile identity = IMEI Message not ciphered
23	SS -> MS	P-TMSI REALLOCATION COMMAND	Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 Message ciphered
24	MS -> SS	P-TMSI REALLOCATION COMPLETE	Message ciphered
25	MS		The MS is switched off or power is removed (see PICS).
26	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach' Message ciphered
27	SS		Cell B is powered down and Cell A is restored to full power.
28	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 26.

Note that due to the test of ciphering, it is in this test case indicated whether each message is ciphered or not.

Specific message contents

AUTHENTICATION AND CIPHERING REQUEST in step 5:

Same as default content except :

Information element	Value/remark
IE AUTN	Not present for K = 1 Not present for K = 2 Not present for K = 3 Present for K = 4, calculated as defined for Test USIM
Ciphering Algorithm Type of Algorithm	 No ciphering

AUTHENTICATION AND CIPHERING REQUEST in step 13:

Same as default content except:

Information element	Value/remark
IE AUTN	Not present for K = 1 Not present for K = 2 Not present for K = 3 Present for K = 4, calculated as defined for Test USIM
Ciphering Algorithm Type of Algorithm	 GEA/1 for K = 1 GEA/2 for K = 2 GEA/3 for K = 3 GEA/4 for K = 4

44.2.5.2.2 Ciphering mode / stop ciphering

44.2.5.2.2.1 Conformance requirements

1. When the MS receives the AUTHENTICATION AND CIPHERING REQUEST message during the attach procedure, with Ciphering indicator information element set to 'ciphering mode on', the Mobile Station shall:

   1.1. responds with an AUTHENTICATION AND CIPHERING RESPONSE message;

   1.2. start ciphering and deciphering with the algorithm indicated by the Ciphering algorithm information element;

   1.3. the ciphering uses the cipher key determined during the authentication procedure.

2. When the MS receives the AUTHENTICATION AND CIPHERING REQUEST message during the routing area updating procedure, with Ciphering indicator information element set to 'ciphering mode off', the Mobile Station shall:

   2.1. responds with an AUTHENTICATION AND CIPHERING RESPONSE message;

   2.2. stop ciphering.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.7.

44.2.5.2.2.2 Test purpose

To test the behaviour of the MS if the network accepts the authentication and ciphering procedure without ciphering.

44.2.5.2.2.2 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

A GPRS attach is performed, and the SS initiates an authentication and ciphering procedure to start ciphering.

A RA updating procedure is initiated, and authentication procedure without ciphering is performed. Ciphering is turned off.

Maximum duration of test

15 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 22.
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI Message not ciphered
5	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Ciphering on Set GPRS-CKSN-1 RAND Message not ciphered
6	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	SRES Message not ciphered
7	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Message ciphered
8	MS -> SS	ATTACH COMPLETE	Message ciphered
9	SS -> MS		The SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell. Message not ciphered
10	MS -> SS		Verify that the MS initiates a TBF connection And sends an UPLINK RLC DATA BLOCK as a Response to the paging request. Message may or may not be ciphered
			The following messages are sent and shall be received on cell B.
11	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
12	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1 Message not ciphered
13	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Ciphering off Set GPRS-CKSN-2 RAND Message not ciphered
14	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	SRES Message not ciphered
15	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 Message not ciphered
16	MS -> SS	ROUTING AREA UPDATING COMPLETE	Message not ciphered
17	SS -> MS		The SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell. Message not ciphered

Step	Direction	Message	Comments
18	MS -> SS		Verify that the MS initiates a TBF connection And sends an UPLINK RLC DATA BLOCK as a Response to the paging request. Message not ciphered
19	MS		The MS is switched off or power is removed (see PICS).
20	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach' Message not ciphered
21	SS		Cell B is switched off and Cell A is restored to full power.
22	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 20.

Note that due to the test of ciphering, it is in this test case indicated whether each message is ciphered or not.

Specific message contents

None.

44.2.5.2.3 Ciphering mode / IMEISV request

44.2.5.2.3.1 Conformance requirements

1 When the MS receives the AUTHENTICATION AND CIPHERING REQUEST message during the attach procedure, with Ciphering indicator information element set to 'ciphering mode on' and 'IMEISV requested', the Mobile Station shall:

1.1 responds with an AUTHENTICATION AND CIPHERING RESPONSE message;

1.2 include IMEISV;

1.3 start ciphering and deciphering with the algorithm indicated by the Ciphering algorithm information element;

1.4 the ciphering uses the cipher key determined during the authentication procedure.

2 When the MS receives the AUTHENTICATION AND CIPHERING REQUEST message during the routing area updating procedure, with Ciphering indicator information element set to 'ciphering mode off' and 'IMEISV not requested', the Mobile Station shall:

2.1 responds with an AUTHENTICATION AND CIPHERING RESPONSE message;

2.2 not include IMEISV;

2.3 not start ciphering.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.7.

44.2.5.2.3.2 Test purpose

To test the behaviour of the MS with respect to return IMEISV on request only.

44.2.5.2.3.3 Method of test

Initial conditions

System Simulator:

Two cells, cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

A GPRS attach is performed, and the SS initiates an authentication and ciphering procedure. IMEISV is requested.

The MS initiates a routing area updating procedure, and the SS initiates a new authentication and ciphering procedure without requesting IMEISV.

Maximum duration of test

15 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 21.
2	SS		The SS activates cell A.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI Message not ciphered
5	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Ciphering on IMEISV requested Message not ciphered
6	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	SRES Mobile identity = IMEISV Message not ciphered
7	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Message ciphered
8	MS -> SS	ATTACH COMPLETE	Message ciphered
9	SS -> MS		The SS pages the MS with mobile identity P-TMSI-2 and paging order for TBF establishment according to the channel combination of the cell. Message not ciphered
10	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request. Message may or may not be ciphered
			The following messages are sent and shall be received on cell B.
11	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
12	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1 Message not ciphered
13	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Ciphering off IMEISV not requested Message not ciphered
14	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	SRES No IMEISV included Message not ciphered
15	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4 Message not ciphered
16	MS -> SS	ROUTING AREA UPDATING COMPLETE	Message not ciphered
17	SS -> MS		The SS pages the MS with mobile identity P-TMSI-1 and paging order for TBF establishment according to the channel combination of the cell. Message not ciphered

Step	Direction	Message	Comments
18	MS -> SS		Verify that the MS initiates a TBF connection and sends an UPLINK RLC DATA BLOCK as a response to the paging request. Message not ciphered
19	MS		The MS is switched off or power is removed (see PICS).
20	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach' Message not ciphered
21	MS		The MS is set in MS operation mode B (see PICS), cell B is switched off, Cell A is restored to full power and the test is repeated from step 3 to step 20.

Note that due to the test of ciphering, it is in this test case indicated whether each message is ciphered or not.

Specific message contents

None.

44.2.5.2.4 Ciphering mode/Cipher key Kc_{128} and algorithm changes

44.2.5.2.4.1 Conformance requirement

A Mobile Station shall correctly respond in an authentication and ciphering procedure by sending a response with the SRES information field set to the same value as the one produced by the authentication and ciphering algorithm in the network.

In a UMTS authentication challenge, if the AUTHENTICATION_AND_CIPHERING REQUEST message includes the UMTS authentication parameters GPRS CKSN, RAND and AUTN, then upon receipt of the message, the MS verifies the AUTN parameter and if this is accepted, the MS processes the challenge information and sends an AUTHENTICATION_AND_CIPHERING RESPONSE message to the network.

In a UMTS authentication challenge, the new UMTS ciphering key, the new GSM ciphering key and the new UMTS integrity key calculated from the challenge information shall overwrite the previous UMTS ciphering key, GSM ciphering key and UMTS integrity key. The new UMTS ciphering key, GSM ciphering key and UMTS integrity key are stored on the USIM together with the ciphering key sequence number. Furthermore, in A/Gb mode when after the authentication procedure an A5 ciphering algorithm that requires a 128-bit ciphering key is taken into use, then a new GSM Kc_{128} shall also be calculated as described in the subclause 4.3.2.3a

Reference(s):

3GPP TS 24.008 subclause 4.7.7.2.

3GPP TS 24.008 subclause 4.3.2.2.

44.2.5.2.4.2 Test purpose

To verify that the MS uses correctly Kc and Kc_{128} when the GPRS Encryption Algorithm is changed from GEA 2/GEA 3 to GEA 4 and from GEA 4 to GEA 2/GEA 3.

44.2.5.2.4.3 Method of test

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC2.

Both cells are operating in network operation mode II, SGSN is R99

Mobile Station:

Test USIM is plugged into the MS. The MS has a valid IMSI. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Supported encryption Algorithm: GEA2 (TSPC_Feat_GEA2)
- Supported encryption Algorithm: GEA3 (TSPC_Feat_GEA3)

PIXIT statements:

-

Test procedure

A GPRS attach is performed, and the SS initiates an authentication and ciphering procedure with an UMTS challenge request; type of algorithm is GEA 2 or GEA 3 dependent on supported algorithm.

The SS checks the value RES sent by the MS in the AUTHENTICATION AND CIPHERING RESPONSE message (calculated with UMTS AKA algorithm).

The cell A is deactivated and cell B activated .

The MS initiates a routing area updating procedure and the SS initiates an authentication and ciphering procedure with an UMTS challenge request. The SS sends ROUTING ARE UPDATING ACCEPT ciphered with GEA 4 and the MS answer with ciphered ROUTING ARE UPDATING COMPLETE.

The cell B is deactivated and cell A activated

The MS initiates a routing area updating procedure and the SS initiates an authentication and ciphering procedure with an UMTS challenge request. The SS sends ROUTING ARE UPDATING ACCEPT ciphered with GEA 2/GEA 3 and the MS answer with ciphered ROUTING ARE UPDATING COMPLETE.

Expected sequence

The sequence is executed with GEA x = GEA 3 when GEA2 is not supported or GEA 2 when GEA2 is supported.

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 18.
3	MS		The MS is powered up or switched on and initiates an attach (see PICS).
4	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
5	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request UMTS authentication. Set GPRS-CKSN-1 RAND & AUTN included (see specific message content) Type of algorithm : GEAx
6	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	The SS checks the RES value.
7	SS -> MS	ATTACH ACCEPT	Message ciphered with GEAx Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
8	MS -> SS	ATTACH COMPLETE	Message deciphered
9	SS		The SS deactivates cell A and activates cell B.
			The following messages are sent and shall be received on cell B.
10	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-1 GPRS-CKSN-1
11	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request UMTS authentication. Set GPRS-CKSN-1 RAND & AUTN included (see specific message content) Type of algorithm: GEA4
12	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	The SS checks the RES value.
13	SS -> MS	ROUTING AREA UPDATING ACCEPT	Message ciphered with GEA4 Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
14	MS -> SS	ROUTING AREA UPDATING COMPLETE	Message deciphered
15	SS		The SS deactivates cell B and activates cell A.
			The following messages are sent and shall be received on cell A.
16	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' P-TMSI-2 signature Routing area identity = RAI-4 GPRS-CKSN-1
17	SS -> MS	AUTHENTICATION AND CIPHERING REQUEST	Request UMTS authentication. Set GPRS-CKSN-1 RAND & AUTN included (see specific message content) Type of algorithm: GEAx
18	MS -> SS	AUTHENTICATION AND CIPHERING RESPONSE	The SS checks the RES value.
19	SS -> MS	ROUTING AREA UPDATING ACCEPT	Message ciphered with GEAx Update result = 'RA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
20	MS -> SS	ROUTING AREA UPDATING COMPLETE	Message deciphered

21	MS		The MS is switched off or power is removed (see PICS).
22	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
23	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 3 to step 22.

Specific message contents

AUTHENTICATION AND CIPHERING REQUEST in step 5:

Same as default content except :

Information element	Value/remark
IE AUTN Ciphering Algorithm Type of Algorithm	Calculated as defined for Test USIM GPRS Encryption Algorithm - GEA2 when supported - GEA3 when GEA2 is not supported

AUTHENTICATION AND CIPHERING REQUEST in step 11:

Same as default content except :

Information element	Value/remark
IE AUTN Ciphering Algorithm Type of Algorithm	Calculated as defined for Test USIM GPRS Encryption Algorithm GEA4

AUTHENTICATION AND CIPHERING REQUEST in step 17:

Same as default content except :

Information element	Value/remark
IE AUTN Ciphering Algorithm Type of Algorithm	Calculated as defined for Test USIM GPRS Encryption Algorithm - GEA2 when supported - GEA3 when GEA2 is not supported

44.2.5.2.5 Ciphering mode / Non support of GEA1

44.2.5.2.5.1 Conformance requirement

It is mandatory for GEA2, GEA3 and non encrypted mode (i.e. GEA0) to be implemented in mobile stations. GEA1 and GEA4 may be implemented in the mobile stations.

NOTE: As mobile stations are not allowed to implement GEA1 from Release 12 onwards, it is strongly discouraged to support GEA1 in Release 11 MS.

Reference(s):

3GPP TS 43.020 Annex D.4.9

44.2.5.2.5.2 Test Purpose

To verify that MS does not apply GEA1 ciphering algorithm.

44.2.5.2.5.3 Method of Test

Initial Conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

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Test procedure

MS sends ATTACH REQUEST. The SS checks that GPRS Encryption Algorithm GEA/1 bit is 0.

The SS sends GMM CIPHERING AND AUTHENTICATION REQUEST with Cipher algorithm GEA1. MS sends GMM STATUS message with Cause Value #95.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is set in MS operation mode B or C (see PICS).
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	GPRS Encryption Algorithm GEA/1= 0 Attach type = 'GPRS attach' Mobile identity = IMSI Message not ciphered
4	SS -> MS	GMM AUTHENTICATION AND CIPHERING REQUEST	Request authentication. Cipher algorithm = GEA1 Ciphering On Set GPRS-CKSN-1 RAND Message not ciphered
5	MS -> SS	GMM STATUS	Cause Value #95 Message not ciphered
6	SS -> MS	ATTACH REJECT	GMM cause = "Network failure' Message not ciphered

Specific message contents

None.

44.2.6 Identification procedure

The purpose of this procedure is to check that the MS gives its identity as requested by the network. If this procedure does not work, it will not be possible for the network to rely on the identity claimed by the MS.

44.2.6.1 General Identification

44.2.6.1.1 Conformance requirement

1) When requested by the network the Mobile Station shall send its IMSI.

2) When requested by the network the Mobile Station shall send its IMEI as stored in the Mobile Equipment.

3) When requested by the network the Mobile Station shall send its IMEISV as stored in the Mobile Equipment.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclauses 4.7.8.

44.2.6.1.2 Test purpose

To verify that the MS sends identity information as requested by the system. The following identities can be requested: IMSI, IMEI and IMEISV.

44.2.6.1.3 Method of test

Initial conditions

System Simulator:

One cell operating in network mode II.

Mobile Station:

The MS has a valid IMSI.. MS is Idle Updated.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

The SS requests identity information from the MS:

- IMSI;
- IMEI;
- IMEISV.

Maximum duration of test

10 minutes.

Expected sequence

Step	Direction	Message	Comments
1	SS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported, goto step 14.
2	MS		The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-1
5	MS -> SS	ATTACH COMPLETE	
6	SS -> MS	IDENTITY REQUEST	Identity type = IMSI
7	MS -> SS	IDENTITY RESPONSE	Mobile identity = IMSI
8	SS -> MS	IDENTITY REQUEST	Identity type = IMEI
9	MS -> SS	IDENTITY RESPONSE	Mobile identity = IMEI
10	SS -> MS	IDENTITY REQUEST	Identity type = IMEISV
11	MS -> SS	IDENTITY RESPONSE	Mobile identity = IMEISV
12	MS		The MS is switched off or power is removed (see PICS).
13	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'
14	MS		The MS is set in MS operation mode B (see PICS) and the test is repeated from step 2 to step 13.

Specific message contents

None.

44.2.7 GMM READY timer handling

The READY timer, T3314 is used in the MS and in the network per each assigned P-TMSI to control the cell updating and paging procedure.

When the READY timer is running the MS shall perform cell update each time a new cell is selected (see 3GPP TS 03.22 [3]). If a routing area border is crossed a routing area updating procedure shall be performed instead of a cell update.

44.2.7.1 Conformance requirement

1) When the READY timer is running the MS shall perform cell update each time a new cell is selected.

2) The READY timer shall be restarted in the MS when the GMM entity receives an indication from lower layers that user data or GMM or SM signalling messages have been transmitted.

3) The READY timer shall be stopped when force to standby is received in a signalling message from the network, after successful completion of the signalling procedure.

4) if the negotiated READY timer value indicates that the ready timer function is deactivated, then the MS shall behave as if READY timer never expires (i.e. the MS remains in READY state all the time).

5) If the READY timer length is set to zero, the MS shall immediately be forced into STANDBY state .MS shall not perform cell update.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclause 4.7.2.1.

44.2.7.2 Test Purpose

To verify the functionality of the READY timer.

44.2.7.3 Method of test

44.2.7.3.1 Test procedure 1

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI.. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C) (only if mode B not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

An attach is performed. The SS negotiates T3314. The MS selects a new cell within the old RA. A cell update is performed.

T3314; set to 60 s.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode B (see PICS). If MS operation mode B not supported set the MS in operation mode C. The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3314 = 60 seconds
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating cell update.
8	MS		The MS is switched off or power is removed (see PICS).
9	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.7.3.2 Test procedure 2

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI.. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

An attach is performed. The SS negotiates T3314. A page is responded by the MS. The MS selects a new cell within the old RA. A cell update is performed, as T3314 is reset by the paging response.

T3314; set to 60 s.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported set the MS in operation mode B. The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3314 = 60 seconds
5	MS -> SS	ATTACH COMPLETE	
6	SS		No action for 90 seconds
7	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-2 Paging order is for TBF establishment.
8	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating paging response. T3314 reset.
			The following messages are sent and shall be received on cell B.
9	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
10	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating cell update.
11	MS		The MS is switched off or power is removed (see PICS).
12	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.7.3.3 Test procedure 3

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI.. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C) (only if mode B not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

An attach is performed. The SS indicates 'force to standby'. The MS selects a new cell within the old RA. No cell update is performed as the MS is in STANDBY state.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode B (see PICS). If MS operation mode B not supported set the MS in operation mode C. The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 Force to standby indicator set
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
7	SS		The SS verifies for 45 seconds that no cell update is received, as the MS is in STANDBY state
8	MS		The MS is switched off or power is removed (see PICS).
9	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.7.3.4 Test procedure 4

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI.. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

An attach is performed. The SS negotiates T3314. The MS selects a new cell within the old RA. A cell update is performed.

T3314; set to deactivated.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported set the MS in operation mode B. The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3314 deactivated
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
7	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating cell update.
8	SS		No action for 120 seconds.
			The following messages are sent and shall be received on cell A.
9	SS		The RF level of cell A is increased and the RF level of cell B is lowered until cell A is preferred by the MS.
10	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating cell update.
11	MS		The MS is switched off or power is removed (see PICS).
12	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach'

Specific message contents

None.

44.2.7.3.5 Test procedure 5

Initial conditions

System Simulator:

Two cells (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1, cell B in MCC1/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI.. MS is Idle Updated on cell A.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C) (only if mode B not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test procedure

If the READY timer length is set to zero, the MS shall immediately be forced into STANDBY state.

No cell update is performed as the MS is in STANDBY state.

Maximum duration of test

5 minutes.

Expected sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on cell A.
1	SS		The SS activates cell A.
2	MS		The MS is set in MS operation mode B (see PICS). If MS operation mode B not supported set the MS in operation mode C.
			The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI R99 MS shall include Revision Level Indicator=’99 or later’
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3314 = 0 seconds
5	MS -> SS	ATTACH COMPLETE	
			The following messages are sent and shall be received on cell B.
6	SS		Activate cell B with a lower signal strength than cell A The RF level of cell A is lowered until cell B is preferred by the MS.
7	SS		The SS verifies for 45 seconds that no cell update is received, as the MS is in STANDBY state
8	MS		The MS is switched off or power is removed (see PICS).
9	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, GPRS detach' R99 MS shall include Mobile identity = P-TMSI-2 P-TMSI-2 signature

Specific message contents

None.

44.2.8 DTM mobility management

44.2.8.1 Change of cell between two LAs in idle mode

44.2.8.1.1 Change of cell between two LAs in idle mode / RAU completes first

44.2.8.1.1.1 Conformance requirements

RA update and LA update procedures shall be supported in parallel in the main DCCH with SAPI 0. This helps reduce the congestion caused by GPRS signalling on GPRS TCHs that naturally exists in cells on the border of a RA or RA/LA without noticeably affecting the QoS of the CS connection.

In network mode of operation II and III, whenever a Class-A MS determines that it shall perform both a LA update and an RA update it shall initiate the LA update and then initiate the RA update.

A MS supporting the «GPRS» option whose CHANNEL REQUEST message contained a packet access establishment cause shall obey an IMMEDIATE ASSIGNMENT message to a channel which is to be used in dedicated mode.

References

3GPP TS 03.55/43.055, sub-clause 6.4.1

3GPP TS 23.060, sub-clause 6.9.1

3GPP TS 04.18/44.018, sub-clause 3.3.1.3

44.2.8.1.1.2 Test purpose

To verify that both Location Updating and Routeing Area Updating procedures are completed in parallel and also to guarantee that the GPRS mobile obeys a command to use the SDCCH for signalling.

44.2.8.1.1.3 Method of test

Initial Conditions

System Simulator:

2 cells, A and B with different LAIs, both operating in network operation mode II and both support DTM.

Mobile Station:

The MS is in packet idle mode with a TMSI and P-TMSI allocated.

Specific PICS statements:

-

PIXIT statements:

-

Test Procedure

Once the MS is camped on cell A in the first LA, the SS commences the test by lowering the RF level of cell A below that of cell B prompting the MS to complete cell reselection. Once cell B has been selected by the MS, the MS initiates the Location Updating and Routing Area Updating procedures. The SS responds to the ROUTING AREA UPDATE REQUEST message with a ROUTING AREA UPDATE ACCEPT message and then completes the Location Updating procedure by replying with a LOCATION UPDATING ACCEPT message to the LOCATION UPDATING REQUEST sent by the MS. The SS then releases the RR connection.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1	SS		The RF level of cell A is lowered until the MS selects cell B.
2	MS->SS	CHANNEL REQUEST	"Establishment cause": Location updating.
3	SS->MS	IMMEDIATE ASSIGNMENT	Allocates an SDCCH to the MS.
4	MS->SS	LOCATION UPDATING REQUEST	SS verifies that all signalling sent on the main DCCH is transmitted on the allocated SDCCH.
5	MS->SS	GPRS INFORMATION	Contains the ROUTING AREA UPDATE REQUEST message. SS verifies that all signalling sent on the main DCCH is transmitted on the allocated SDCCH
6	SS->MS	GPRS INFORMATION	Contains the ROUTING AREA UPDATE ACCEPT message
7	SS->MS	LOCATION UPDATING ACCEPT	
8	SS->MS	CHANNEL RELEASE	

44.2.8.1.2 Change of cell between two LAs in idle mode / LAU completes first / SS releases channel

44.2.8.1.2.1 Conformance requirements

RA update and LA update procedures shall be supported in parallel in the main DCCH with SAPI 0. This helps reduce the congestion caused by GPRS signalling on GPRS TCHs that naturally exists in cells on the border of a RA or RA/LA without noticeably affecting the QoS of the CS connection.

In network mode of operation II and III, whenever a Class-A MS determines that it shall perform both a LA update and an RA update it shall initiate the LA update and then initiate the RA update.

References

3GPP TS 03.55/43.055, sub-clause 6.4.1

3GPP TS 23.060 sub-clause 6.9.1

44.2.8.1.2.2 Test purpose

To verify that:

- both Location Updating and Routing Area Updating procedures are completed in parallel.
- the MS can complete the Routing Area Updating procedure on TBFs when the channel is removed.
- the GPRS mobile obeys a command to use a TCH/F for signalling.

44.2.8.1.2.3 Method of test

Initial Conditions

System Simulator:

2 cells, A and B with different LAIs, both operating in network operation mode II and both support DTM.

Mobile Station:

The MS is in "idle" state with a TMSI and P-TMSI allocated.

Specific PICS statements:

-

PIXIT statements:

-

Test Procedure

Once the MS is camped on cell A in the first LA, the SS commences the test by lowering the RF level of cell A below that of cell B prompting the MS to complete cell reselection. Cell B is selected by the MS and then initiates Location Updating and Routing Area Updating procedures. The SS completes the Location Updating Procedure by responding to the LOCATION UPDATING REQUEST message with a LOCATION UPDATING ACCEPT message. The SS then releases the RR connection. After the RR connection has been released, the SS establishes a downlink TBF, and transmits a ROUTING AREA UPDATE ACCEPT message reallocating the P-TMSI of the MS. The MS initiates the establishment of an uplink TBF, to complete the Routing Area Updating procedure by sending a ROUTING AREA UPDATE COMPLETE message and accepts the new P-TMSI.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1	SS		The RF level of cell A is lowered until the MS selects cell B.
2	MS->SS	CHANNEL REQUEST	"Establishment cause": Location updating.
3	SS->MS	IMMEDIATE ASSIGNMENT	Allocates a TCH/F to the MS.
4	MS->SS	LOCATION UPDATING REQUEST	SS verifies that all signalling sent on the main DCCH is transmitted on the allocated TCH.
5	MS->SS	GPRS INFORMATION	Contains the ROUTING AREA UPDATE REQUEST message. SS verifies that all signalling sent on the main DCCH is transmitted on the allocated TCH.
6	SS->MS	LOCATION UPDATING ACCEPT	
7	SS->MS	CHANNEL RELEASE	
8			A downlink TBF is then established to allow the RAU ACCEPT message to be returned to the MS.
9	SS->MS	ROUTING AREA UPDATE ACCEPT	Allocates a new P-TMSI. See specific message contents.
10			An uplink TBF is then established to allow the RAU COMPLETE message to be returned by the MS.
11	MS->SS	ROUTING AREA UPDATE COMPLETE	

Specific message contents

ROUTING AREA UPDATE ACCEPT (Step 9):

Information Element	Value/remark
As default message contents except: - Allocated P-TMSI - Type of Identity - P-TMSI value	 P-TMSI 12345678 (Hex)

44.2.8.1.3 Change of cell between two LAs in idle mode / LAU completes first / SS maintains channel

44.2.8.1.3.1 Conformance requirements

RA update and LA update procedures shall be supported in parallel in the main DCCH with SAPI 0. This helps reduce the congestion caused by GPRS signalling on GPRS TCHs that naturally exists in cells on the border of a RA or RA/LA without noticeably affecting the QoS of the CS connection.

In network mode of operation II and III, whenever a Class-A MS determines that it shall perform both a LA update and an RA update it shall initiate the LA update and then initiate the RA update.

References

3GPP TS 03.55/43.055, sub-clause 6.4.1

3GPP TS 23.060, sub-clause 6.5.1

44.2.8.1.3.2 Test purpose

To guarantee that the MS can complete the Routing Area Updating procedure on the main DCCH, if the network maintains the CS connection after the Location Updating procedure is completed.

44.2.8.1.3.3 Method of test

Initial Conditions

System Simulator:

2 cells, A and B with different LAIs, both operating in network operation mode II and both support DTM.

Mobile Station:

The MS is in "idle" state with a TMSI and P-TMSI allocated.

Specific PICS statements:

-

PIXIT statements:

-

Test Procedure

Once the MS is camped on cell A in the first LA, the SS commences the test by lowering the RF level of cell A below that of cell B prompting the MS to complete cell reselection. Cell B is selected by the MS and then initiates Location Updating and Routing Area Updating procedures. The SS completes the Location Updating Procedure by responding to the LOCATION UPDATING REQUEST message with a LOCATION UPDATING ACCEPT message. The SS then waits 5 seconds before continuing the test. The SS then transmits a ROUTING AREA UPDATE ACCEPT message reallocating the P-TMSI of the MS. The MS completes the Routing Area Updating procedure by transmitting a ROUTING AREA UPDATE COMPLETE message on the main DCCH, accepting the new P-TMSI.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1	SS		The RF level of cell A is lowered until the MS selects cell B.
2	MS->SS	CHANNEL REQUEST	"Establishment cause": Location updating.
3	SS->MS	IMMEDIATE ASSIGNMENT	
4	MS->SS	LOCATION UPDATING REQUEST	
5	MS->SS	GPRS INFORMATION	Contains the ROUTING AREA UPDATE REQUEST message.
6	SS->MS	LOCATION UPDATING ACCEPT	
7			The SS waits 5 seconds, maintaining the main DCCH.
8	SS->MS	GPRS INFORMATION	Contains the ROUTING AREA UPDATE ACCEPT message, reallocating the MSs P-TMSI. See specific message contents.
9	MS->SS	GPRS INFORMATION	Contains the ROUTING AREA UPDATE COMPLETE message.
10	SS->MS	CHANNEL RELEASE	

Specific message contents

ROUTING AREA UPDATE ACCEPT (Step 8):

Information Element	Value/remark
As default message contents except: - Allocated P-TMSI - Type of Identity - P-TMSI value	 P-TMSI C2345678 (Hex)

44.2.8.2 Void

44.2.9 Network Identity and Timezone (NITZ)

44.2.9.1 NITZ and GPRS procedures

44.2.9.1.1 NITZ / GPRS / Timezone, Time and DST Handling

44.2.9.1.1.1 Conformance requirement

The feature Network Identities and Timezone shall make it possible for a serving PLMN to transfer its current identity, universal time, DST and LTZ to MSs, and for the MS to store and use this information. Each one of these elements is optional. The feature significantly enhances roaming as it enables the accurate indication of network identities that are either newer than the ME or have changed their name since the ME was manufactured or sold. Additionally time and timezone information can be utilised by MEs as desired.

The serving PLMN shall make Local Time Zone (LTZ) available to the MS as an offset from Universal Time in units of 15 minutes.

When the LTZ is compensated for DST (summertime), the serving PLMN shall provide a DST parameter to indicate this. The adjustment for DST can be +1h or +2h.

The Time Zone code enables the receiver to calculate the equivalent time in GMT from the other semi-octets in the Service-Centre-Time-Stamp, or indicate the time zone (GMT, GMT+1H etc.), or perform other similar calculations as required by the implementation. The value contained in the Time Zone field must take into account daylight saving time, such that when the sending entity changes from regular (winter) time to daylight saving (summer) time, there is a change to the value in the Time Zone field.

The mobile station should assume that this time zone applies to the routing area the MS is currently in. The mobile station shall not assume that the time information is accurate.

If the local time zone has been adjusted for Daylight Saving Time, the network shall indicate this by including the IE Network Daylight Saving Time.

Reference(s):

3GPP TS 02.42 / 3GPP TS 22.042 subclause 4

3GPP TS 03.40 / 3GPP TS 23.040 subclause 9.2.3.11

3GPP TS 04.08 / 3GPP TS 24.008 subclause 9.4.19.4

44.2.9.1.1.2 Test purpose

To verify that a MS supporting any of the NITZ Time related feature (Local Time Zone, Universal Time and DST IE (and thus GMM Information) is able to handle them properly.

44.2.9.1.1.3 Method of test

Initial conditions

System Simulator:

Two cells operating in network operation mode I, cell A in MCC1/MNC1/LAC1/RAC1 (RAI-1), cell B in MCC1/MNC1/LAC1/RAC2 (RAI-4).

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Use of NITZ DST (TSPC_NITZ_DST)
- Use of NITZ Universal Time for PLMN (TSPC_NITZ_Universal_Time)
- Use of NITZ Local Time Zone for PLMN (TSPC_NITZ_Time_Zone)

PIXIT statements:

-

Test procedure

Following the GPRS attachment on Cell A, SS sends its local time and date (on GMT+1, Winter Time) using the GMM INFORMATION Message to the MS. The operator verifies then the parameters and/or the time and date stored in the MS.

The MS is then moved to a second cell (Cell B), and after a ROUTING AREA UPDATE procedure, the time is changed to “Summer Time” with the DST IE using a GMM INFORMATION Message. The operator verifies then the parameters and/or the time and date stored in the MS and switches Off the MS

The MS is re-attached on Cell A, the Time Zone is then changed, no DST present (GMT+2, Winter Time), using GMM INFORMATION message. The operator verifies then the parameters and/or the time stored on the MS

Maximum duration of test

-

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is powered up or switched on and initiates an attach (see PICS).
2	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI
3	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
4	MS -> SS	ATTACH COMPLETE	
5	SS ->MS	GMM INFORMATION	Universal Time IE is included : “< Current Year >/05/08 05:15:00” for Local Time “+ 1 hour” for Timezone No DST or Local Time Zone IE included See specific message content

Step	Direction	Message	Comments
6	MS		**Operator Action :** The use of the supported Fields is checked: Universal Time: Year: < Current Year > Month: May Day: 8th Hour: 5 Hours Minute: 15 Minutes Timezone: GMT+1 Local Time Zone: Not sent DST: Daylight Saving Time not in use (i.e. winter time) cf note
7	SS		Activate cell B with a lower signal strength than cell A. The RF level of cell A is lowered until cell B is preferred by the MS.
8	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1
9	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
10	MS -> SS	ROUTING AREA UPDATING COMPLETE	
11	SS ->MS	GMM INFORMATION	Local Time Zone IE and DST IE are included : "+ 2 hours" for Timezone (including DST) "+ 1 hour" for DST See specific message content
12	MS		**Operator Action :** The use of the supported Fields is checked: Universal Time Year: < Current Year > Month: May Day: 8th Hour: 6 Hours Minutes: 15 Minutes Timezone: GMT+1 Local Time Zone Timezone: GMT+1 (DST included) DST: Daylight Saving Time in use (i.e. "summer time") cf note
13	SS		The RF level of cell B is lowered and the RF level of cell A is increased until cell A is preferred by the MS.
14	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-1 signature Routing area identity = RAI-4
15	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
16	MS -> SS	ROUTING AREA UPDATING COMPLETE	
17	SS ->MS	GMM INFORMATION	Only Local Time Zone IE is included : "+ 2 hours" for Timezone No DST IE included See specific message content

Step	Direction	Message	Comments
18	MS		**Operator Action :** The use of the supported Fields is checked: Universal Time: Year: < Current Year > Month: MayDay: 8th Hour: 6 Hours Minutes: 15 Minutes Timezone: GMT+2 Local Time Zone: Timezone: GMT+2 DST: Daylight Saving Time not in use (i.e. winter time) cf note

Note: In step 6, 12 and 18 the “minute” is not so relevant and can be higher than “15” depending on operator’s action time.

The check of Timezone and DST is done implicitly by checking the time only in case MS does not support the display of these two fields.

Current Year is derived by the SS.

Specific message contents

GMM Information on step 5:

Information element	Value/remark
Universal Time IE	47
Year	40 - < Current Year >
Month	50 - May
Day	80 - 8th
Hour	40 - 4 hours
Minute	51 - 15 Minutes
Second	00 - 0 second
Time Zone	40 - GMT+1 (4*15 minutes+ 0*15 minutes DST)

GMM Information on step 11:

Information element	Value/remark
Local Time Zone IE	46
Time Zone	80 - GMT+1+1(4*15 minutes+ 4*15 minutes DST)
Daylight Saving Time IE	49
Length of DST Content	1
Value	1 - + 1 hour (summer time)

GMM Information on step 17:

Information element	Value/remark
Local Time Zone IE	46
Time Zone	80 - GMT+2 (8*15 minutes+ 0*15 minutes DST)

44.2.9.1.2 NITZ / GPRS / NITZ Parameters / Storage / Deletion

44.2.9.1.2.1 Conformance requirement

The feature Network Identities and Timezone shall make it possible for a serving PLMN to transfer its current identity, universal time, DST and LTZ to MSs, and for the MS to store and use this information. Each one of these elements is optional. The feature significantly enhances roaming as it enables the accurate indication of network identities that are either newer than the ME or have changed their name since the ME was manufactured or sold. Additionally time and timezone information can be utilised by MEs as desired.

When using the default character set (see TS 23.038 [4]), the serving PLMN shall make both a "short" and a "long" name available to the MS. As an alternative or, in addition, to the default character set, the serving PLMN can make a name available in UCS2. The MS shall be free to choose one of these names depending upon its own characteristics and/or limitations, such as those of its display.

Switching off the MS should not cause the updated name of the network(s) to be deleted.

Reference(s):

3GPP TS 02.42 / 3GPP TS 22.042 subclause 4 and 6.2

44.2.9.1.2.2 Test purpose

To verify that a MS supporting any of the NITZ Name realted feature (Short or Full PLMN name and thus GMM Information) is able to handle the names properly and does not erase the PLMN name sent using NITZ procedure at switch off.

44.2.9.1.2.3 Method of test

Initial conditions

System Simulator:

One cell operating in network operation mode I.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Use of NITZ Full name for PLMN (TSPC_NITZ_Full_Name)
- Use of NITZ Short name for PLMN (TSPC_NITZ_Short_Name)PIXIT statements:
-

Test procedure

Following the GPRS attachment, SS sends a Short and a Full Name for the PLMN using the GMM INFORMATION Message to the MS. The operator verifies then the parameters stored in the MS.

The MS is then switched Off. The MS is re-attached after switching on, and the operator verifies then that the names are still stored/used in the MS.

Maximum duration of test

5 minutes

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is powered up or switched on and initiates an attach (see PICS).
2	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached'
3	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature

Step	Direction	Message	Comments
4	MS -> SS	ATTACH COMPLETE	
5	SS ->MS	GMM INFORMATION	Full Name for Network and Short Name for Network IE are included : "NITZDeletionPLMN" for Full Name "NITZPLMN" for Short Name See specific message content
6	MS		**Operator Action :** Verify that the names are stored and handled correctly according to Specific PICS Statements: "NITZDeletionPLMN" for Full name, "NITZPLMN" for Short name
7	MS		The MS is switched off or power is removed (see PICS).
8	MS -> SS	DETACH REQUEST	Message not sent if power is removed. Detach type = 'power switched off, combined GPRS / IMSI detach'
9	MS		The MS is powered up or switched on and initiates an attach (see PICS).
10	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached'
11	SS -> MS	ATTACH ACCEPT	No new mobile identity assigned. P-TMSI and P-TMSI signature not included. Attach result = 'Combined GPRS / IMSI attached'
12	MS		**Operator Action :** Verify that the same names are still stored and handled correctly according to Specific PICS Statements: "NITZDeletionPLMN" for Full name, "NITZPLMN" for Short name

Specific message contents

GMM Information on step 5:

Information element	Value/remark
Full Name IE	43
Length	0F (15 octets)
Ext	1 - - - - - - - (Spare Bit)
Coding scheme	- 0 0 0 - - - - (Cell Broadcast data coding scheme, GSM default alphabet, language unspecified)
Add CI	- - - - 0 - - - (Initials Country not included)
Spare Bit in final Octet	- - - - - 0 0 0 (No info about number of spare bits)
Text String	CE 24 55 4B 2 C B3 CB F4 F4 DB 0D 65 36 9 D ("NITZDeletionPLMN")
Short Name IE	45
Length	08 (8 octets)
Ext	1 x x x x x x x (Spare Bit)
Coding scheme	x 0 0 0 x x x x (Cell Broadcast data coding scheme, GSM default alphabet, language unspecified)
Add CI	x x x x 0 x x x (Initials Country not included)
Spare Bit in final Octet	x x x x x 0 0 0 (No info about number of spare bits)
Text String	CE 24 55 0B 65 36 9D ("NITZPLMN")

44.2.9.1.3 NITZ / GPRS / MM and GMM Signalling

44.2.9.1.3.1 Conformance requirement

The feature Network Identities and Timezone shall make it possible for a serving PLMN to transfer its current identity, universal time, DST and LTZ to MSs, and for the MS to store and use this information. Each one of these elements is optional. The feature significantly enhances roaming as it enables the accurate indication of network identities that are

either newer than the ME or have changed their name since the ME was manufactured or sold. Additionally time and timezone information can be utilised by MEs as desired.

When using the default character set (see TS 23.038 [4]), the serving PLMN shall make both a "short" and a "long" name available to the MS. As an alternative or, in addition, to the default character set, the serving PLMN can make a name available in UCS2. The MS shall be free to choose one of these names depending upon its own characteristics and/or limitations, such as those of its display.

It is expected that the MS will display the most up to date information transferred to it.

Reference(s):

3GPP TS 02.42 / 3GPP TS 22.042 subclause 4 and 6.2

44.2.9.1.3.2 Test purpose

To verify that a MS supporting NITZ (any of the Fields) is able to handle both MM INFORMATION and GMM INFORMATION messages and that parameters set in the latest message override the previous ones.

44.2.9.1.3.3 Method of test

Initial conditions

System Simulator:

Two cells operating in network operation mode I (not simultaneously activated), cell A in MCC1/MNC1/LAC1/RAC1 (RAI-1), cell B in MCC1/MNC1/LAC1/RAC2 (RAI-4).

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).
- Use of NITZ DST (TSPC_NITZ_DST)
- Use of NITZ Full name for PLMN (TSPC_NITZ_Full_Name)
- Use of NITZ Short name for PLMN (TSPC_NITZ_Short_Name)
- Use of NITZ Universal Time for PLMN (TSPC_NITZ_Universal_Time)
- Use of NITZ Local Time Zone for PLMN (TSPC_NITZ_Time_Zone)

PIXIT statements:

-

Test procedure

Following its GPRS Attachment procedure, the MS receives from SS, through the GMM INFORMATION a complete set of NITZ parameters (PLMN long name, short name, and Universal time with local time adjustment). The operator verifies then the names used and the time and date stored in the MS (according to specific PICS Statements).

The MS is then paged on its paging group with its IMSI. SS verifies that the MS sends a PAGING RESPONSE. SS sends back a MM INFORMATION message changing the NITZ PLMN names (short and full names) and the local time information.

The operator verifies then that the new NITZ names are used and the time information changed (if supported).

The serving cell is then lowered and the MS triggers a ROUTING AREA UPDATE procedure on the second cell. Following this procedure, SS sends some new NITZ PLMN names (full and short) using the GMM INFORMATION message.

The operator verifies then that the new NITZ names are used, if supported, and, if possible, that the time information is not changed.

Maximum duration of test

5 minutes

Expected sequence:

Step	Direction	Message	Comments
1	MS		The MS is powered up or switched on and initiates an attach (see PICS).
2	MS -> SS	ATTACH REQUEST	Attach type = 'Combined GPRS / IMSI attach' or 'GPRS attach while IMSI attached' Mobile identity = IMSI
3	SS -> MS	ATTACH ACCEPT	Attach result = 'Combined GPRS / IMSI attached' Routing area identity = RAI-1 Mobile identity = P-TMSI-2 P-TMSI-2 signature
4	MS -> SS	ATTACH COMPLETE	
5	SS ->MS	GMM INFORMATION	Full Name for Network, Short Name for Network and Universal Time IE are included : “NITZ GMM PLMN” for Full Name “GMM PLMN” for Short Name “< Current Year >/05/08 05:15:00” for Local Time “+ 1 hour” for Timezone No DST or Local Time Zone IE included See specific message content
6	MS		**Operator Action :** Verify that the names and time are stored and handled correctly according to specific PICS Statements: “NITZ GMM PLMN” for Full name, “GMM PLMN” for Short name The use of the supported Fields is checked: Universal Time: Year: < Current Year > Month: May Day: 8th Hour: 5 Hours Minute: 15 Minutes Timezone: GMT+1 Local Time Zone: Not Sent DST: Daylight Saving Time not in use (i.e. “winter time” cf note

Step	Direction	Message	Comments
7	SS -> MS		SS pages the MS with mobile identity IMSI and paging order for RR connection according to the channel combination of the cell.
8	MS		Verify that the MS initiates a RR connection and sends a PAGING RESPONSE with mobile identity IMSI.
9	SS -> MS	MM INFORMATION	Full Name for Network, Short Name for Network, Local Time Zone and DST IE are included: "NITZ MM PLMN" for Full Name "MM PLMN" for Short Name "+ 2 hours" for Timezone (including DST) "+ 1 hour" for DST See specific message content
10	SS		SS releases the RR connection and indicates the successfully resumption of GPRS services.
11			**Operator Action :** Verify that the names and time are stored and handled correctly according to specific PICS Statements: "NITZ MM PLMN" for Full name, "MM PLMN" for Short name The use of the supported Fields is checked: Universal Time: Year: < Current Year > Month: May Day: 8th Hour: 6 Hours Minute: 15 Minutes Timezone: GMT+1 Local Time Zone: Timezone: GMT+1 (including DST) DST: Daylight Saving Time in use (i.e. "summer time") cf note
12	SS		The SS deactivates cell A and activates cell B.
13	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'Combined RA/LA updating' P-TMSI-2 signature Routing area identity = RAI-1
14	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'Combined RA/LA updated' Mobile identity = P-TMSI-1 P-TMSI-1 signature Routing area identity = RAI-4
15	MS -> SS	ROUTING AREA UPDATING COMPLETE	
16	SS ->MS	GMM INFORMATION	Full Name for Network and Short Name for Network IE are included : "NITZ GMM PLMN" for Full Name "GMM PLMN" for Short Name See specific message content
17	MS		**Operator Action :** Verify that the names and time are stored and handled correctly according to specific PICS Statements: "NITZ GMM PLMN" for Full name, "GMM PLMN" for Short name if possible, verify that no change is done on the time information

Note: In step 6, 11 and 17 the "minute" is not so relevant and can be higher than "15" depending on operator's action time.

The check of Timezone and DST is done implicitly by checking the time only in case MS does not support the display of these two fields.

Current Year is derived by the SS.

Specific message contents

GMM Information on step 5:

Information element	Value/remark
Full Name IE	43
Length	0D (13 octets)
Ext	1 x x x x x x x (Spare Bit)
Coding scheme	x 0 0 0 x x x x (Cell Broadcast data coding scheme, GSM default alphabet, language unspecified)
Add CI	x x x x 0 x x x (Initials Country not included)
Spare Bit in final Octet	x x x x x 1 0 1 (Bit 4 to 8 of last Octet are set to '0')
Text String	CE 24 55 0B 3A 36 9B 20 28 B3 E9 04 ("NITZ GMM PLMN")
Short Name IE	45
Length	08 (8 octets)
Ext	1 x x x x x x x (Spare Bit)
Coding scheme	x 0 0 0 x x x x (Cell Broadcast data coding scheme, GSM default alphabet, language unspecified)
Add CI	x x x x 0 x x x (Initials Country not included)
Spare Bit in final Octet	x x x x x 0 0 0 ("no information about the number of spare bits in last octet")
Text String	C7 66 13 04 65 36 9D ("GMM PLMN")
Universal Time IE	47
Year	40 - < Current Year >
Month	50 - May
Day	80 - 8th
Hour	40 - 4 hours
Minute	51 - 15 Minutes
Second	00 - 0 second
Time Zone	40 - GMT+1 (4*15 minutes+ 0*15 minutes DST)

MM Information on step 9:

Information element	Value/remark
Full Name IE	43
Length	0C (12 octets)
Ext	1 x x x x x x x (Spare Bit)
Coding scheme	x 0 0 0 x x x x (Cell Broadcast data coding scheme, GSM default alphabet, language unspecified)
Add CI	x x x x 0 x x x (Initials Country not included)
Spare Bit in final Octet	x x x x x 1 0 0 (Bit 5 to 8 of last Octet are set to '0')
Text String	CE 24 55 0B 6A 36 41 50 66 D3 09 ("NITZ MM PLMN")
Short Name IE	45
Length	08 (8 octets)
Ext	1 x x x x x x x (Spare Bit)
Coding scheme	x 0 0 0 x x x x (Cell Broadcast data coding scheme, GSM default alphabet, language unspecified)
Add CI	x x x x 0 x x x (Initials Country not included)
Spare Bit in final Octet	x x x x x 1 1 1 (Bit 2 to 8 of last Octet are set to '0')
Text String	CD 26 08 CA 6C 3A 01 ("MM PLMN")
Local Time Zone IE	46
Time Zone	80 - GMT+1+1(4*15 minutes+ 4*15 minutes DST)
Daylight Saving Time IE	49
Length of DST Content	1
Value	1 - + 1 hour (summer time)

GMM Information on step 16:

Information element	Value/remark
Full Name IE	43
Length	0D (13 octets)
Ext	1 x x x x x x x (Spare Bit)
Coding scheme	x 0 0 0 x x x x (Cell Broadcast data coding scheme, GSM default alphabet, language unspecified)
Add CI	x x x x 0 x x x (Initials Country not included)
Spare Bit in final Octet	x x x x x 1 0 1 (Bit 4 to 8 of last Octet are set to '0')
Text String	CE 24 55 0B 3A 36 9B 20 28 B3 E9 04 ("NITZ GMM PLMN")
Short Name IE	45
Length	08 (8 octets)
Ext	1 x x x x x x x (Spare Bit)
Coding scheme	x 0 0 0 x x x x (Cell Broadcast data coding scheme, GSM default alphabet, language unspecified)
Add CI	x x x x 0 x x x (Initials Country not included)
Spare Bit in final Octet	x x x x x 0 0 0 ("no information about the number of spare bits in last octet")
Text String	C7 66 13 04 65 36 9D ("GMM PLMN")

44.2.10 MS Radio Access Capability Interrogation

This procedure allows the network to request the MS to supply its radio access capability information to the network.

44.2.10.1 Conformance requirements

In state GMM-DEREGISTERED, the MS initiates the GPRS attach procedure by sending an ATTACH REQUEST message to the network, starts timer T3310 and enters state GMM-REGISTERED-INITIATED.

The ATTACH REQUEST message contains the MS Radio Access capability information element.

The purpose of the *MS RA capability* information element is to provide the radio part of the network with information concerning radio aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station.

The *MS RA capability* is a type 4 information element, with a maximum length of 52 octets.

DARP is contained in the Release 6 specifications. In order to implement an MS conforming to Release 99 but supporting DARP, it is necessary for the MS to additionally conform to some parts of the Release 6 specifications, such as the radio frequency requirements for DARP and some signalling extensions relating to the MS Classmark and radio access capabilities.

References

3GPP TS 04.08 / 3GPP TS 24.008 subclauses 4.7.3.1.1, 9.4.1 and 10.5.5.12a.

3GPP TS 05.15 / 3GPP TS 45.015

44.2.10.2 Test purpose

To verify that the MS supplies all its radio access capabilities and Network MS Capabilities, when attaching to the network for GPRS services.

44.2.10.3 Method of test

44.2.10.3.1 Initial Conditions

System Simulator:

One cell operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is Idle Updated.

Specific PICS statements:

- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

- Contents of MS Radio Access Capability.

Maximum duration of test

3 minutes.

44.2.10.3.2 Test procedure

The MS sends an ATTACH REQUEST message with identity IMSI. The SS allocates a P-TMSI and returns ATTACH ACCEPT message with a P-TMSI. The MS acknowledge the P-TMSI by sending ATTACH COMPLETE message.

Expected sequence

Step	Direction	Message	Comments
1	MS		The MS is powered up or switched on and initiates an attach procedure (see PICS).
2	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = IMSI Contents as defined for default message.
3	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1
4	MS -> SS	ATTACH COMPLETE	

Specific message Contents

Contents of ATTACH REQUEST message:

Protocol discriminator Skip indicator Attach request message identity MS network capability	1000 (MM message for GPRS service) 0000 00000001 See PICS/PIXIT.
MS Radio Access capability	See PICS/PIXIT. Note for R99 and onwards a MS that supports “Downlink Advance Receiver Performance” shall include the Downlink Advanced Receiver Performance indication.

44.2.11 Cell Notification

44.2.11.1 Conformance Requirement

When the READY timer is running or has been deactivated the MS shall perform cell update each time a new cell is selected.

When the READY timer has expired the MS shall:

- perform the routing area updating procedure when a routing area border is crossed;
- not perform a cell update when a new cell is selected.

The READY timer is started:

- in the MS when the GMM entity receives an indication from lower layers that an LLC frame other than LLC NULL frame has been transmitted on the radio interface; and

- in the network when the GMM entity receives an indication from lower layers that an LLC frame other than LLC NULL frame has been successfully received by the network.

If a new READY timer value is negotiated, the MS shall upon the reception of the ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message perform a initial cell update (either by transmitting a LLC frame or, if required, a ATTACH COMPLETE or ROUTING AREA UPDATE COMPLETE message), in order to apply the new READY timer value immediately. If both the network and the MS supports the Cell Notification, the initial cell update shall use any LLC frame except the LLC NULL frame.

In A/Gb mode, if the ATTACH ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates.

In A/Gb mode, if the ROUTING AREA UPDATE ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates.

44.2.11.2 Test Purpose

Test purpose 1

The MS shall start to use the LLC NULL frame to perform cell updates following receipt of an ATTACH ACCEPT message containing the Cell Notification information element.

Test purpose 2

The MS shall start to use the LLC NULL frame to perform cell updates following receipt of a ROUTING AREA UPDATE ACCEPT message containing the Cell Notification information element.

Reference(s):

3GPP TS 04.08 / 3GPP TS 24.008 subclauses 4.7.2.1.1, 4.7.3.1.3, 4.7.5.1.3

44.2.11.3 Method of Test

44.2.11.3.1 Test Procedure 1 – Ready Timer Behaviour

Initial Conditions

System Simulator:

Two cells (not simultaneously activated), Cell A in MCC1/MNC1/LAC1/RAC1, Cell B in MCC1/MNC1/LAC1/RAC1.

Both cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI. MS is switched off.

Specific PICS statements:

- MS operation mode B (TSPC_operation_mode_B).
- MS operation mode C (TSPC_operation_mode_C) (only if mode B not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test Procedure

The MS switches on and performs GPRS ATTACH on Cell A. Cell Notification is indicated in the ATTACH ACCEPT message. The MS is made to re-select to Cell B whilst the READY timer is still running. The MS performs Cell Update / Cell Notification on Cell B by sending an LLC NULL frame. The SS then waits for the READY TIMER to expire.

The MS is made to re-select to Cell A. It is checked that the MS does not perform Cell Update / Cell Notification. The MS is paged to confirm the cell-reselection to Cell A.

NOTE: the READY timer is not reset following the cell update from Cell A to Cell B but is runs uninterrupted since being started following transmission of the ATTACH COMPLETE message in the initial Cell Update - during the GPRS ATTACH Procedure on Cell A. The value of the ready timer is chosen such that if the MS were to have erroneously re-set the READY timer following the Cell Update from Cell A to Cell B it would perform a Cell Update when returning to Cell B from Cell A.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on Cell A.
1	SS		The SS activates Cell A.
2	MS		The MS is set in MS operation mode B (see PICS). If MS operation mode B not supported set the MS in operation mode C. The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach'
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Mobile identity = P-TMSI-2 P-TMSI-2 signature Routing area identity = RAI-1 T3314 = 3 mins Cell Notification IE = Present
5	MS -> SS	ATTACH COMPLETE	
6	SS		The SS waits for 1.5 mins.
			The following messages are sent and shall be received on Cell B.
7	SS		Activate Cell B with a lower signal strength than Cell A The RF level of Cell A is lowered until Cell B is preferred by the MS.
8	MS -> SS	UPLINK RLC DATA BLOCK	Contains the LLC NULL frame. Received within T3314 of Step 5.
9	SS		The SS waits for 1.5 minutes for the READY timer to expire.
			The following messages are sent and shall be received on Cell A.
10	SS		The RF level of cell A is increased until cell A is preferred by the MS.
11	SS		The SS checks that no LLC frame is received on Cell A for a period equivalent to T3314 following Step 8.
12	SS -> MS	PAGING REQUEST TYPE 1	Mobile identity = P-TMSI-2 Paging order is for TBF establishment.
13	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating paging response.

Specific Message Contents

None.

44.2.11.3.2 Test Procedure 2 – Use of LLC NULL Frame

Initial Conditions

System Simulator:

Three cells (not simultaneously activated), Cell A in MCC1/MNC1/LAC1/RAC1, Cell B in MCC1/MNC1/LAC1/RAC2 and Cell C in MCC1/MNC1/LAC1/RAC2.

All cells are operating in network operation mode II.

Mobile Station:

The MS has a valid IMSI and P-TMSI-1 stored. MS is switched off.

Specific PICS statements:

- MS operation mode C (TSPC_operation_mode_C).
- MS operation mode B (TSPC_operation_mode_B) (only if mode C not supported).
- Switch off on button (TSPC_Feat_OnOff).
- Automatic GPRS attach procedure at switch on or power on (TSPC_AddInfo_on_auto_GPRS_AP).

PIXIT statements:

-

Test Procedure

The MS switches on and performs GPRS ATTACH on Cell A. In the ATTACH ACCEPT message the SS assigns a new (non-default) value for the READY timer but does not assign a new P-TMSI. Cell Notification is indicated in the ATTACH ACCEPT message. The MS performs an initial Cell Update by sending an LLC frame. It is checked that the MS does not send the LLC NULL frame. The MS is made to re-select to Cell B. The MS sends a ROUTING AREA UPDATE REQUEST. The SS sends a ROUTING AREA UPDATE ACCEPT message assigning a new value for the Ready timer but does not assign a new P-TMSI. Cell Notification is indicated in the ROUTING AREA UPDATE ACCEPT message. The MS performs an initial Cell Update by sending an LLC frame. It is checked that the MS does not send the LLC NULL frame. Before the Ready timer expires, the MS is made to re-select to Cell C. The MS performs Cell Update / Cell Notification by sending an LLC NULL frame.

NOTE : The SS does not assign a new value of P-TMSI in either the ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT messages to prevent the sending of ATTACH COMPLETE and ROUTING AREA UPDATE COMPLETE messages by the MS which would obscure possible erroneous use of the LLC NULL frame for the initial cell update by the MS.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
			The following messages are sent and shall be received on Cell A.
1	SS		The SS activates Cell A.
2	MS		The MS is set in MS operation mode C (see PICS). If MS operation mode C not supported set the MS in operation mode B. The MS is powered up or switched on and initiates an attach (see PICS).
3	MS -> SS	ATTACH REQUEST	Attach type = 'GPRS attach' Mobile identity = P-TMSI-1
4	SS -> MS	ATTACH ACCEPT	Attach result = 'GPRS only attached' Routing area identity = RAI-1 T3314 = 3 mins Allocated P-TMSI = Not Included Cell Notification IE = Present
5	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU for initial cell update. Must not contain the LLC NULL frame.
			The following messages are sent and shall be received on Cell B.
6	SS		Activate Cell B with a lower signal strength than Cell A The RF level of Cell A is lowered until Cell B is preferred by the MS.
7	MS -> SS	ROUTING AREA UPDATING REQUEST	Update type = 'RA updating' Routing area identity = RAI-1
8	SS -> MS	ROUTING AREA UPDATING ACCEPT	Update result = 'RA updated' Routing area identity = RAI-4 T3314 = 4 mins Allocated P-TMSI = Not Included Cell Notification IE = Present
9	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU for initial cell update. Must not contain the LLC NULL frame.
			The following messages are sent and shall be received on Cell C.
10	SS		Activate Cell C with a lower signal strength than Cell B. The RF level of Cell B is lowered until Cell C is preferred by the MS.
11	MS -> SS	UPLINK RLC DATA BLOCK	Contains the LLC NULL frame. Received within T3314 of Step 9.

Specific Message Contents

None.