A 3G-UMTS originating call is described here. Setup radio bearers and RANAP signaling are covered in detail. You can click on most RANAP messages to see the full content of the message.

This call flow has been generated with from a Wireshark PCAP file using VisualEther (http://www.eventhelix.com/VisualEther/). The generated call flow was later modified with EventStudio (http://www.eventhelix.com/EventStudio/) to add comments and terminal level interactions.

RRC Connection Request

rrc → rrc

UE Identity,
UE Capabilities,
Establishment Cause
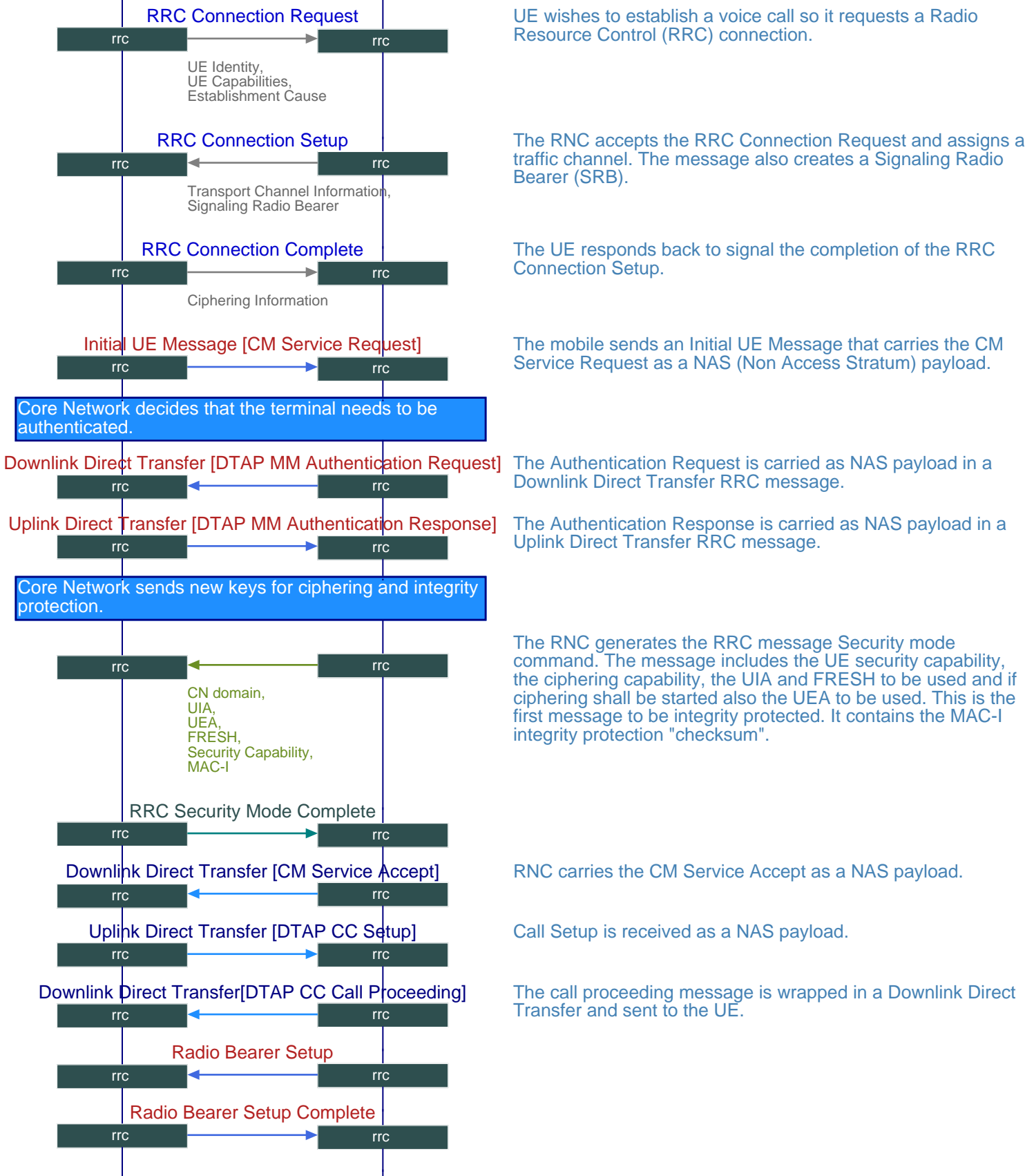
UE wishes to establish a voice call so it requests a Radio Resource Control (RRC) connection.

RRC Connection Setup

rrc ← rrc

Transport Channel Information,
Signaling Radio Bearer

The RNC accepts the RRC Connection Request and assigns a traffic channel. The message also creates a Signaling Radio Bearer (SRB).

RRC Connection Complete

rrc → rrc

Ciphering Information

The UE responds back to signal the completion of the RRC Connection Setup.

Initial UE Message [CM Service Request]

rrc → rrc

The mobile sends an Initial UE Message that carries the CM Service Request as a NAS (Non Access Stratum) payload.

Core Network decides that the terminal needs to be authenticated.

Downlink Direct Transfer [DTAP MM Authentication Request]

rrc ← rrc

The Authentication Request is carried as NAS payload in a Downlink Direct Transfer RRC message.

Uplink Direct Transfer [DTAP MM Authentication Response]

rrc → rrc

The Authentication Response is carried as NAS payload in a Uplink Direct Transfer RRC message.

Core Network sends new keys for ciphering and integrity protection.

rrc ← rrc

CN domain,
UIA,
UEA,
FRESH,
Security Capability,
MAC-I

The RNC generates the RRC message Security mode command. The message includes the UE security capability, the ciphering capability, the UIA and FRESH to be used and if ciphering shall be started also the UEA to be used. This is the first message to be integrity protected. It contains the MAC-I integrity protection "checksum".

RRC Security Mode Complete

rrc → rrc

Downlink Direct Transfer [CM Service Accept]

rrc ← rrc

RNC carries the CM Service Accept as a NAS payload.

Uplink Direct Transfer [DTAP CC Setup]

rrc → rrc

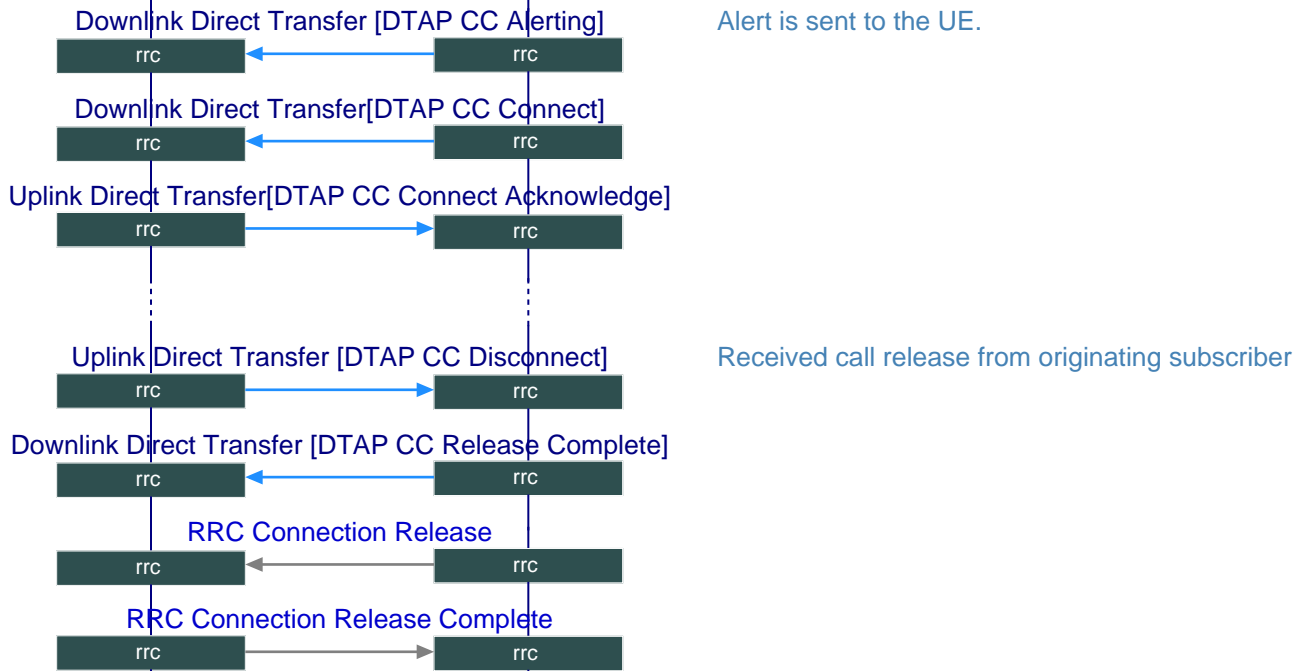Call Setup is received as a NAS payload.

Downlink Direct Transfer[DTAP CC Call Proceeding]

rrc ← rrc

The call proceeding message is wrapped in a Downlink Direct Transfer and sent to the UE.

Radio Bearer Setup

rrc ← rrc

Radio Bearer Setup Complete

rrc → rrc

User Equipment	UTRAN	**EventStudio System Designer 6**
UE	RNC	06-Oct-13 07:42 (Page 2)

Downlink Direct Transfer [DTAP CC Alerting]   Alert is sent to the UE.

rrc ← rrc

Downlink Direct Transfer[DTAP CC Connect]

rrc ← rrc

Uplink Direct Transfer[DTAP CC Connect Acknowledge]

rrc → rrc

Uplink Direct Transfer [DTAP CC Disconnect]   Received call release from originating subscriber

rrc → rrc

Downlink Direct Transfer [DTAP CC Release Complete]

rrc ← rrc

RRC Connection Release

rrc ← rrc

RRC Connection Release Complete

rrc → rrc

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Explore more call flow diagrams at: http://www.eventhelix.com/realtimemantra/telecom/