Title

GERAN Sequence Diagrams

Source

Lucent Technologies

Abstract

To prepare for updates to 04.60, this contribution proposes GERAN sequence diagrams. In developing these sequence diagrams, we have assumed the present functional split between RRC (Radio Resource Control) and MAC (Medium-Access Control). Simply put, RRC handles resource allocation for dedicated channels and MAC handles resource allocation for shared channels. We do not believe this is the best functional split, but the GERAN ad hoc appears to be moving towards this position.

Recommendation

For information.

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Figures and Drawings

GERAN-003 Sequence Diagram .....Enclosure

Revision History

Date	Description
03 Nov 00	First release.

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1. Introduction

To prepare for stage-3 updates to 04.60, this contribution follows the 3-stage method specified in CCITT I.130 [1]:

- It describes a service scenario from a user perspective.
- It uses the user-perspective scenario to develop a network perspective.
- From the network perspective, future contributions will propose changes to 04.60.

In developing the network perspective, we have assumed the present functional split between RRC (Radio Resource Control) and MAC (Medium-Access Control). Simply put, RRC handles resource allocation for dedicated channels and MAC handles resource allocation for shared channels. We do not believe this is the best functional split, but the GERAN ad hoc appears to be moving towards this position.

2. User Perspective

We have assumed the following user perspective:

1. Turn on your mobile station.
2. Place a voice call.
3. While talking on the voice call, upload a file to an ftp (File Transfer Protocol) server.

We will provide additional user scenarios that allow a complete specification of the MAC and RLC to be developed.

3. Network Perspective

Drawing GERAN-003 presents a network perspective for the user perspective presented in § 2. This perspective is based on the following steps from Q.65 [2]:

1. *Derive a functional model.* GERAN-003 shows functional blocks at the top of each sheet. (As with any functional model, these blocks do not unnecessarily constrain physical implementation.) Red blocks are in the control plane; blue blocks are in the user plane; purple blocks are in both planes. The drawing groups these blocks into three high-level network blocks: MS (Mobile Station), GERAN (GPRS/EDGE Radio Access Network), and CN (Core Network). Cyan shading indicates the grouping. See § 4 for a list of the functional blocks. Stretched hexagons indicate service access points.

2. *Based on the functional model, develop a SIB-based description.* We have ignored this optional step.

3. *Based on the functional model, develop information flows.* Information flows, in the form a sequence diagram, appear beneath the blocks. Arrows indicate individual messages and primitives (signals). Signal names appear above the arrows. Shading indicates a macro flow that may be used later in the sequence. Double arrows filled with shading indicate a previously defined macro.

4. *List actions performed by each functional block.* We will combine this step with step 5.

5. *Based on the information flows and actions, develop SDL (Specification and Description Language) diagrams for each functional block.* We have started this process, and at the next meeting, plan to introduce SDL diagrams for the MAC manager. This should aid the development of 04.60 text. We do not intend that the SDLs would become part of the standard.

6. *Allocate functional blocks to physical locations. Functions in separate physical locations must communicate using protocols specified in stage 3.* The high-level network blocks from step 1 (MS, GERAN, and CN) are sufficient for the standards under the purview of TSG-GERAN.

4. Functional Blocks

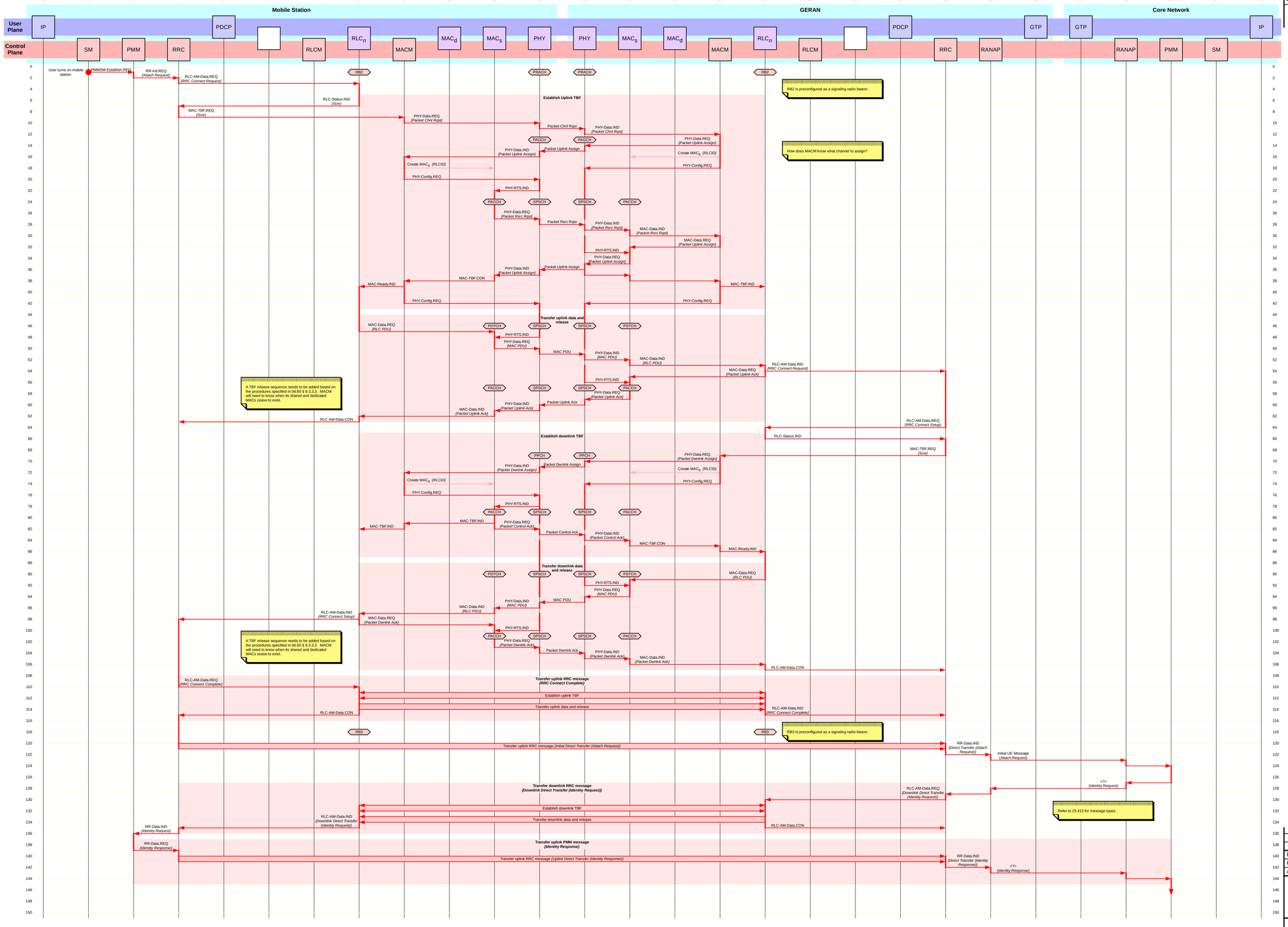
GERAN-003 contains the following functional blocks:

Acronym	Name
GTP	GPRS Tunneling Protocol
IP	Internet Protocol
MAC_d	Medium Access Control (Dedicated) 0 to multiple instances may be present.
MACM	Medium-Access-Control Manager
MAC_s	Medium Access Control (Shared) 0 to multiple instances may be present.
PDCP	Packet-Data Convergence Protocol 0 to multiple instances may be present.
PHY	Physical Layer
PMM	Packet Mobility Management
RANAP	Radio-Access-Network Application Protocol
RLCM	Radio-Link-Control Manager This block is unused.
RLC_n	Radio Link Control 0 to multiple instances may be present.
RRC	Radio-Resource Control
SM	Session Management

5. References

1. CCITT I.130.
Method for the Characterization of Telecommunication Services Supported by an ISDN and Network Capabilities of an ISDN.
Geneva: International Telecommunication Union, 1988.

2. ITU-T Q.65.
Functions and Information Flows for Services in the ISDN – Methodology – The Unified Functional Methodology for the Characterization of Services and Network Capabilities Including Alternative Object-Oriented Techniques.
Geneva: International Telecommunication Union, 2000.



- **Power on.**
- **Connect RRC peers and attach.**

DR/CO	APVD	DESCRIPTION	DATE	REV
		First release.	03 Nov 00	0

ITEM	DWG NO	TITLE	REV
LIST OF REFERENCE DOCUMENTS			

DRAWN	ADS	Next Generation — Site 19 • Box 84 • SS 1 — Calgary • Alberta • T2M 4N3
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GERAN

Sequence Diagram

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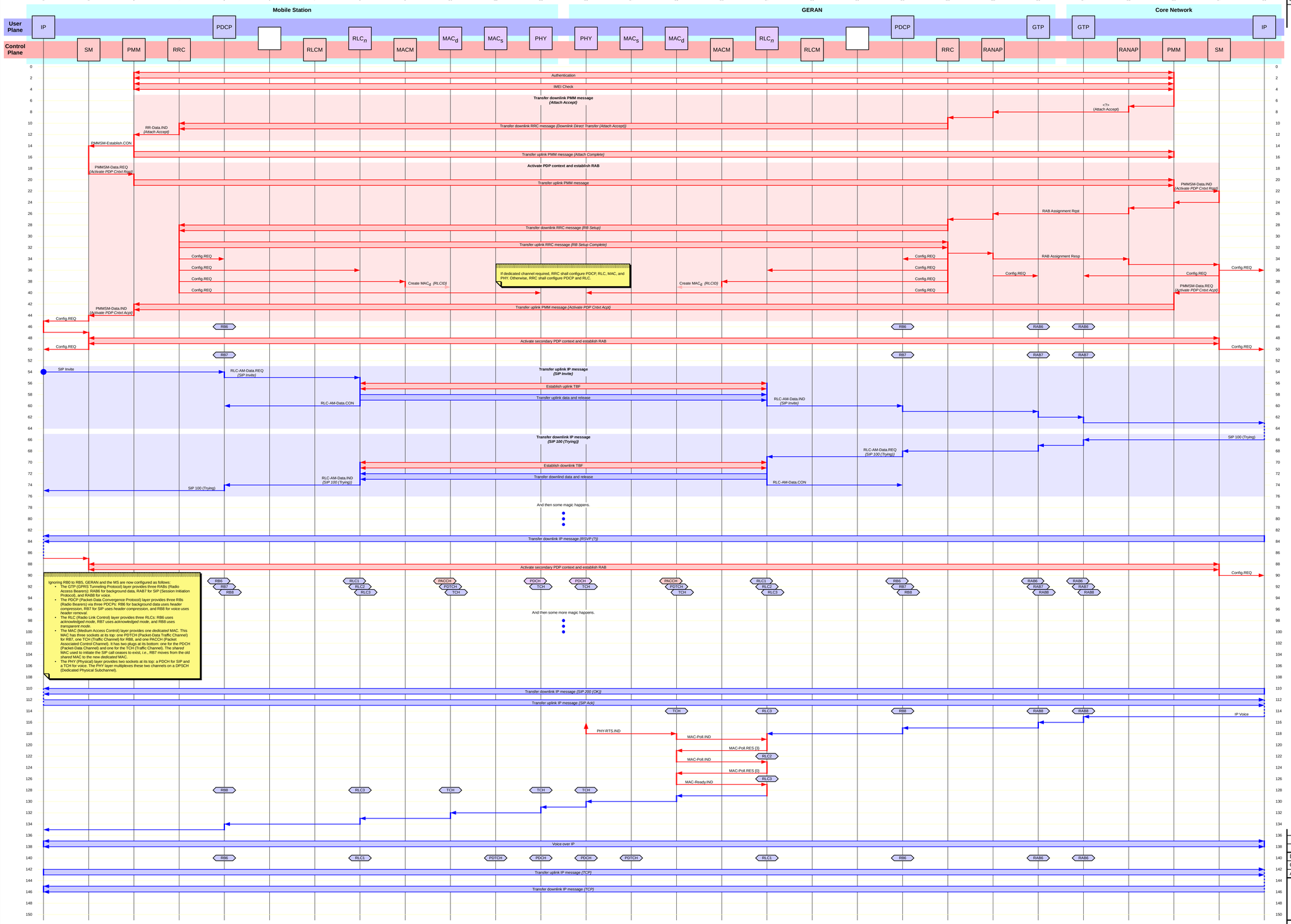
SCALE | SHEET 1 CONTINUED ON 2



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