
Transaction Capabilities Application Part (TCAP)

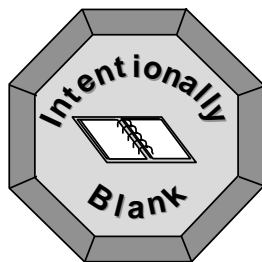
—— Chapter 11 ——

This chapter is designed to provide the student with an overview of the protocol Transaction Capabilities Application Part (TCAP)

OBJECTIVES:

Upon completion of this chapter the student will be able to describe:

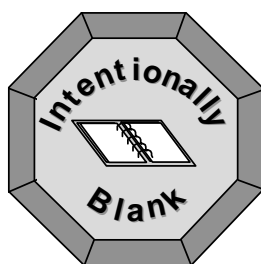
- what the main function of TCAP is.
- the general format of TCAP messages.



11 Transaction Capabilities Application Part (TCAP)

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TRANSACTION CAPABILITIES APPLICATION PART (TCAP)

The Transaction Capabilities (TC) are defined in CCITT Recommendations Q.771-Q.775. TC consists of two elements:

- Transaction Capabilities Application Part (TCAP)
- Intermediate Services Part (ISP) (not defined)

As currently specified, TCAP provides services based on connectionless network services. TC provides the means to establish non-circuit related communication between two nodes in the signaling network and to exchange messages via a dialogue.

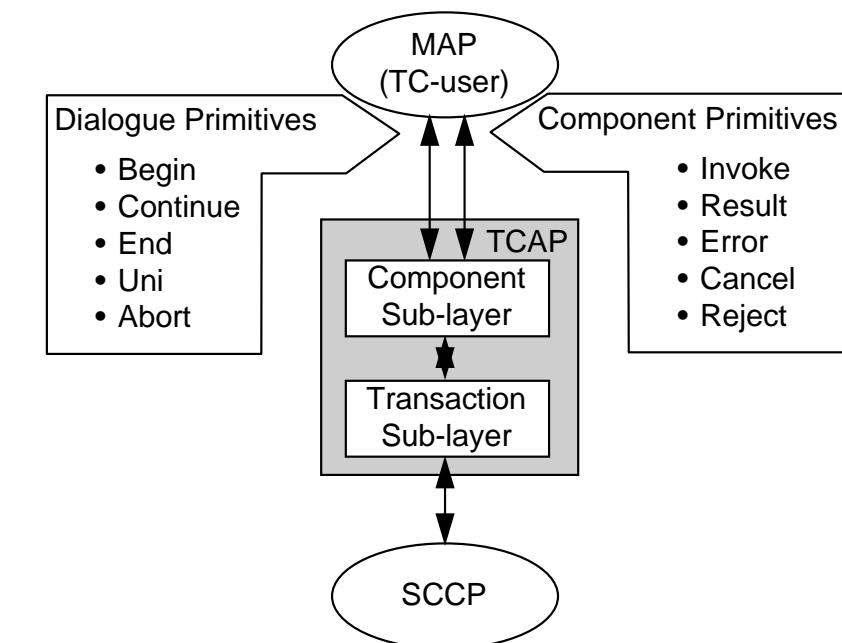
The TCAP is a common platform for different applications. TCAP has a standard interface with all applications called TC users. This includes MAP in GSM.

Common functions like sending/receiving, coding/decoding, packing/unpacking are withdrawn from each application and included in TCAP. TCAP has a buffer and handles the multiplexing and timing of the information received from a TC user. It receives incoming messages from SCCP, unpacks and delivers them and deliver to the correct TC user. TCAP makes it possible for TC users to have several dialogues running concurrently. It can be seen as a secretary to the manager e.g. MAP.

Figure 11-1 shows the TCAP structure, divided into transaction and component sublayers. The component sublayer deals with individual actions or data, called components. The transaction sublayer deals with the exchange of messages between two TC users. For transfer of information between MAP and TCAP, primitives are used.

A dialogue consists of successive components exchanged between two TC users to run an application. The transaction sublayer gives each transaction a unique identity. This implies that each TC user can have several dialogues running concurrently and that there may be several TC users on one node.

In Figure 11-2 the message flow during location updating type normal, new MSC/VLR, is shown. Between HLR and MSC/VLR, MAP messages are sent. The dialogue and component primitives are shown in brackets.



Example of Dialogue Primitives

TC-BEGIN	Begins a dialogue
TC-CONTINUE	Continues a dialogue
TC-END	Ends a dialogue
TC-UNI	Requests/Indicates an unstructured dialogue
TC-U-ABORT	Allows a TC-user to terminate a dialogue abruptly
TC-P-ABORT	Informs the TC-user that the dialogue has been terminated by TCAP

Example of Component Primitives

TC-INVOKE	Invocation of an operation, which may be linked to another operation invocation
TC-RESULT-L	Only the result or last part of the segmented result of a successfully executed operation
TC-U-ERROR	Replay to a previously invoked operation, indicating that the operation execution has failed
TC-L-CANCEL	Informs the TC-user locally that an operation invocation is terminated due to a time out condition
TC-U-CANCEL	Causes local termination of an operation invocation, as a consequence of a TC-user decision
TC-L-REJECT	Reject by local TCAP
TC-U-REJECT	Reject by TC-User
TC-R-REJECT	Reject from remote TCAP

Figure 11-1 TCAP structure, primitives between TCAP and MAP.

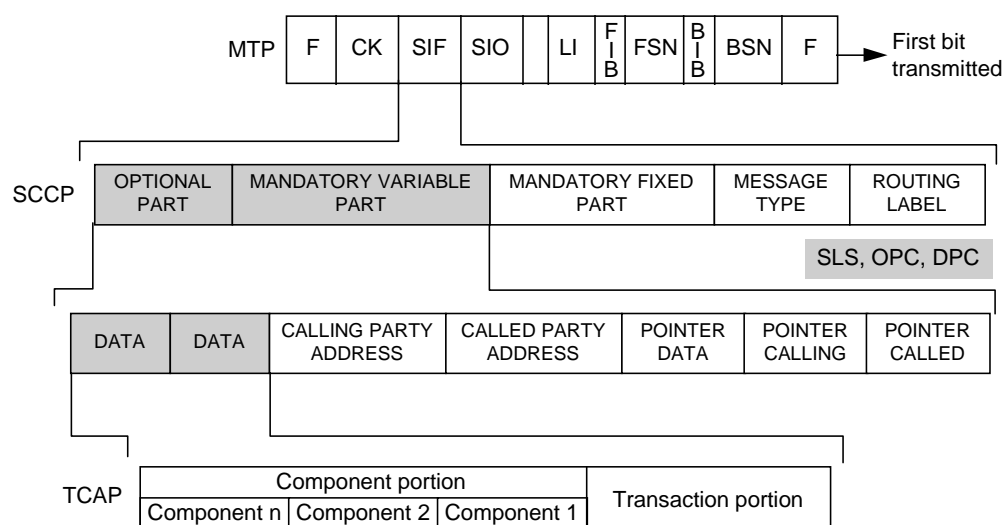


Figure 11-3 MSU with SCCP and TCAP messages.

Each information element within a TCAP message has the same structure. An information element consists of three fields, which always appear in the following order:

1. Tag: distinguishes one type from another and governs the interpretation of the Contents.
2. Length: specifies the number of octets in the Contents.
3. Contents: is the substance of the element, containing the primary information that the element is intended to convey.

The contents of each element is either one value (primitive) or one or more information elements (constructor). This is shown in Figure 11-4.

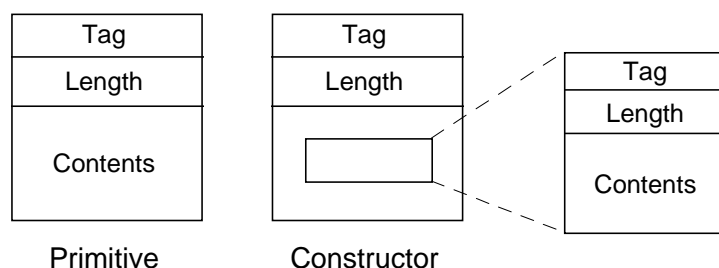


Figure 11-4 Types of contents in a TCAP message.

TCAP MESSAGE STRUCTURE

A TCAP message is structured as a single constructor information element, as shown in Figure 11-5. It consists of a transaction portion which contains information used by the transaction sublayer, and a component portion which contains

the information used by the component sublayer, like components. Each component is a constructor information element.

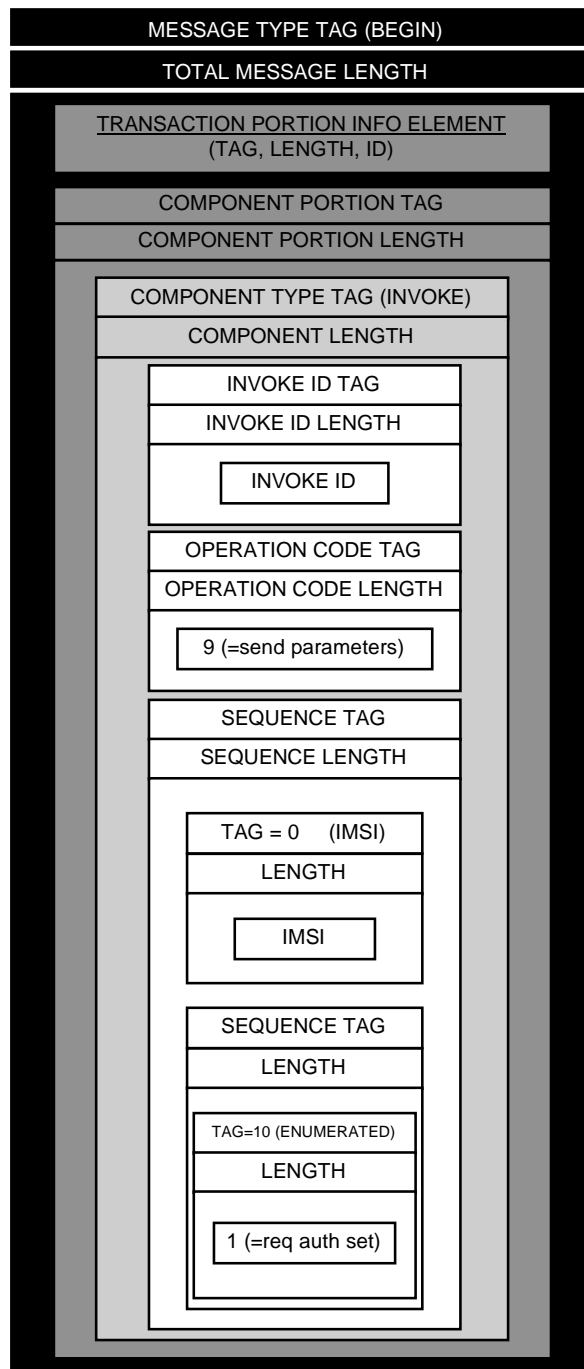


Figure 11-5 The structure of the TCAP message Send Parameters.

