requested service operation is processed exactly once: detection of repeatedly sent requests.

Any communication between a sender and a receiver is subject to communication failures. Therefore, we distinguish between different call semantics.

- **at-least-once semantics**
- **exactly-once semantics**
- **last semantics**

Under a last semantics, the requested service operation is processed once or several times, however, only the last processing produces a result and, potentially, some side-effects.

- **at-most-once semantics**

  Under an at-most-once semantics, the requested service operation is processed once or not at all.

  Example for providing an at-most-once semantics:

  After timeout at the sending site the request is not retransmitted.

  The request is transmitted in the context of a transaction.
Bidirectional communication

Usage of the request-answer scheme for message exchange.

Sockets

Call semantics

Communication between sender and receiver is influenced by the following situations:

- loss of request messages,
- loss of answer messages,
- sender crashes and is restarted,
- receiver crashes and is restarted.

Different types of call semantics