Two Generals' Problem

Description

- Two armies, surrounding a city, are prepared to attack the city. They must attack at the same time in order to succeed, otherwise they will fail.
- They send messages to each other through an unreliable medium, e.g. a message-carrier-boy walking through the city.
- There is no way to guarantee that both generals agree a message was delivered, especially the last message!

With traitors – Byzantine Generals' Problem

- Several divisions of the byzantine army are camped outside an enemy city, each division commanded by its own general
- The generals communicate via an unreliable channel
- They must decide upon a common plan of action (attack or retreat)
- Some of the generals may be traitors, forwarding wrong information.
- A reliable agreement is possible for $g > 3 \cdot t$, where g = number of generals, t = number of traitors among them.
- An agreement is impossible for $g \leq 3 \cdot t$
- Possible solutions: redundancy (e.g. send every message 100 times, expect more than one ACK, ...) and majority voting (which message is most probable to be true?)