

Communication concept airship - base station

Andreas Bischoff

<http://prt.fernuni-hagen.de/~bischoff/>

The communication link between the PRT autonomous airship (blimp, UAV) [1][2] and ground control station was realized redundantly over three communication channels in different frequency ranges. The communication channels consists of a WLAN connection following the IEEE 811.2h standard in the 5 GHz band, a serial connection within the 800 MHz band and a GPRS/UMTS broadband connection in 1,9 to 2.1 GHz band.

Apart from the redundancy (connecting security, reliability) this structure offers interoperability to external services of project partners with on-board sensor systems. These partners must be provided with sensor data in real time.

To establish a robust communication link between our base station PC and sensor partner PCs, a thread based software structure was chosen. The communication with each client is capsuled in a single thread and synchronized with the communication to the airship. Also the redundant communication channels are modeled as single synchronized non-blocking threads to realize a robust communication between the ground base station and the airship. An automatic switching algorithm chooses the best available communication link. A virtual single communication link makes the whole process transparent to the GUI PC and the connected PCs of the project partners.

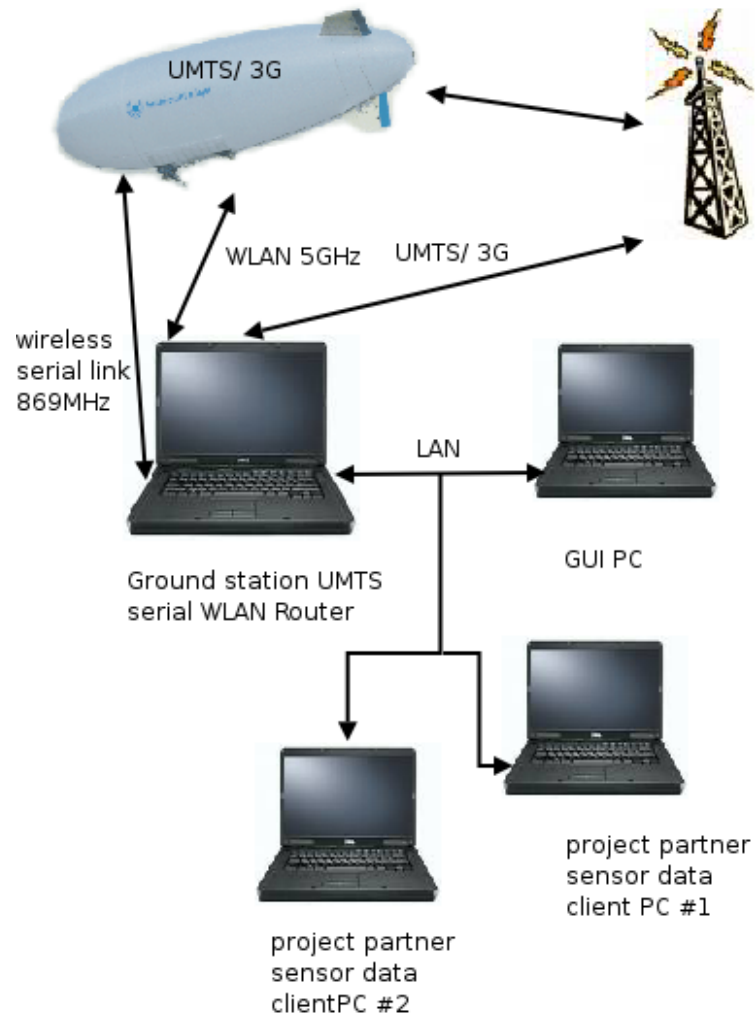


Figure 1: Communication structure

[1] <http://prt.fernuni-hagen.de/pro/imr/index.html>

[2] <http://prt.fernuni-hagen.de/pro/iwbb/index.html>