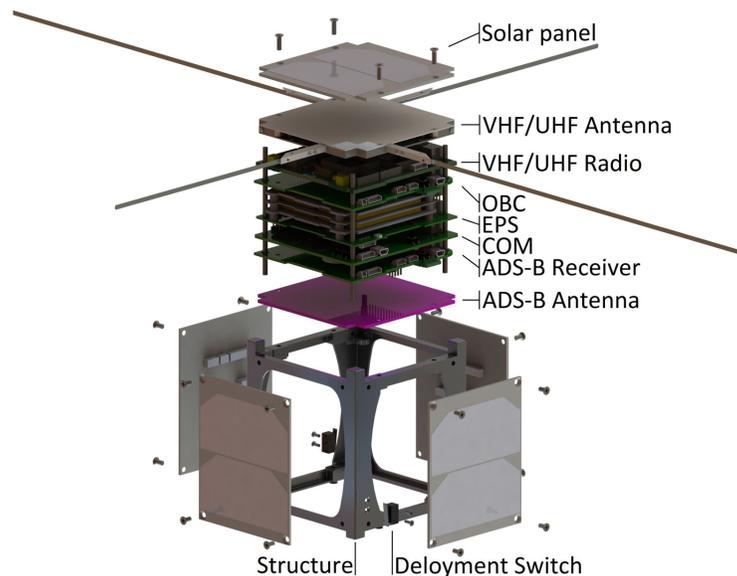


ISTSAT-1 - first nanosatellite project developed by students, professors and radioamateurs at the Instituto Superior Técnico / University of Lisbon in Portugal

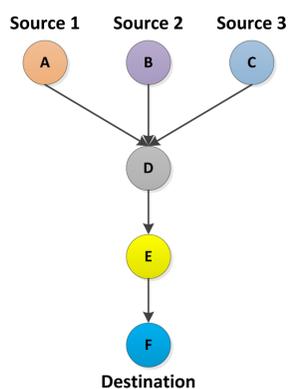
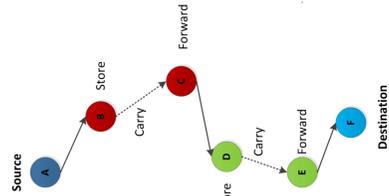
Mission: test compact ADS-B receiver and antenna

DDTP motivation: in complex scenarios with several GS and satellites the transport of ADS-B traffic down to Earth can be a problem.



DTN TYPICAL ARCHITECTURE

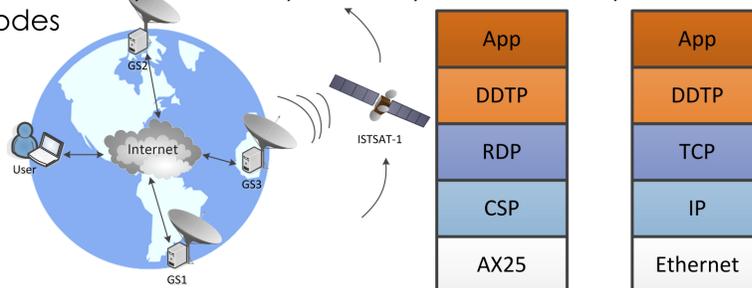
- Store and Forward
- Delay Tolerant protocols are able to sustain connections even in the presence of transmission drops
- Long distance communications also use DTN links



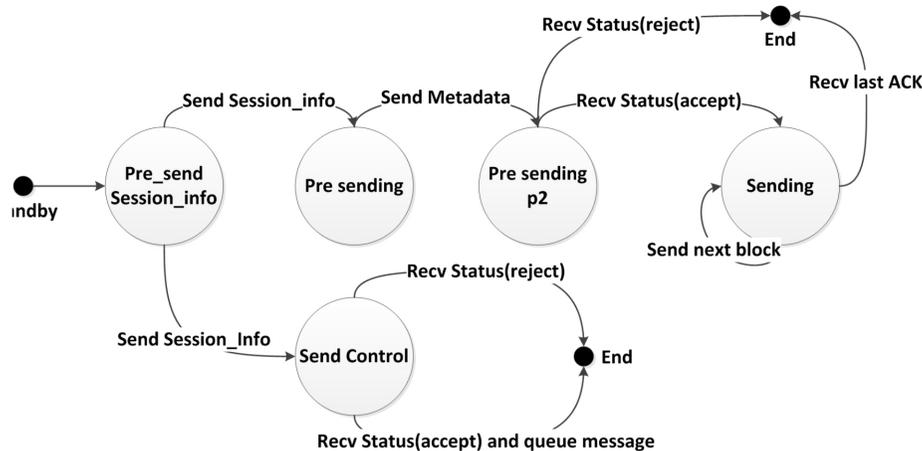
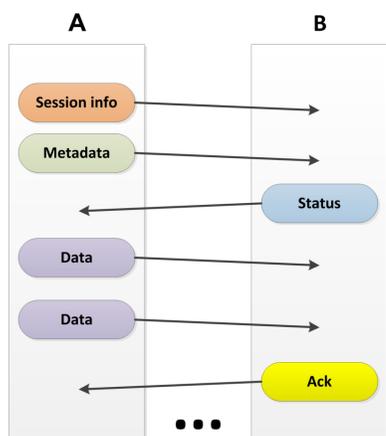
DISTRIBUTED DTN ARCHITECTURE

Capable of dealing with disruptive environments but doing so in a distributed manner

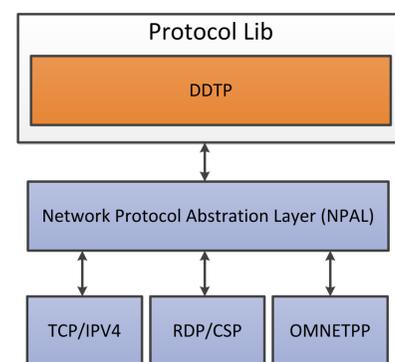
- transmission chunks over several GS
- may include several data sources as well
- one-to-many and many-to-many besides many-to-one modes



DISTRIBUTED DT PROTOCOL

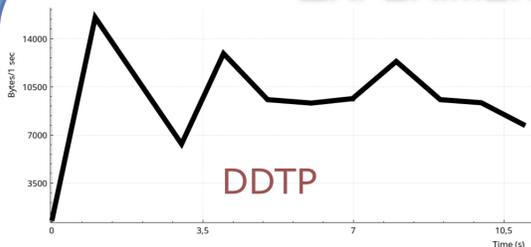


IMPLEMENTATION



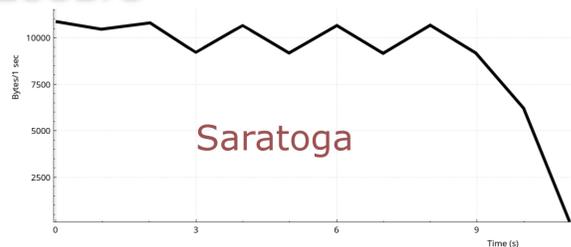
DDTP flexible stack implementation

EXPERIMENTAL RESULTS



Set-up:

- point-to-point channel - 10kB/s
- payload data - 100 kB



Saratoga:

- duration - 10.6 s; Thr_{av} - 9,6 kB/s
- duration - 11.8 s; Thr_{av} - 8.7 kB/s

CONCLUSIONS

- Current solutions only solve one-to-one and many-to-one transmission scenarios.
- A Distributed DTN data transfer protocol can take advantage of multiple communication links.
- This becomes very useful in conditions where multiple, yet low quality, links are available.