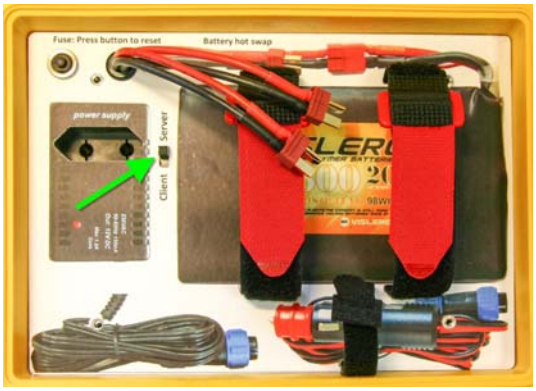
Design principles for the connection of mobile sensor platforms

Hartmut Surmann[+*], Rainer Worst[+] and the Tradr team



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NiFTi / Tradr

https://www.youtube.com/watch?v=uyh5Ho-xPRc
https://www.youtube.com/watch?v=gTLnJsLEnNs

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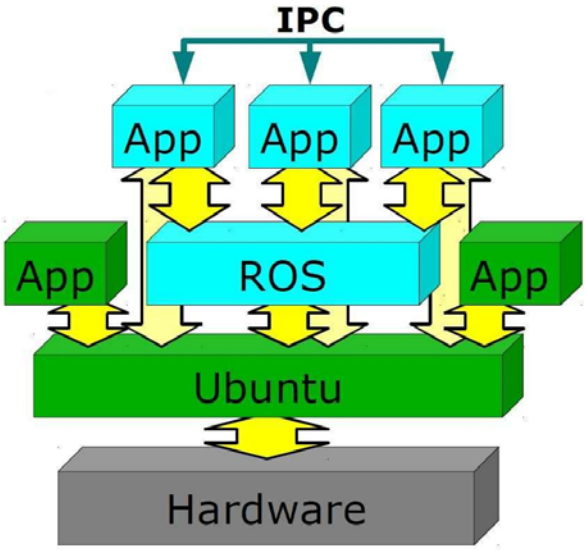
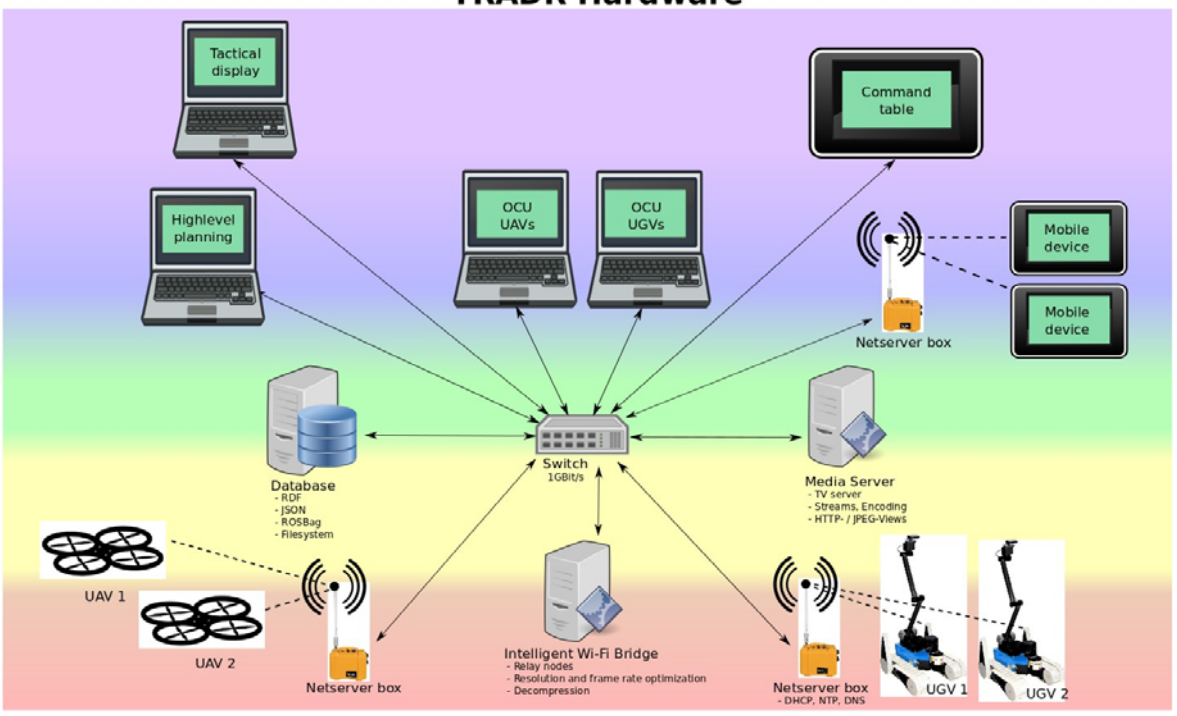
Hartmut Surmann

Hardware vs Software



TRADR Hardware



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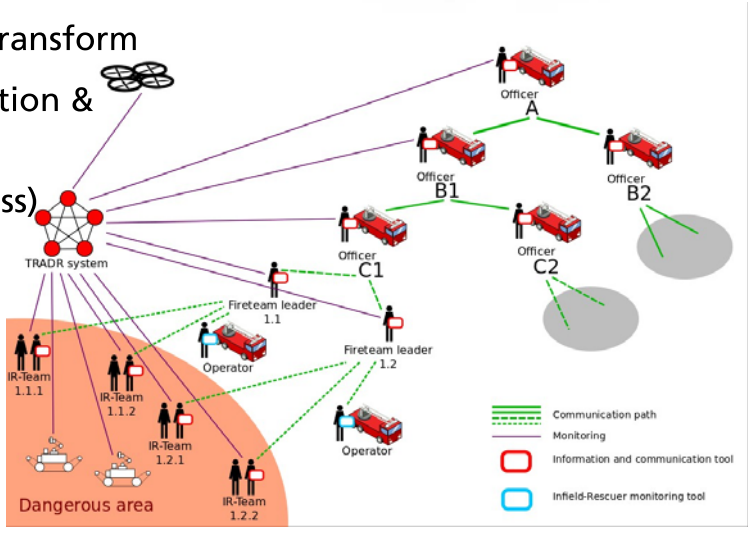
Hardware (NiFTi + Tradr)

- 2.4 and 5 GHz
- Bullets (also on the robot)
- micro controller (Linux)
- Batter power 8h
- Supports infield and development
- Hot swap
- Car charging

Software

Train your developers !!!

- ROS / topic tools
  - Mux, relay, drop, trottle, transform
  - Data link toolkit (aggregation & compression)
- Nodlets (copy cost, intra process)
- Wireshark
- UDP instead of TCP



Network optimization

- Using UDP (instead TCP)
- Reducing the packet size:
  - image size
  - compression rate
  - frame skipping
- Parameter adaptation (here Bullet)

MBits	Image size	Compression rate	Frame-skipping
>= 54	1.00	70	0
>= 48	1.00	60	0
>= 36	1.00	50	0
>= 24	0.90	45	0
>= 18	0.80	40	0
>= 11	0.65	35	0
>= 5	0.50	30	1
>= 2	0.35	25	2
>= 1	0.20	20	3
else	0.10	15	4