Planning a WSN deployment

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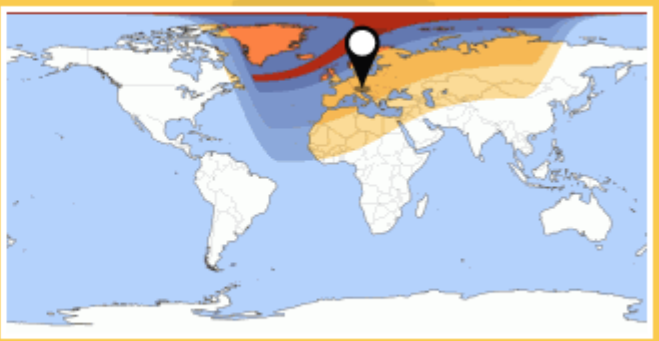
Last edit: March 2015
ICTP Workshop on
Scientific Applications for the Internet of Things (IoT)

Today

Max view in Trieste

Friday, 20 March 2015, 10:39

Global Type:	Total Solar Eclipse
Trieste:	Partial Solar Eclipse
Begins:	Fri, 20 Mar 2015, 09:30
Maximum:	Fri, 20 Mar 2015, 10:39
Ends:	Fri, 20 Mar 2015, 11:51
Duration:	2 hours, 21 minutes



Aspects of planning

- The big picture
- Physical Sensors
- Networking options
- Powering options
- Physical installation, protection
- Data transport
- Data management
- Maintenance
- Budget
- The actual deployment

The big picture

- What do you intend to do?
- Why do you intend to do it?
- What are your goals and outcomes?
- Who is it for?
- What should it look like in 5 years?

(you might call this ...

... a business plan!)

Physical sensors

Choosing the right type

- Environmental properties
- Size
- Price

Calibration !!!

- Initial
- Recalibration?

How often? Who? How?

Networking options

- Wired (Ethernet, Fiber)

  Wireless
- 802.15.4, zigbee
- 802.11 WiFi
- TVWS
- GSM/GPRS
- Satellite
- Bluetooth

Wireless networking: Frequency aspects

- higher frequency, higher data rate
- higher frequency, shorter reach
- lower frequency, better penetration

  (through objects, environment)

Site survey

- Interference, coexistence?
- Conditions that change over time?

Seasons? Traffic?

Powering options

- Dependent or autonomous?

  Autonomous options

- Battery only / Supercaps
- Solar
- Wind
- Hydro
- Thermal, vibrational energy harvesting
- Wireless power transfer

Physical installation, protection

- Environmental protection
- Weather
- Lightning
- Wind
- Humidity
- Fires
- Animals?
- Social aspects, human factors
- Theft? Vandalism
- Cleaning personnel :)

Data transport

- From sensor to database, archive, lab
- How often?
- Protocol
- Security aspects
- Delays, failure, failover

Data management

- Where does the data go?
- Database design, format, organization of data
- Backup
- Access, dissemination, openness?
- Visualization

Data management: Security

Security, data integrity

- Imagine a scenario where data are manipulated -

  e.g. disaster *early warning* systems, radiation, pollution, electricity, ... !

Maintenance

- Long term maintenance & support
- Hardware replacement plan
- Physical distance from “civilization” to deployment location
- Unattended restart, recovery
- Human factors

Budget

- :)

The actual deployment, part 1

- First rule:

  Never deploy anything that has not been tested at the lab,

  and that means:

  a 100% identical system has been tested!

  No excuses!

The actual deployment, part 2

- **Communications:**

  How do lab and field teams communicate during the actual deployment?

- **Transport:** Getting there and back
- What to take:

  we typically forget **essentials** like

  umbrellas, water, food,

  charged batteries, ...

The actual deployment, part 3

- **Document everything!**

  (and take it with you **in print)**
- **What does the field team need to know?**
- **What does the lab/home team need?**
- **Clear project management, roles, responsibilities!**

Conclusion: my personal

Top 3
things that go wrong in WSN

1/ Power

2/ Not having a maintenance / operations plan

- including people, budgets, travels, ...

3/ Now you have data ...

but you don't know what to do with them

Questions?

Thanks! **sebastian@nsrc.org**