N4C
Networking for Communications Challenged Communities:
Architecture, Test Beds and Innovative Alliances
Grant Agreement: 223994

N4C Experimentation Experiences

DTN in real context
Kocevje, Slovenia and Swedish Lapland

Maria Udén, Avri Doria, Samo Grasic (LTU)
Stephen Farrell (TCD)
Boštjan Grašič (MEIS)

Experimentation as a methodology to achieve concrete results: where, how, when?

The network itself – evolving at protocol and implementation level – behaviour t. b. d.

Because of its nature closely intertwined with:

Applications – instruments (e.g. meteo data), professional and consumer services

Data on performance – certain factors not obvious how to interprete

Use in real context – response to access in new context, on ”delayed terms”

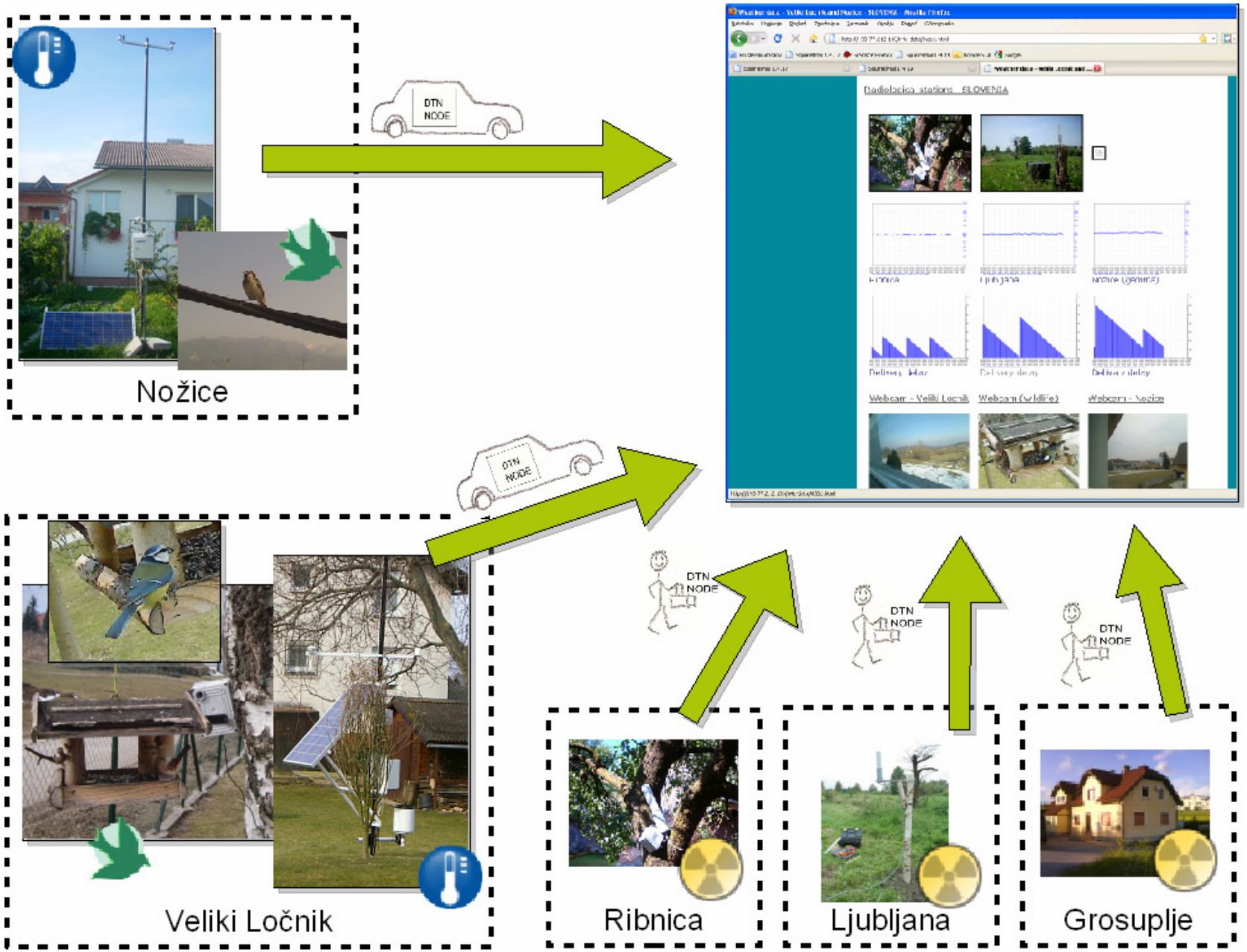
The plan was three generations, each tested twice (summer/winter). Has become more intense and somewhat seamless

On one hand: stable technology and realistic user interfaces, on the other: put paradigms and implementations to test

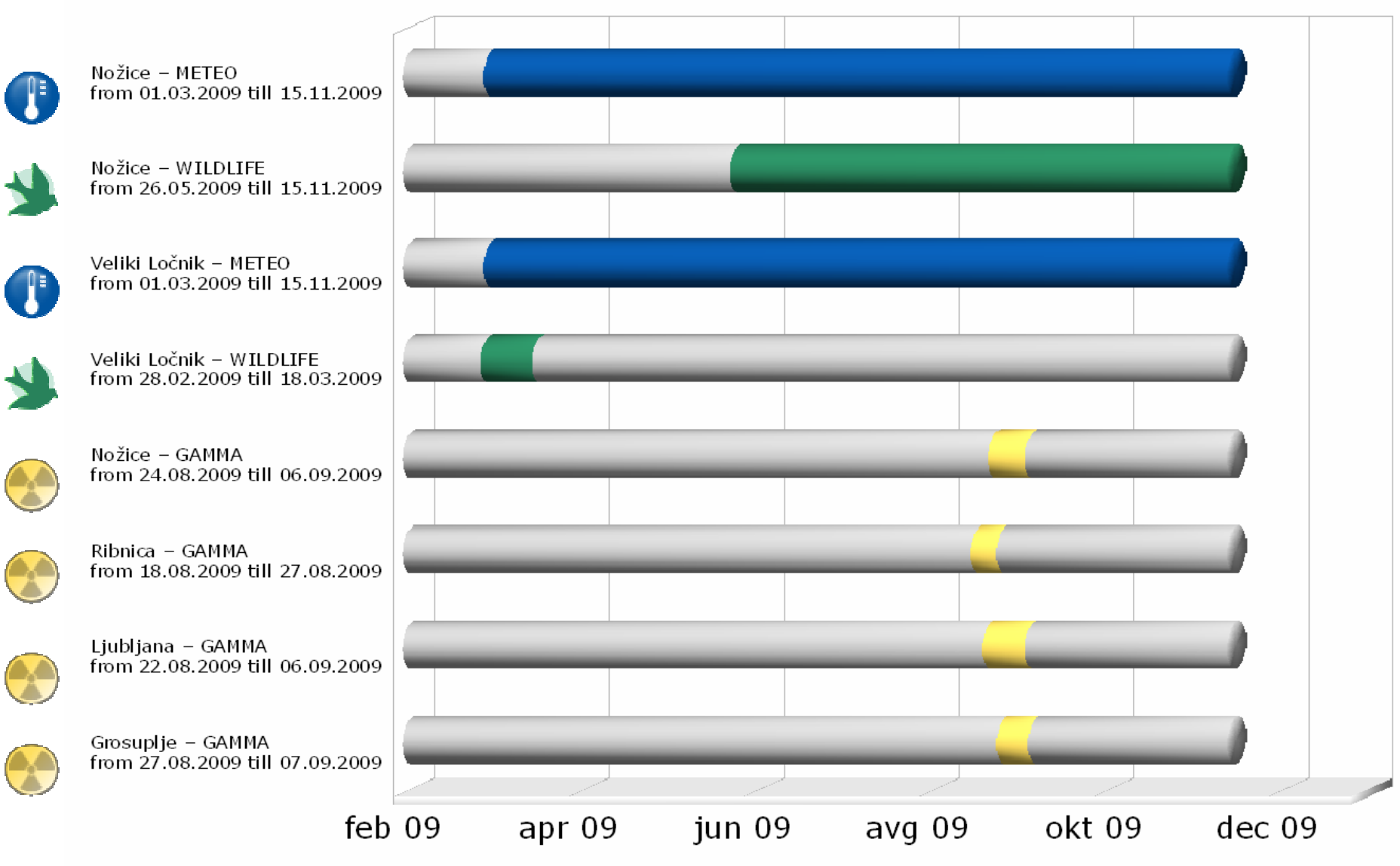
Concluding summer tests 2010 shall have content of ”Living Labs type ”. This takes particularly systematic preparations

Strong, experienced team needed for this step

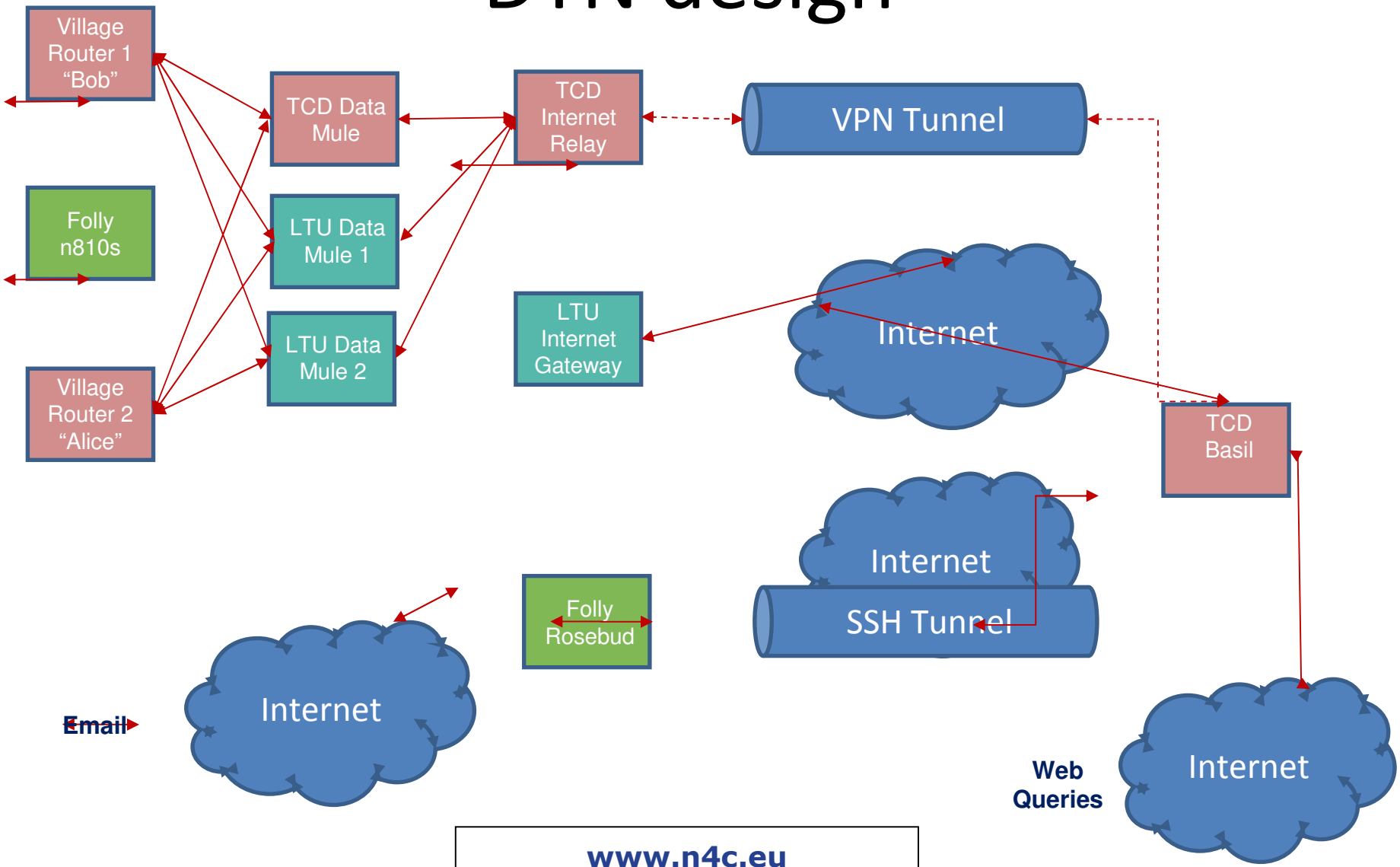
DTN structure of tests in Slovenia



Permanently running tests in Slovenia



DTN design


Village Router 1 "Bob"
Folly n810s
Village Router 2 "Alice"
TCD Data Mule
LTU Data Mule 1
LTU Data Mule 2
TCD Internet Relay
VPN Tunnel
LTU Internet Gateway
Internet
TCD Basil
Internet
SSH Tunnel
Folly Rosebud
Internet
Email
Web Queries
Internet

Saltoluokta – Location of Router
WEB and email@village.n4c.eu

Mule transporter

Gateway
DTN Relay
In Ritsem

Mule 901 Atom eeePC

Timeline for the Irish team 2009

- 27th Jul – Shipping to Lulea took 7 days.
- 2nd Aug - Travel to Lulea to setup and test
- 7th Aug – Drive to Ritsem, testing
  - Setup hiker user emails and made some WEB requests
- 9th - Helicopter to Saltoluokta, setup again
- 11th Completed 2 full return rotations
- 12th Hikers arrive in Saltoluokta and check email and WEB requests
- 13th Packup and move to Staloluokta, setup system and users pickup more mail.
- 15th Home!

The experimentation facilities as a service offered to R&D

What are the metrics relevant to experimentations?

The impact to standardization

Reflexions – some notes Lapland tests

-All coordination need be done before the test (almost no coordination during test, as the people involved can not communicate)

- So easy to fail (eg. burned fuse worth few cents can cost several hundreds euros to buy it and replace it - travel/time expenses)

-Lots of improvisation (soldering with a nail heated with a candle, using wooden stick as antenna mast)

-For some experiments impossible to set exactly the same conditions twice one summer (weather, etc)

Conclusion

To the above comes ”taking care of oneself” in field conditions

For capacity, validity, reliability: specialized staff

Reason for permanent test bed = service to researchers

Contradictions and measures

- New, “better” technology is driver for front line researchers, for N4C e.g. implementations
- The test bed however, requires tuning each time new components are combined
- Optimal strategy for meaningful, strong impact results?
- Without social interaction the capacity to handle this at all goes down

the local community

inclusion and long term effects

Thanks for the attention