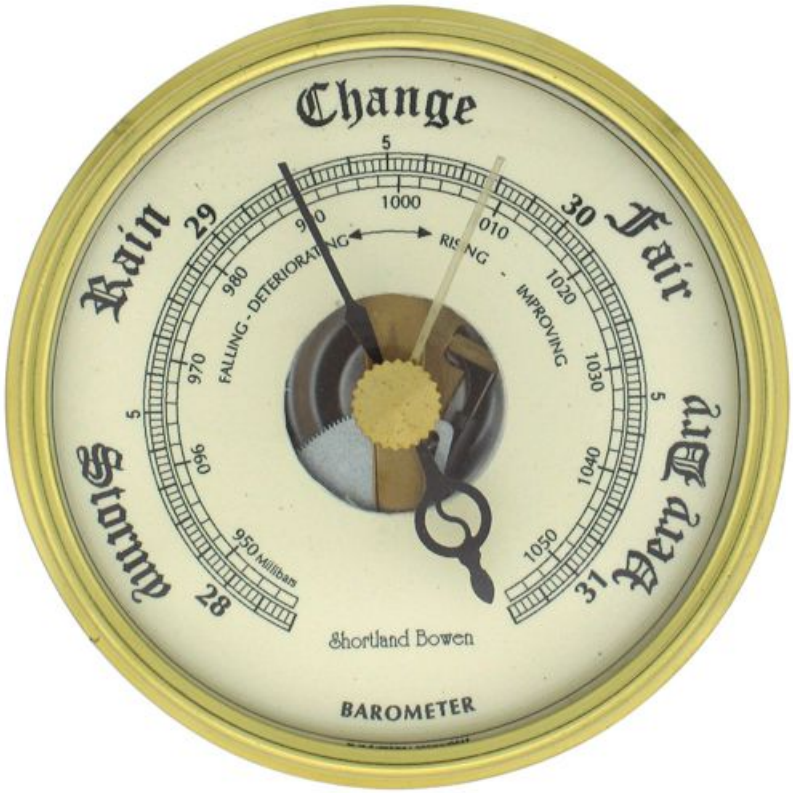
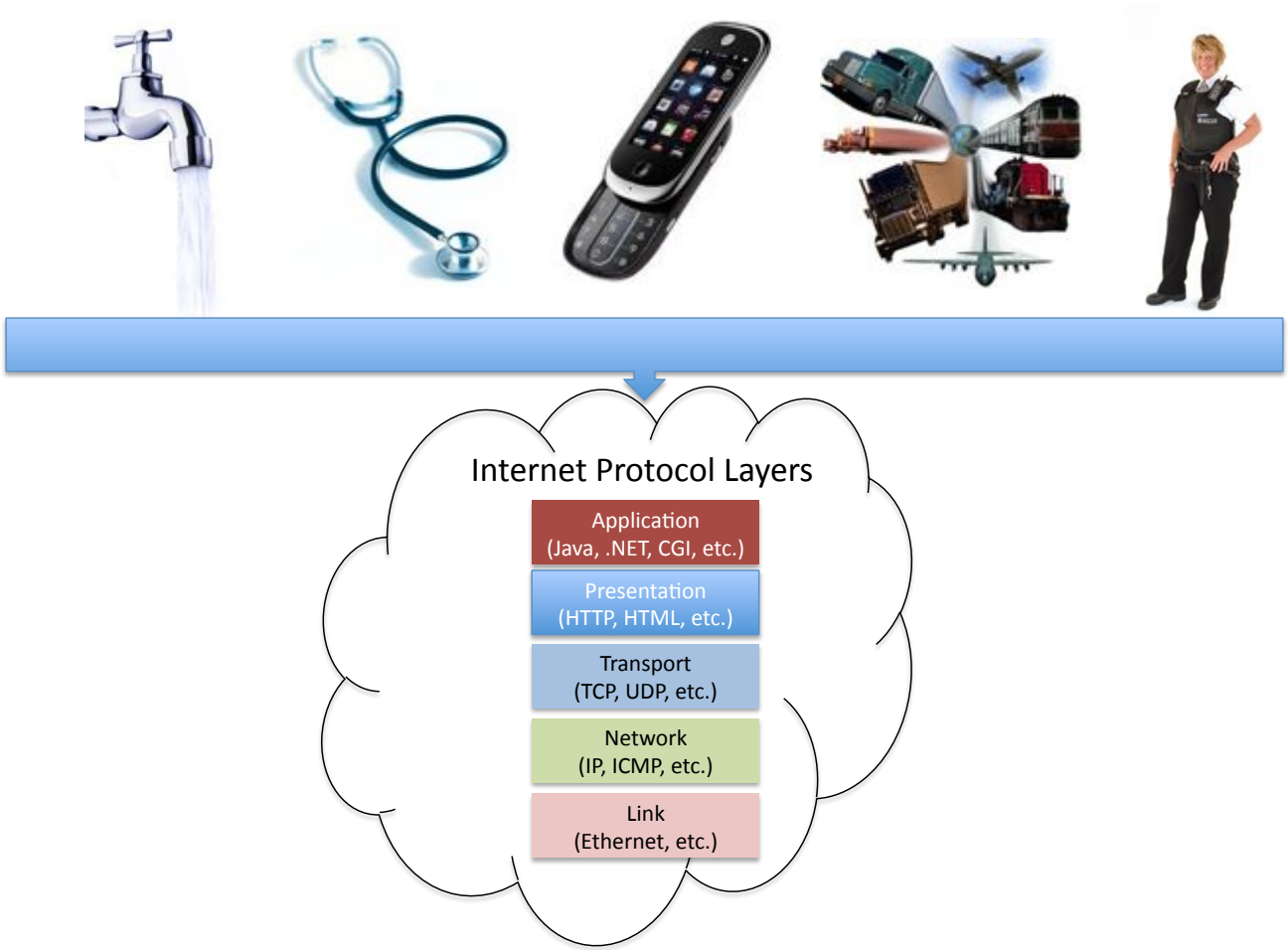
Measuring Mobile Broadband in Norway



Amund Kvalbein
Senior Research Scientist
Simula Research Laboratory

RIPE-64
April 19 2012

Networks are critical infrastructure



Measurements are needed to understand the robustness of mobile broadband networks

Governments need data to guide regulation

Customers need data to make informed choices

Critical users need data about reliability

Measurements can give increased competition and innovation

Increasing focus on measurements in academia, industry and from regulators

MLab

RIPE Atlas

SamKnows for OFCOM, FCC and EU

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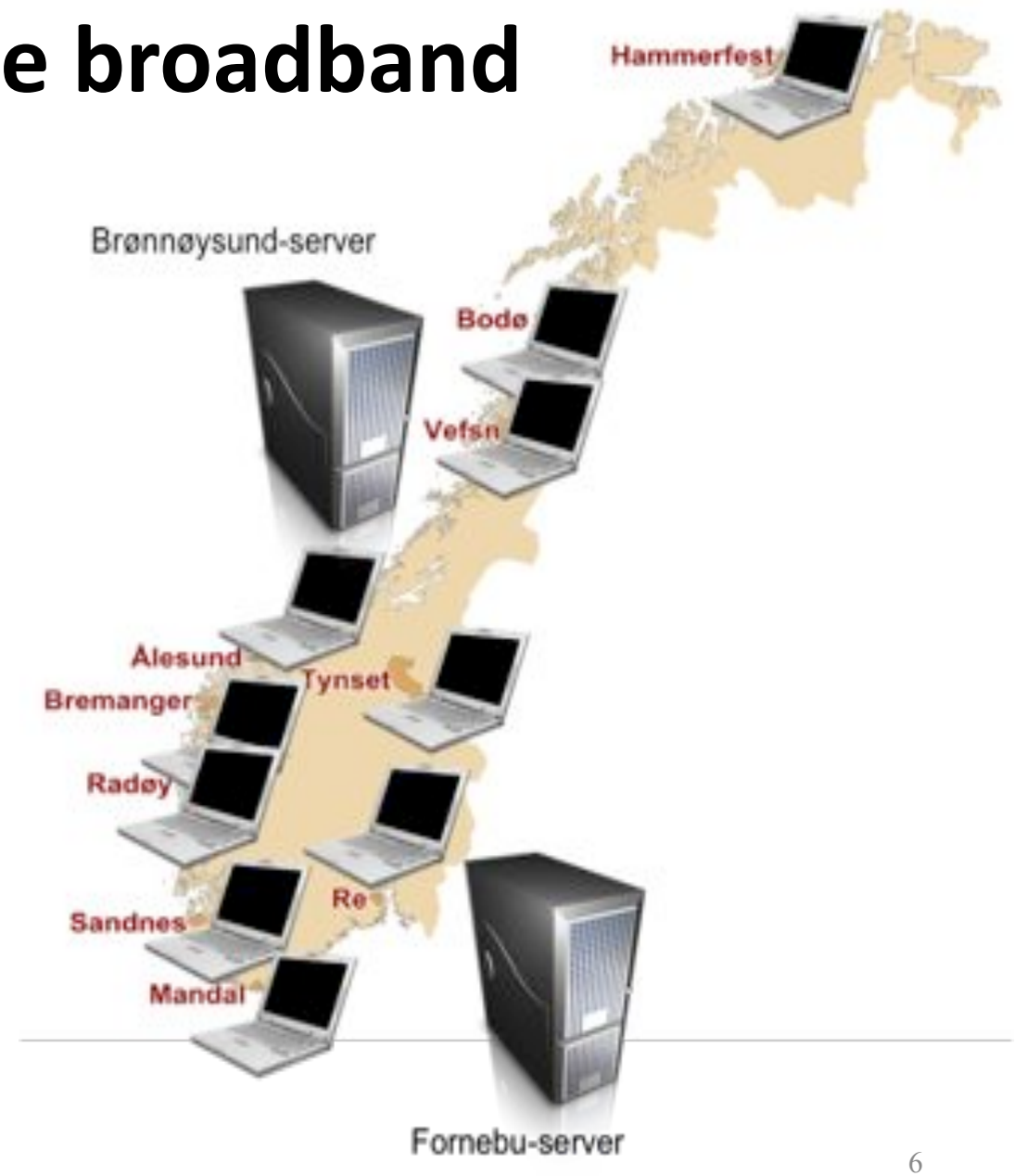
Our goal: continuous monitoring of all MBB networks in Norway

Measuring mobile broadband

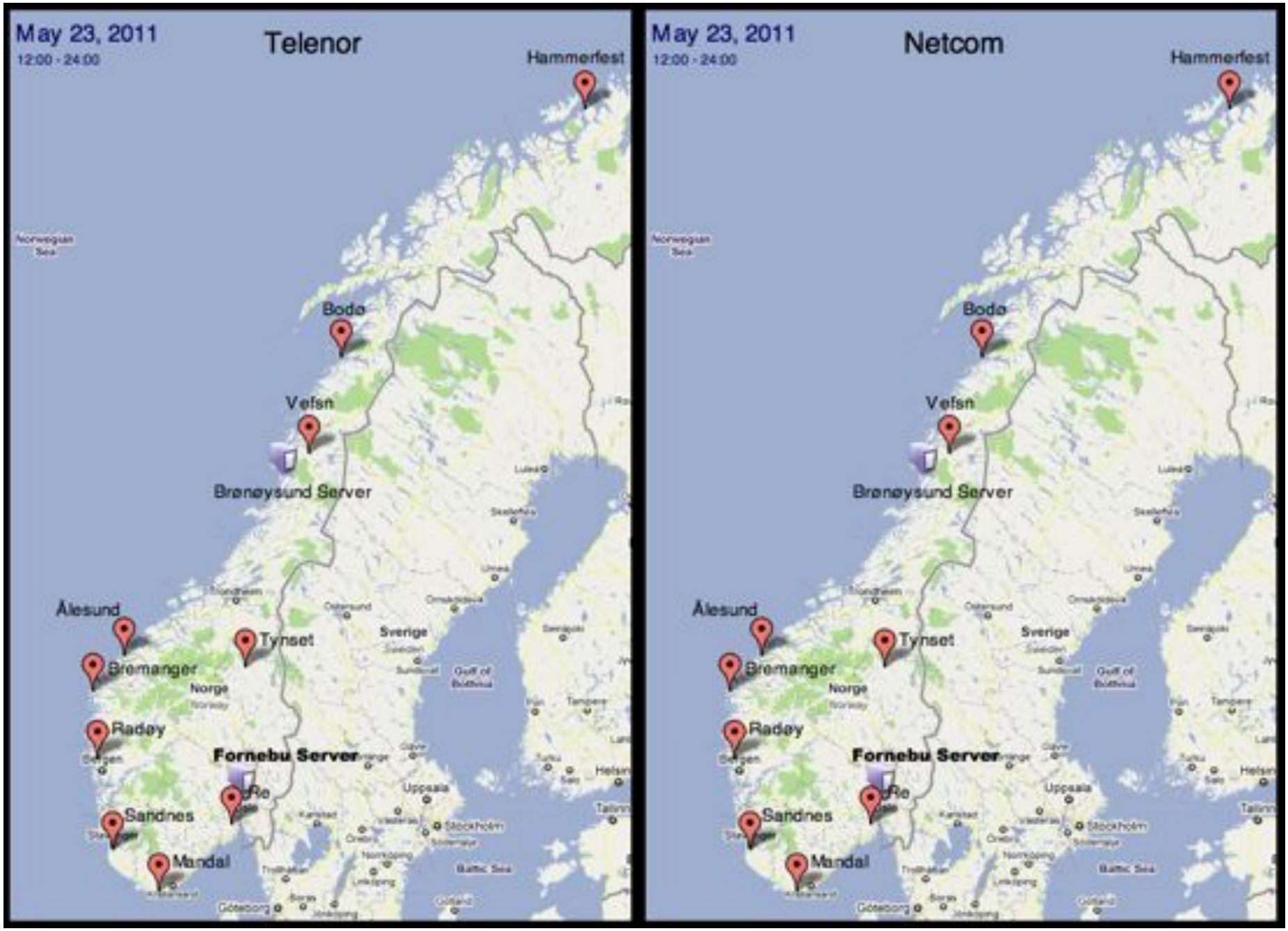
Can we trust the Internet connection on election day?

Measurements from almost 100 voting locations in 10 municipalities

Active measurements of availability and quality from multiple operators



http://nevada.simula.no


May 23, 2011
12:00 - 24:00
Telenor
Hammerfest
Bodø
Vefsn
Brønøysund Server
Ålesund
Tynset
Sverige
Bremanger
Norge
Radøy
Fornebu Server
Re
Sandnes
Mandal
May 23, 2011
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Netcom
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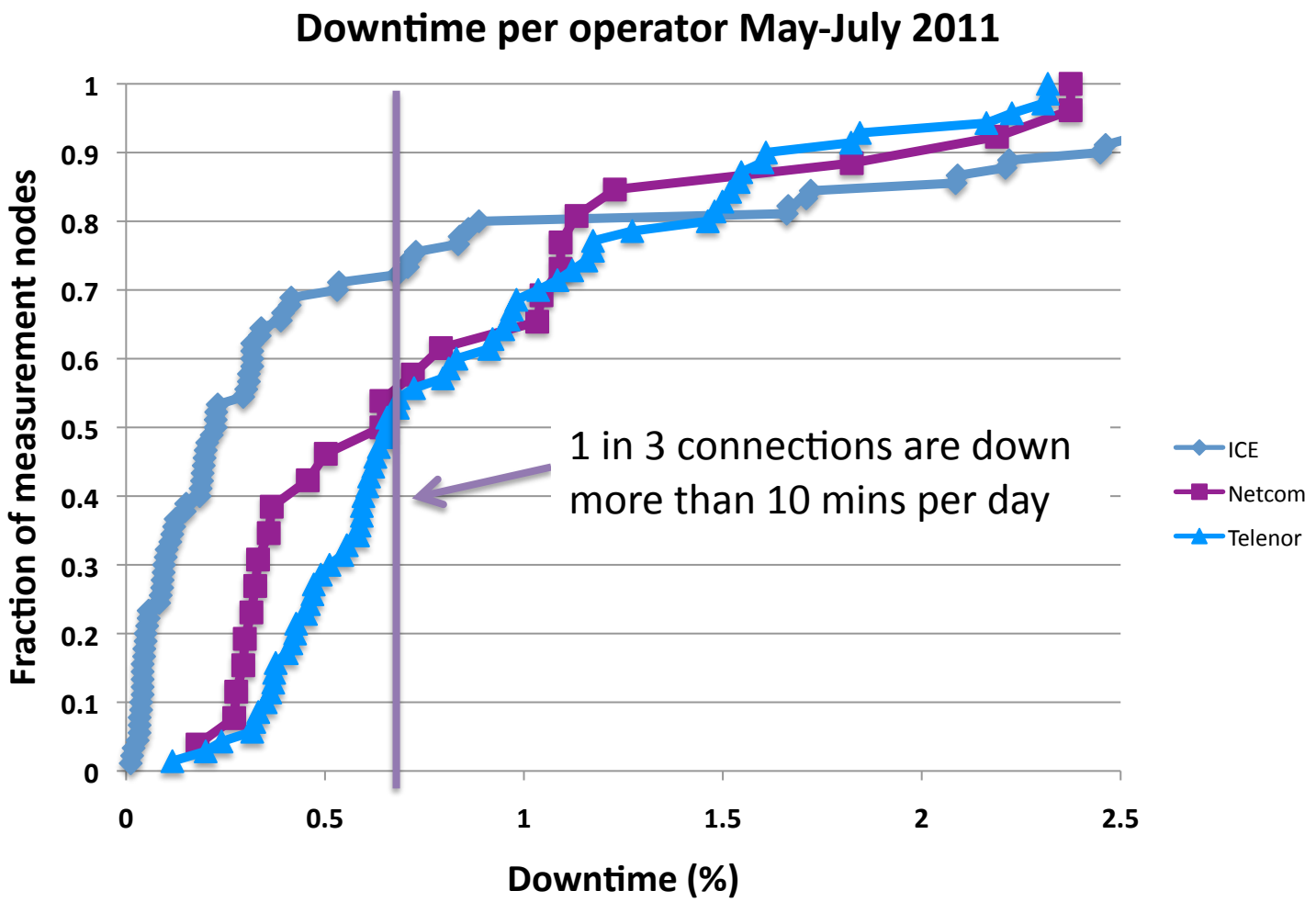
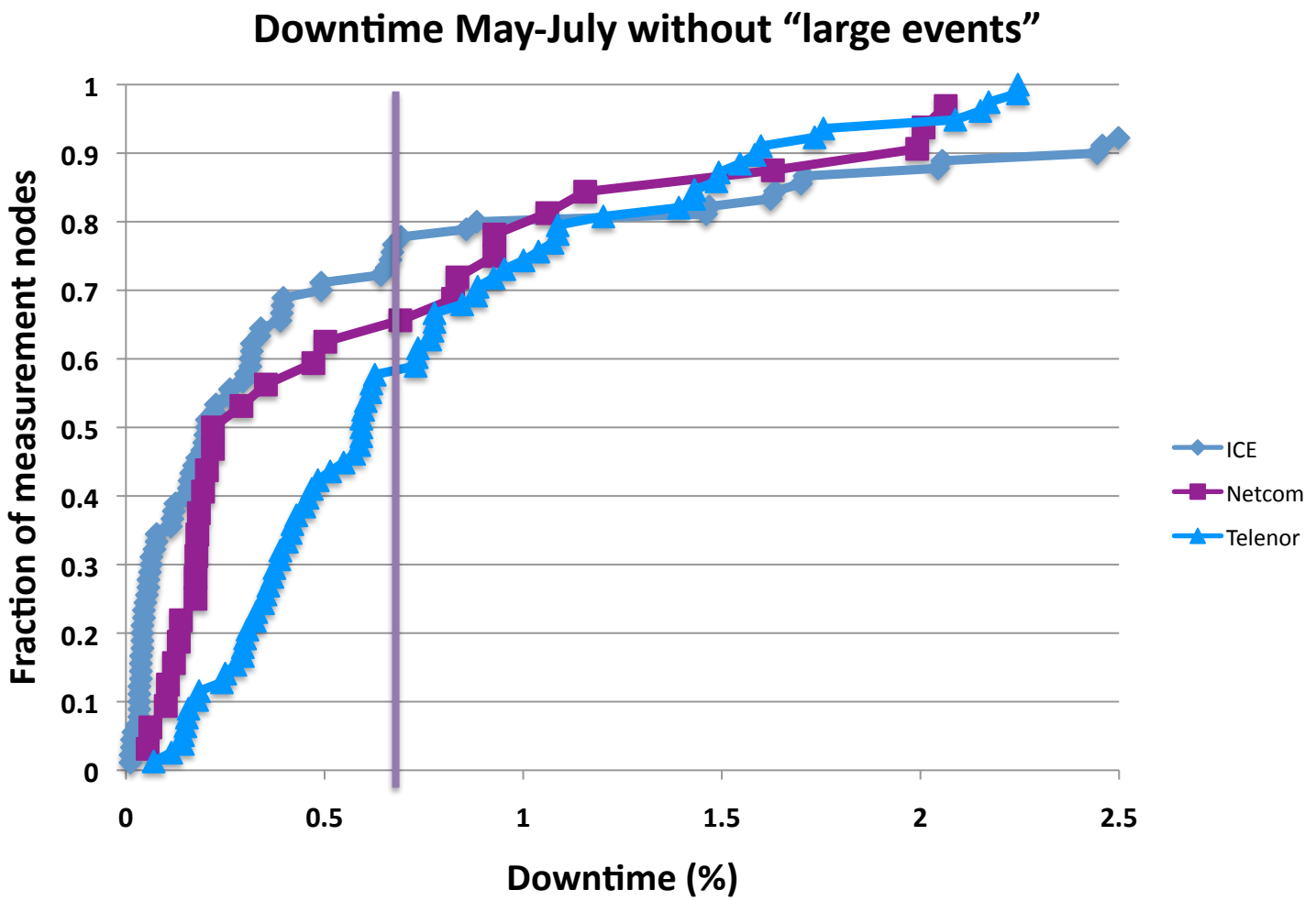
Vefsn
Brønøysund Server
Ålesund
Tynset
Sverige
Bremanger
Norge
Radøy
Fornebu Server
Re
Sandnes
Mandal

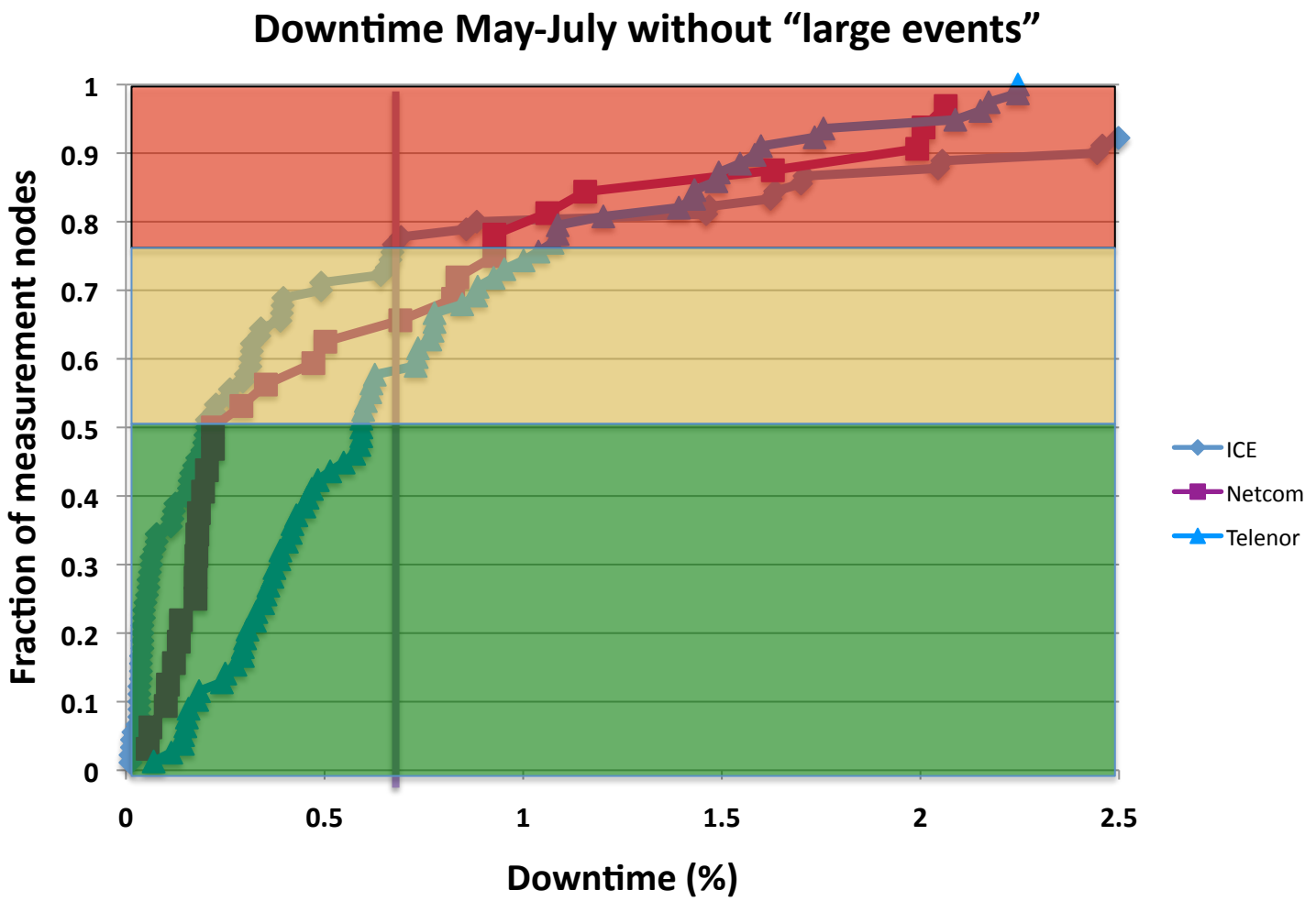
Mobile broadband is less stable than it should



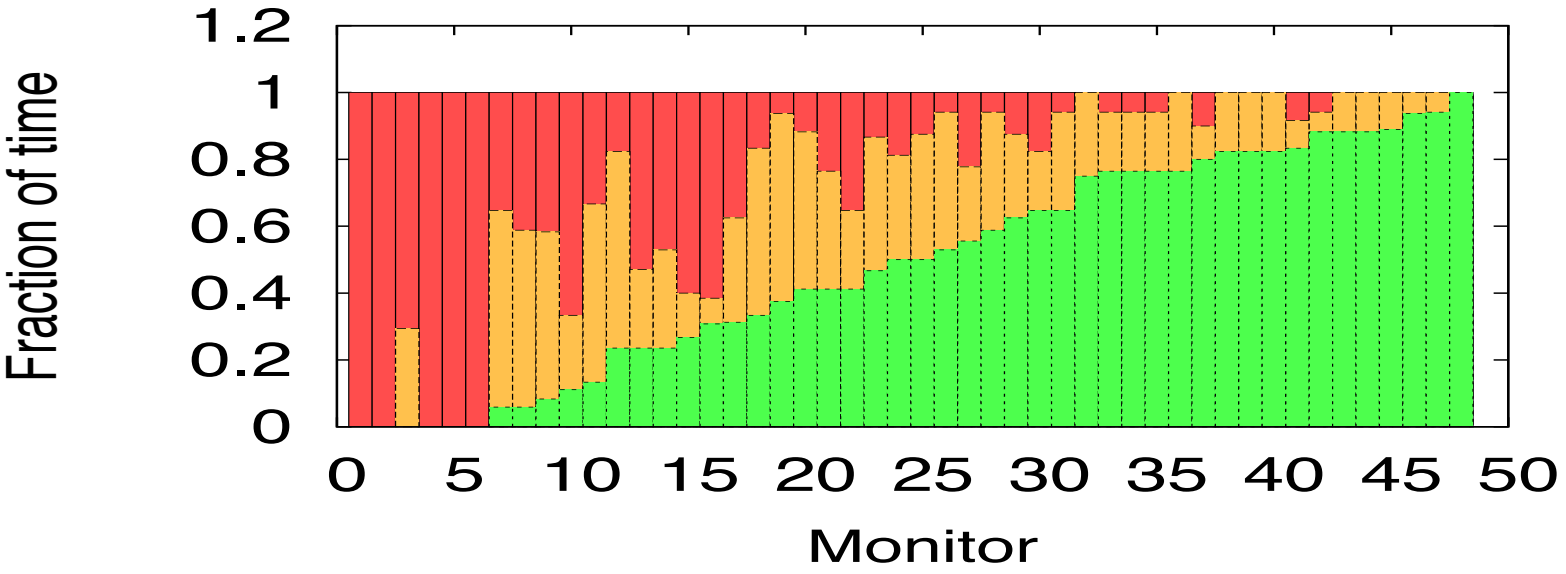
The main challenge is the many small outages that happen every day



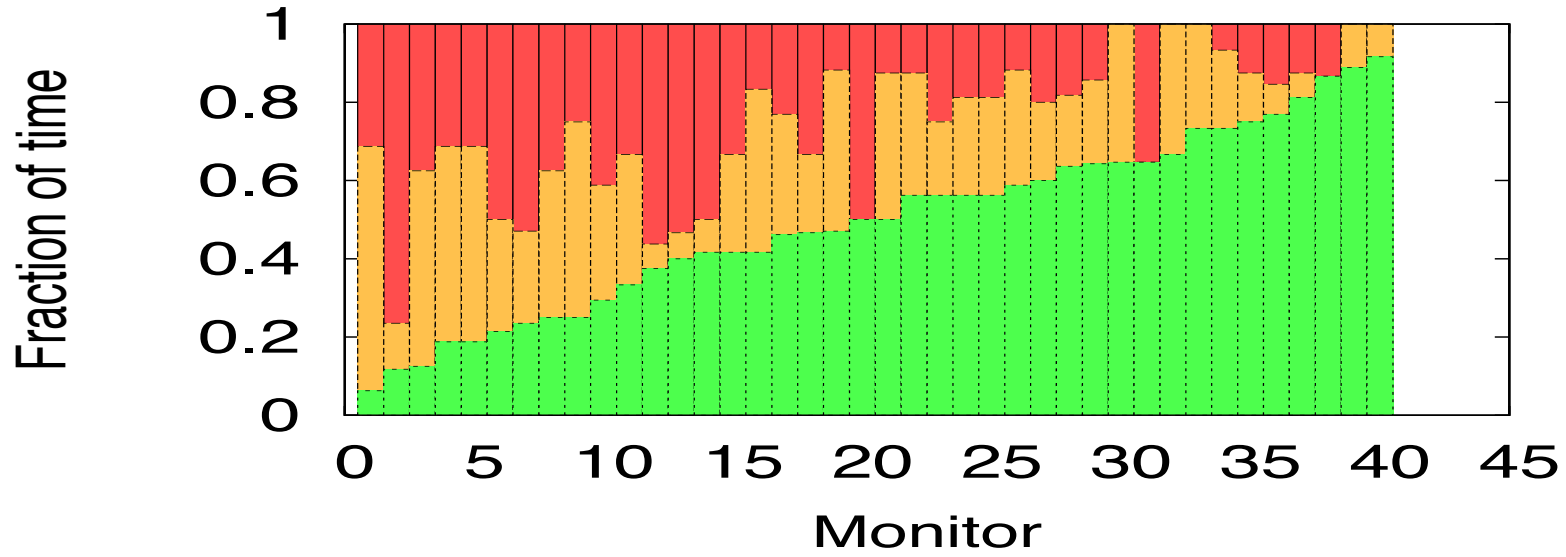
Classify nodes based on relative performance



Monitors are good at different times

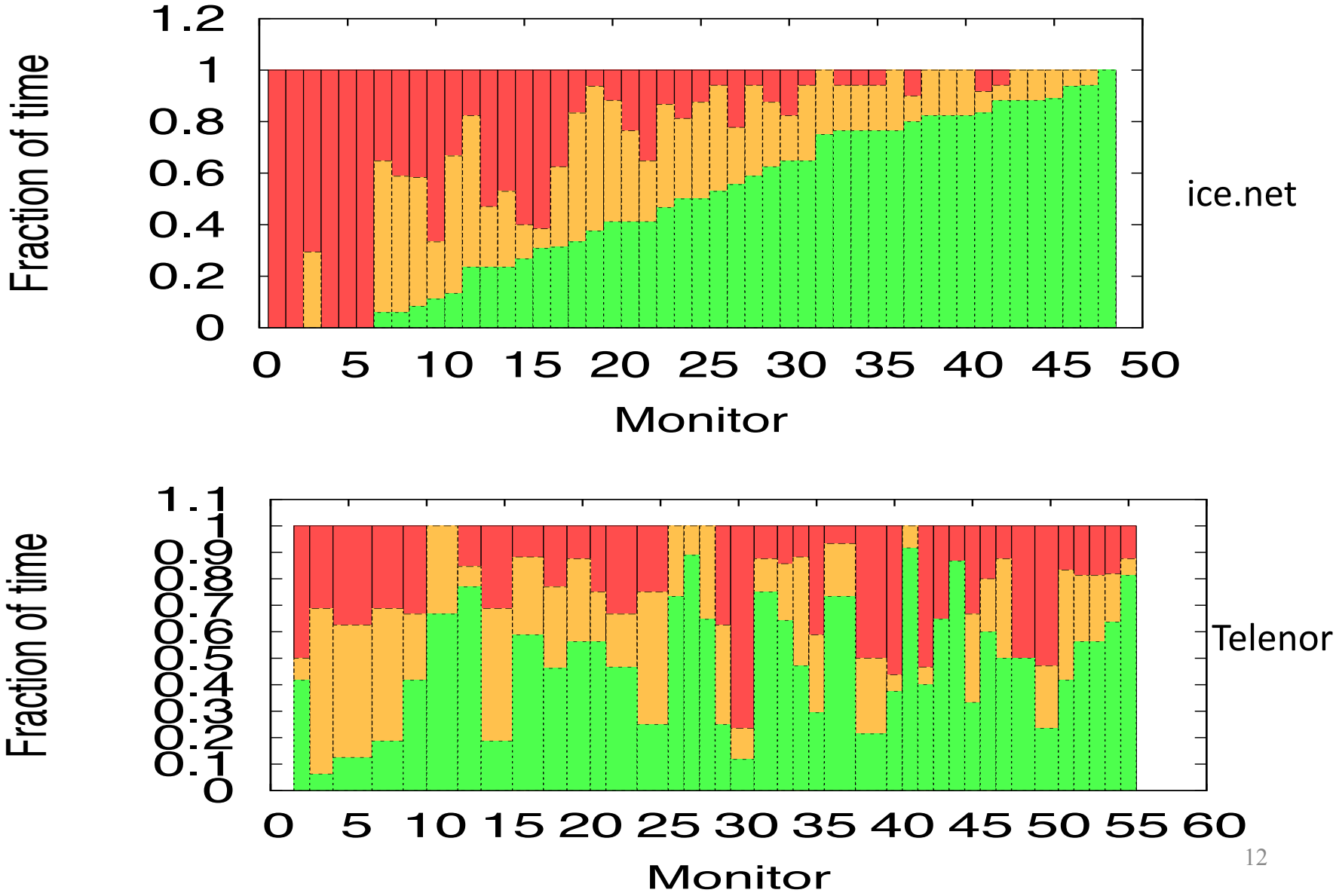


ice.net

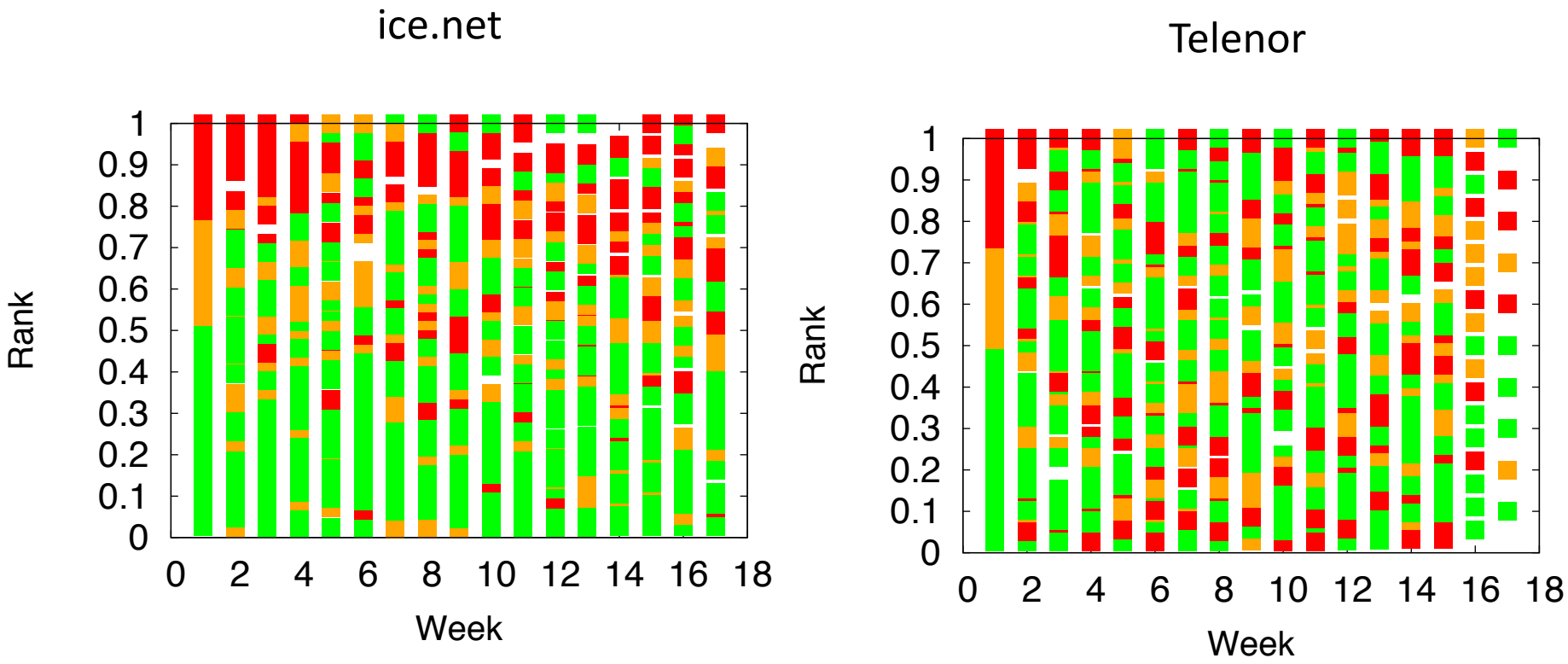


Telenor

Operators are good at different places



Operators have different failure patterns



Large room for improved robustness if you could connect to multiple operators at the same time

Permanent measurement infrastructure

Simula is establishing a permanent infrastructure for measuring MBB

- Main motivation is to measure robustness

All MBB operators in Norway were invited into the project

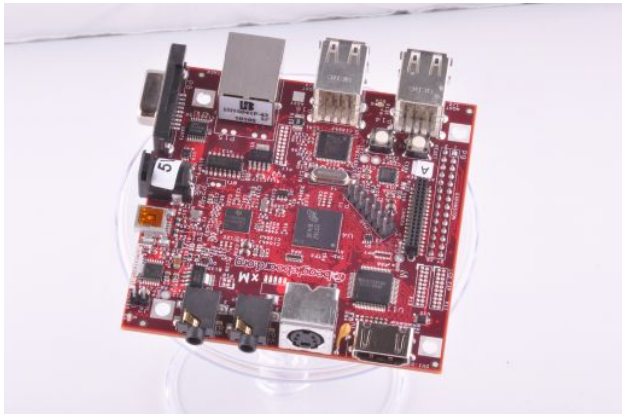
- Two have joined and will provide financial support + equipment and subscriptions

Initially, all measurement nodes are stationary

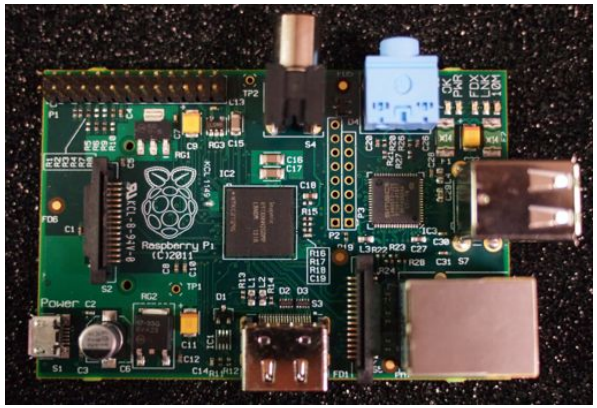
- Goal: 500 measurement points

We are testing different hardware

TP-LINK TL-WR703N

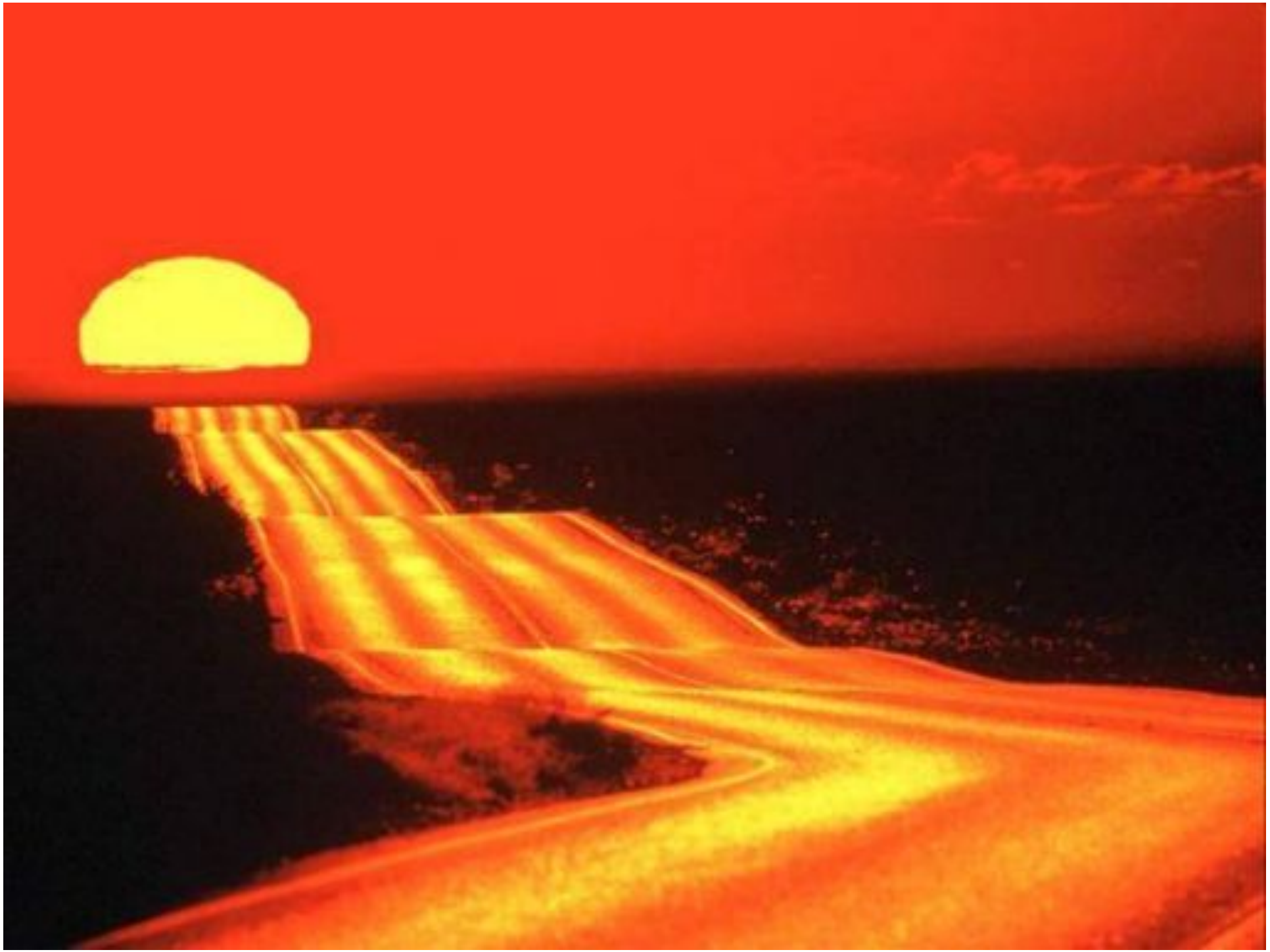


BeagleBoard xM



Raspberry Pi

BeagleBone



How should we measure robustness?

Connectivity?

Stability?

Quality?

Ability to maintain a VoIP call?

Ability to maintain service as you move?

We need good and commonly accepted metrics