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# SUNET

## Norway CBF update

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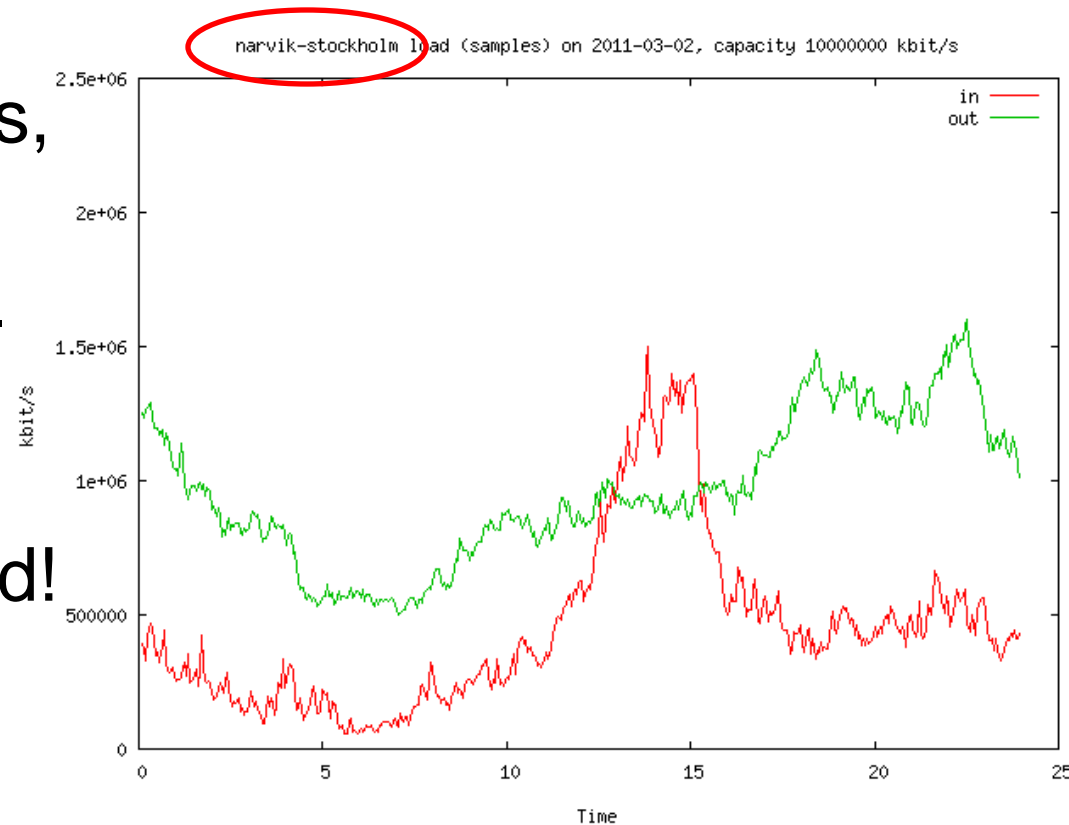
March 2011

# Background

- Request from  on transmission via OptoSunet from northern Norway to Stockholm, and then onwards to Oslo via  **NORDUnet**  
Nordic Infrastructure for Research & Education
- In order to create better redundancy for Uninett's customers in the northern part of Norway.
- Request for access from potential new SUNET customers in Kiruna.
- Potential new research projects with  $2 * 10$  GB/s from the Kiruna area.

# Status of today

- Per 2011-03-01, the connection Narvik-Stockholm was formally delivered to Uninett.
- Not without obstacles, but we made it!
  - A bit delayed, though. More on why later.
- Thanks to all involved!



# Fiber cuts in Norway

- On March 3, a supertanker anchored and cut one of the two cables between north and south. ☹️
- On March 4, the other cable broke ☹️ ☹️
- Uninett was quite happy to have the Swedish link to rely on. So – yes, the project became a success already on day 4 of operation 😊

*Men man er jammen bra glad for at Narvik-Stockholm linken nå finnes :-). Masse kudos og takksigelser til dere øvrige Skandinaver som har muliggjort vårt samarbeide og bidratt til at det akademiske Nord-Norge ikke er rammet av situasjonen mange andre der nord nå opplever.*

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# Network design

(most of you might have  
seen this already)

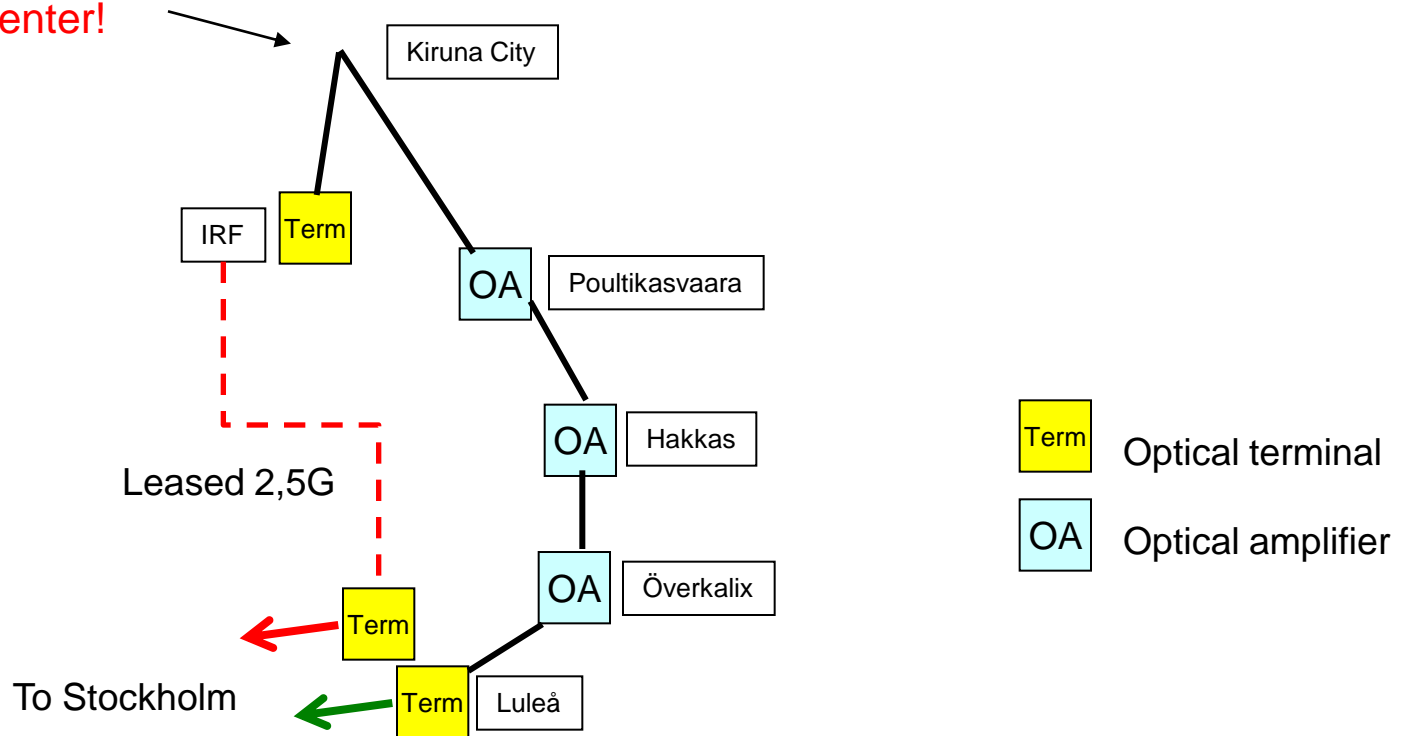


→ 2010

- "Blue" regional network  
Luleå-Kiruna (IRF)
- Green Long Haul network  
(to Stockholm)
- Red Long Haul network  
(to Stockholm)

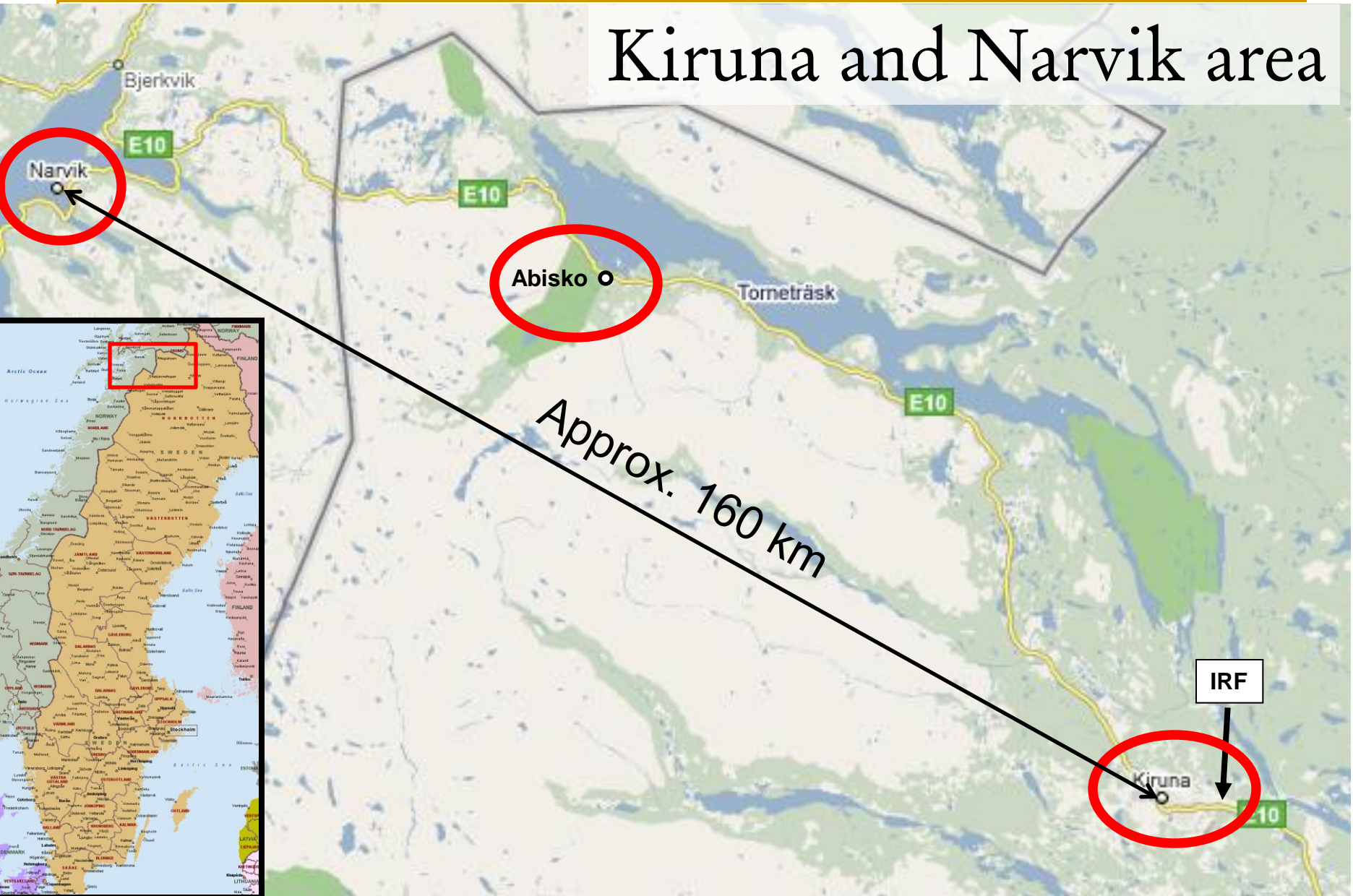
# The Blue Network [→2010]

**Note:** No equipment in Kiruna City center!



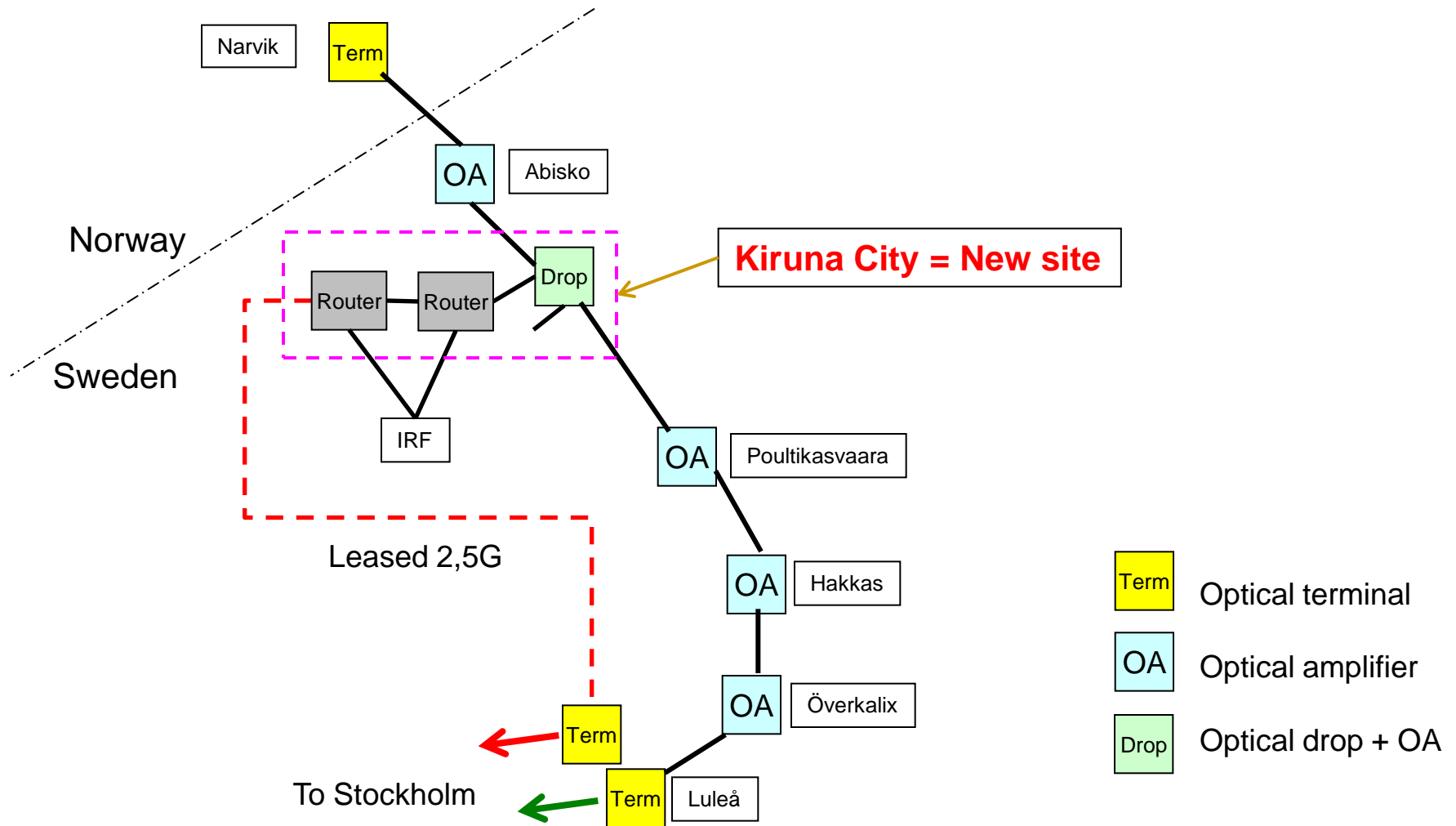


# Kiruna and Narvik area





# Blue network [after redesign]



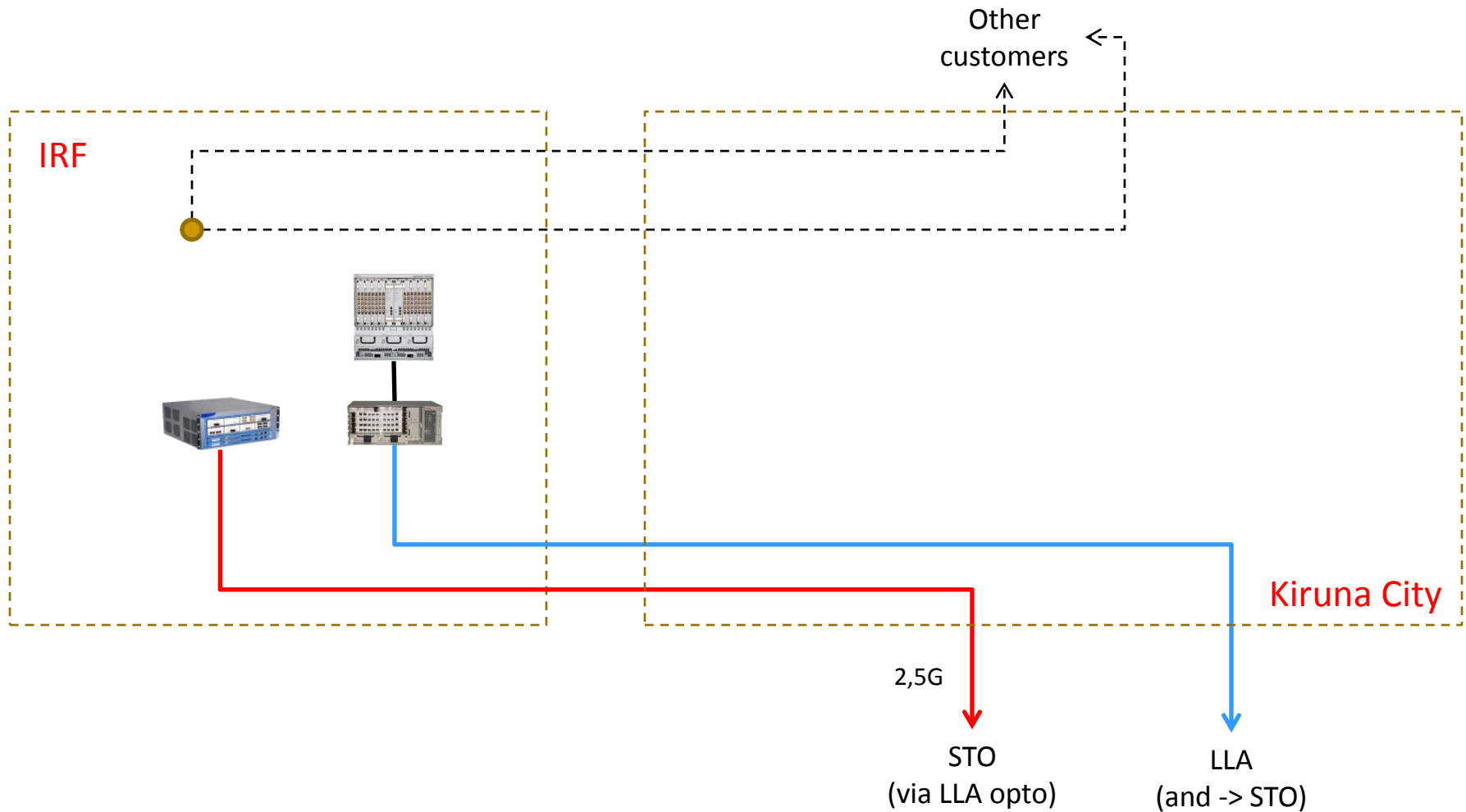
# Challenges

[a]

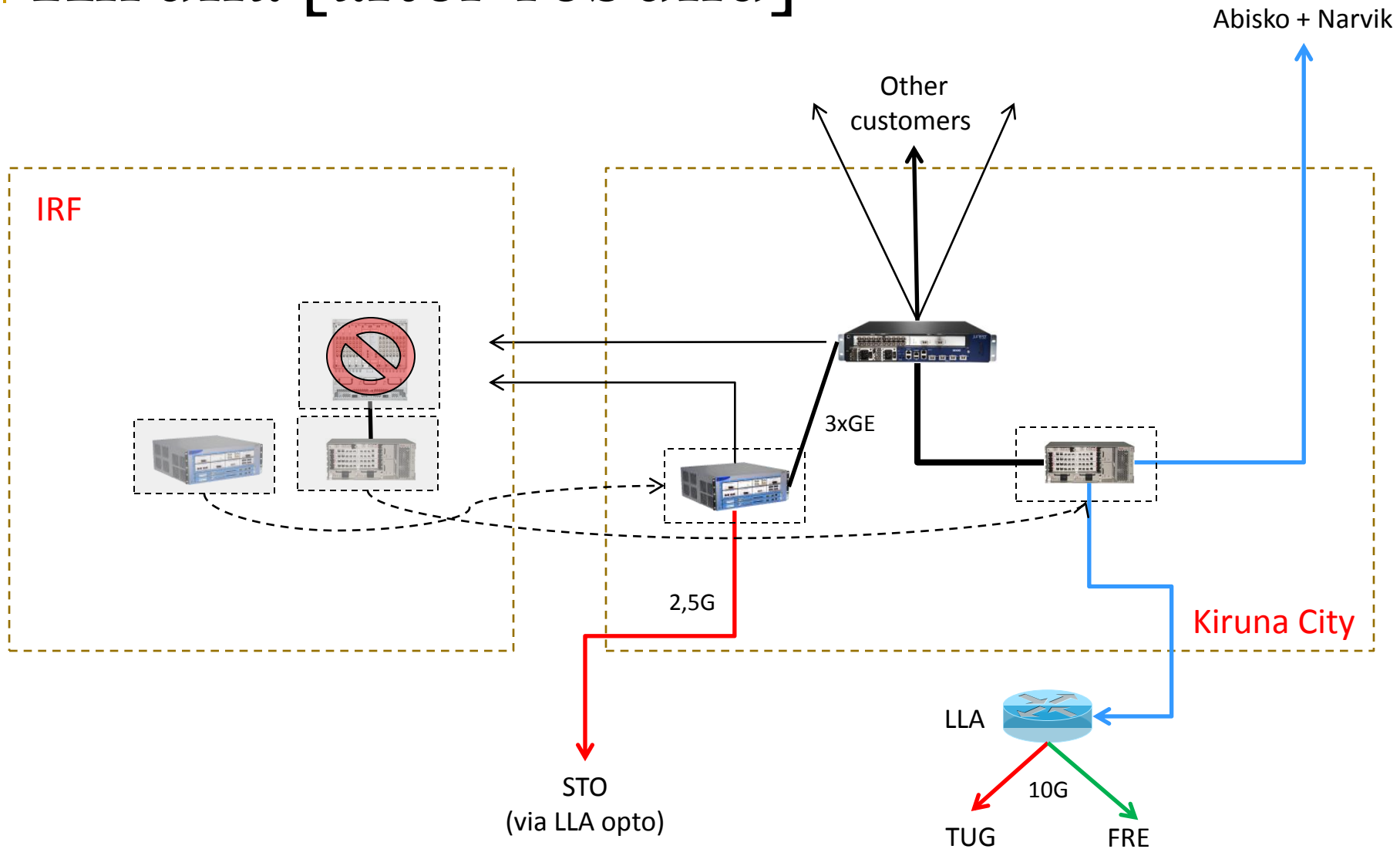
To move a site to new location  
without loosing traffic.

(this actually don't have anything to do with the  
CBF itself, but it was a prerequisite for us to be  
able to do the extension of the Blue network)

# Kiruna [→ 2010]



# Kiruna [after rebuild]



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[b]

To build a network in the  
middle of nowhere, in the  
middle of the winter.



# The site in Abisko



# [c] To extend an optical network

# Optical balancing

- We extended the length of the *Blue* network with roughly 30% (!).
- That caused a lot of work to balance the optical parameters (launch levels, amplifiers etc) to get rid of bit errors.
  - We didn't have customer affecting bit errors, it was well below the FEC margin, but we wanted to have an alarm free network.
  - The changes had to be done as planned works (since this was live), and this caused delays.

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[d]  
To deal with suppliers in  
another country.

# Actually, that wasn't hard at all!



*Fint, takk for info.*

*Hvis du kan foreslå et tidspunkt for montasjen så skal jeg undersøke med Relacom i Narvik om de kan stille med en elektriker samtidig når dere utfører montasjen.*

*Vennlig hilsen Bjørnar Blomli*

Big thanks to **UNINETT** and Olaf S for invaluable help!

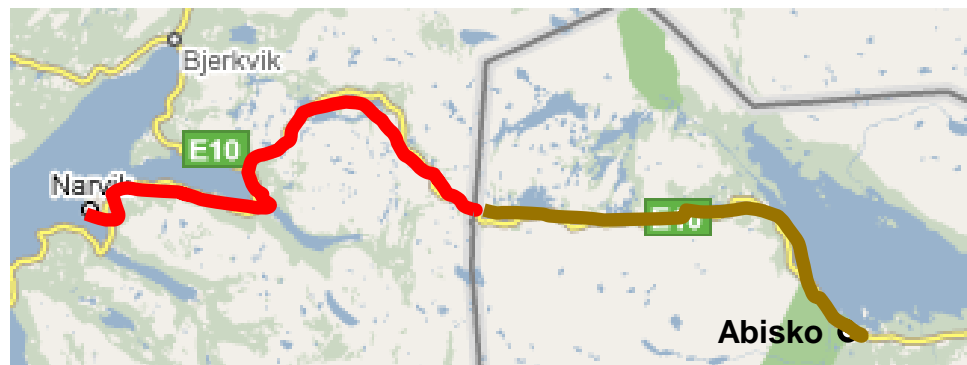
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[e]  
To document things.

... and to use the docs.



# How to handle this scenario?



- The **red** fiber is rented from Ventelo by Uninett.
- The **brown** fiber is rented from TDC by SUNET
  - And TDC have sub-rented it from IT Norrbotten.
- We have no equipment where the fibers meet.
  - I.e. we don't know where a break occurs
- How do NUNOC document this?
  - And who do they call when things break?

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# For the future

# Things to consider the next time [1]

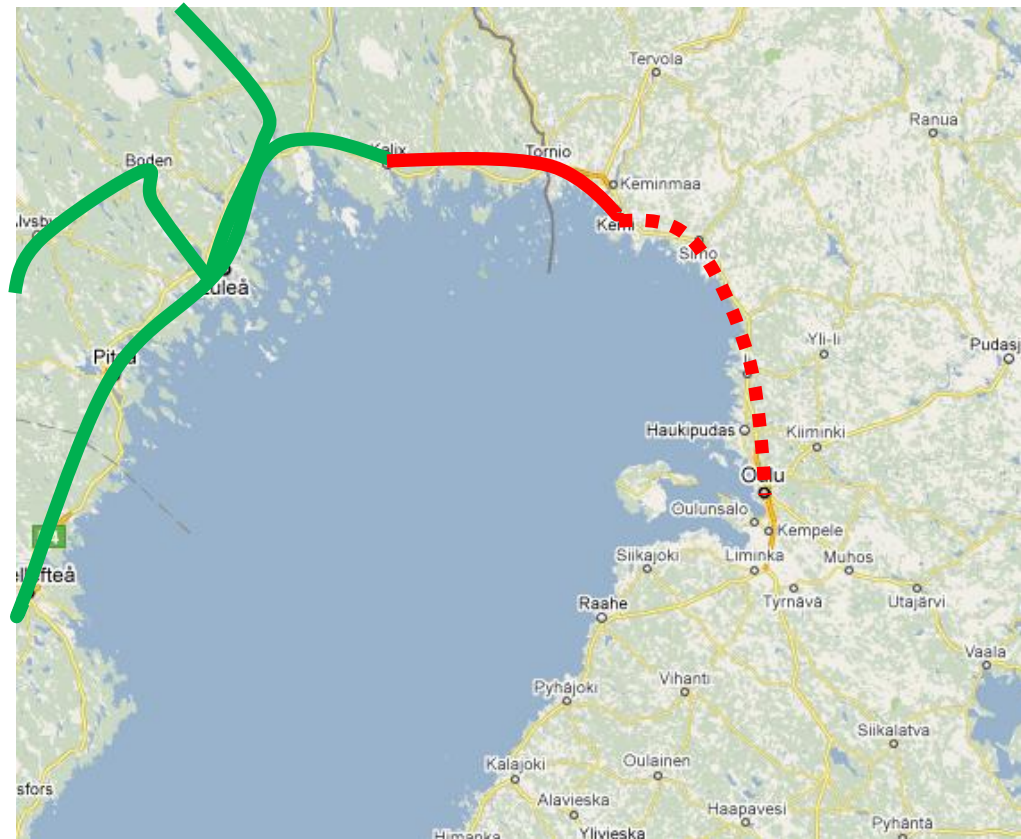
- Avoid the hassle with moving a site
  - We didn't have a choice, but it was a pain!
  - But it became real good when it got finished!
- Order the new fiber well in advance
  - If possible, don't switch fiber suppliers on other places than where you have equipment.
  - Get measurements end-to-end (between equipment sites), not to a patch box at the border.
- If possible, avoid blizzards ☺

# Things to consider the next time [2]

- If extending an existing link
  - Spend more time with the (measured) fiber parameters and do simulations to get the optical levels right.
  - Plan the logistics so that the time for “Christmas tree lighting” at the NOC is as short as possible.
    - It is unavoidable that the NOC gets a lot of alarms when you play with live systems, but the time needs to be short.
- Try to get a mgmt connection to the far end.
  - Uninett helped us with that, and it was/is extremely useful!

# Next step [1]?

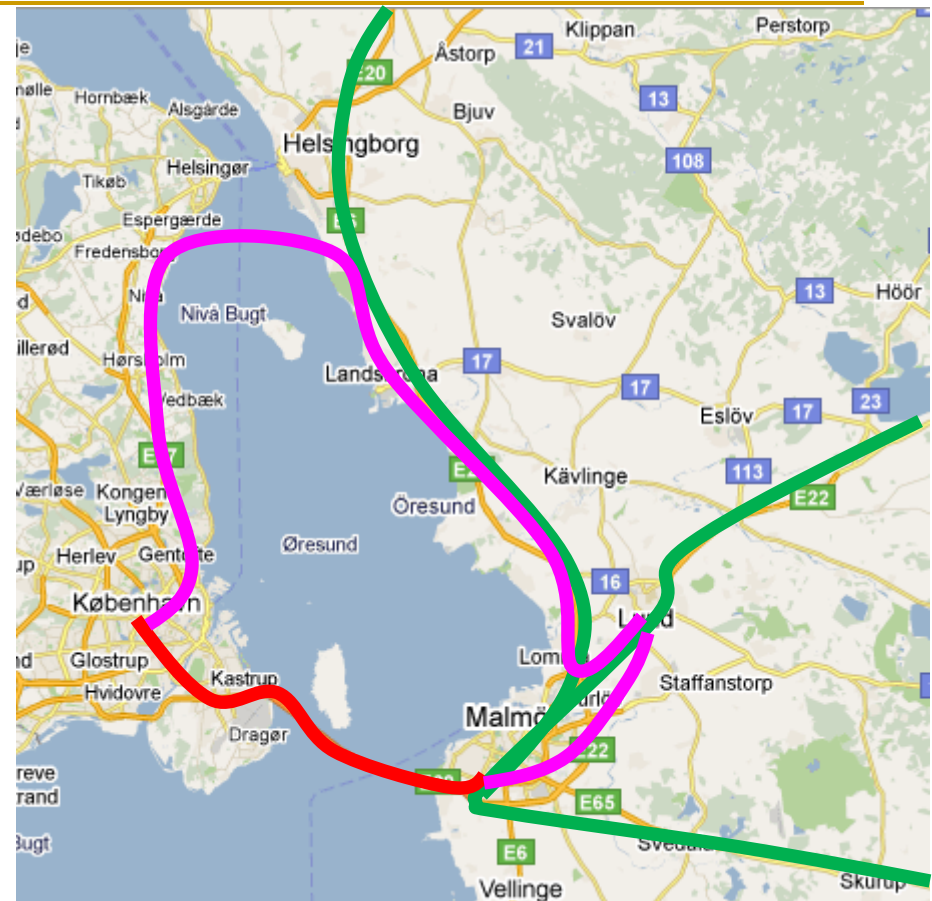
- Sweden-Finland?
  - Might be interesting for the new CSC data center in Kajaani?
- Operational 2012?
  - But then we should start planning rather soon...



- Existing SUNET links
- "Easy(?)" extension (no regen)
- - - Possible extension (needs to be studied further)

# Next step [2]?

- Sweden-Denmark?
  - For ESS
- Not as easy as the one up north.
  - Needs to be studied further
- Operational 2015?



- Existing SUNET links
- Possible extension??
- New link(s)





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