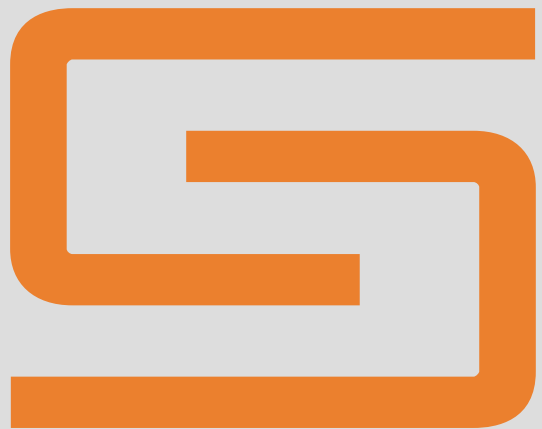




SUNET

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DC Orion

Sustainable data center

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Who am I?

Börje Josefsson

but no one outside Scandinavia can pronounce that. *Call me BJ* 😊

- Studied civil engineering at LTU in Luleå.
- Started as systems admin at LTU IT.
 - Team leader → Technical coordinator → CTO.
- SUNET - the Swedish University Network:
 - CTO → COO → Now focusing on Cloud and Data Center



Build a data center - But where?

- There are a lot of things that points in favor of a location in the northern part of the country, when it comes to reliable electricity supply.
- Also - that the electricity price and transmission fees in northern Sweden is cheaper than in the south, a significant advantage when it comes to consumption in the magnitude of a data center.
- Another major advantage is that one can reduce the need for "active" cooling, by using the colder outside air or cold water. [*More on this later*]
- Given the energy demand, it is also an advantage if the location is reasonably close to larger power lines or transformers/substations.

This is what we found...



In Karlsborg, outside Kalix

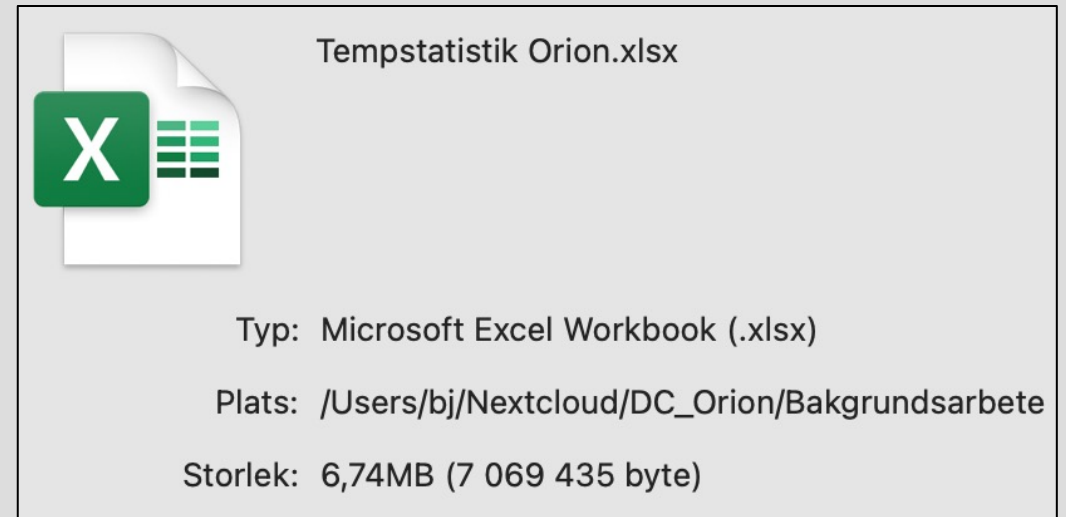
As far north in Sweden you can go by boat...

Cool(ing) design

- 25 year of temperature history, with 1 hour interval → around 225 k samples.
- This gave us some confidence to do something drastic:

Only passive cooling!

- This reduces both CAPEX and OPEX significantly – in addition to being more sustainable.
- Redundant (or triple in some cases) cooling equipment also gives better reliability.



The surprising result...



Cooling central

VS.



LED lights in general areas

Small environmental impact, due to:

- Cold climate. 100% "*Passive cooling*". This reduces power consumption significantly.
- Discussions ongoing regarding recovery of excess heat to heating of the buildings in the area.
- Hydropower, and also some wind power, accounts for the main power production in northern Sweden.
- Access to cold water from the Kalix river in case we need more cooling in the future for AI systems etc.
- *Maybe* - our own solar power plant, that can feed extra electricity to the cooling system on hot days. Thanks to the midnight sun, this can give some time of 24x7 feed from solar power(!)



Green!

Orion rising
over Orion

