



# The CSC Kajaani datacenter



HEPIX Fall 2013 Ulf Tigerstedt

# Wings of a butterfly

- 2007: Nurses union wanted more pay, mass resignations
- Paper industry was going fine, but demand going down
- Paper union wanted a lot more pay, the factories shut down
- Enter Google in Hamina
- Then current government wanted decentralization
- CSC needed new resources, extremely expensive to build in the capital area
- A bid was sent out for a suitable site for a new datacenter

# Kajaani

- ➔ Kajaani won the bid
- ➔ Big paper mill, 40000 square meters, 10 m high
- ➔ Hydroelectric power close by
- ➔ Flowing water nearby for cooling
- ➔ Fiber already present nearby



# Kajaani

- ➔ Situated in the middle of the county
- ➔ Population of 38k
- ➔  $64^{\circ}13'30''\text{N}$ ,  $27^{\circ}44'00''\text{E}$
- ➔ Average temperature  $+1,1 - 2^{\circ}\text{C}$
- ➔ July average  $+15^{\circ}\text{C}$
- ➔ February average  $-17^{\circ}\text{C}$
- ➔ Average 75 cm of snow in March

## We are however not Google

- One big cluster and one supercomputer won't fill a really big room
- Supercomputers have special cooling needs
- Cooling a big, half empty room is hard
- More tenants planned, what about fires?

# Problems rack up

- ➔ Property owner could not manage it.



# Alternatives on site

- ➔ Slab of asphalt
- ➔ Old paper warehouse



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# Modular Data Centre

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  - Cold
  - Snow
  - Using water for cooling

## MDC inside the paper warehouse

- MDC supplied by SGI (IceCube Air)
- Different containers for the super and the cluster
- Watercooled Cray XC30 in one
- Free air cooled HP Infiniband based cluster in another
- Storage from DDN
- All parts will be expanded, this was just Phase 1

## Old datacenter in Espoo

- Hosted previously 3 HP clusters, one Cray XE4/XE5 hybrid and some storage.
- PuE of 1,20 when in full production during winter, 1,40 during summer.
- PuE now 1,80 after the Cray got shut down, management is not happy.

# Cluster

- ➔ HP scaleouts: SL230s, 2\*8 core Xeon
- ➔ Used both as a HPC cluster and cloud resources
- ➔ Will most likely be used for Alice and CMS at some point
- ➔ Was 9 weeks late due to the InfiniBand fabric by Mellanox not being stable

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- Remote management works for computers, not humans (especially contractors)
- Mellanox really need a competitor