

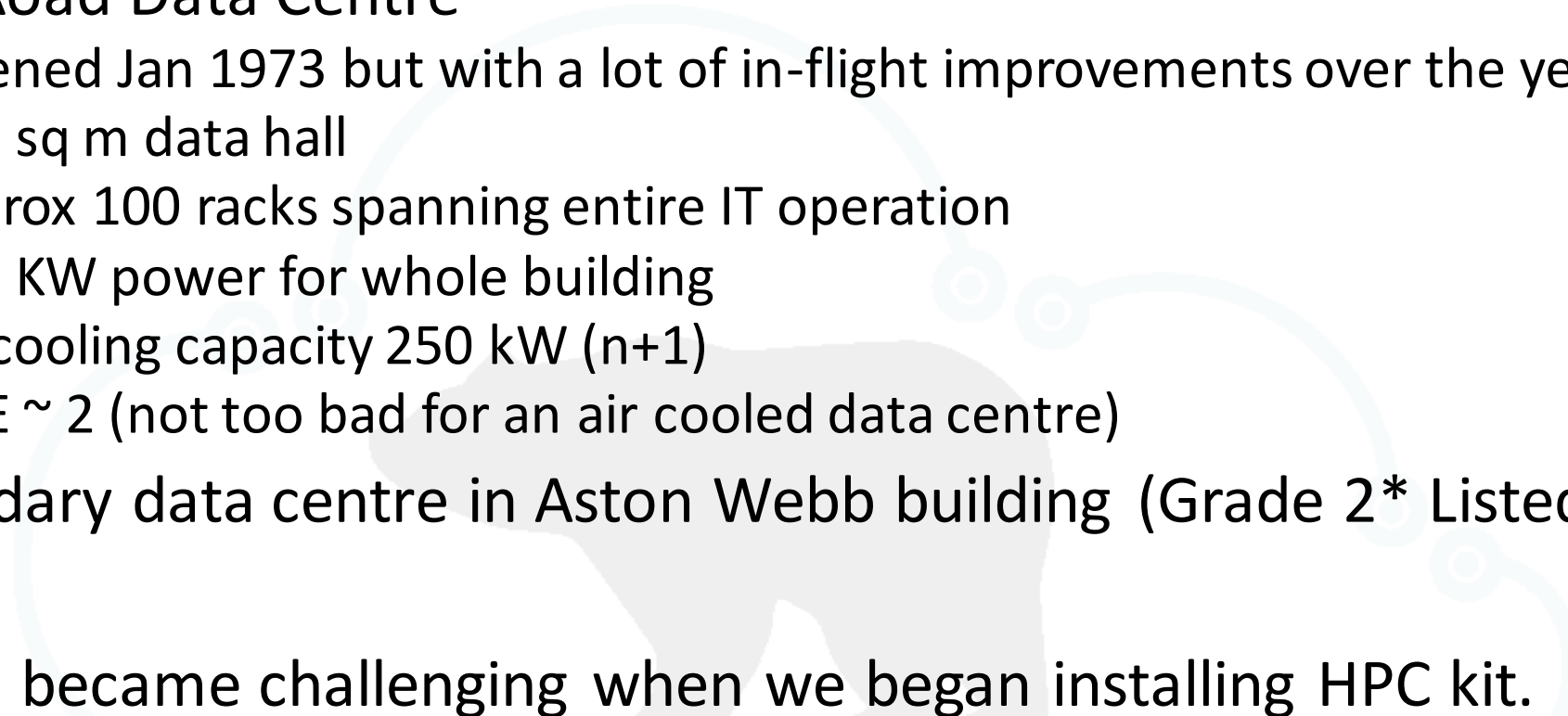
# Birmingham University's Purpose Built, Water-cooled Research Focussed Datacentre (zero reliance on traditional air cooling!).

BEAR – [www.bear.bham.ac.uk](http://www.bear.bham.ac.uk)

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# A Brief History

- Elms Road Data Centre
    - Opened Jan 1973 but with a lot of in-flight improvements over the years
    - 270 sq m data hall
    - approx 100 racks spanning entire IT operation
    - 640 KW power for whole building
    - air cooling capacity 250 kW (n+1)
    - PUE ~ 2 (not too bad for an air cooled data centre)
  - Secondary data centre in Aston Webb building (Grade 2\* Listed)
  - Things became challenging when we began installing HPC kit.
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# An End to Sticking Plaster

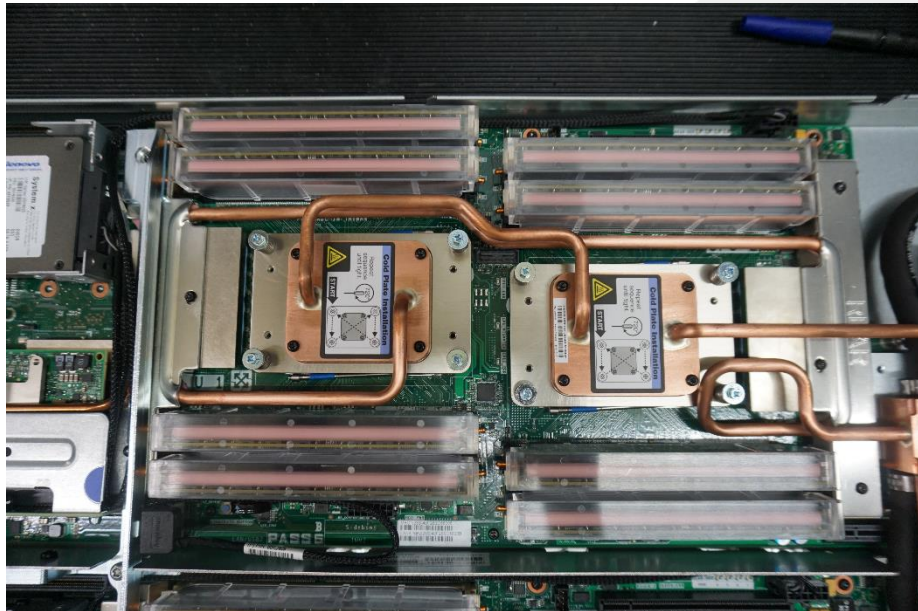
- Recognition that there's only so much you can do before you're throwing good money after bad.
- “We need a brand new data centre!”



December 2005 !!!

# BEAR Infrastructure

- BlueBEAR, BEAR Cloud, Data Storage are all closely integrated
- Our standard compute node is now Lenovo NeXtScale servers with direct on-chip liquid cooling
- All nodes are connected with 1000 Gb/sec Infiniband networking

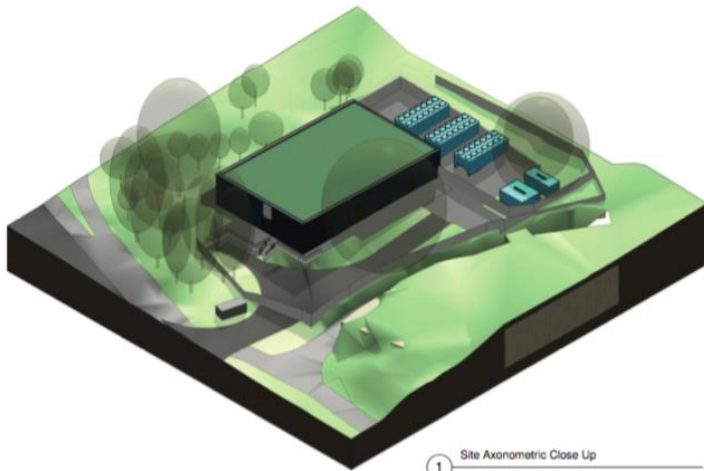


# Progress in Recent Years

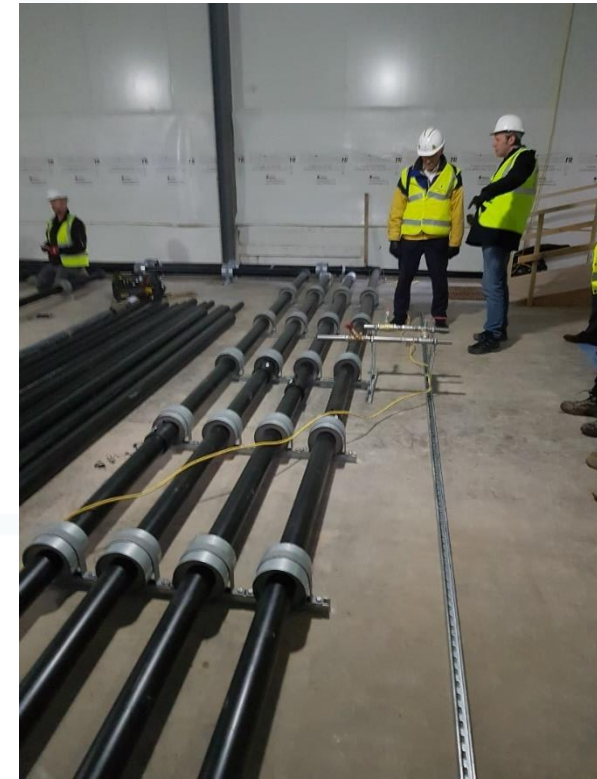
- Water cooled loop prototype installed in Elms Road – Spring 2015
- Extension to water loop Sept 17
- Agreed most recent data centre strategy late 2015
  - Two DC builds (corporate and research)
    - Choice of cooling technology
    - Availability of sites on campus
  - Agree site for Research Data Centre (January 2016)
  - Design PUE < 1.2

# Park Grange Data Centre

Work starts on site  
11 Sept 17



1 Site Axonometric Close Up



# New Research-only Data Centre

- All water cooled (so highly efficient)
  - To chip or via rear door cooling (storage)
- Handed to the University on 15<sup>th</sup> May 2018 !
- Migration of kit started 17<sup>th</sup> May 2018.
- 1 MW and 36 rack capacity
- 140 sq m data hall



# Data Centre – 18<sup>th</sup> May 2018

