> Successes and problems serving the health sector

> The DeiC experience …

GÉANT eHealth Baselining Meeting

On Zoom
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> Denmark and the research network

- > 5.8 mill inhabitants
- > 8 universities
- > 3 university hospitals
- > 5 healthcare regions
- > 50 other R&HE institutions
- > 5 science parks/innovation hubs
- > 3 suppliers
- > 47 student homes/dormitories

- > Infrastructure approx. 275 places in Denmark
- > NREN development, operations and services are financed 100% by users since 2008

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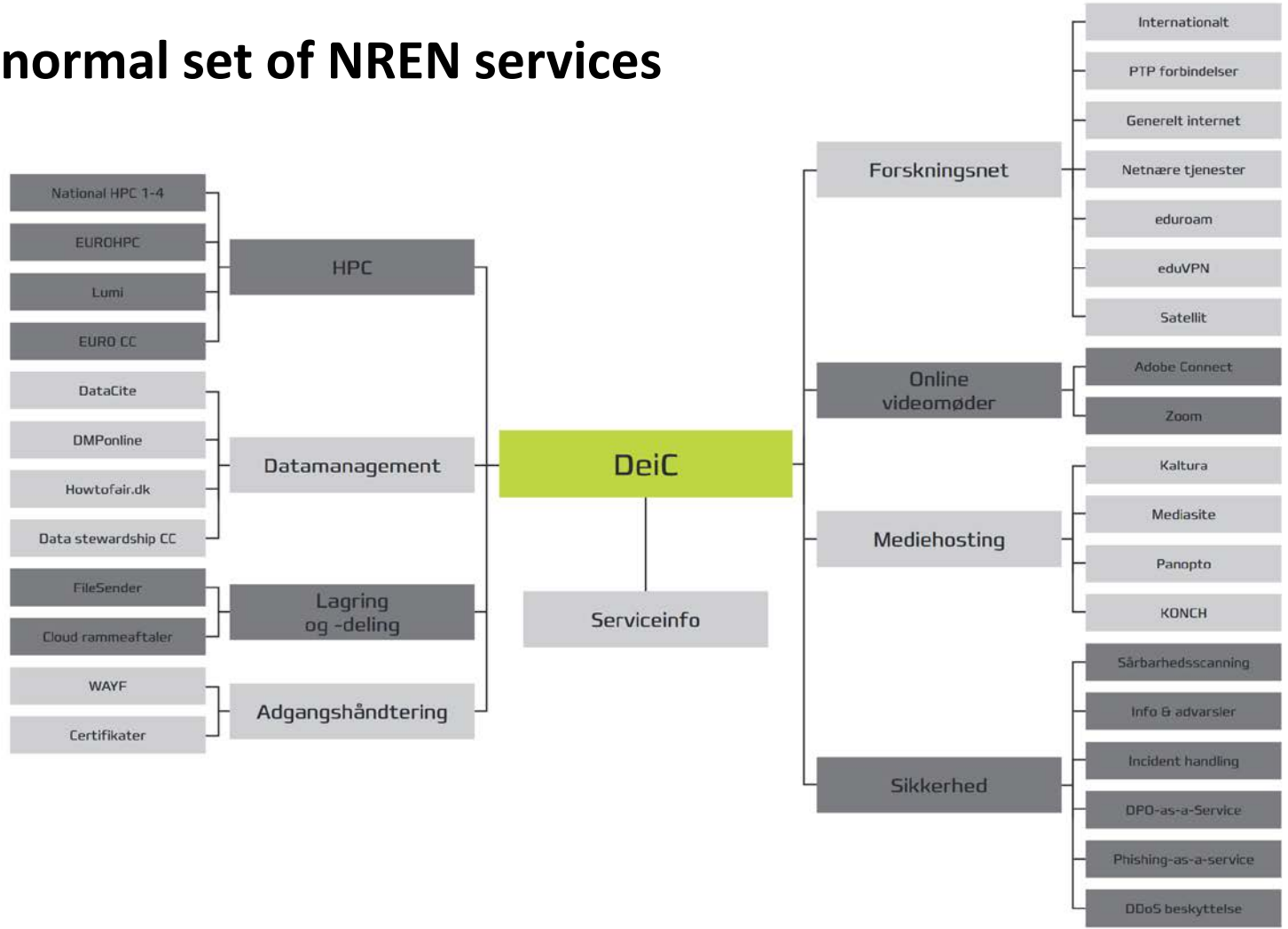
> A fairly normal set of NREN services



> Medical research and health care in Denmark

- > 5 health regions each containing several hospitals
- > All regions do medical research as well as general health care
- > All regions participate in the training of doctors, nurses etc
- > 4 universities educate candidates in medicine
- > Primary healthcare via local GPs
- > Large pharmaceutical industry
- > Many private/commercial hospitals and laboratories

- > In the following, we put **health sector = (university) hospitals**

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> Health sector usage of our NREN services?

NREN-provided services	Hospitals use NREN services	Hospitals otherwise use
Basic Internet connectivity	In a few places	Commercial ISPs
Point-to-point connections	Some	Commercial ISPs
MDVPN-type connections	-	Dedicated structure (Medcom)
New connections for genome processing	10G and 100G	-
Video conferencing	Zoom is allowed for education	Teams and Skype
AAI federation (wayf.dk)	Only for a few services	Their own AAI-federation
eduroam	In a few places	Classical guest wifi access
CERT and security	-	A dedicated setup for the sector
HPC and Data Management	For genome processing	Own IT departments

> New powerful trend: Personalized medicine

- > Each machine produces data at a continous rate around 4-8Gbps
- > All Danish hospitals are getting them
- > Several machines at each hospital for redundancy reasons
- > Once sequenced, the genome data is sent to the National Genome Center computers for analysis against their data banks

Result:

- > All hospitals are getting 100G or multiple 10G connections to the NREN – also the hospitals that are not currently on the NREN !
- > The local network infrastructures are usually not ready for 100G and often not even for full-bandwidth 10G traffic
- > Hospitals are the main driver at the moment for new connections!

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> The genome processing

> DeiC has also contributed to the HPC facilities for processing genome data

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> Hospitals and Zoom

- > Nordic NRENs offer a Zoom service, based on on-prem server infrastructure in the Nordic region
- > When Covid hit (and before), the hospitals were much more comfortable using Teams and Skype
- > Zoom (in our setup) is just as good or better from a security point of view
- > First, Zoom was forbidden
- > Then, after huge pressure due to educational obligations, Zoom was allowed for educational purposes

- > This illustrates that hospitals are huge, conservative and complex organizations
- > Most IT and security people in hospitals come from commercial or public administration – not from the research sector

This means a lot of people with a conservative enterprise-IT mindset who are

- > Know nothing about NREN services
- > Not motivated to use NREN services

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> Is the glass half empty or half full?

- > Hospitals are an important part of national research and education
- > A part from a lot of 10G and 100G connections, at the moment, they have a poor uptake of our other services
- > Due to their sizes, they are still, however, important NREN users

Conclusion:

- > The hospitals need our services – a fact of which they are not fully aware ;-)
- > This is a challenge we have to work with – even more in the future

Thank you

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