

Operations in NDGF-T1 and SE-SNIC-T2

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ALICE Tier-1/Tier-2 workshop 2022

NDGF & NeIC: Background

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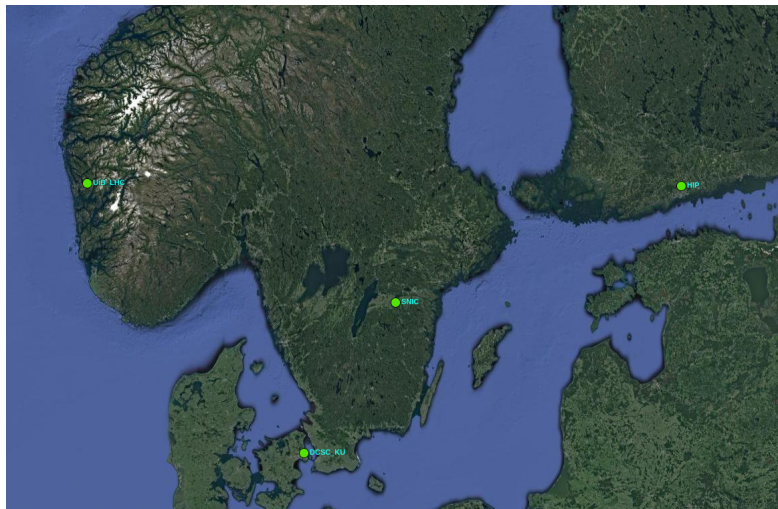
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- ▶ In addition to the NDGF-T1, there's a few T2:s in the Nordics
 - ▶ FI-HIP-T2 for CMS
 - ▶ SE-SNIC-T2 for ALICE and ATLAS
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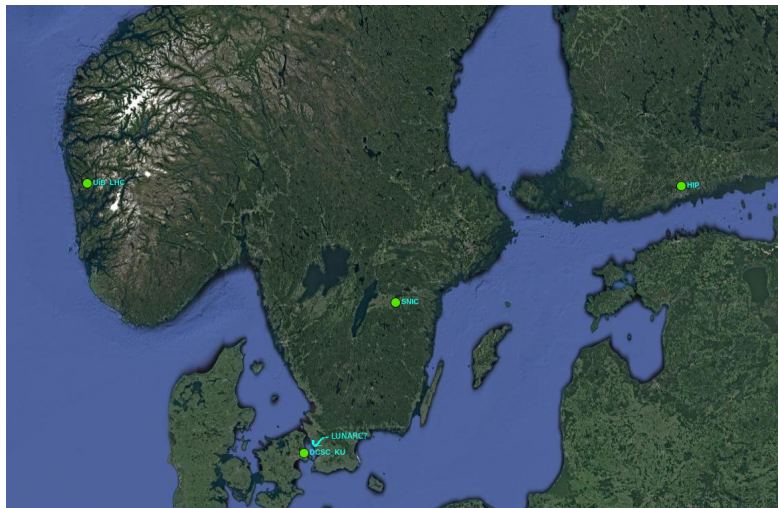
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- ▶ NDGF-T1 is sometimes also referred to as the NT1 ("Nordic Tier 1")

ALICE sites in NDGF-T1 & SNIC-T2



ALICE sites in NDGF-T1 & SNIC-T2



Sites: Finland

▶ HIP

- ▶ Run by Helsinki Institute of Physics (HIP)
- ▶ Bunch of VMs, running on CSC's openstack system cPouta
- ▶ A "quick-and-dirty" setup (read: an embarassingly ugly mess of ansible and python scripts), but at least it's operational
- ▶ Nowadays $576 \text{ cores} \times 19.62 \text{ HS06} \approx 11.3 \text{ kHS06 cores}$
- ▶ CentOS 7, slurm
- ▶ Recently switched over from AliEn to JAliEn

Sites: Sweden 1/2

- ▶ SNIC
 - ▶ National Supercomputer Center, Linköping, Sweden
 - ▶ Backend: Slurm
 - ▶ HEPSPC06: 15.925
 - ▶ Shared with ATLAS
 - ▶ Last few years \sim 600 cores reserved for ALICE, will probably stay this way for now.
 - ▶ Still on AliEn

Sites: Sweden 2/2

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- ▶ Future: ?

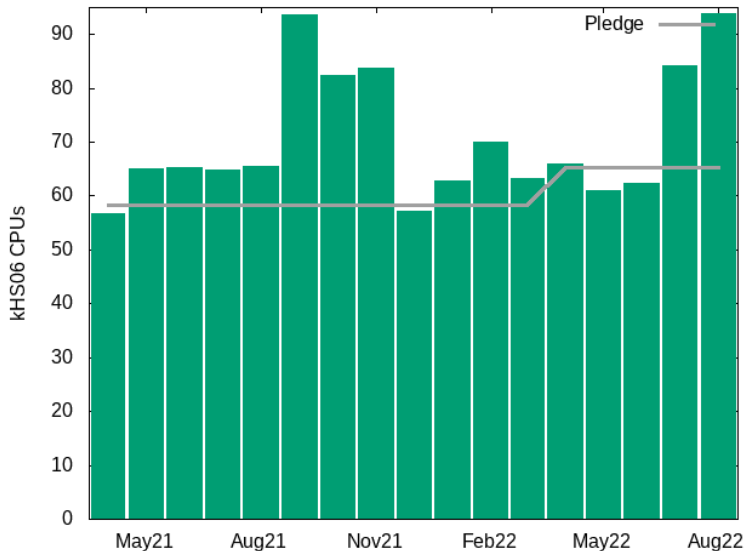
Sites: Denmark

- ▶ DCSC/KU
 - ▶ Københavns Universitet
 - ▶ Backend: ARC / Slurm
 - ▶ Heterogeneous cluster; ~~oldest node > 10 years old.~~
 - ▶ Average HEPSPC06: 24.82
 - ▶ ~ 35 kHS06 CPUs shared by ALICE and ATLAS
 - ▶ No major changes expected during the next year.
 - ▶ Still on AliEn

Sites: Norway

- ▶ UiB (Bergen)
 - ▶ hardware installed in 2019 and 2022
 - ▶ 44 Dell compute nodes with dual socket AMD EPYC
 - ▶ Hardware is part of Norwegian research cloud (NREC) in Bergen
 - ▶ 300 VM instances, RHEL8 based Almalinux
 - ▶ 4500 cores, 13.55 HS06/core, total 60.9 kHS06
 - ▶ Backend: Slurm
 - ▶ no new hardware before 2025
 - ▶ JAliEn since 2019

NDGF-T1 + SNIC-T2 CPU resources, compared to pledge



CPUs, Summary

- ▶ Total (theoretical) capacity available: 99.2 kHS06

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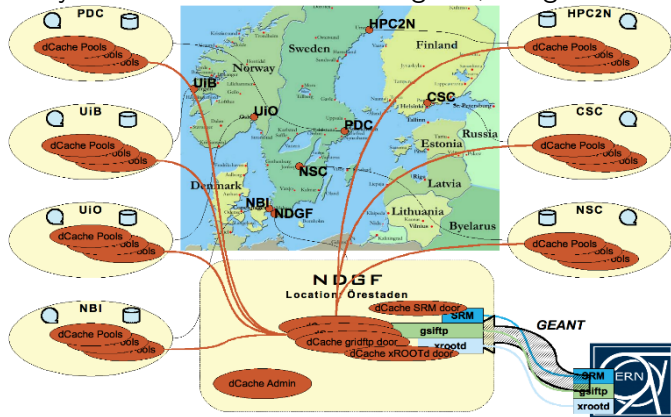
- ▶ Total (theoretical) capacity available: 99.2 kHS06
- ▶ Pledge (NDGF-T1 + SE-SNIC-T2) 2022: 65.24 kHS06
- ▶ Pledge (NDGF-T1 + SE-SNIC-T2) 2023: 70.38 kHS06

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- ▶ Pledge (NDGF-T1 + SE-SNIC-T2) 2023: 70.38 kHS06
- ▶ A few more kHS06 might (re)appear in Sweden ...

Storage

- ▶ Many small sites look like one big site, using dCache



- ▶ Lets us hide problems on one site by keeping data on other sites.
 - ▶ (at least, almost ...)

Storage

- ▶ FI / Helsinki/Kajaani: Disk + Tape
- ▶ SE / Umeå: Disk + Tape
- ▶ SE / Linköping: Disk
- ▶ DK / Copenhagen: Disk + Tape
- ▶ NO / Bergen: Disk + Tape

Storage in numbers

NDGF-T1

- ▶ Disk:
 - ▶ 2022 Pledge: 6.27 PB, 2023 pledge: 7.54 PB
 - ▶ Currently available: 4.75 PB
 - ▶ ~ 3.25 PB more should become available during this fall.
 - ▶ Currently in use: 1.556 PB

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- ▶ Tape:
 - ▶ Pledge: 6.09 PB, 2023 pledge: 7.19 PB
 - ▶ Currently available: 6.24
 - ▶ ~ 1 PB should be coming during the next 12 months.
 - ▶ Currently used: 1.584 PB

Storage in numbers

SE-SNIC-T2

- ▶ Disk:
 - ▶ Pledge: 400 TB
 - ▶ Currently available: 407 TiB
 - ▶ Currently in use: 266.6 TB

Storage in numbers

SE-SNIC-T2

- ▶ Disk:
 - ▶ Pledge: 400 TB
 - ▶ Currently available: 407 TiB
 - ▶ Currently in use: 266.6 TB
 - ▶ Future: Might turn into a part of the NDGF-T1 disk?

IPv6 readiness

- ▶ Yes:
 - ▶ All our SEs
 - ▶ NDGF::dCache
 - ▶ NDGF::dCache_tape
 - ▶ SNIC::dCache
 - ▶ Some CEs
 - ▶ SNIC
 - ▶ UiB

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 - ▶ NDGF::dCache
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 - ▶ SNIC::dCache
 - ▶ Some CEs
 - ▶ SNIC
 - ▶ UiB
- ▶ Not yet: Some other CEs
 - ▶ HIP (Not supported by the underlying cloud system yet)
 - ▶ DCSC/KU (Work in progress)

Questions?