NDGF Tier1 and NeIC – status update

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WLCG GDB

12/12/12 CERN

Nordic e-Infrastructure Collaboration – NeIC@NordForsk

NDGF
NORDIC DATAGRID FACILITY

NORDUGRID
Grid Solution for Wide Area Computing and Data Handling
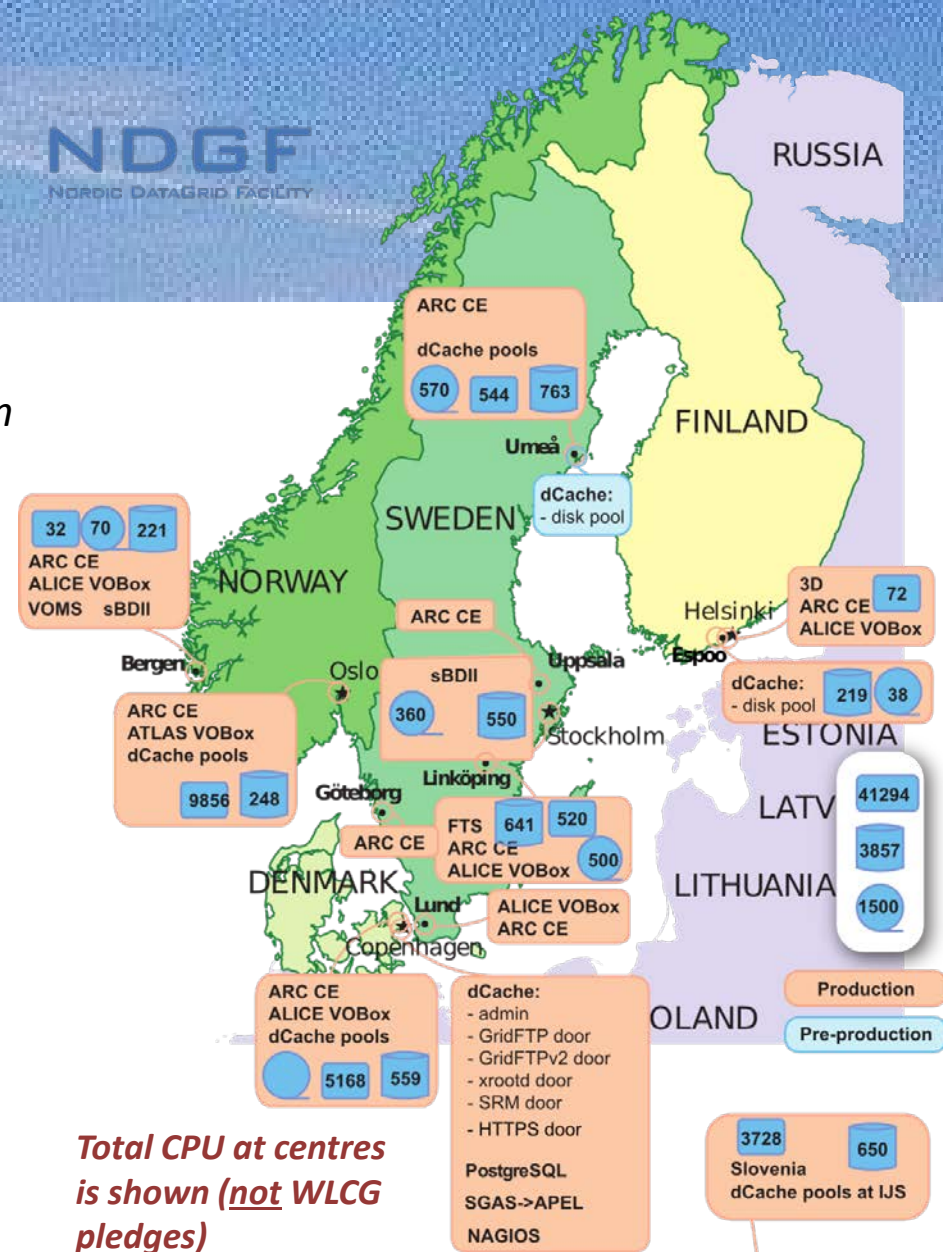
Data GRID

2001   2002   2003   2006   2012

From NDGF to NeIC – Nordic e-Infrastructure Collaboration

- Collaboration started in 2003 (NDGF pilot)
- Hosted by NORDUnet (in Copenhagen) during 2006-2011 (NDGF proper)
- Evaluation and next phase proposal 2010
- Five national funding agencies established NeIC as an entity hosted by NordForsk (in Oslo) from 1 January 2012
  - Annual budget ~1.7 MEUR (12,5 MNOK): human resources to support common operations
    - Director: **Gudmund Høst**
  - Hardware and application software contributed by users
  - Enabling software taken from EMI (ARC, dCache, VOMS, FTS, BDII)
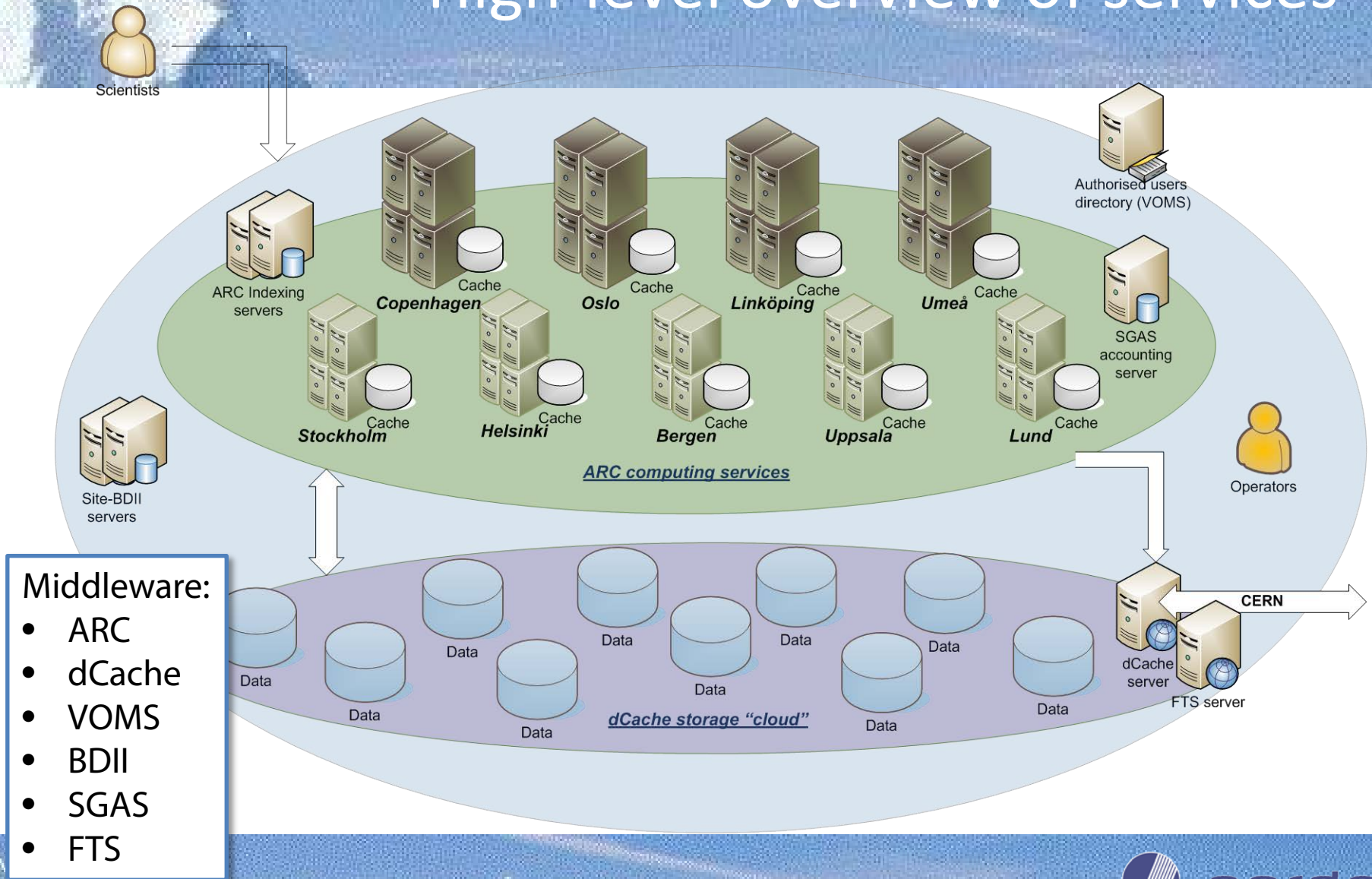- NeIC hosts Nordic Tier 1 for WLCG, a.k.a. **NDGF-T1**

NDGF-T1

- **NDGF-T1 staff:**
  - Overall coordinator: *Mattias Wadenstein*
  - CERN Liaison – *Oxana Smirnova*
  - Security officer: *Leif Nixon*
  - Technical staff affiliated with each contributed computing centre
  - Expected soon: software experts

- **NDGF-T1 operations:**
  - Business as usual
  - WLCG Tier 1 for ATLAS and ALICE
    - Includes dCache pools in SI
  - Co-operates with WLCG T2s (NO and SE for ATLAS, SE for ALICE, FI for CMS)
  - Part of ATLAS' "ND cloud"
    - Cloud includes also sites in SI, CH
  - EGI Resource Centre
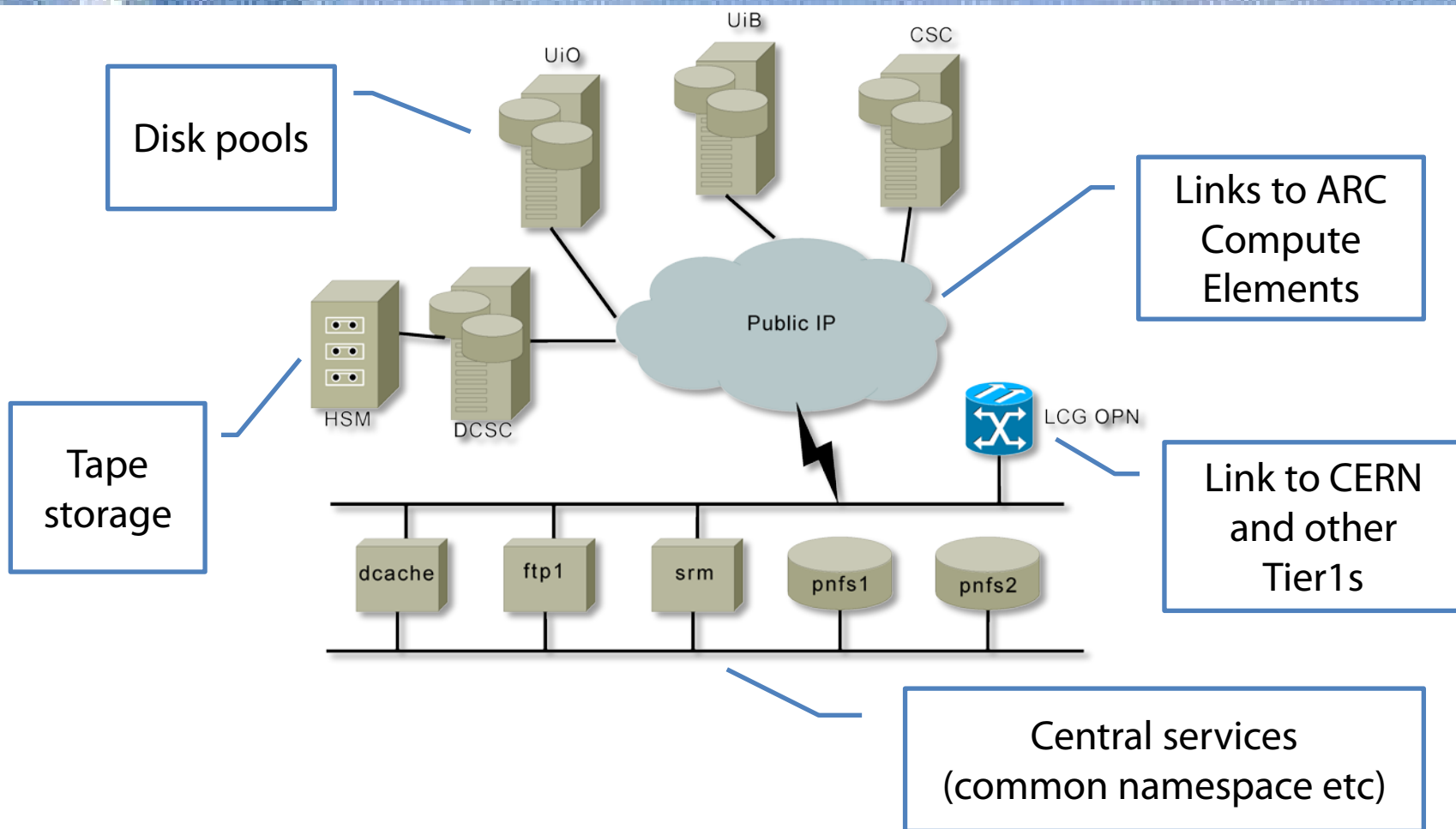   - ROC functions for Nordic and Baltic states

Total CPU at centres is shown (not WLCG pledges)

High-level overview of services

Scientists

ARC Indexing servers

Copenhagen · Cache
Oslo · Cache
Linköping · Cache
Umeå · Cache

Authorised users directory (VOMS)

Stockholm · Cache
Helsinki · Cache
Bergen · Cache
Uppsala · Cache
Lund · Cache

SGAS accounting server

ARC computing services

Site-BDII servers

Operators

Middleware:
- ARC
- dCache
- VOMS
- BDII
- SGAS
- FTS

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dCache storage "cloud"

dCache server
FTS server
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Distributed dCache

Disk pools

Tape storage

UiO

UiB

CSC

Public IP

Links to ARC Compute Elements

HSM

DCSC

LCG OPN

Link to CERN and other Tier1s

dcache   ftp1   srm   pnfs1   pnfs2

Central services (common namespace etc)
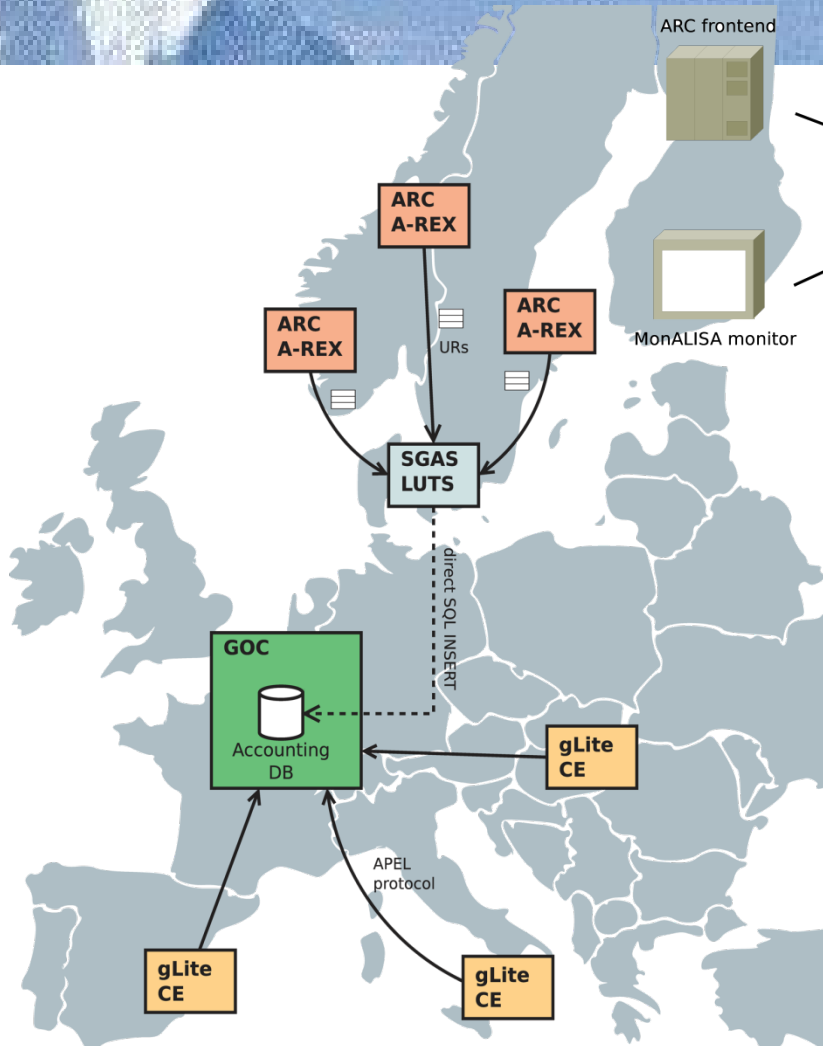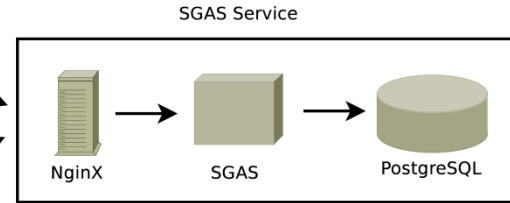
Accounting service: SGAS

- Collects execution activity records from ARC and other services
- Aggregates data over NDGF
  - To be later submitted to e.g. WLCG

Enabling software

- From EMI and UMD distributions:
  - ARC CE/Core/Infosys 1.1.x and 2.0.x
  - dCache 2.4
  - FTS 2.2.8 (with patches)
  - VOMS 2.0.9, VOMS-Admin 2.7.0
  - BDII 5.2.12
  - Globus 5.0.x and 5.2.x
- SGAS 3.6.0-rc1

Hardware and systems

- LHC OPN to every computing centre that has T1 storage
- Variety of very different hardwares, operating systems and batch systems at sites:
  - CentOS, SL, RHEL, Ubuntu
  - SLURM, Torque, (S)GE, LoadLeveler, Condor
  - Lustre, GPFS, NFS

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NDGF-T1 pledges

2013

	ALICE	ATLAS	Total	% of all ALICE T1	% of all ATLAS T1
CPU, KHS06	11.8	17.2	29.0	10%	5%
Disk, PB	1.1	1.6	2.7	10%	5%
Tape, TB	2.2	2.1	4.3	10%	5%

Pledges are aggregate of national funding agencies grants, typically awarded for one year at a time

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ATLAS ND Cloud

ATLAS Grid Monitor

2012-10-13 CEST 10:50:31

Processes: ■ Grid ■ Local

Country	Site	CPUs	Load (processes: Grid+local)	Queueing
🇩🇰 *Denmark*	**Steno Tier 1 (DCSC/KU)**	5168	864+2935	**1296**+1
🇳🇴 *Norway*	**Tier1 (BCCS/UiB)**	372	0+234	**0**+1
	Titan A (UiO/USIT)	9856	886+2216	**282**+8
	Titan C (UiO/USIT)	9856	0+3103	**0**+8
🇸🇮 *Slovenia*	**Arnes**	1636	1558+0	**1003**+0
	SiGNET	2092	2027+0	**684**+0
🇸🇪 *Sweden*	**Alarik (SweGrid, Luna>**	3328	114+2315	**52**+0
	Grad (SweGrid, Uppmax)	512	353+0	**59**+2
	Ritsem (SweGrid, HPC2>	544	322+0	**243**+0
	Siri (SweGrid, Lunarc)	512	332+138	**240**+50
	Smokerings (NSC)	520	416+80	**2525**+0
	Smokerings TEST (NSC)	520	0+496 (queue inactive)	**0**+2519
🇨🇭 *Switzerland*	**Bern ATLAS T3**	532	456+0	**150**+0
	Bern UBELIX T3	1216	448+0	**396**+1
	Geneva ATLAS T3	278	27+193	**77**+357
	Manno PHOENIX T2	2176	252+1916	**53**+403
	Manno PHOENIX T2	2176	245+1921	**54**+402
TOTAL	*17 sites*	**41294**	**8300 + 15547**	**7114 + 3752**

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Jobs per VO, last 60 days
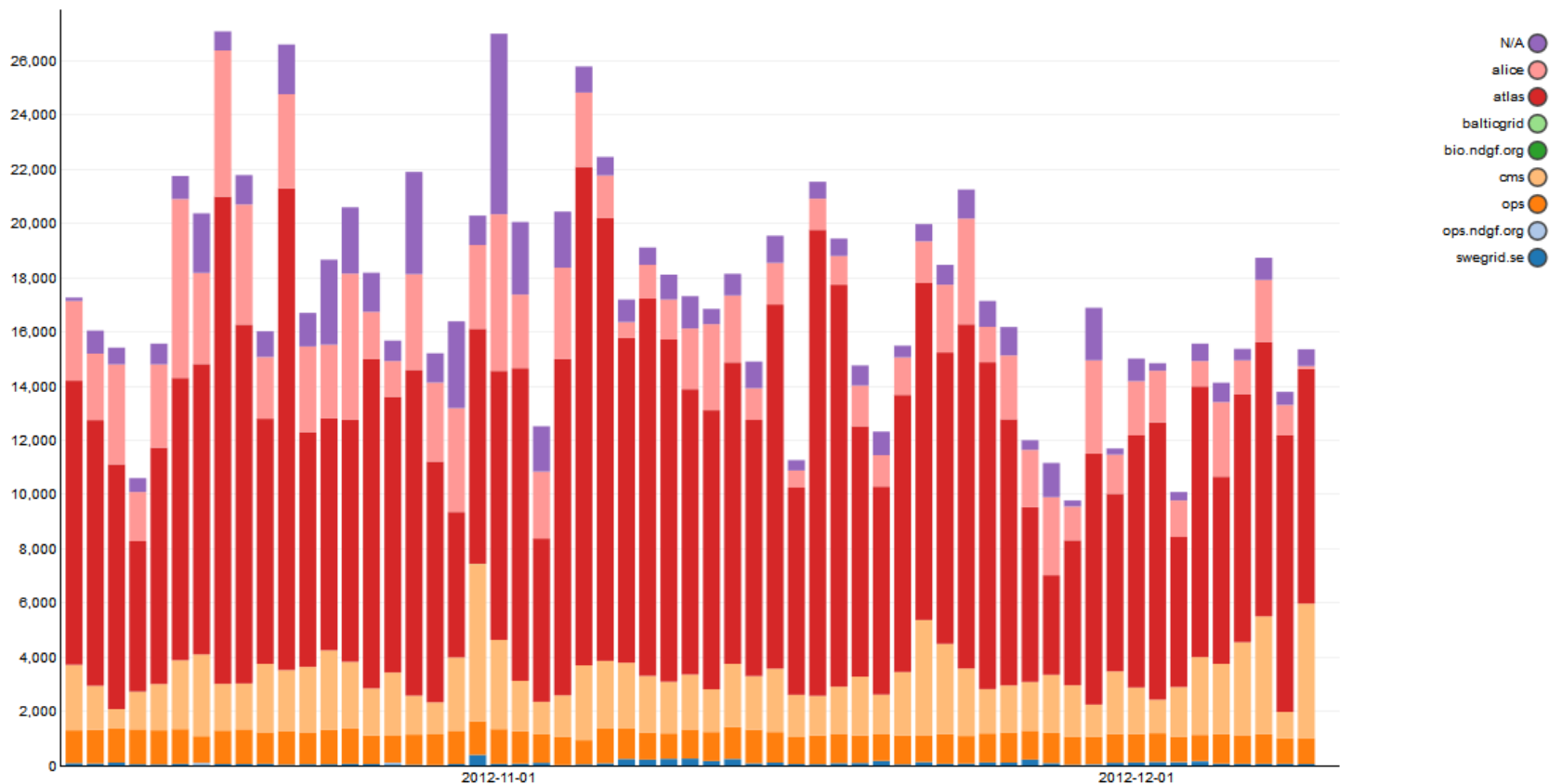
Storage usage by groups / media (terabytes).
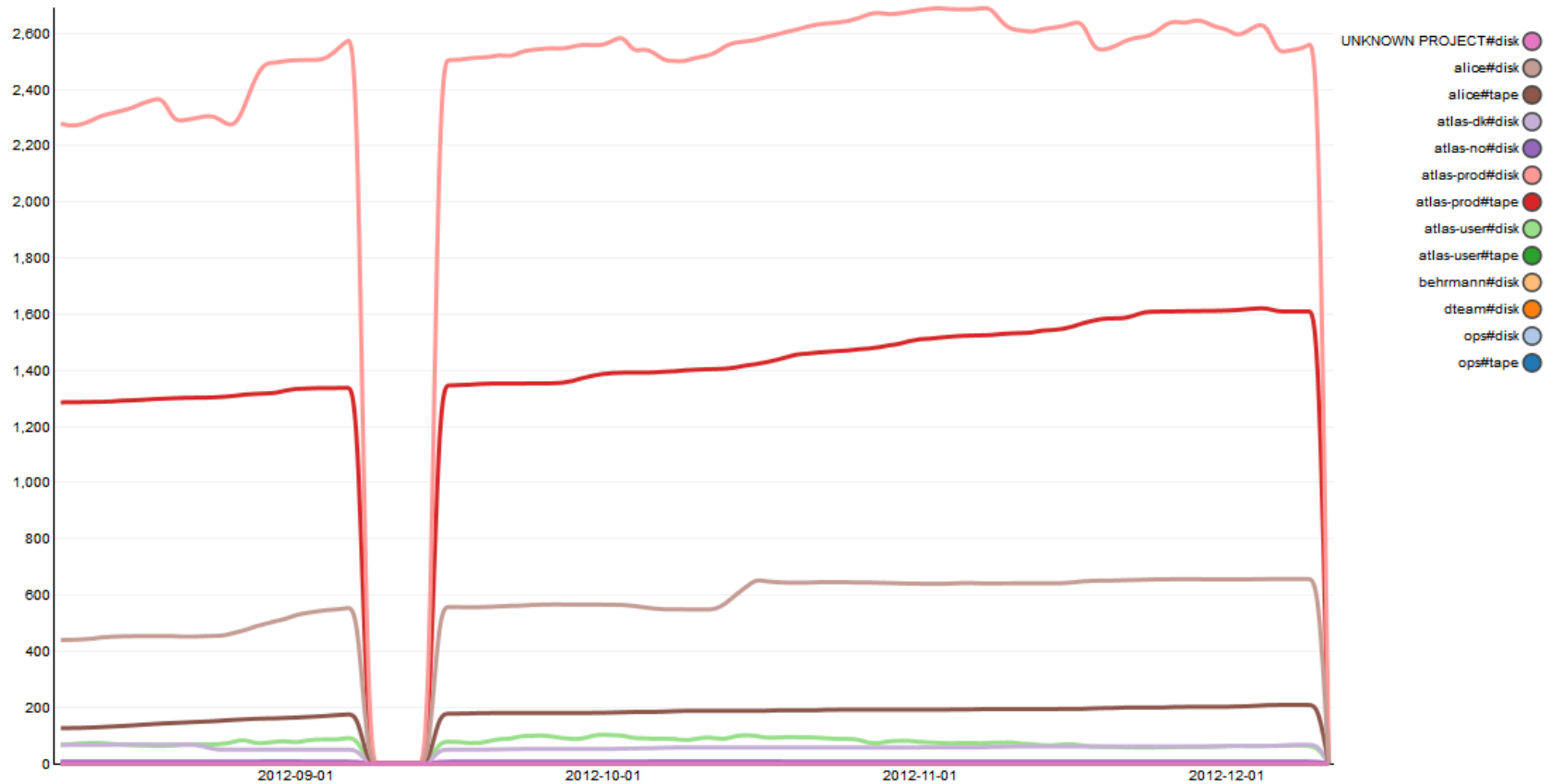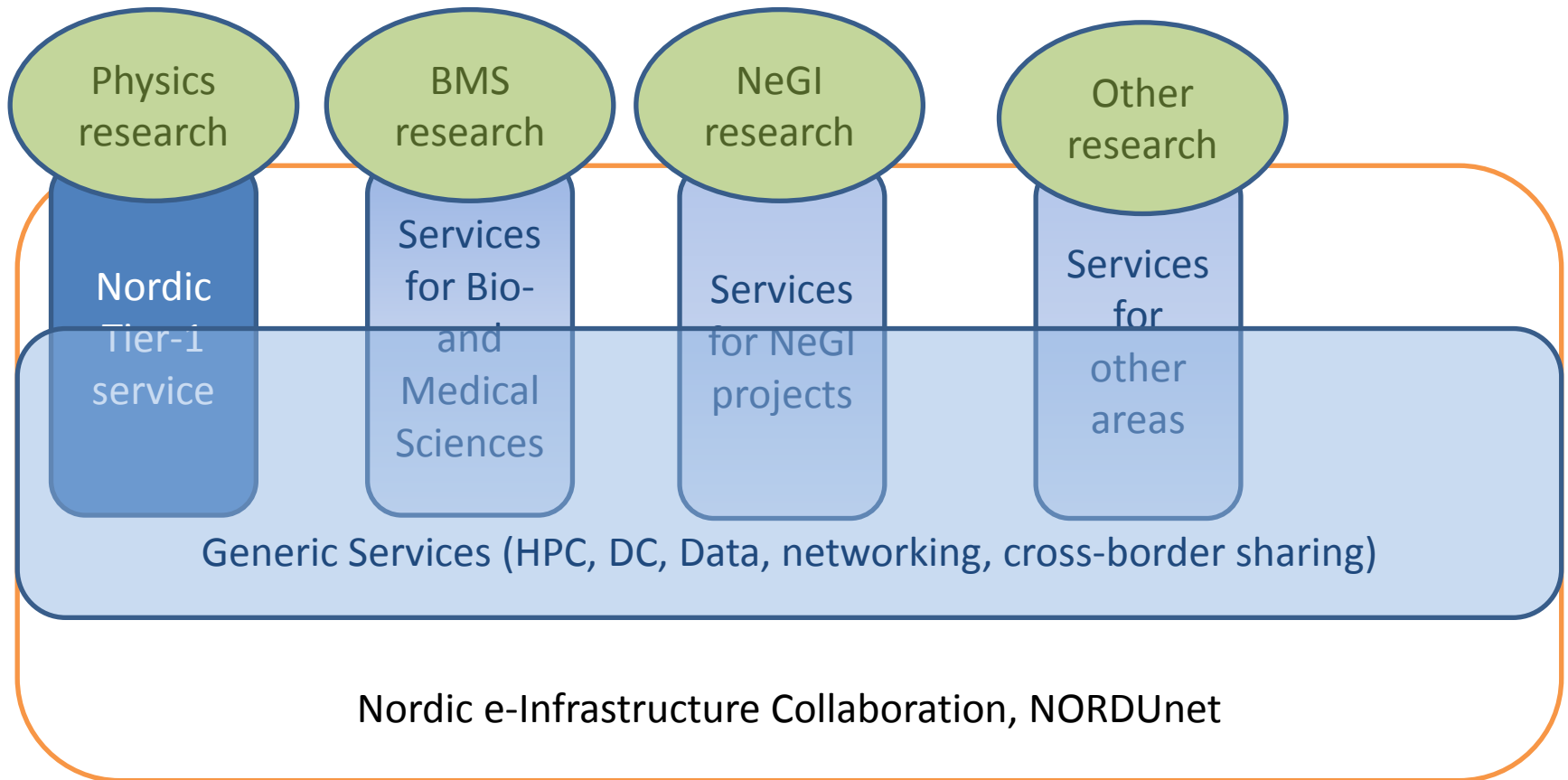
Beyond WLCG

MORE ABOUT NEIC

Mission and Goals

The mission of NeIC is to facilitate the development of high-quality e-Infrastructure solutions in areas of joint Nordic interest

Within 3-4 years, the goal is to have

- Three new strategic areas
- Strengthened Nordic collaboration on e-Infrastructures at the funding-agency level
- Increased the international visibility of the Nordic region in the area of regional e-Infrastructure collaboration
- A smoother and more efficient ecosystem of e-Infrastructures in the Nordic region
- Elicited several new opportunities for widening the scope of Nordic e-Infrastructure collaboration

NeIC supporting Nordic research

Physics research

BMS research

NeGI research

Other research

Nordic Tier-1 service

Services for Bio- and Medical Sciences

Services for NeGI projects

Services for other areas

Generic Services (HPC, DC, Data, networking, cross-border sharing)

Nordic e-Infrastructure Collaboration, NORDUnet

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Organization

NordForsk Board

NeIC Board

NordForsk Director

NeIC Director

Executive Team

Technical Advisors

Area Generic
Area Coordinator

Area Tier-1
Area Coordinator

Area BMS
Area coordinator

Area Adm
Area Coordinator

Provider Forum

Project

Project

Project

NLCG Committee

Tier-1 Operations

Project

Project

User Forum

Project

Project

Project

Project

Conclusion

- Grid-centric NDGF is evolving into generic Nordic e-Infrastructure

- WLCG and EGI services are integral part of NeIC

- NDGF-T1 is kept as a name for the Nordic Tier1 (for practical reasons)

- It is business as usual, despite re-branding