

Computing Storage Analysis Collaboration

Jeff Templon

Program Leader “Physics Data Processing”



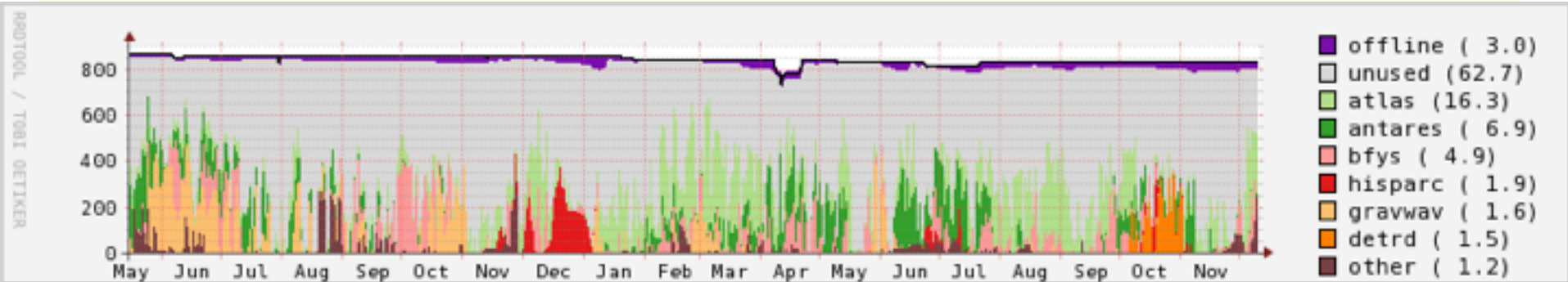
Contents

- Local activities (e.g. stoomboot)
- National stuff (e.g. Tier-1)
- International stuff (e.g. Europe)

Orange boxes indicate PDP activities

Stoomboot and halls of fame

Stoomboot Usage until 11 Dec 2015



Name	wallsum
gadatsch	40.5478
mjongen	35.8927
georgm	25.2221
tinom	18.8873
jomeyer	18.7416
koeno	16.1613
adelaat	14.9904
rjonker	13.1544
lbrenner	12.8525
cthomay	12.2168

“Most satisfied stoomboot user”



Name	count	wallsum
hweits	474210	2.5983
tinom	367488	18.8873
georgm	199379	25.2221
vsyropou	187265	6.3907
mjongen	169683	35.8927
wwollenb	142863	0.4095

“Operations”

Local Infrastructure stuff

- New storage cluster “dCache” (Pickford / van Dok)
 - replaces glusterfs “posix-like” access
 - also has grid and xrootd access
 - support by colleagues at DESY
- Python “anaconda” ... eliminate version hell
- CVMFS on most nodes
 - newer C compilers, Geant in “sft”
 - Locally needed stuff (GARFIELD) in “softdrive”
- plans 2016
 - dCache deployment (now still in test)
 - optimisation storage network (HvA students, Groep)
 - cloudification; at first invisible
 - replace old “gloei” nodes with retired “smrt” nodes from grid
- “working hard to make it appear we’re hardly working”

“Operations”

Experiment specific developments

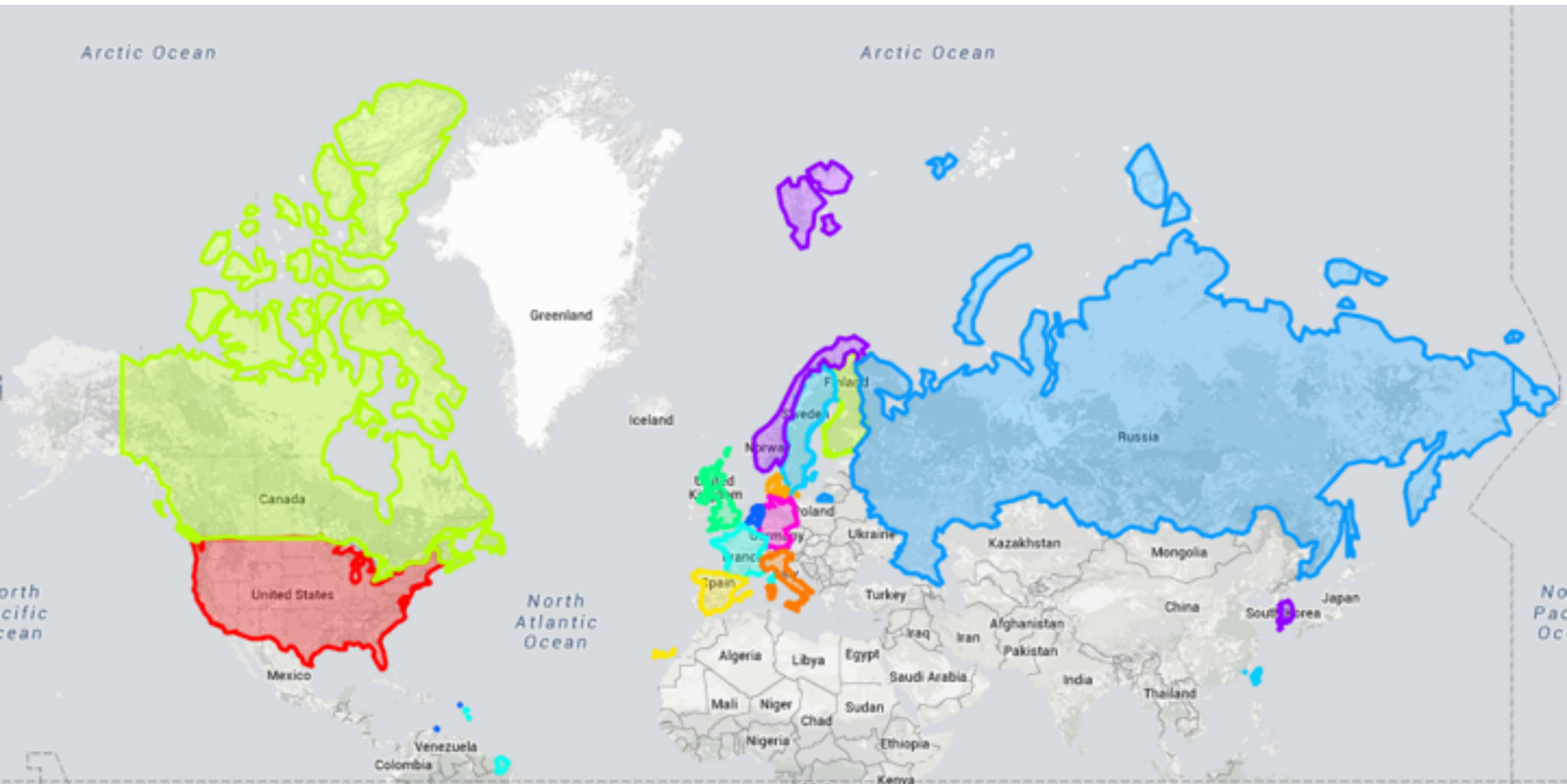
- XENON (Keijser)
 - PDP @ Gran Sasso, now better connected to Nikhef than anywhere else in world (Suerink)
 - link to XENON Tier-0 mirror hosted on DNI
 - PDP helps prototype “Xenon modern storage” (ask Chris T)
- LHCb
 - Gerhard Raven now 20% PDP
 - LHCb Trigger (Baan Hofman, Raven)
- “Advanced Software Engineering”
Baan Hofman, Raven, Keijser, Templon
- Detector R&D
 - GARFIELD program now available on most Nikhef nodes
 - newer version VASP in progress (new icc, van Dok)

“Scaling R&D”

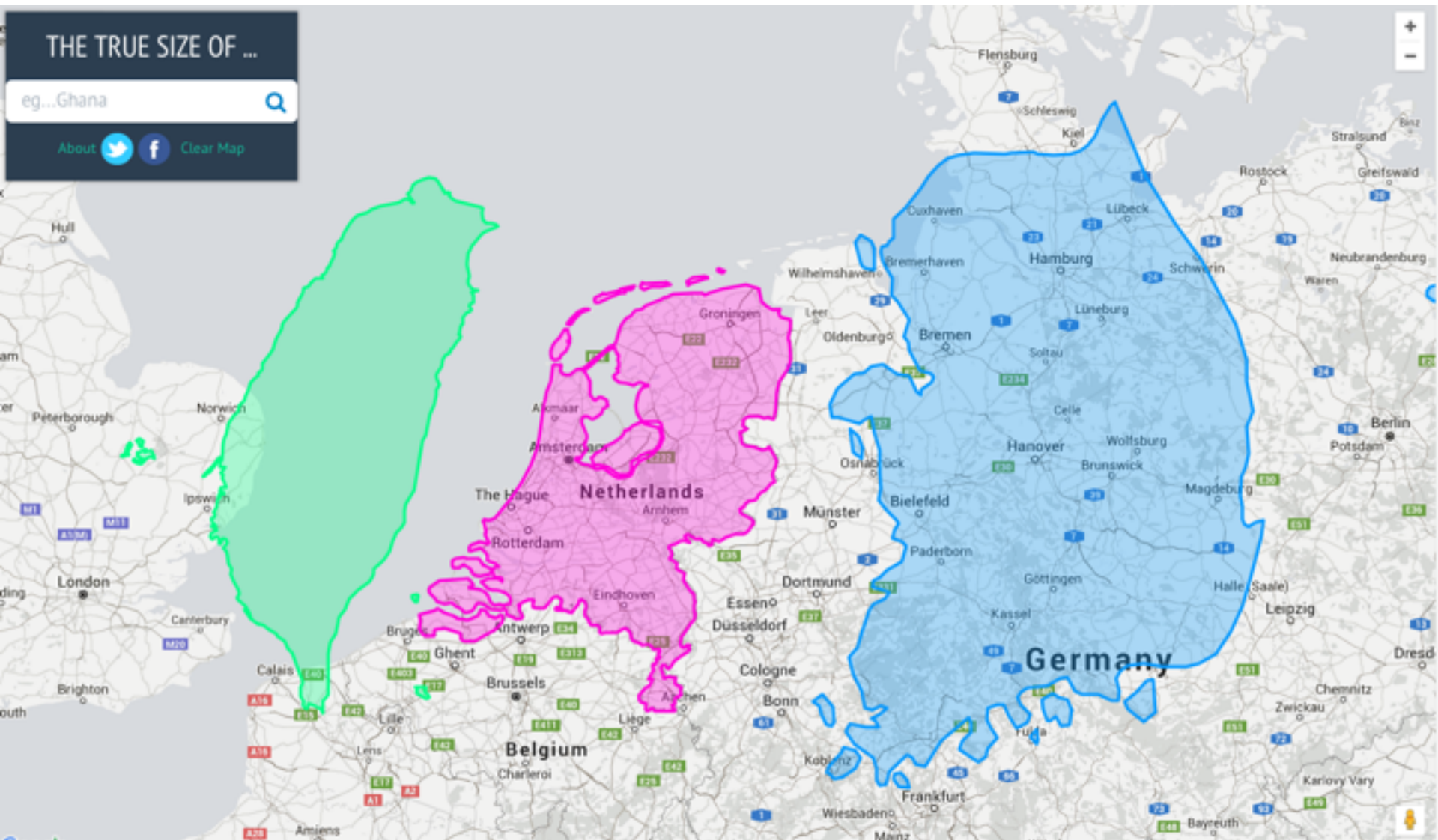
Computing Training

- Promised last year (sorry)
- We're working on it
- Documentation steadily appearing on [PDP wiki](#)

Countries with an LHC Tier-1 Center



The 3 smallest Tier-1 countries

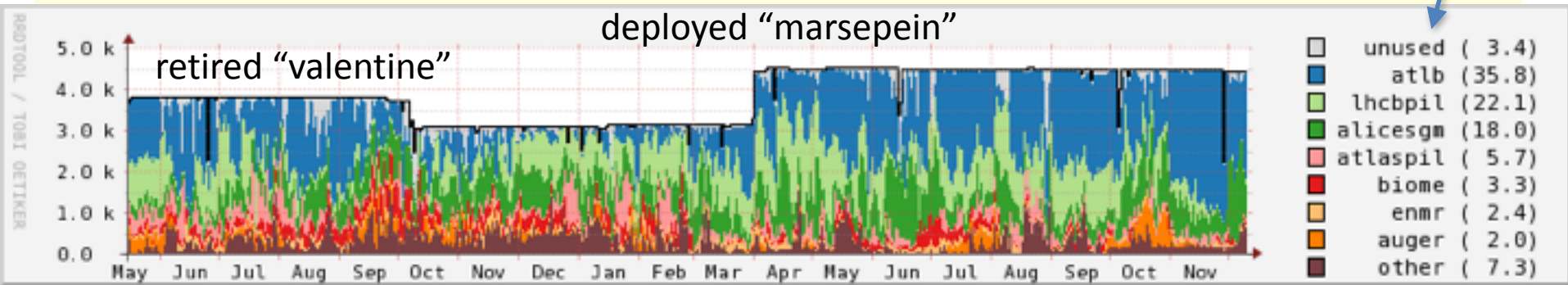


Nikhef Data Processing Facility

50% is the Nikhef part of the NL Tier-1 for LHC Computing
SURFsara has roughly same amount of LHC compute
Storage MUCH bigger at SARA

The other 50% of NDPF is for the National eInfrastructure

ATLAS
LHCb
ALICE



5-year evolution:

Network 20 Gb/s -> 100 Gb/s

Follow Moore's law

20% increase /yr CPU

15% / yr disk, tape

Hardware funded via NWO Roadmap

NL Tier-1 totals end 2015:

63000 HS06 (modern core = 18 HS06)

6 Petabyte disk

10 Petabyte tape

“Operations”

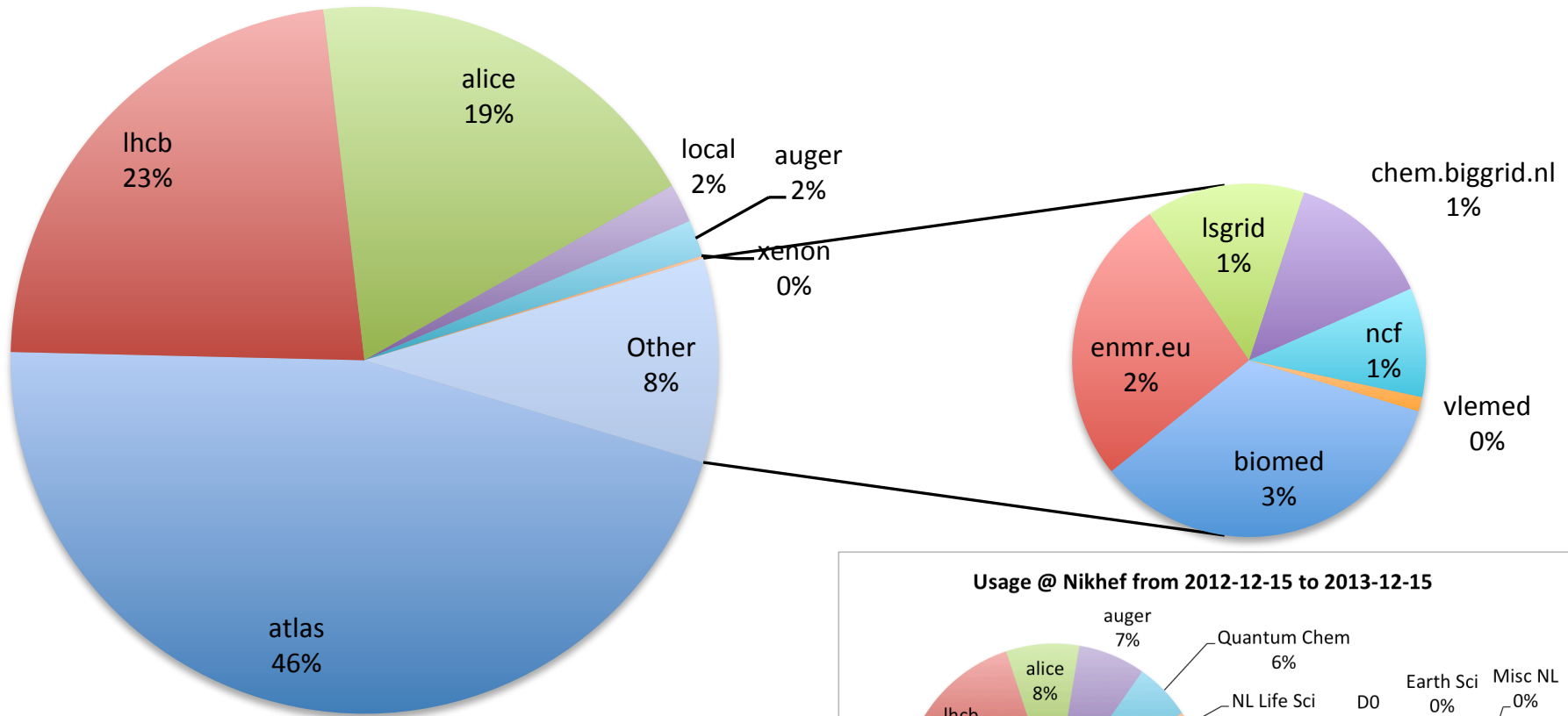
Dutch National e-Infra & why should you care

- LHC Tier-1 : Nikhef pays hardware via NWO roadmap
- DNI (*De Nationale eInfra*) pays **everything else**: power, cooling, manpower, housing
- DNI grants access to other Nikhef programs
 - XENON Tier-0 mirror, Auger, GRAPPA
- DNI likely to play a role in Data Management (later)
- DNI pays for **4 FTE** in CT/PDP at Nikhef
 - DNI operations (includes Tier-1 ops) (van Dok, Pickford)
 - DNI innovation (Nikhef provides Cloud blueprint)
 - DNI representation (JT, AvR @ International Meetings)
 - “Security” stuff (single sign-on, collaboration software)
Groep, Sallé, Balogh, Baan Hofman

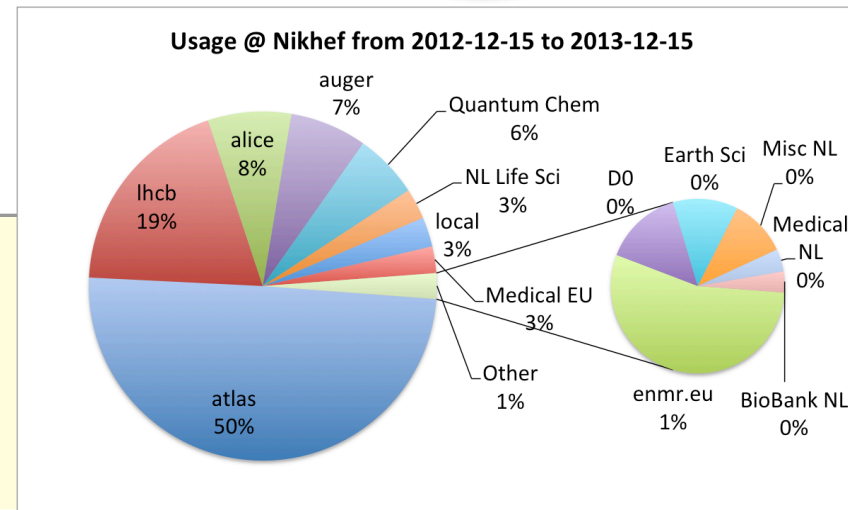
“Operations” “Security”

Computing work performed at NDFP

Usage @ Nikhef from 2014-12-11 to 2015-12-11



Two years ago, 13% non-HEP
 Now 8%
 One of motivations for “cloudification”



Netherlands eScience Center



Dr. Jeff Templon

eScience Integrator Subatomic Physics

- Strongly related to our DNI activities
- Funds “accelerating science” via computing; since about a year, HEP is eligible
- total 1,1 M€ funding to Nikhef coming years: XENON, KM3Net, iDark (Nijmegen), ROOFIT (Verkerke)
 - XENON -> good python on stoomboot (D Remenska)
 - connection to HEP software foundation
 - Verkerke -> improvements to ROOFIT (scalability)
- “Advanced Software Engineering”
- huge “physics” response; very high quality proposals.
- “indicatie dat er eigenlijk veel meer geld naar eScience-gerelateerd onderzoek moet”

“Scaling R&D”

International stuff

- worldwide LHC Computing Grid
 - evolution towards HL-LHC becoming important
- EGI (Gabriel, Salle, Balogh, Groep, van Rijn)
 - Major funded role for Nikhef in security
 - funds many important developments
 - at Nikhef
 - for wLCG
 - for other sciences
- EU-To
 - club mostly of Tier-1 data centers
 - can we do “LHC Grid” for other sciences e.g. SKA?
 - practical results for Nikhef:
 - closer contact with ASTRON
 - closer contact with UK colleagues (eg about cloudification)

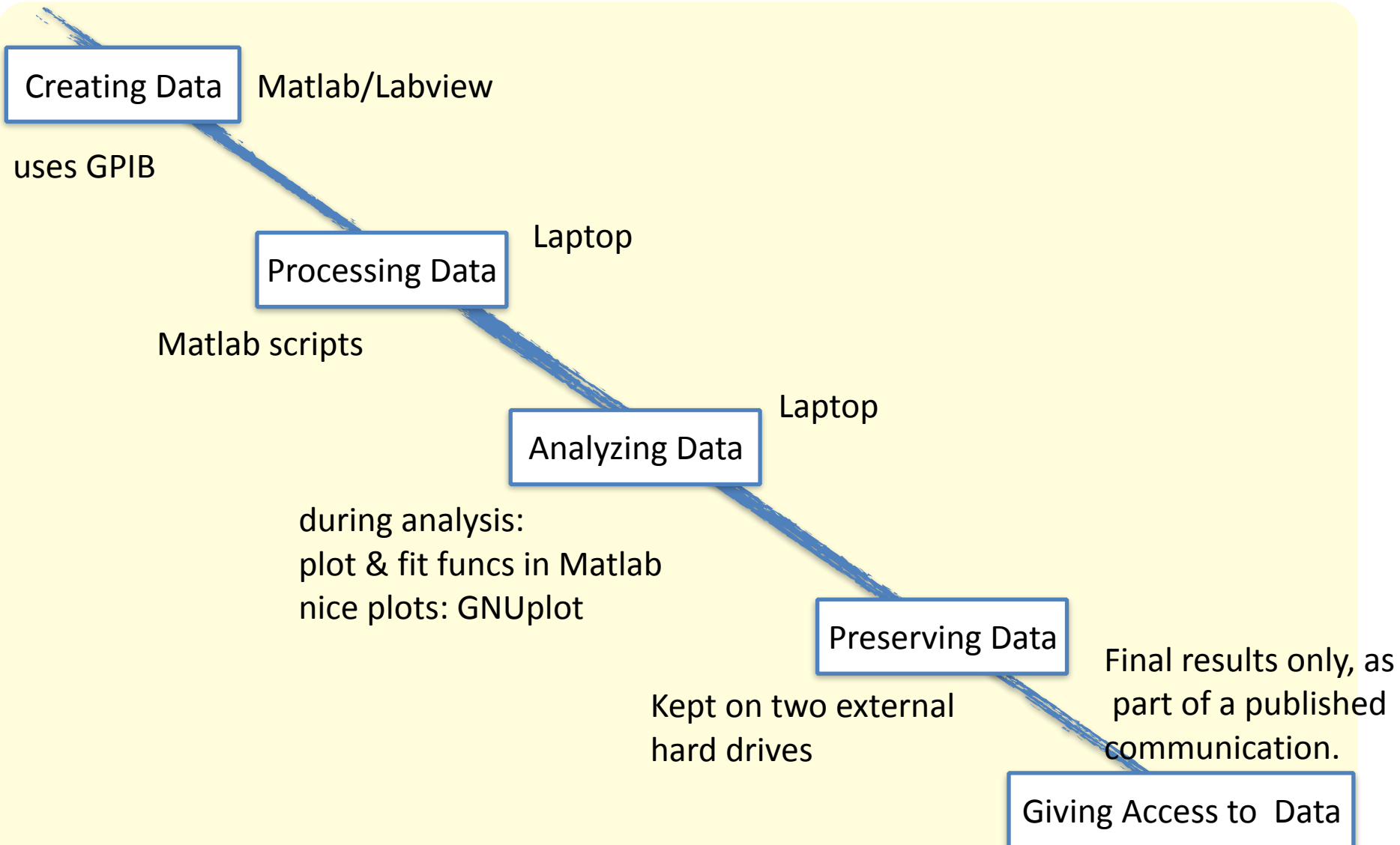
- actively pursue goal of world without user certificates
- use your Nikhef login just like
 - time sheets, wiki, travel system, Foodl, ...
- no more “renew your certificate”, “download your certificate”, “pkcs12” etc
- example [Grav Wav community page](#)
- big challenge is “non-web SSO”
 - as well as get all participating countries to agree on policies!
- major funded role for Nikhef (Groep, Sallé)



“Security”

- Funds both NLeSC and DNI
- starts to worry about Data Management
- keywords:
 - reproducibility
 - open access
- example - *replication package*: “any required software, hardware and tooling, or a detailed description in cases where these cannot or may not be archived”
- JT in “contact group” : main input has been
 - protect PhD student time
 - make costs visible (Nikhef has no “institute data manager”)
 - “increase our budget and we can talk”
- Nikhef likely involved from other side too, via DNI

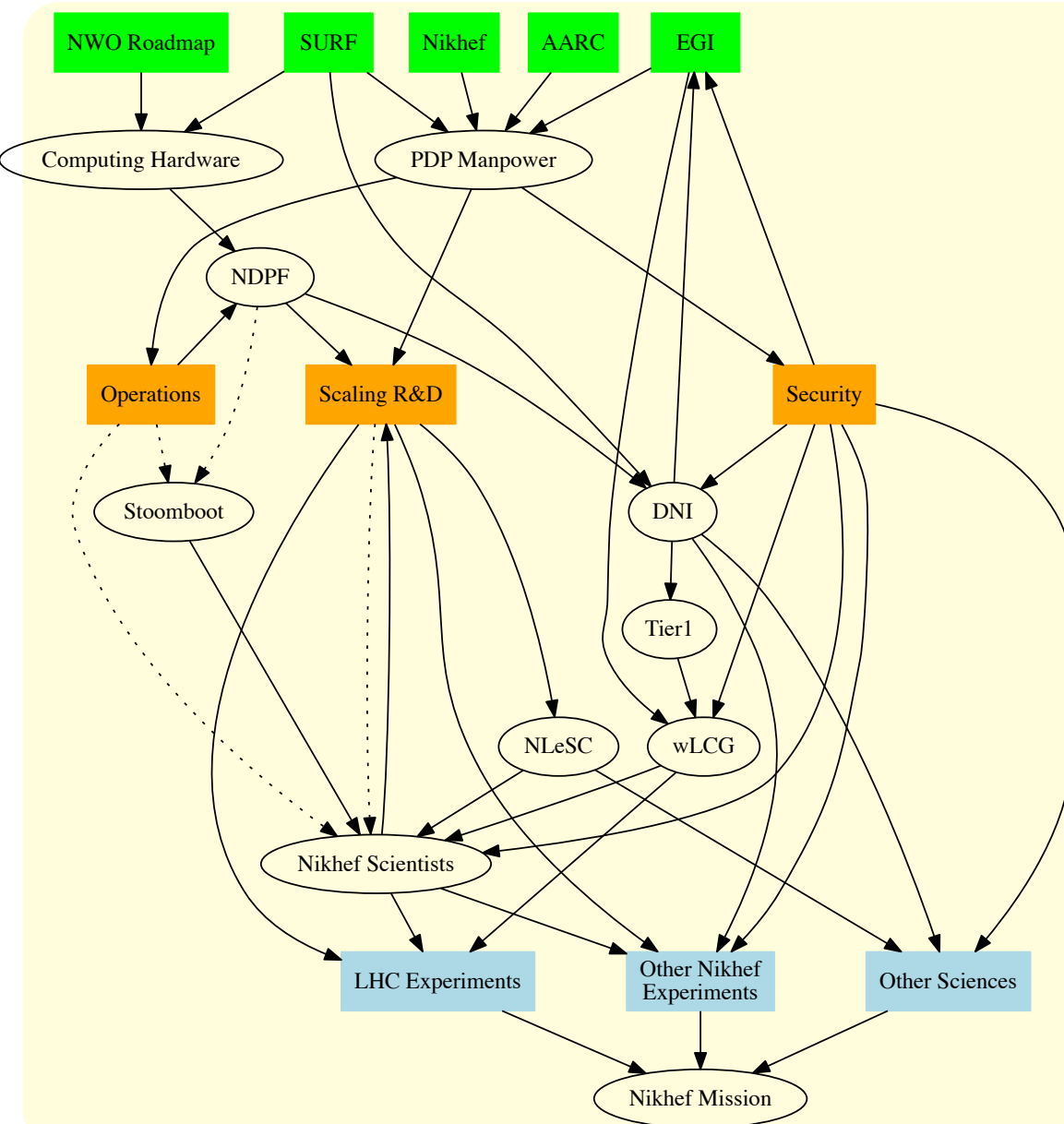
Example open access investigation @ Nikhef



Computing Professionals

- Postdocs don't design support frames
- Grad students don't design front-end electronics
- why is this different for computing? Increasing need for professionals
 - frameworks
 - Moore's law no longer in raw speed
 - external demands for “professional” data management
- LHCb trigger project step in right direction
- How to do this with no funding?
- also “non-advanced” sw engineering needed

Summary



- A lot going on
- Covers spectrum from support to research
- Much external funding
- Coherent set of activities support Nikhef staff, enable experiments, and advance mission