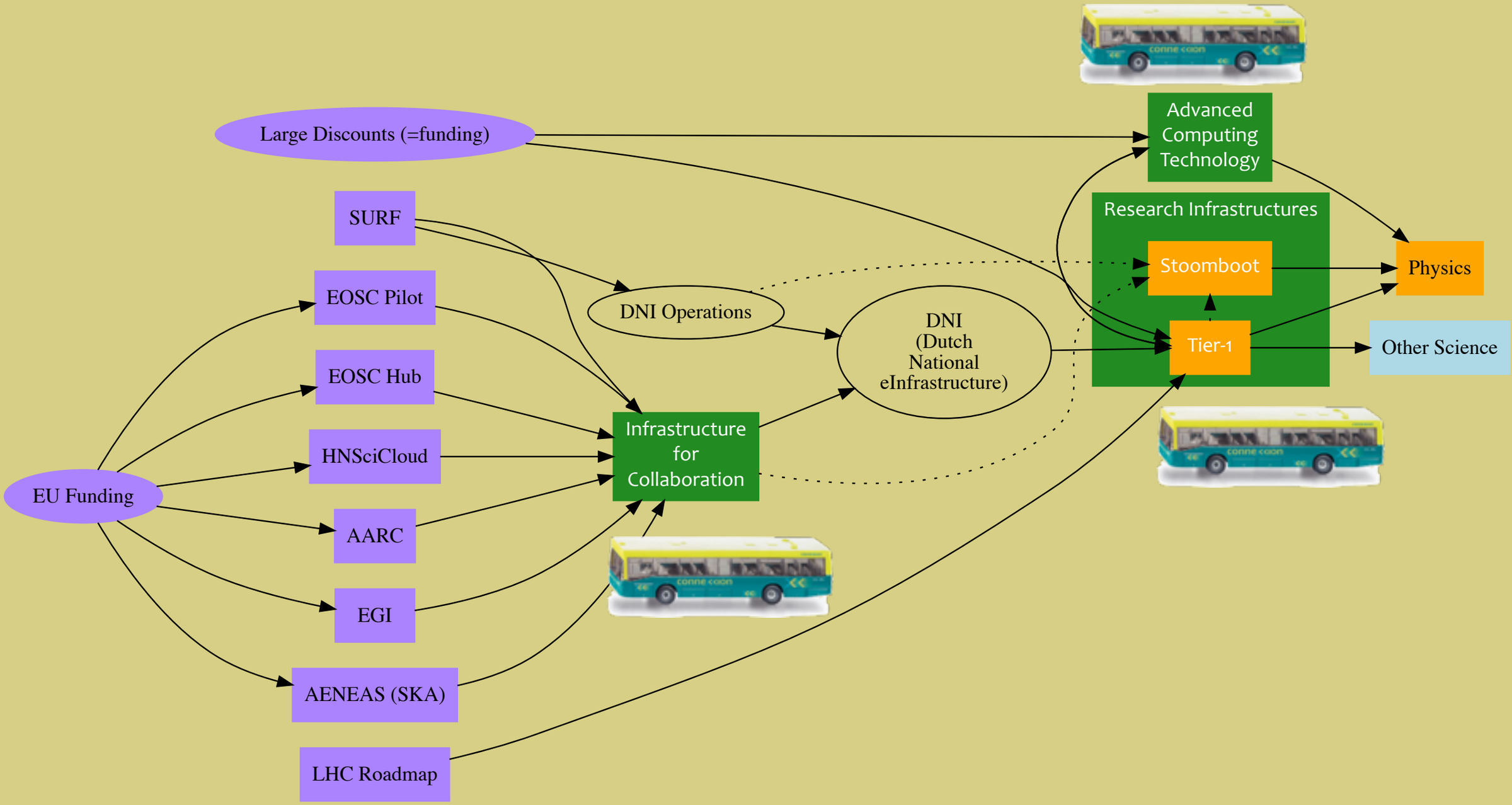
Research Computing at Nikhef

Jeff Templon
PDP Group


Large Discounts (=funding)
SURF
EOSC Pilot
EOSC Hub
HNSciCloud
AARC
EGI
AENEAS (SKA)
LHC Roadmap
EU Funding
DNI Operations
DNI (Dutch National eInfrastructure)
Infrastructure for Collaboration
Advanced Computing Technology
Research Infrastructures
Stoomboot
Tier-1
Physics
Other Science

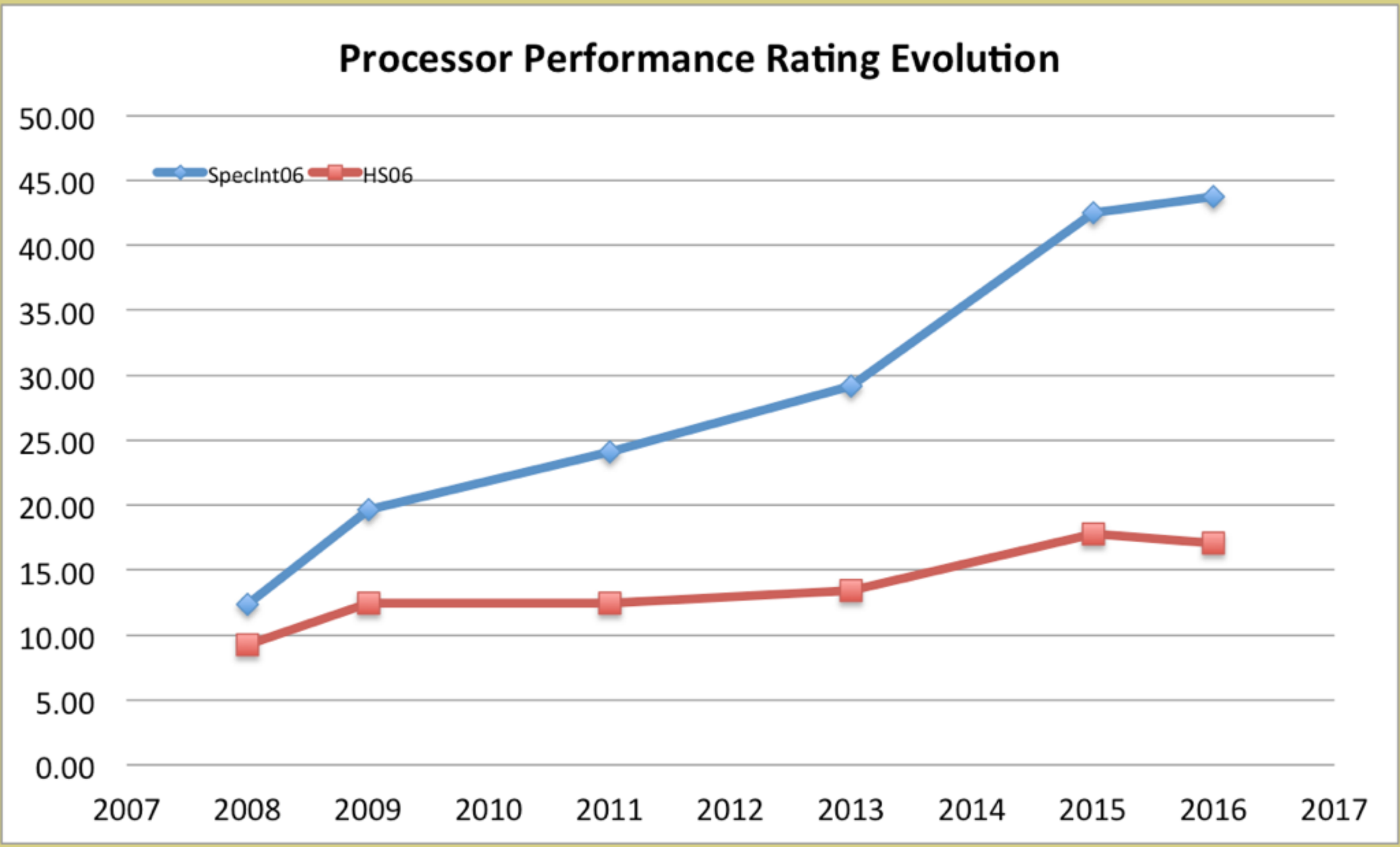
Nikhef

connexion

Instruction Set

SIMD
Single Instruction Multiple Data

Processor Performance Rating Evolution



"getting the most physics out of modern processors"

Main outcomes of Vista25-NG

Jan-Just Keijser : LHCb trigger plus GPU

doubtful whether we could make impact
many groups working, academic, data science institutes, experiment ML fora, ….

parallel: FPGA, GPU, Xeon Phi …

(important) niche right now
lots of groups working (also academic)

Machine/Deep Learning

Specific Expertise

algorithms / HP programming tension demands vs Moore

this is what we should go for
FPGA/GPU etc is a subset of this

Training for PhD Students

we do this in collaboration with existing training (Verkerke C++ course eg)

Perceived Future Need

aware of challenge: enough "in" collaboration to have impact
while retaining PDP "independence" and tackling various projects

Code and Data Organisation Required

Code and Data Organisation Required

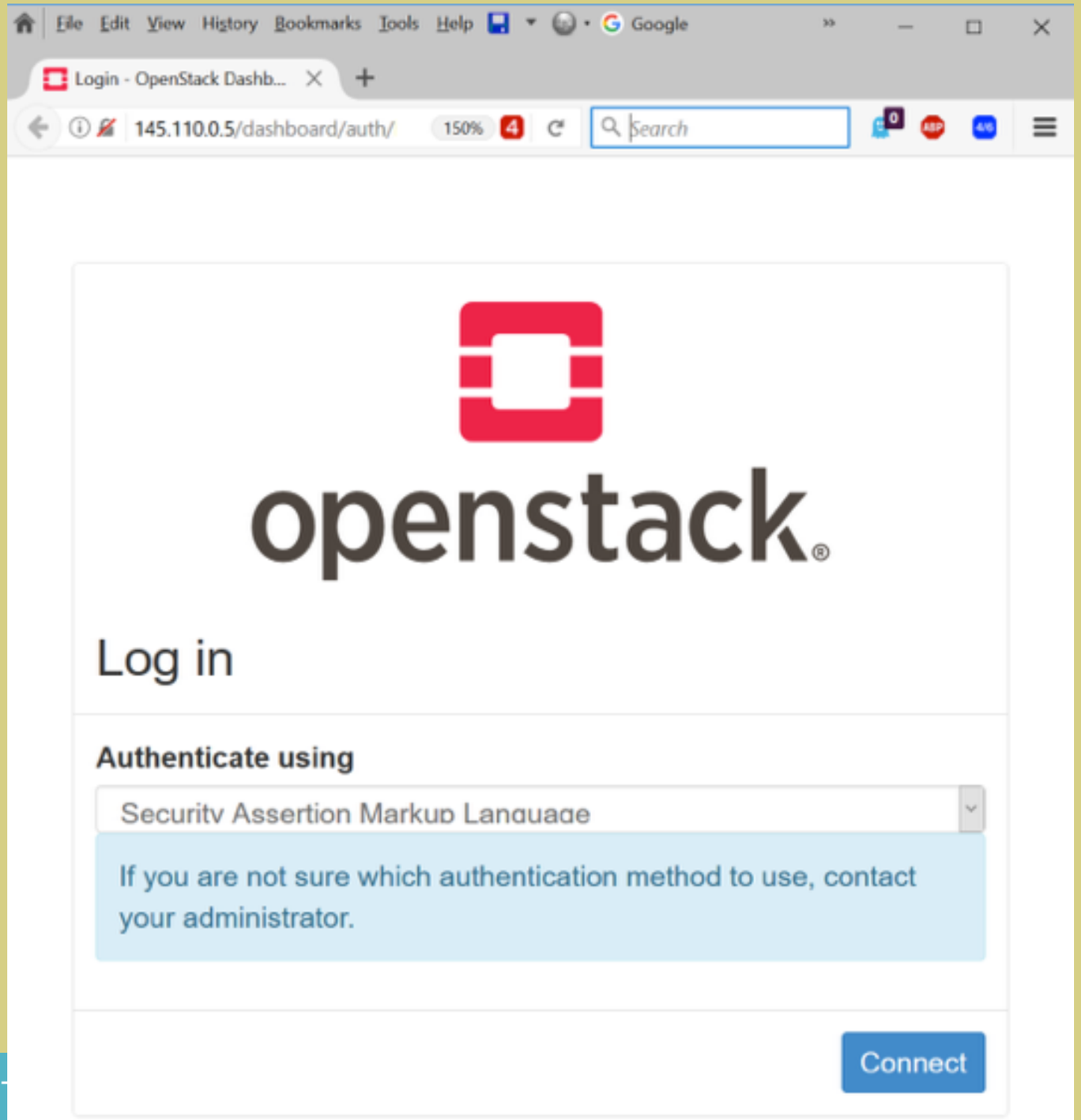
Ask your neighbour in line

- HTC (High Throughput Coffee)
- Connections @ Nikhef

- Who knows what collaborations may ensue?

Connecting to Cloud

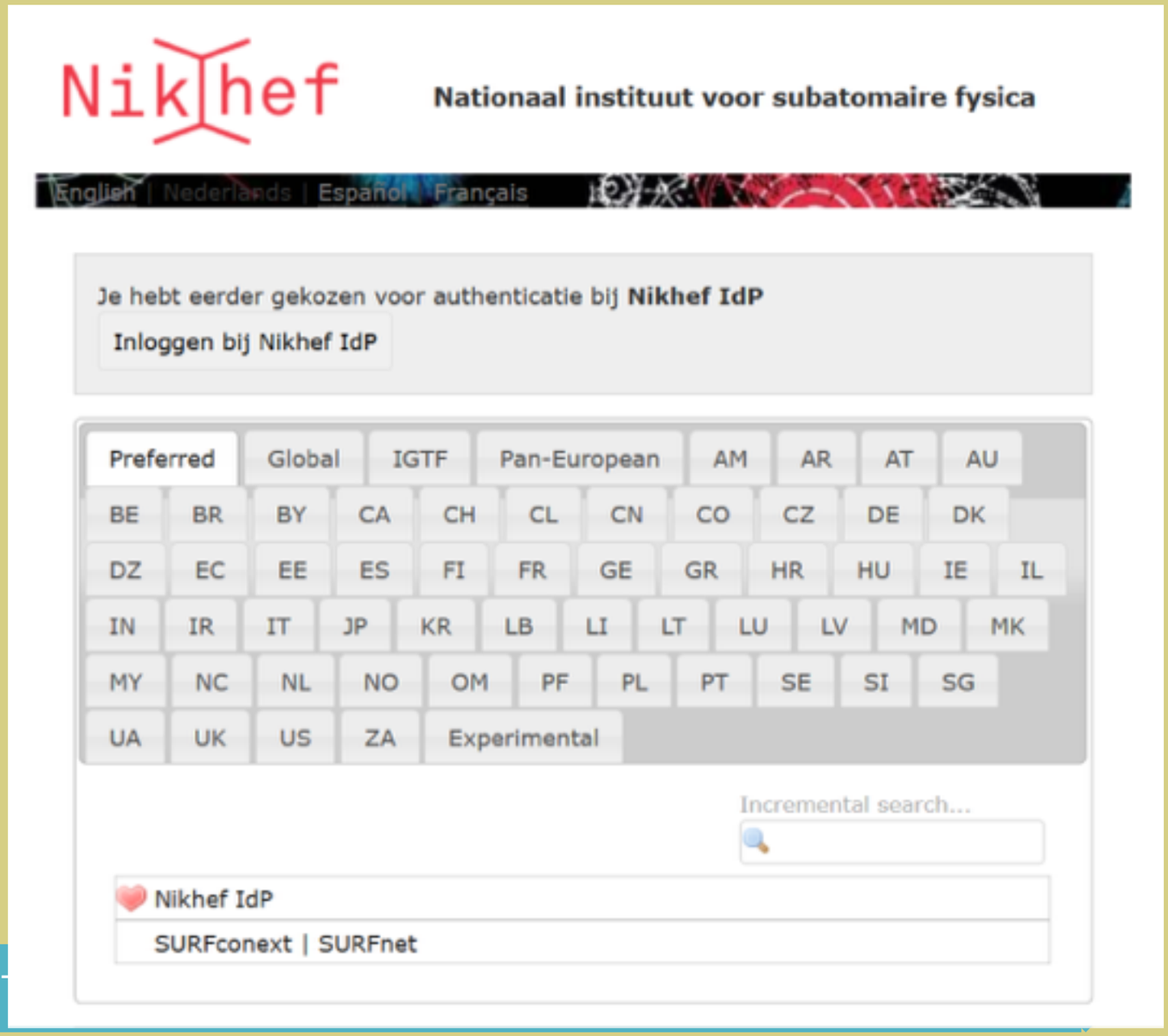
- Prototype front end to new openstack NikCloud
- “Security Assertion …” is security-speak for SSO



Connecting to Cloud

- Nikhef SSO

Relies on earlier work by Nikhef “Infrastructure for Collaboration” team …
Groep, Sallé, Roorda
and former colleagues



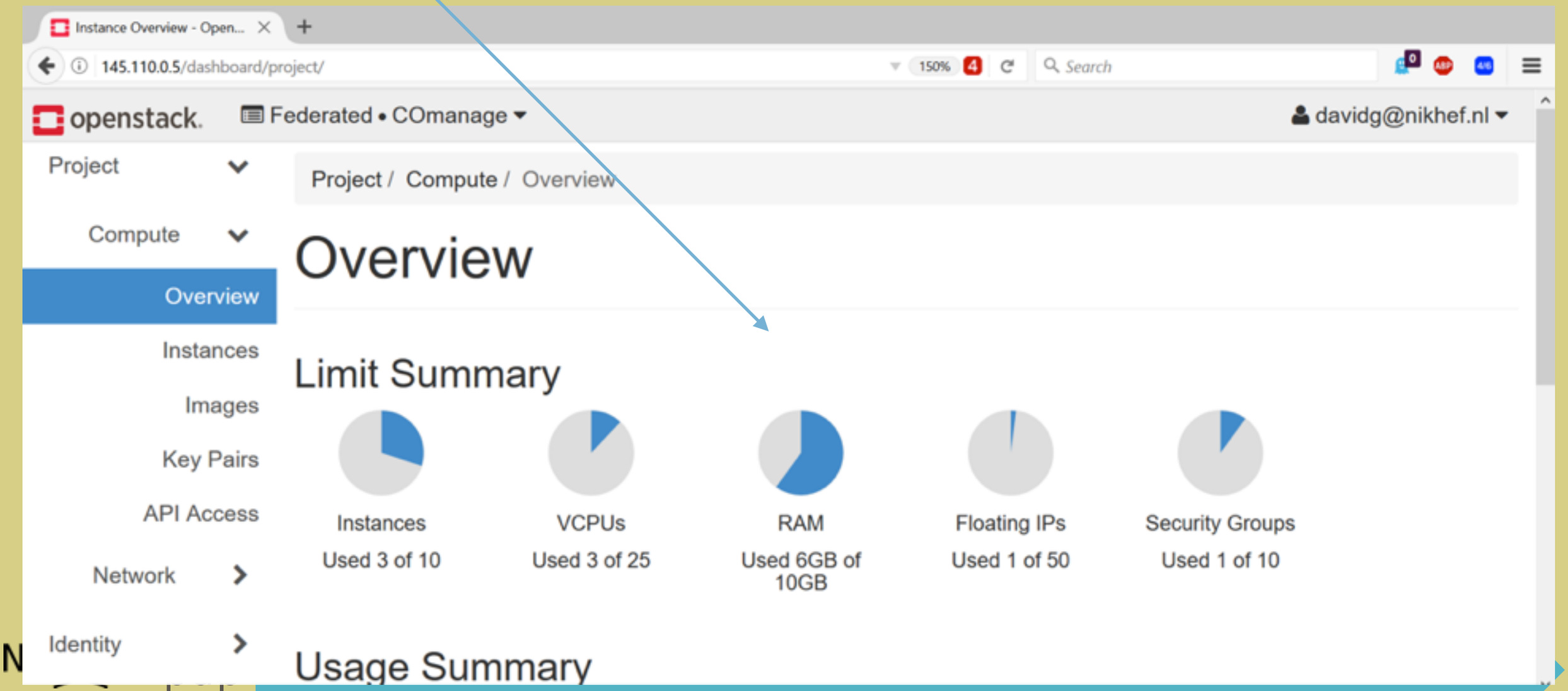
Cloud User Dashboard

J. Roorda

D. van Dok, A. Pickford

Proof of Concept Cloud

Ops team hard at work
with **real** back-end cloud

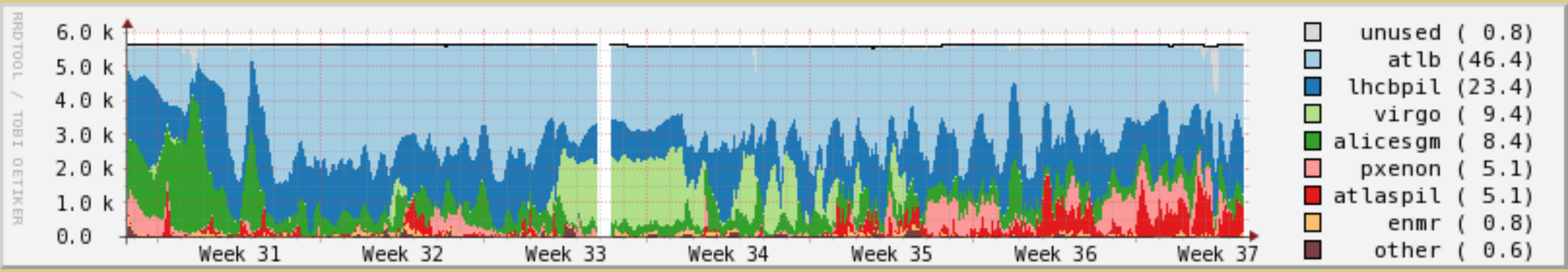


Network Connections

- New router … 96 Tbit/sec backplane capacity
- “1 gbit and 10 gbit are legacy speeds, new router has 40 and 100 gbit ports”
- tests of new device responsible for most of SURFnet (all of NL) traffic in last months
- 900 Gbit/s tests with Geneva

- lots of work preparing disk and network arch for HL-LHC era … otherwise disk-to-cpu bandwidth limits physics reach

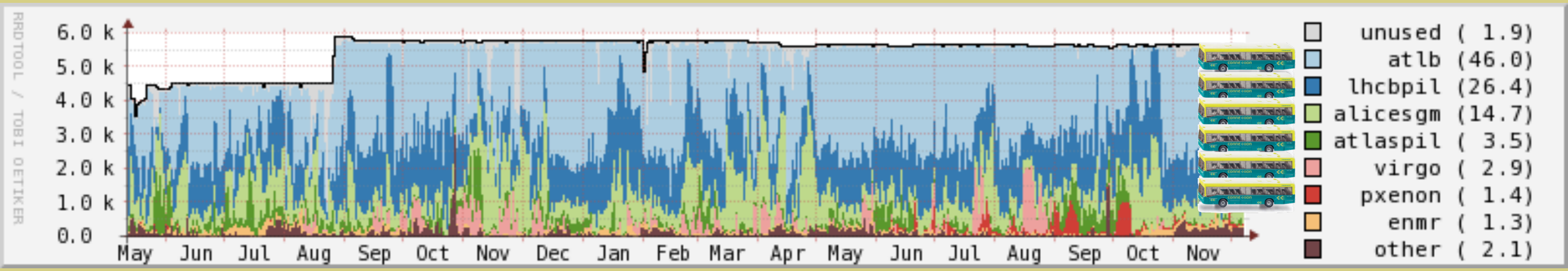
T. Suerink

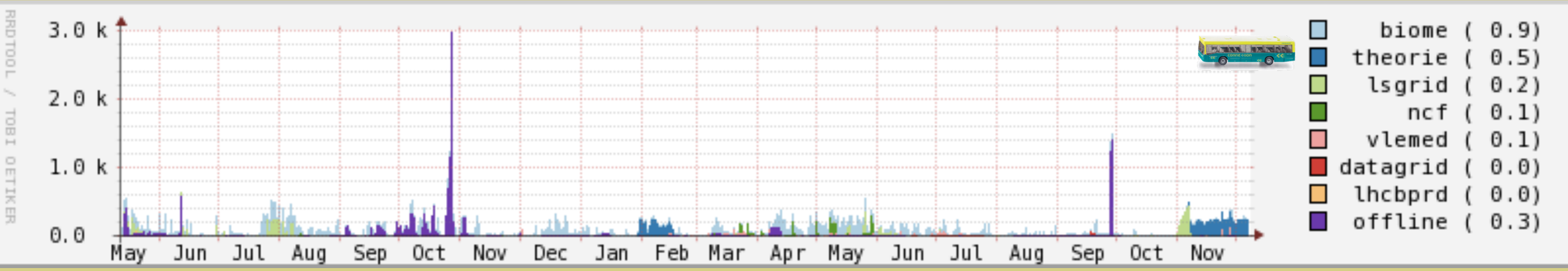


VIRGO T1

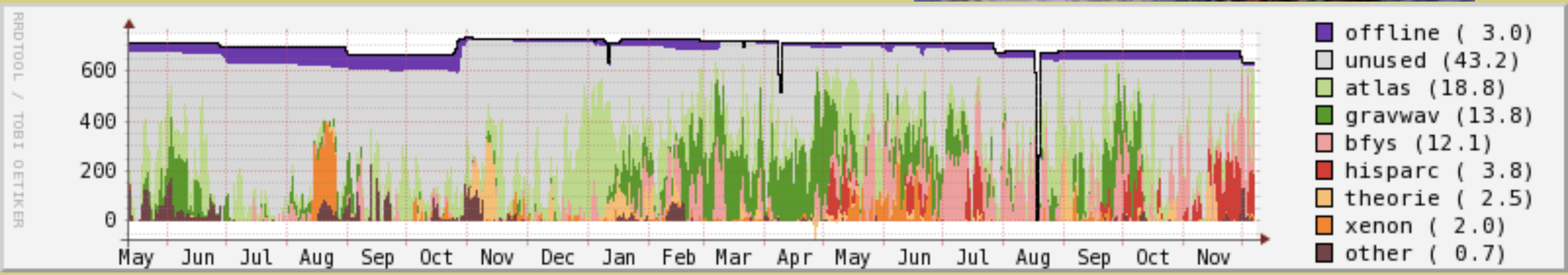
- VIRGO computing ill-equipped to make use of distributed resources
- Opportunity for VIRGO@Nikhef and PDP … bottleneck is manpower

NDPF Past Year





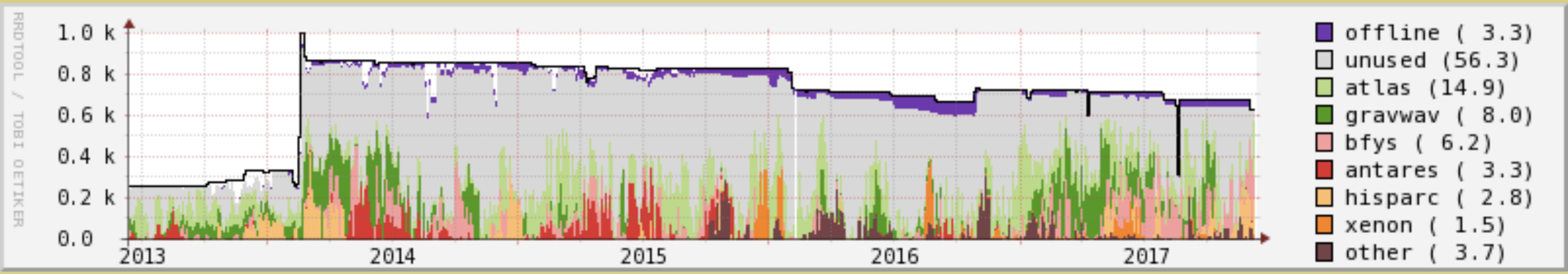
Stoomboot



#jobs	compute-years	user name
95664	94.92	kwtsang
140050	73.55	laurentd
190974	49.69	dduda
50472	26.65	kaspervd
22675	15.10	jomeyer
153706	11.50	rcasteli
61256	10.70	twolf
36579	7.09	mbedog
31241	6.57	nhartlan
37527	6.47	jorana

user name	#jobs	compute years	mean runtime (s)
aaaaaaa	6146	0.01	43.74
bbbb	21789	0.08	116.83
ccccccc	17884	0.12	204.64
dddddd	18945	0.32	540.35

Stoomboot Door joost j. bakker from ijmuiden, the netherlands - Connexxion Catharina-Amalia, CC BY



Need a new Stoomboot

- Capacity slowly decreasing (not so urgent)
- Processors are old (**urgent**)
- Order is being prepared!

T. Suerink, D. Groep, G. Raven

Computing Course

- Bash & Unix (Dennis van Dok)
- Overview of Nikhef Computing (Starink)
- Research Integrity (JT)
- Storage (Andrew Pickford)
- Stoomboot / Software (JT)

Research Data Management

- Policy in draft form
- Implements NWO Institute DM policy framework
- Our focus: find balance between intended result and minimal work

Nikhef Research Data Management Policy v03

Nikhef Research Data Management Policy

The Dutch National Institute for Sub-atomic Physics Nikhef, via its mission and through the programmes, projects, and collaborations that it operates and subscribes to, is a significant producer of scientific research data, and transfer of this knowledge to third parties, i.e., industry, civil society and general public, is an integral part of Nikhef's mission. Nikhef is committed to ensuring careful management and optimal exploitation of the research data, both in the short term and the long term, in alignment with the principles on data management of NWO, and in accordance with this Policy[1].

Scope

This Policy applies to all research data that are relevant for re-use and produced as a result of Nikhef *Research Activities*, i.e.,

- all approved granted research programmes and granted research projects, and
- research projects so designated and approved by the Nikhef director, and
- any activity that results in *Published* data as per the General Principles.

D. Groep

"Data Stewardship"

Archive "your data"

- Choices on what to archive and where
- may not be practical to archive everything! References?
- what can you easily regenerate (MC code + versions + input file)

Archive your analysis

- Code is what you did, maybe not what you think you did
- Dependecies on other code (eg numpy): record versions too!

FAIR

Findable, Accessible, Interoperable, Reusable

Nikhef

“program” material in 2017

- Vista 25 paper
- SAC Meeting
- PDP Focus Session Vista25
- NWO Site Visit

Nikhef

connexion