

Site / Campus / IP interface

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LHCOPN and LHCONE joint meeting



Enlighten Your Research

- **Enlighten Your Research** is a contest to stimulate use of (dynamic) network services:
 - Resulting e.g. in dynamic lightpaths in addition to (campus) IP uplinks
 - Support teams
 - Organisational “issues”
 - Technical design

More info on Enlighten Your Research:

<http://www.surfnet.nl/en/thema/eyr/Pages/Default.aspx>

http://www.surfnet.nl/Documents/juryrapport_201112_EYR3_EN_web.pdf

<http://www.internet2.edu/presentations/spring12/20120424-gregoire-enlightenyourresearch>



Use case Genomics



NEXT GENERATION NETWORKING FOR NEXT GENERATION SEQUENCING

Lead applicant: Jan Bot (Delft University of Technology)

Partners: Delft University of Technology, Amsterdam Academic Medical Centre, Groningen University, Erasmus University Medical Centre, Hubrecht Institute, Leiden University Medical Centre, VU University Amsterdam, Wageningen University and Research Centre, BGI (Hong Kong), and Complete Genomics (USA)

Requested infrastructure:

Grid infrastructure

- Storage: 20 TB
- Computing time: Life Science Grid clusters

Connectivity

- 1 Gbe dynamic lightpath port at Delft University of Technology (delivered)
- 1 Gbe dynamic lightpath port at Amsterdam Academic Medical Centre (delivered)
- 1 Gbe dynamic lightpath port at Groningen University (delivered)
- 1 Gbe dynamic lightpath port at Erasmus University Medical Centre
- 1 Gbe dynamic lightpath port at Hubrecht Institute
- 1 Gbe dynamic lightpath port at Leiden University Medical Centre



This study keys in to developments in the world of DNA sequencing. It is relevant and challenging, and is supported by a large consortium. Large quantities of data are utilised, which are currently distributed primarily by hard disk. The need for cloud storage, computing time on the Life Science Grid, and lightpaths is abundantly clear, and critical to the success of the study.

Jury comments:

“Sound approach, impressive network both nationally and internationally.”

Use case Medical

2nd

IMPLEMENTATION OF A CENTRALIZED IMAGE PROCESSING UNIT TO SUPPORT ANALYSIS IN LARGE-SCALE POPULATION IMAGING STUDIES

Lead applicant: Henri Vrooman (Erasmus University Medical Centre)

Partners: Erasmus University Medical Centre, Leiden University Medical Centre, Delft University of Technology

Requested infrastructure:

HPC Cloud Infrastructure

- Storage: 15 TB
- Computing time: 20K core hours

Connectivity

- 1 Gbe fixed lightpath between Leiden University Medical Centre and SARA
- 1 Gbe fixed lightpath between Erasmus University Medical Centre and SARA
- 1 Gbe dynamic lightpath port at Delft University of Technology

This study focuses on population screening aimed at identifying the first signs of illness. From the scientific point of view, this is a very important subject. Combining large quantities of data (MRI/CT scans) benefits quantitative research and will contribute to a better understanding of medical conditions; it can also help predict the progression of a condition. The value of lightpaths and the infrastructure has been properly substantiated; an existing problem can be solved.



Jury comments:

“Interesting subject, with priority being given to the provision of information and high-quality data via the cloud as a service.”

“This proposal opens up the discussion of the sharing of medical research data and the security and privacy aspects of the infrastructure of university medical centres that arise in that connection.”

“This project promotes collaboration between the various university hospitals.”

Use case

Water management



STREAM IN THE NETHERLANDS: AN E-INFRASTRUCTURE FOR DISTRIBUTED VISUAL ANALYSIS OF FLOODING SCENARIOS



Lead applicant: Gerwin de Haan (TU Delft)

Partners: Delft University of Technology, Donald Smits Centre for Information Technology (Groningen University), Alterra

Requested infrastructure:

HPC Cloud Infrastructuur

- Storage: 2 TB
- Computing time: 2K core hours

Connectivity

- 1 Gbe dynamic lightpath port at Delft University of Technology
- 1 Gbe dynamic lightpath port at Groningen University
- 2x 1 Gbe dynamic lightpath ports at SARA

Study of models for predicting the effect of rainfall and rising sea level. The results are used as a basis with which decision-makers can evaluate water management in the Netherlands. The scientific challenge is to visualise the available data so as to give decision-makers a better idea of the consequences of rising sea level for the country's flood defences. Another major challenge involves optimising visualisation tools. An important study, with a wide scientific impact in the field of the visualisation of large quantities of data. Good use of the infrastructure that is to be linked and good integration of the lightpaths around it.



Jury comments:

"Good combination of available infrastructure components."

"Of major public importance due to the potential for real-time assistance in the event of emergencies."

"Sets a splendid example for the other sectors."

Use case Climate research

CONCLUDE: CONNECTING CLIMATE MODEL DATA FOR SCIENTIFIC USERS EN DECISION MAKERS



Lead applicant: Wilco Hazeleger (Royal Netherlands Meteorological Institute, KNMI)

Partners: KNMI, Wageningen University and Research Centre (WUR), UK National Centre for Atmospheric Science (NCAS)

Requested infrastructure:

Connectivity

- 1 Gbe fixed lightpath between NCAS/British Atmospheric Data Centre (BADC) and Netherlight
- 1 Gbe dynamic lightpath port at KNMI
- 1 Gbe dynamic lightpath port at WUR

Study of the impact of climate change on the basis of regional and global models. This proposal offers Dutch institutes the possibility of making their models more precise. This means more accurate input for decision-makers and detailed models for scientists to use in future research. Lightpaths would be extremely useful; there is a clear need for a large amount of bandwidth for transporting the data.



Jury comments:

"Interesting case for dynamic lightpaths."

"Sets an example internationally because of the lightpath to the UK."

Use case

Distributed simulations

HIGH-PERFORMANCE DISTRIBUTED MULTI-MODEL / MULTI-KERNEL SIMULATIONS



Hoofdaanvrager: Frank Seinstra (VU University Amsterdam)

Partners: VU University Amsterdam, Leiden University, Utrecht University

Requested infrastructure:

Grid-Infrastructuur

- Storage: 20 TB
- Computing time: 20K core hours

Connectivity

- 1 Gbe fixed lightpath between Leiden University and SARA

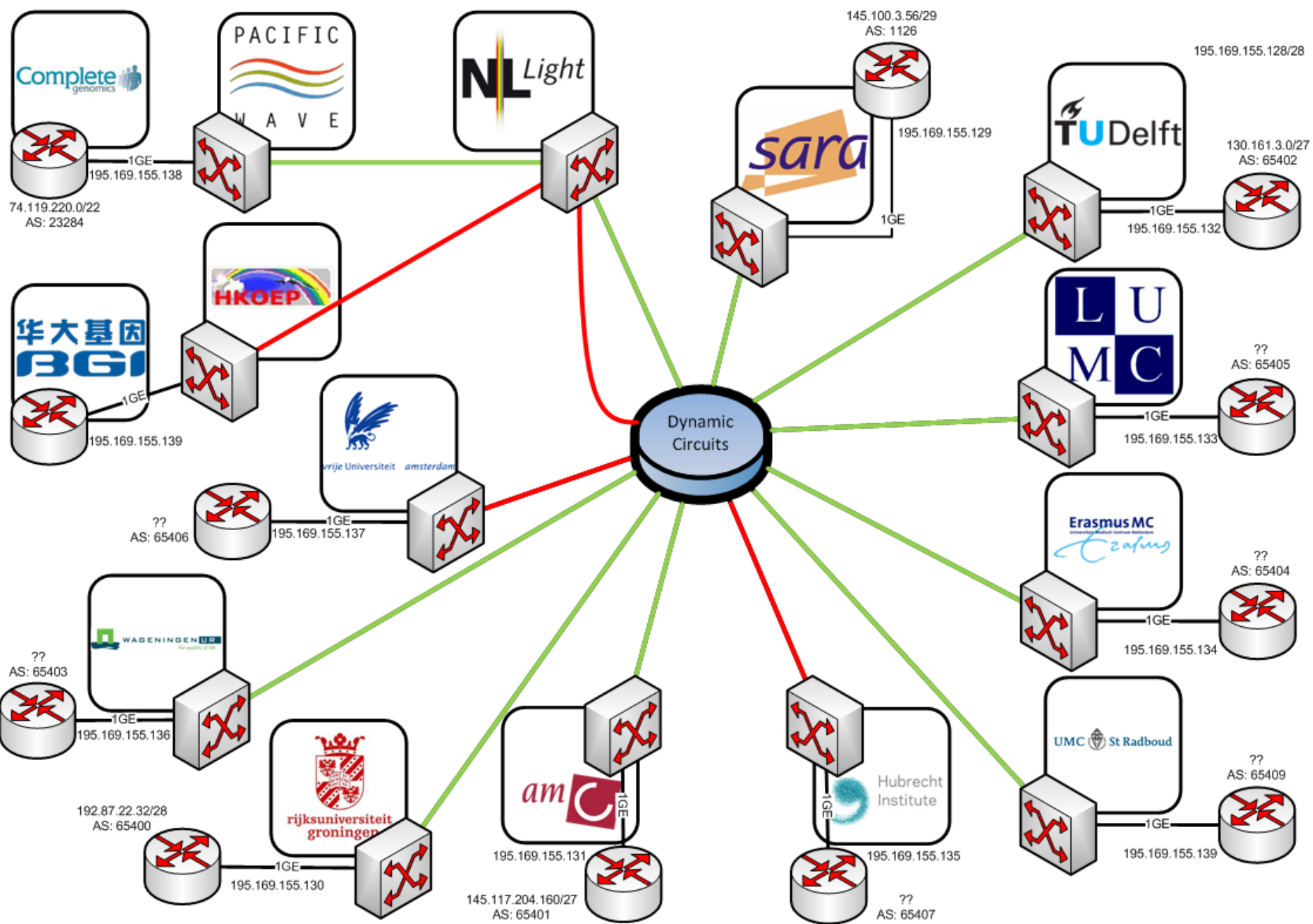
The proposal involves the use of the Ibis framework in two scientific disciplines, namely astronomy and climate modelling. The study will also contribute to further elaborating the Ibis framework for Jungle Computing. The innovative element is that the various infrastructures are used simultaneously, with each component serving the purpose to which it is best suited. In this proposal, optimisation of energy consumption plays an important role. The project consequently makes clever use of the available infrastructure and creates a basis for hybrid and distributed computer architectures.



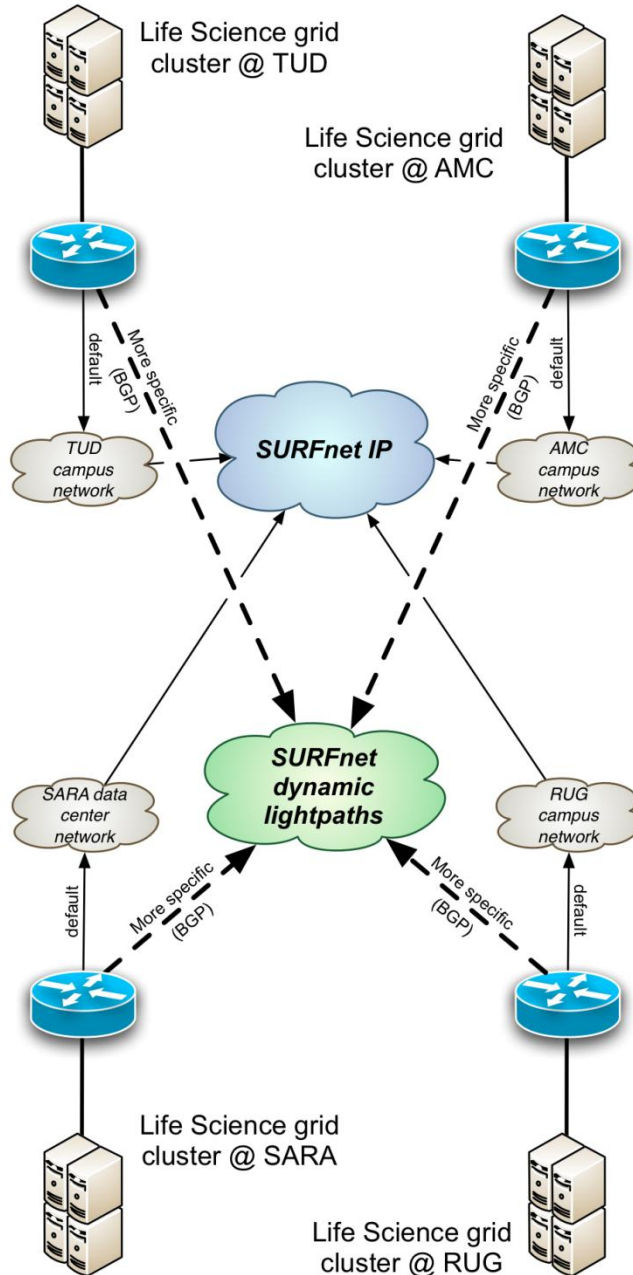
Jury comments:

"This proposal distinguishes itself from the other proposals because the lightpath is a component of the simulation instrument itself."

"This proposal deserves the sustainability prize because of the way it utilises smart software that makes efficient use of the architecture and the resources."

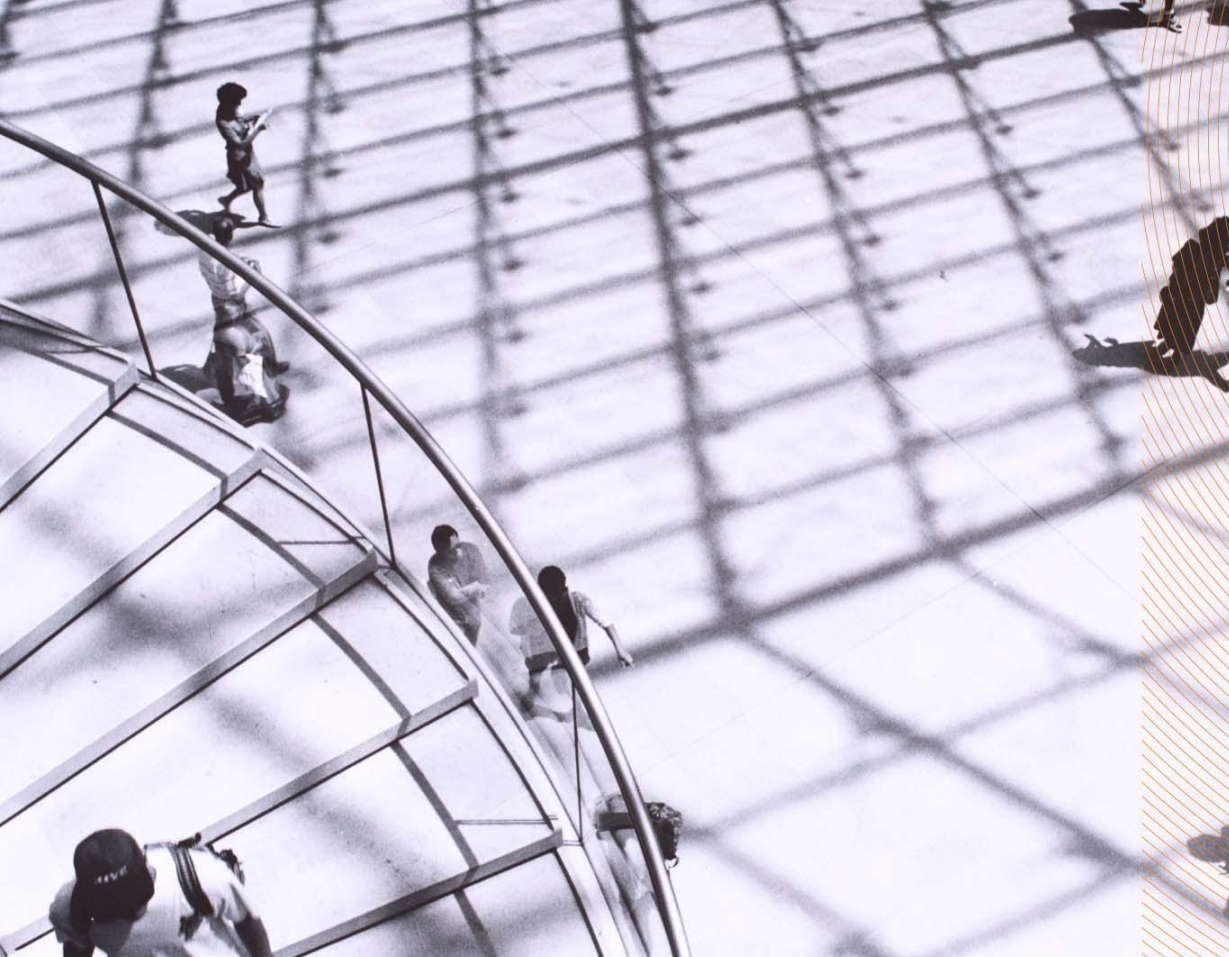


Cloud bypassing for Life Science clusters with dynamic lightpaths



A full mesh of BGP sessions is configured across interfaces facing the dynamic lightpath infrastructure. Once a lightpath is initiated, a BGP session springs to life and installs more specific routes in the router's routing table. The BGP session goes down again when the dynamic lightpath is taken out of service.

— Normal Internet connection
- - More specific (BGP) → Dynamic lightpath



SURF
NET

Discussion!