

Holland Avond SC10

Cees de Laat

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Hurricane Katrina Editorial & Stock Image Archive • Unclassified Hurricane Katrina Photos and Images • Photos: The French Quarter is trying to come back to life following the Hurricane Katrina devastation. [Login](#)

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Photos: The French Quarter is trying to come back to life following the Hurricane Katrina devastation.

New Orleans, French Quarter LA 9-27-05 Alex Petout's Restaurant put out free food for 3 days in celebration of the site being opened back up. Creating a real party atmosphere.

Date: 09/27/2005

Administration

Use add photo to cart to order a print or high resolution download.

You have 0 photos in your CART.

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Random Image



Survivors Board Helicopter

Date: 09/26/2005

Views: 2433

Harvest Image



Katrina Satellite Image



www.fotomug.com

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Home » Blog » Article

At least 58 killed as Katrina blasts through the Gulf

By Scott Gold and Elise Gany in New Orleans
August 31, 2005



A woman stands in floodwaters in front of a severely damaged building in the Quarter. Photo: AP

Whirling ashore like a destructive pinwheel, Hurricane Katrina delivered a glancing blow to New Orleans, then spent its full fury on the Mississippi Gulf Coast, sweeping homes and streets...

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Here
that

photos by several bloggers who were in the French Quarter of New Orleans, were first linked on the Gill Blog on September 10th but the photo gallery has moved to a new site.

Our original post included links to other excellent photoblogs, too, that were specifically started in the wake of Hurricane Katrina and are still maintained as active blogs today. Two of the best Katrina photo blogs are [Eye of the Storm](#) and [Cajun John](#). Nearly four months after Hurricane Katrina hit,

- [The Public Market](#)
- [The Public Market](#)
- [The Public Market](#)
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IJKDIJK

300000 * 60 kb/s * 2 sensors (microphones) to cover all Dutch dikes



Sensor grid: instrument the dikes

First controlled breach occurred on sept 27th '08:



TouchTable Demonstration @ SC08





Video
Services
UK Scho

Alien light From idea to realisation!

40Gb/s alien wavelength transmission via a multi-vendor 10Gb/s DWDM infrastructure



Alien wavelength advantages

- Direct connection of customer equipment^[1] → cost savings
- Avoid OEO regeneration → power savings
- Faster time to service^[2] → time savings
- Support of different modulation formats^[3] → extend network lifetime

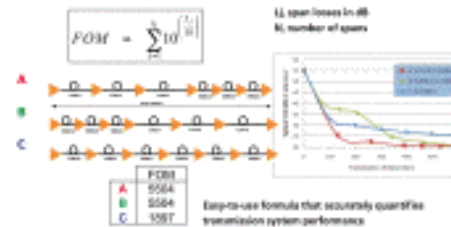
Alien wavelength challenges

- Complex end-to-end optical path engineering in terms of linear (i.e. OSNR, dispersion) and non-linear (PWM, SPM, XPM, Raman) transmission effects for different modulation formats.
- Complex interoperability testing.
- End-to-end monitoring, fault isolation and resolution.
- End-to-end service activation.

In this demonstration we will investigate the performance of a 40Gb/s PM-QPSK alien wavelength installed on a 10Gb/s DWDM infrastructure.

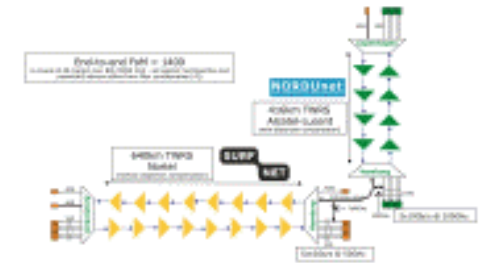
New method to present fiber link quality, FoM (Figure of Merit)

In order to quantify optical link grade, we propose a new method of representing system quality: the FOM (Figure of Merit) for concatenated fiber spans.

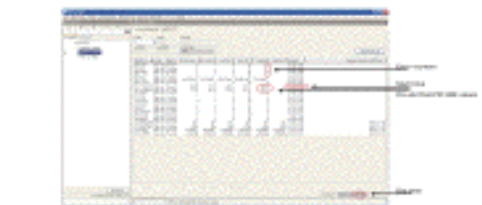


Transmission system setup

JOINT SURFnet/NORDUnet 40Gb/s PM-QPSK alien wavelength DEMONSTRATION.



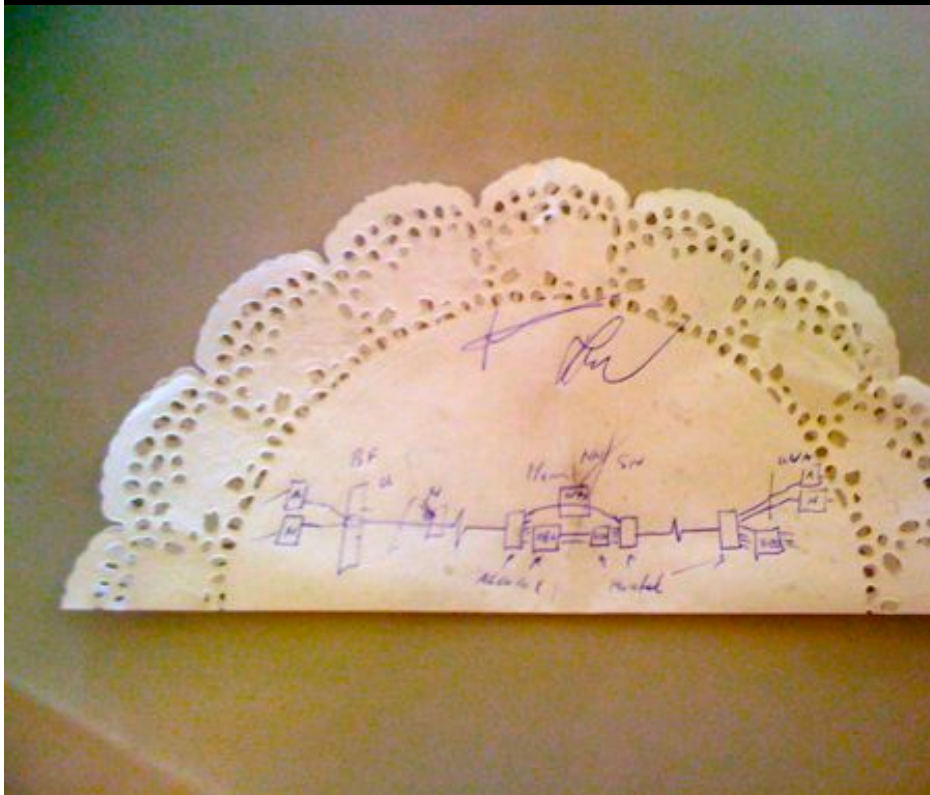
Test results



Error-free transmission for 23 hours, 17 minutes → BER < 3.0 · 10⁻¹⁶

Conclusions

- We have investigated experimentally the all-optical transmission of a 40Gb/s PM-QPSK alien wavelength via a concatenated native and third party DWDM system that both were carrying live 10Gb/s wavelengths.
- The end-to-end transmission system consisted of 1056 km of TWRS (TrueWave Reduced Slope) transmission fiber.
- We demonstrated error-free transmission (i.e. BER below 10⁻¹⁵) during a 23 hour period.
- More detailed system performance analysis will be presented in an upcoming paper.



REFERENCES
[1] "OPERATIONAL SOLUTION FOR AN OPEN DWDM LAYER", B. GONTEL ET AL., OTC 2009. [2] "NET OPTICAL TRANSMIT SERVICES", MARCELUS SMITH, OTC09. [3] "SPIN SPINNING OF ALL-OPTICAL CORE NETWORKS", ANDREW LLOYD AND CARL ENGLISH, ECOC2009. [4] NORDUnet and SURFnet COMMUNICATIONS AND CONTROL STRAITS TO BE AVAILABLE FOR PARTICIPATING IN THE BARRAGE SERVICE. THIS CAPABILITY FOR TWO EXPERIMENTAL AND ALSO FOR THE SUPPORT AND ASSISTANCE DURING THE EXPERIMENT. WE ALSO ACKNOWLEDGE TELUM and NORTEL FOR THEIR IN-DOMAIN SERVICES AND SUPPORT OF THIS SUPPORT.





GLIF 2010 40 Gbps Lambda Based on Ethernet From UVA cluster To CERN cluster

Utilizing shared expertise in advanced photonic, leading edge hardware and high-performance computing, the team created a network application testbed using the 1650 km Cross Border Fiber between NetherLight and CERNLight, lit by SURFnet, connecting servers equipped with 40 Gigabit Ethernet network interface at the University of Amsterdam to remote servers with corresponding interfaces at GLIF 2010 in Geneva.

Network Setup

The Mellanox ConnectX-2 EN 40GbE is the first network interface that allows single stream ethernet transport far exceeding the common 10Gbps boundary limit. The achieved throughput is 26Gbps from CPU to CPU which is the practical limit of the PCI-E interface.

The network infrastructure is based on Ciena's Optical Multiservice Edge (OME) 6500 equipped with 40 GbE interfaces, which enables data speeds to be seamlessly upgraded from 10 Gbps to 40 Gbps.

Application Setup

The DiVinE application is MPI based and in this setup uses TCP/IP as its network backend. DiVinE's runtime system is optimized to achieve good performance despite the very intensive traffic rate and high WAN latency over long distance.

We also use a server with basic UDP and TCP test tools to tune and measure capacities. Going beyond 10 Gbps leads to new challenges in applications, operating system tuning and system architecture design as new bottlenecks appear.

Special attention needs to be given to the setup of multi-core machines in order to have the best I/O performance and maximize the network throughput. During the demo the PCI-E x8 2.0 interface of the network card is saturated when using UDP or TCP traffic.

DiVinE

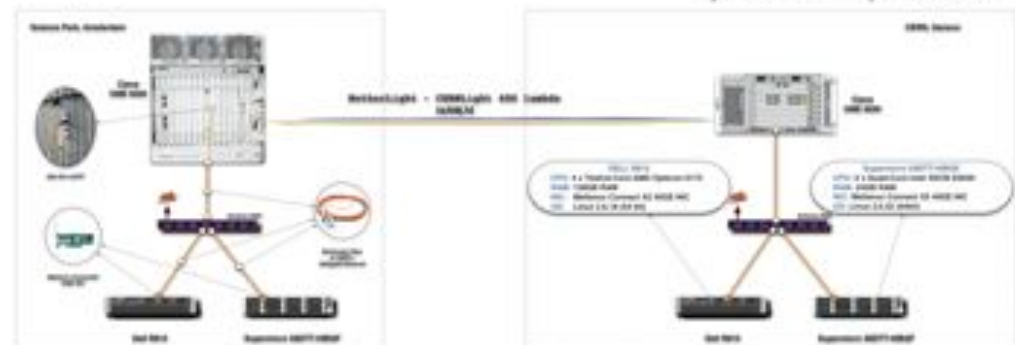
DiVinE is a tool for LTL model checking and reachability analysis of discrete distributed systems. The tool is able to efficiently exploit the aggregate computing power of multiple network-interconnected multi-cored workstations in order to deal with extremely large verification tasks.

Cluster-in-a-box

The Dell R815 is a 2U server powered by 48 AMD Opteron 6100 cores which make it as one of the densest x64 servers available on the market and is used to run the DiVinE application.

High Performance Node

Using a flexible I/O architecture, the Supermicro X8DTT with two quad-core Intel E5620 CPUs, allows extreme speeds of over 25 Gbps to be reached.



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<http://science.uva.nl/research/sne>

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Jan-Willem Ellion

Harry Peng

Kevin McKernan

Martin Blauthner

VU University Amsterdam

Kees Verstoep

Hans Bal

Mellanox

Erez Cohen

Bill Lee

Setup

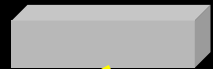
UvA

iPerf

DiViNe

2 quad core

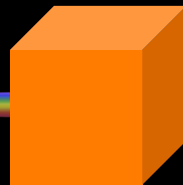
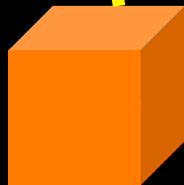
48 core



DELL

Mellanox

Extreme



CIENA OME6500

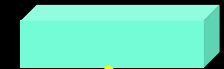
CERN

iPerf

DiViNe

2 quad core

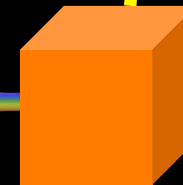
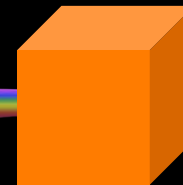
48 core



CV

Mellanox

Extreme



CIENA OME6500

17 ms RTT



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2.28e+07 2.34e+07
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2.28e+07 2.34e+07
2.28e+07 2.34e+07
5.55e+06 2.49e+07
2.27e+07 2.34e+07
eth2
Kbps in Kbps out
2.28e+07 2.34e+07
2.28e+07 2.34e+07
2.28e+07 2.34e+07
2.28e+07 2.34e+07

```

UvA

```

1.02e+07 1.08e+07
9.79e+06 9.13e+06
6.52e+06 6.52e+06
2.28e+06 3.32e+06
2.59e+06 2.13e+06
1.09e+07 1.05e+07
1.04e+07 1.06e+07
7.80e+06 7.61e+06
3.44e+06 4.29e+06
35741.16 32136.81
3.63e+06 3.05e+06
1.07e+07 1.05e+07
eth0
Kbps in Kbps out
8.75e+06 8.74e+06
2.25e+06 3.13e+06

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2.34e+07 2.28e+07
2.34e+07 2.28e+07
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2.34e+07 2.28e+07
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2.34e+07 2.28e+07
2.34e+07 2.28e+07
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eth0
Kbps in Kbps out
2.34e+07 2.28e+07

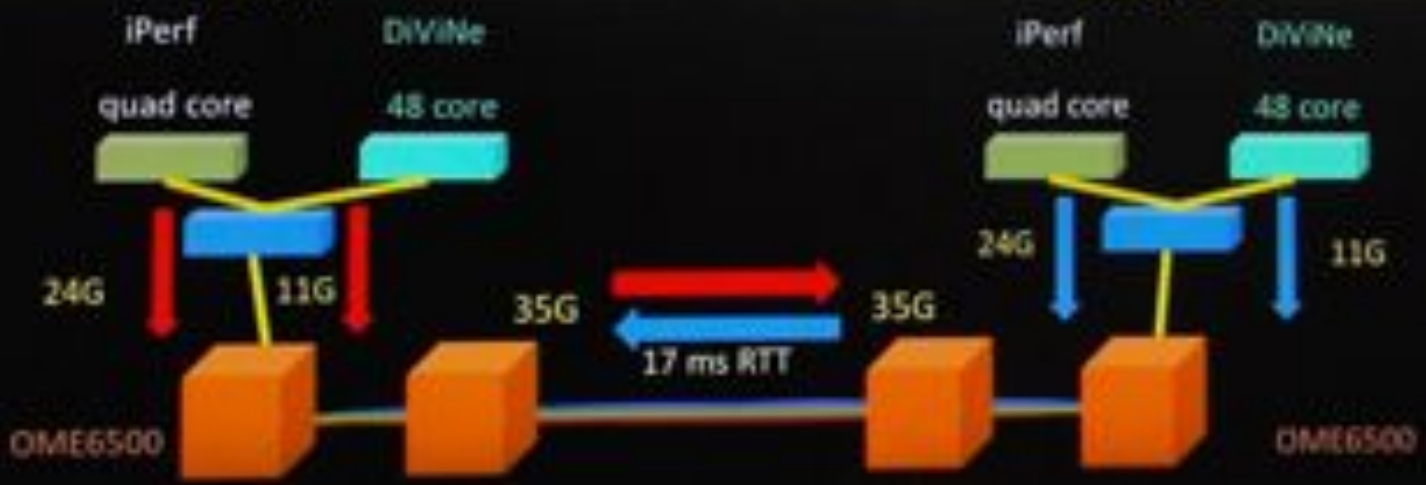
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CERN

```

1.08e+07 1.07e+07
9.23e+06 9.80e+06
6.55e+06 6.53e+06
3.47e+06 2.33e+06
1.03e+06 2.57e+06
1.04e+07 1.09e+07
1.06e+07 1.04e+07
eth0
Kbps in Kbps out
7.73e+06 7.81e+06
4.44e+06 3.48e+06
32517.03 35833.66
2.79e+06 3.60e+06
1.05e+07 1.07e+07
8.86e+06 8.76e+06
3.26e+06 2.28e+06

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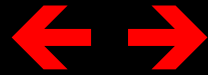
Preliminary results

- Single flow iPerf 1 core -> 21 Gbps
- Single flow iPerf 1 core <> -> 15+15 Gbps
- Multi flow iPerf 2 cores -> 25 Gbps
- Multi flow iPerf 2 cores <> -> 23+23 Gbps
- DiViNe <> -> 11 Gbps
- Multi flow iPerf + DiVine -> 35 Gbps
- Multi flow iPerf + DiVine <> -> 35 + 35 Gbps



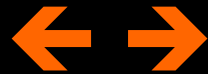
Hybrid computing

Routers



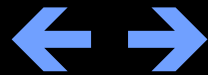
Supercomputers

Ethernet switches



Grid & Cloud

Photonic transport



GPU's

What matters:

Energy consumption/multiplication

Energy consumption/bit transported





The Dutch Booth #4049 at SC 2010, nov 13 - 19, New Orleans (Louisiana)



This page is best viewed with Safari or Firefox.

2005

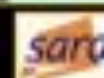
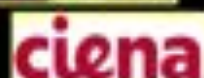
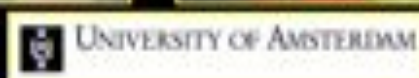
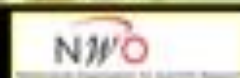
2006

2007

2008

2009

2010

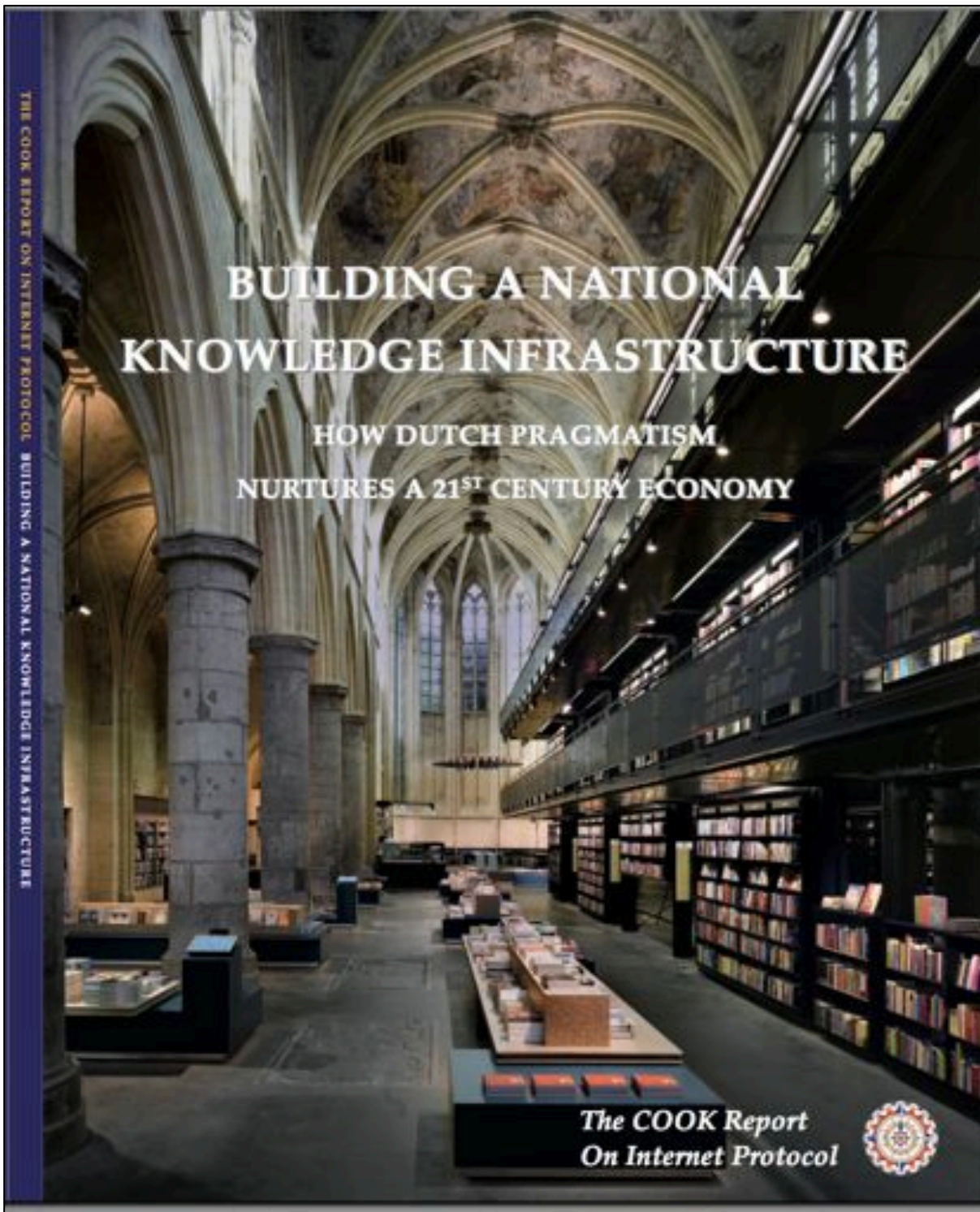


SC2010 demonstrators in the Dutch Consortium Booth

the TouchTable	NDL	AutoGlobe visualization	AutomatedGOOGLEPilot flyer	Interactive Networks
	HIPDMet	ClearGrid.nl	Scale	
SCinet statistics				System & Engineering @ UvA

sc2010 Posters @ Dutch booth (click on poster to download pdf)





Questions ?

CookReport
feb 2009 and feb-mar 2010

november '08
interview with
Kees Neggers (SURFnet),
Cees de Laat (UvA)

and furthermore
on november '09

Wim Liebrandt (SURF),
Bob Hertzberger (UvA) and
Hans Dijkman (UvA)

BSIK projects
GigaPort &
VL-e / e-Science



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