Medical Media HD Live Transmission Pilot

GLIF meeting 1 October 2008

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senior research scientist (IP routing).

Title

- Medical Media HD Live Transmission Pilot:
  Norwegian University of Science and Technology, Norway, and Yonsei Hospital, Korea

Content

- UNINETT and NORDUnet
- The providers.
- The network.
  - ◆ Measurements.
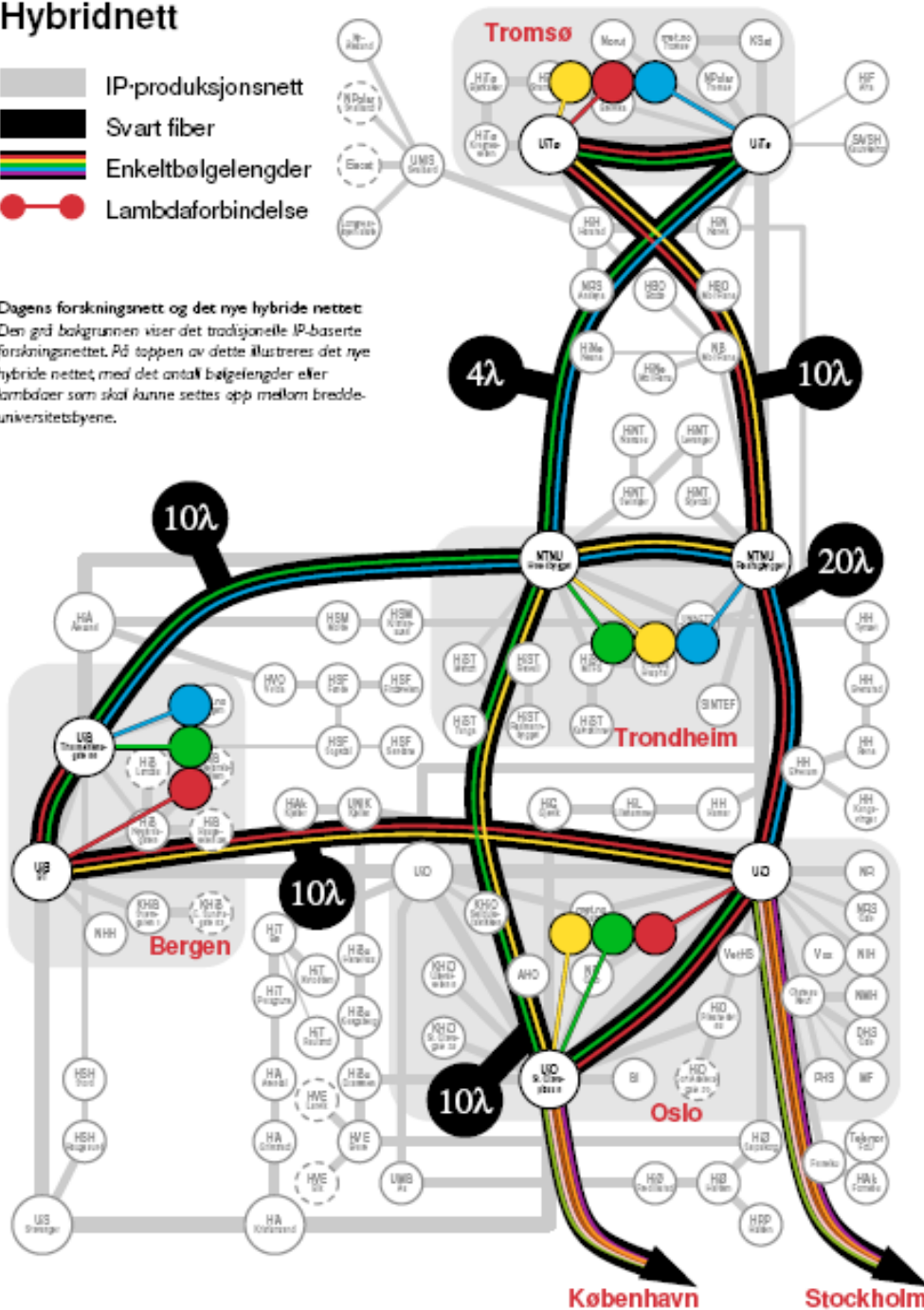- The medical experiment.

UNINETT

What is UNINETT?

- UNINETT AS develops and operates the national research network, which links together Norwegian educational and research institutions and connects them into international networks via NORDUnet.

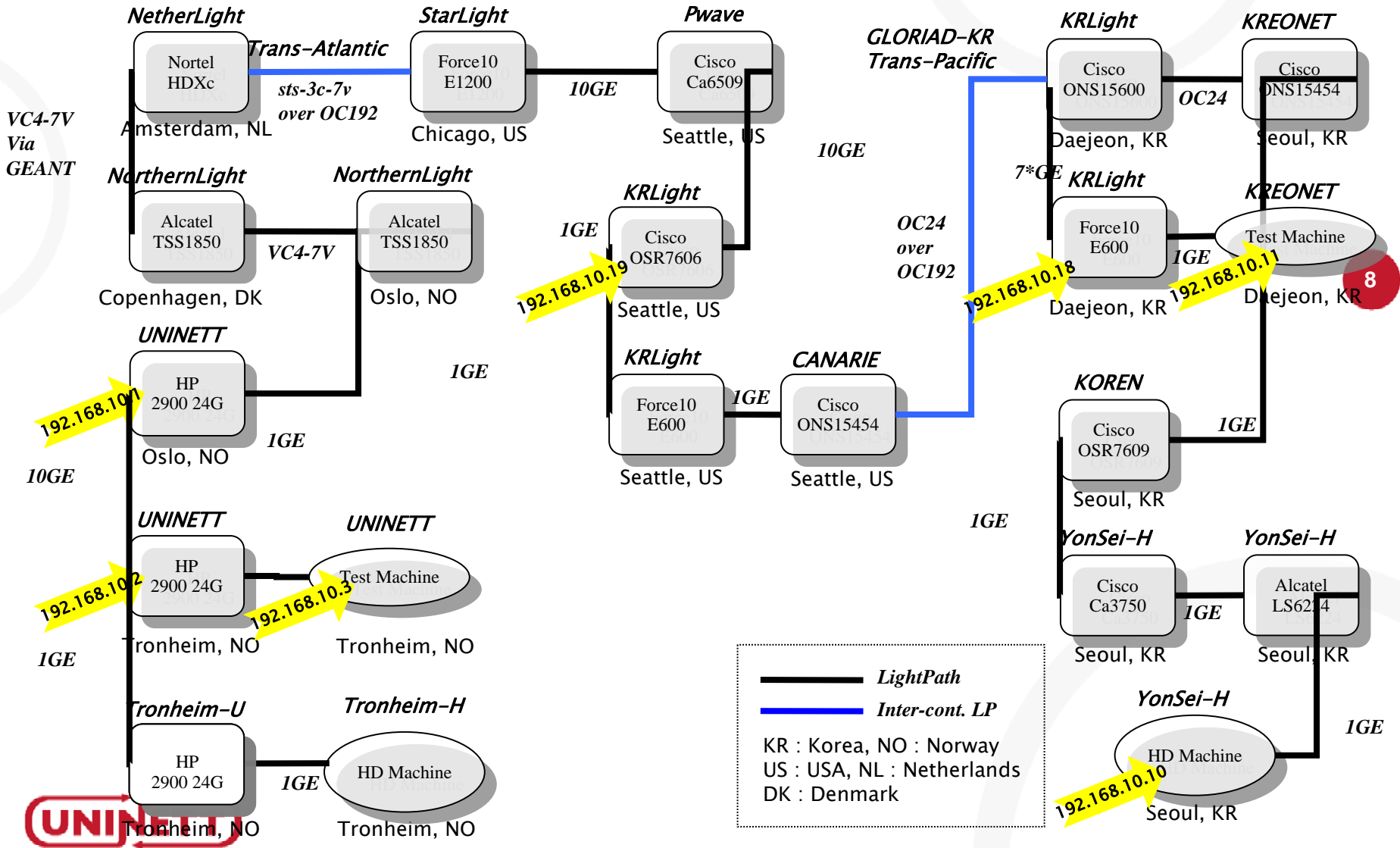- Supports hybrid network to some customers.

NORDUnet

The providers.

- KISTI/KREONET/KRLight
- NIA/KOREN
- NSALK/NTNU hospital
- UNINETT
- NORDUnet
- CANARIE
- PNWGP/Pacific Wave
- StarLight
- SURFnet/NetherLight

Norway–Korea LP Provisioning

Jan. 16, 2008 updated by Dongkyun, Trond, Albert, David, Ronald, Dongkyu, Kwangjong

NetherLight
Nortel HDXc
Amsterdam, NL

Trans-Atlantic
sts-3c-7v over OC192

StarLight
Force10 E1200
Chicago, US

10GE

Pwave
Cisco Ca6509
Seattle, US

GLORIAD-KR Trans-Pacific

KRLight
Cisco ONS15600
Daejeon, KR

OC24

KREONET
Cisco ONS15454
Seoul, KR

VC4-7V Via GEANT

NorthernLight
Alcatel TSS1850
Copenhagen, DK

VC4-7V

NorthernLight
Alcatel TSS1850
Oslo, NO

10GE

KRLight
Cisco OSR7606
Seattle, US

1GE

192.168.10.19

*7*GE*

KRLight
Force10 E600
Daejeon, KR

1GE

KREONET
Test Machine
Daejeon, KR

192.168.10.18

192.168.10.11

OC24 over OC192

8

UNINETT
HP 2900 24G
Oslo, NO

192.168.10.1

1GE

1GE

KRLight
Force10 E600
Seattle, US

1GE

CANARIE
Cisco ONS15454
Seattle, US

KOREN
Cisco OSR7609
Seoul, KR

1GE

10GE

UNINETT
HP 2900 24G
Tronheim, NO

192.168.10.2

UNINETT
Test Machine
Tronheim, NO

192.168.10.3

1GE

YonSei-H
Cisco Ca3750
Seoul, KR

1GE

YonSei-H
Alcatel LS6214
Seoul, KR

Tronheim-U
HP 2900 24G
Tronheim, NO

1GE

Tronheim-H
HD Machine
Tronheim, NO

——————	*LightPath*
——————	*Inter-cont. LP*

KR : Korea, NO : Norway
US : USA, NL : Netherlands
DK : Denmark

YonSei-H
HD Machine
Seoul, KR

192.168.10.10

1GE

Measurements.

- Ping Norway to Korea (192.168.192.10.3 to 192.168.10.18)

64 bytes from 192.168.10.18: icmp_seq=1 ttl=64 time=307 ms

64 bytes from 192.168.10.18: icmp_seq=2 ttl=64 time=300 ms

64 bytes from 192.168.10.18: icmp_seq=3 ttl=64 time=298 ms

64 bytes from 192.168.10.18: icmp_seq=4 ttl=64 time=305 ms

- Network Throughput (w/ iPerf)

957 Mbits/sec

UNINETT

All the collaborators

- Lars Fischer/Nordunet

- Dongkyun Kim/KISTI

- Kwangjong Cho/KISTI

- Dongkyu Lim/Yonsei Hospital

- Sang-Hyun Choi/NIA

- Albert Colmenero/Nordunet

- David Sinn/PNWGP

- Ronal Van der Pol/SARA

- Alan Verlo/StarLight

- Thomas Tam/CANARIE
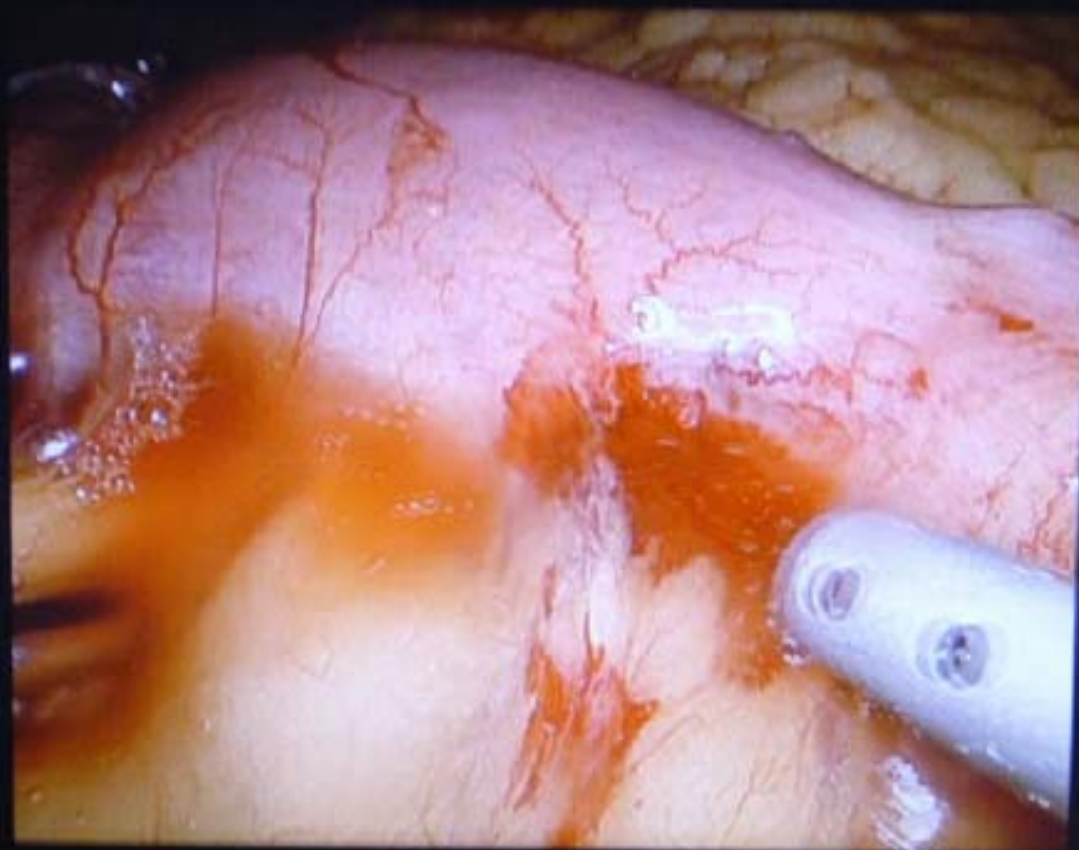
- Trond Skjesol/UNINETT

- ????

As a user

- Special thanks to Lars Fisher for coordinating the whole thing by
  - ◆ Collaboration with all parties involved
  - ◆ Being the user interface
- I think it's still a long way to go before a userfriendly service is in place?
- Does the users know about the possibilities?

The medical experiment

- To test its feasibility and evaluate a full spectrum of relevant technologies for HD live surgery transmission, such as valid network route, quality of network and media transmission image, encoding/decoding, new media applications, terminals, transmission of jpeg2000 video at 800Mb/s, etc...

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The medical experiment

- Collaborate in medicine research and exchange knowledge. By viewing laparoscopy surgery in High Definition Video doctors have seen details which they have never seen before.

- They may exchange knowledge and make advice online during operations.

- The will learn about seldom types of cancer surgery which are more common other places.
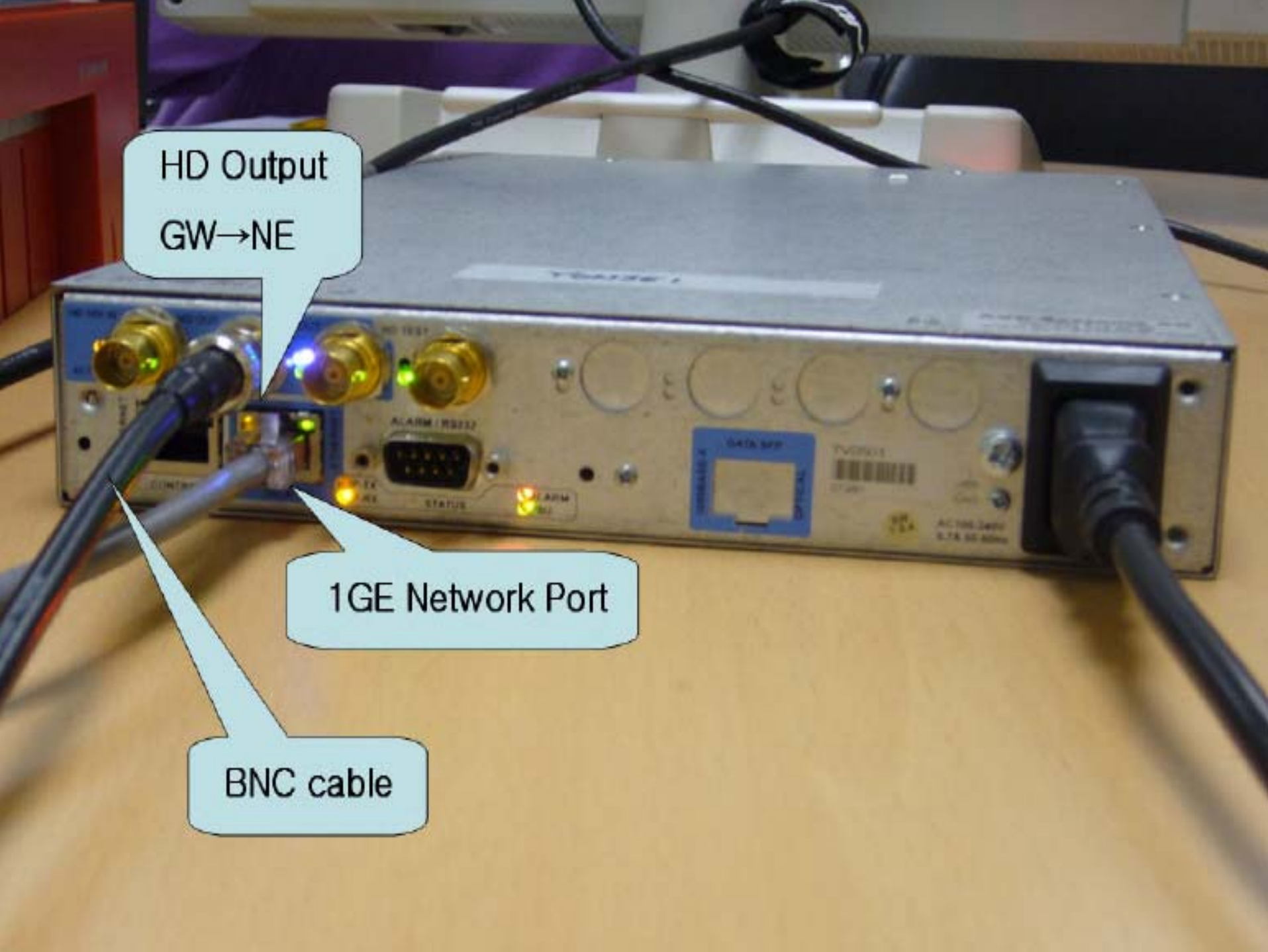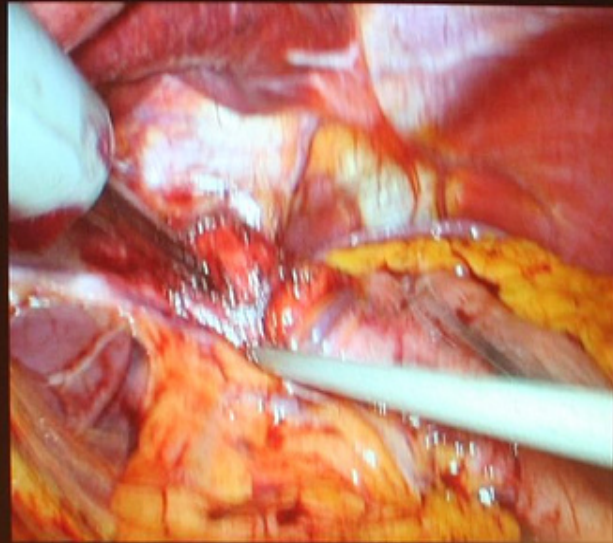
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HD Input port

NE → Sony

AN INDEPENDENT SUPPLEMENT FROM MEDIAPLANET ABOUT HEALTHCARE TECHNOLOGY DISTRIBUTED IN THE TIMES

First medical images transferred live to the cinema

On June 16, Midgard Media Lab, part of the Norwegian University of Science and Technology, and the Operation Rooms of the Future (FOR) for laparoscopy and endovascular surgery at St Olavs Hospital in Trondheim, showed the world's first live transfer of high-definition (HD) surgical images to a cinema projector.

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HDTV

Olympus Advanced EndoALPHA
The Integrated High-Definition Operating Theatre

OLYMPUS

THE TIMES

NEWSPAPER OF THE YEAR

BROKEBACK MOUNTAIN
Free CD audiobook

Meet the SWAGS (Summit wives and girlfriends)

...y steams to rescue
...ns trapped by war

UNINETT

Refences

- http://www.uninett.no/index.en.html
- http://wiki.krlight.net/medicalHD-pilot

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