EVLBI STATUS @ MPIfR, Bonn
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- 100m-telescope at Effelsberg
- MK IV correlator at Bonn
- Lofar station at Effelsberg (December 2006)
  - Participate in EVN eVLBI efforts
  - EU sponsored EXPReS project
  - Geodetic eVLBI efforts with Haystack (near-realtime data transfer to the correlator)
  - Lofar realtime data transfer at ~2.5 Gbit
LOFAR is a very large distributed radiotelescope:
- ~13,000 small antennas
- in ~100 stations
- >20 Tbit/sec raw data
- >40 Tflop central processing
- innovative software systems
- datamining and visualisation

Full and exclusive control via the internet

Instantaneous view of the entire sky, several simultaneous users
Present networking status

- 100 Mbit to Internet
- ~1 Gbit to Géant via 10 Gbit testbed VIOLA (only for eVLBI)
- 2 Mbit from institute to Effelsberg
## MPIfR in the EVN eVLBI landscape

Das Projekt eVLBI und seine technischen Anforderungen

### Routes across GEANT

<table>
<thead>
<tr>
<th>Equipment</th>
<th>RTT &amp; % load</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM-84 (10Gbps)</td>
<td>17 Feb 06</td>
</tr>
<tr>
<td>STM-16 (2.5Gbps)</td>
<td>0.5ms 30%</td>
</tr>
<tr>
<td>Gigabit Ethernet</td>
<td>0.2ms 40%</td>
</tr>
<tr>
<td>Unknown</td>
<td>man-bar GSR12216</td>
</tr>
<tr>
<td>% load is approx daily high value</td>
<td>0.5ms 30%</td>
</tr>
</tbody>
</table>

**Diagram:**

- **MPIfR** + EFF
- **JODRELL BANK, UK**
- **ONSALA, SE**
- **TORON, PL**
- **Bologna**
- **BOLOGNA, IT**
- **AT-9816**
- **Mk5 Toun**

**Equipment:**
- Cisco 3508, Cisco 3508, Cisco 6500, Cisco 6500, Cisco 15216, Cisco 15216 EDFA, Cisco 15252, Cisco 15252 DWDM, M160, Juniper M160, T540, Juniper T640, 1214XX, Cisco GSR 12400 series, BD6808, Extreme Black Diamond 6808, 3812, 3Com 3812 (3C17401), AT-9816, Allied Telesyn AT-9816GB.
Future networking status

- Own fibre between Effelsberg and institute
  - Accepted project by MPG
  - Cost about 1.5 M€
  - Ready 1\textsuperscript{st} half of 2007
  - Digging should start end of 2006
  - Initially 2x 10 Gbit (Lofar & eVLBI), 2x 1 Gbit

- Own fibre between institute and DFN POP
  - Accepted by MPG, cost 0.5 M€

- Leased line to Dwingeloo/Groningen @ 10 Gbit (~100k€/y)
  - A few p2p connections @ 1 Gbit

- Possibly become node of German Grid (DGRID)
MPIfR in city of Bonn: possible routes
P2P from MPIfR – BIR – MUE – Surfnet

Das aktuelle DFN-Netzwerk und Übergänge in Nachbar-NRENs

Geplante CBF

Surfnet

Renater

Switch/GARR

PSNC

DFN PoP

Dark fibre

Wavelength
Present activities

- Testing Mark 5Bs with high-end server boards (2x 1Gbit ethernet on board)
- Network tests and VLBI data transfers with server (5 TB, 2x 1Gbit ethernet) but: problems with Mark 5 software and new Linux kernels (2.6.16)
- Extend correlator to 12 stations and switch to Linux, full eVLBI connectivity (collaboration with Haystack)
- Upgrade Mark 5s with new server mobos (2x 1Gbit)
- Install software correlator (Deller, Swinburn) on cluster for evaluation against MK IV correlator & for „German Lofar“
- With Haystack: 4 Gbit/s recording @ 1mm wavelength on Pico Veleta (Spain)