<table>
<thead>
<tr>
<th>e-RemoteCtrl: Concepts for VLBI station control as part of NEXPRReS</th>
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<tbody>
<tr>
<td>[Image of e-RemoteCtrl logo]</td>
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<td>[Image of NEXPRReS logo]</td>
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<td>[Image of FESG logo]</td>
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<tr>
<td>Martin Ettl (FESG/MPIfR)</td>
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<td>[Image of Max-Planck-Institut für Radioastronomie logo]</td>
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Alexander Neidhardt (FESG), Matthias Mühlbauer (BKG), Jim Lovell (UTAS), Walter Alef (MPIfR), Ed Himwich (NASA/GSFC), Christopher Beaudoin (MIT-Haystack), Christian Plötz (BKG), Arpad Szomoru (JIVE)
NEXPReS
Novel EXplorations Pushing Robust e-VLBI Services
NEXPReS WP5/Task 3: Continuous quality monitoring & Station Remote Control

Novel EXplorations Pushing Robust e-VLBI Services

- three-year project
- aimed at further developing e-VLBI services of the European VLBI Network (EVN)
- incorporating e-VLBI into every astronomical observation conducted by the EVN.
- 15 astronomical institutes and National Research and Education Network (NREN) providers
- e-Infrastructure project funded by the European Union's Seventh Framework Programme
- Four main technical activities:
  - Cloud Correlation
  - Dynamically Provisioned Network Resources
  - Computing in a Shared Infrastructure
  - Provisioning High-Bandwidth, High-Capacity Networked Storage

WP5/Task 3:
(TUM, MPIfR, JIVE)

- identify and re-act on observation failures in near real-time
- improve diagnostics
- allow direct (read) access to the field system control parameters
- extend the capabilities of the NASA Field System by
  - remote control with authentication, authorization and a operator role management
  - station and system monitoring
NEXPREs WP5/Task 3: Continuous quality monitoring & Station Remote Control

- **2010**
  - Preliminary work

- **2011**
  - Authentication & authorization
  - System monitoring
  - Integration into Fieldsystem

- **2012**
  - Role management

- **2013**
  - Test + experiments
  - Test + experiments
  - Test + experiments

*July 1st*

*Now*
Remote Control
(“e-RemoteCtrl” software)
„e-RemoteCtrl“ software – the original test bed

Remote Control on Site

Tele-working

Remote attendance test

GARS O’Higgins/Antarctica

- regular used
- testing
- interest
"e-RemoteCtrl" software – the communication stack for a remote operator

- RPC Interface-definition
- Graphical User Interface (GUI)
- Client (currently wxWidgets)
- Communication generated with the software generator idl2rpc.pl
- Server functionality

- e-RemoteCtrl
- FS Monitor Client GUI
- FS Monitor Client Communication
- TCP/IP-Network
- FS Monitor Server Communication
- FS Monitor Server Functionality
- FS Monitor
- NASA Field System

Wettzell Software Toolbox
(well tested SW modules)

RPC = (Sun) Remote Procedure Calls
SSH = Secure Shell
e-RemoteCtrl software – the communication stack for a remote operator

- FS Monitor
- NASA Field System
- Device
- Device

Graphical User Interface (GUI) Client (currently wxWidgets)

RPC Interface-definition

Communication generated with the software generator idl2rpc.pl

Server functionality

Wettzell Software Toolbox (well tested SW modules)

RPC = (Sun) Remote Procedure Calls
SSH = Secure Shell
AES = Advanced Encryption Standard
"e-RemoteCtrl" software – some impressions

- Status monitor
- Logging
- User input
- Connection information
- Mark 5 capacity
- System temperature
- Connection state

Chat:
alexander*: hello
[oper] hello
alexander*: how are you
[oper] fine, how can I help you?
alexander*: the schedule has changed
alexander*: please check it again
[oper] ok, thanks!
alexander*: thank you
"e-RemoteCtrl" software – some impressions
“e-RemoteCtrl“ software – some impressions

- station overview
- control of multiple telescopes is now possible
- User name and password is required on startup
User access roles and access rights

Static Roles
- Observer
- Notifier
- Scheduler
- Agent
- Operator
- Superuser

Dynamic Roles
- Currently not used
  - Read
  - Chat
  - Schedule (drudg)
  - Adapt (attenuation)
  - Control
  - System change
SysMon
System Monitoring
- **Collect data**
  from several sensors at the telescope and site
- **Visualize**
  the data with graphs and diagrams
- **Archive**
  the collected data
- **React**
  according to predefined rules

→ Get a better knowledge about the system behavior during
  1. Session
  2. Post processing
Local safety for people and systems in combination with reliability in operations

- **Data for science and analysis**
  - Meteo, WVR, Clock offsets, ...
  - => low sampling rates
  - => as scheduled

- **Data for system operations**
  - Power supply, wind uploads, emergency stops, rack temp., ...
  - => medium sampling rates
  - => permanently

- **Data for diagnosis**
  - Servo currents, contouring errors, ...
  - => high sampling rates
  - => on demand

See also:
Monitoring and Control Interface Collaboration Group
1. Temperature
2. Interlock States
3. Power
4. Activity states
5. Meteorology
6. Voltage (higher sampled)
7. Strains
8. Tilts
9. Positions
10. RFI
11. Structural integrity
12. ACU-Data

In general:
(5),(8),(10)

http://groups.google.de/group/vlbi2010-mci-collaboration/files
SysMon – System Monitoring at Wettzell

Display SysMon Data, using eRemoteCtrl

Show/hide SysMon-Data
**SysMon Data in e-RemoteCtrl**

**NASA-Fieldsystem**

**SysMon**

**econtrol server**

**Station specific extensions**
- ASCII text
- HTML

**econtrol client**

**SSH - tunnels**

**TCP/IP-Connection**

**sshbroker**
Current status – a “e-RemoteCtrl” network
Current status – a “e-RemoteCtrl” network

IVS Cont11 Test

The image is taken from http://www.s一所site.org
Thank you
Software available under http://www.econtrol-software.de

Advertising for the poster session:
• Poster about usage of e-RemoteCtrl during CONT11
• Poster about continuous quality control during software development