Concepts for continuous quality monitoring and station remote control

NEXPReS

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Continuous quality monitoring

What does it mean?

(external) observer

- **Status of telescopes ?**
- **Is the telescope on source?**
- **How is the receiving quality?**
- **Environmental Information**

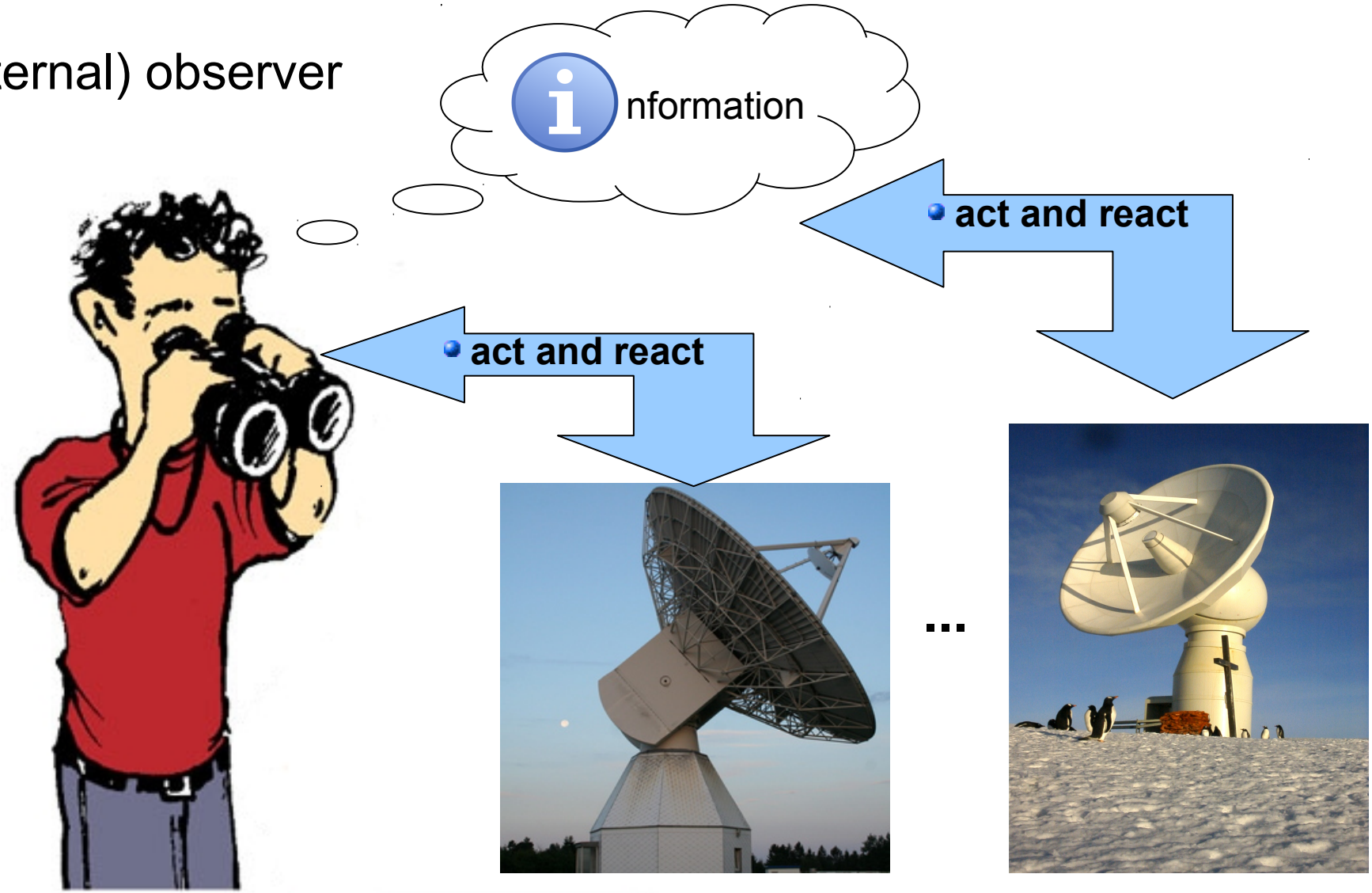
e.g.: temperatur

...

Image from:http://www.thebollard.com/story_views/observer_8.20.06.html

Continuous quality monitoring and remote control

(external) observer



Continuous quality monitoring and remote control

Status before:

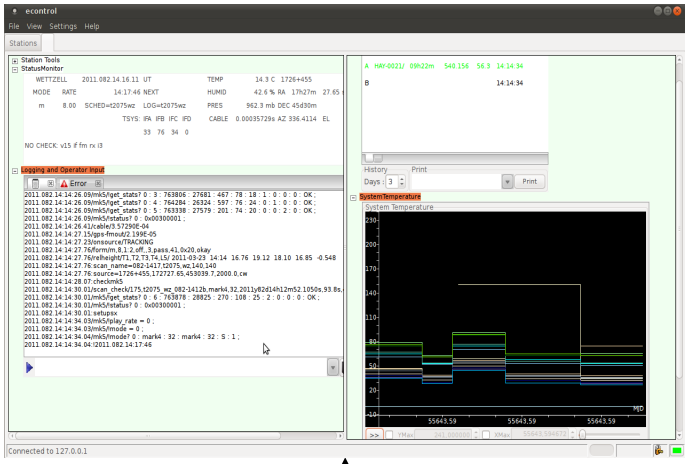
- No realtime access from correlators to read observation status (quality control through fringe checks/logfile monitoring etc.).
- No remote realtime error detection and reaction.
- No direct (read) access to fieldsystem parameters from remote.

WP5
Task3

- Extend the field system remote control software with
  - Authentication
  - Authorization
  - User and role management
- Provide a concept for station monitoring to support remote control.

3 years

The remote control prinziple (local area network)



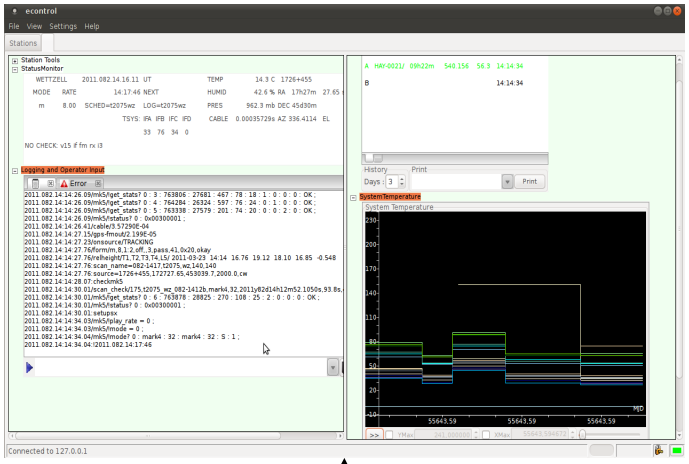
NASA-Fieldsystem

e-RemoteCtrl server

TCP/IP-Connection

e-RemoteCtrl client

The remote control prinziple (internet)



NASA-Fieldsystem

e-RemoteCtrl client

SSH - tunnels

e-RemoteCtrl server

TCP/IP-Connection

sshbroker

Software components

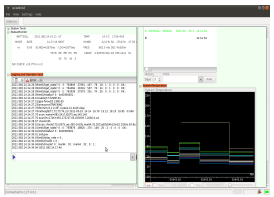
econtrol server

econtrol client

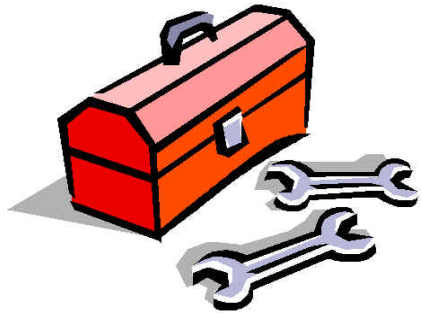
- based on idl2rpc.pl communication software generator
- remote procedure calls via TCP/IP networks

sshbroker

- establish ssh-connection (s)

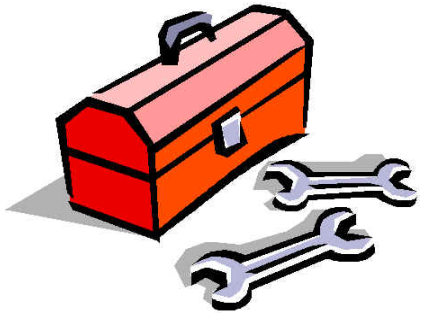


- graphical user interface



Wettzell Software Toolbox

Software components



timecalc

C/C++ - ansi compliant

orbitcalc

sshbroker

socket communication

serial communication

crc32

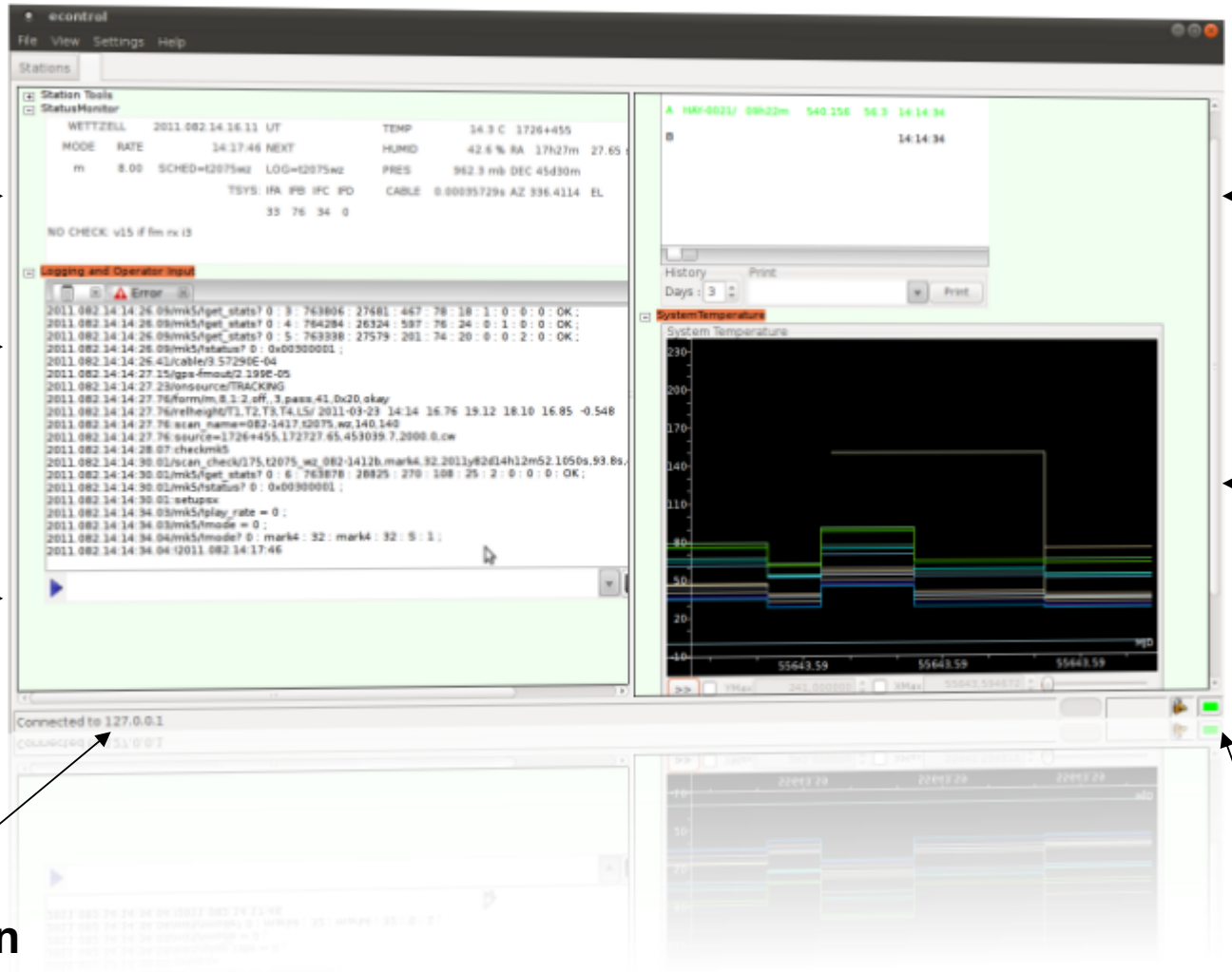
config file parser

AES 256

...

e-RemoteCtrl features

e-RemoteCtrl-software



Status monitor

Logging

User input

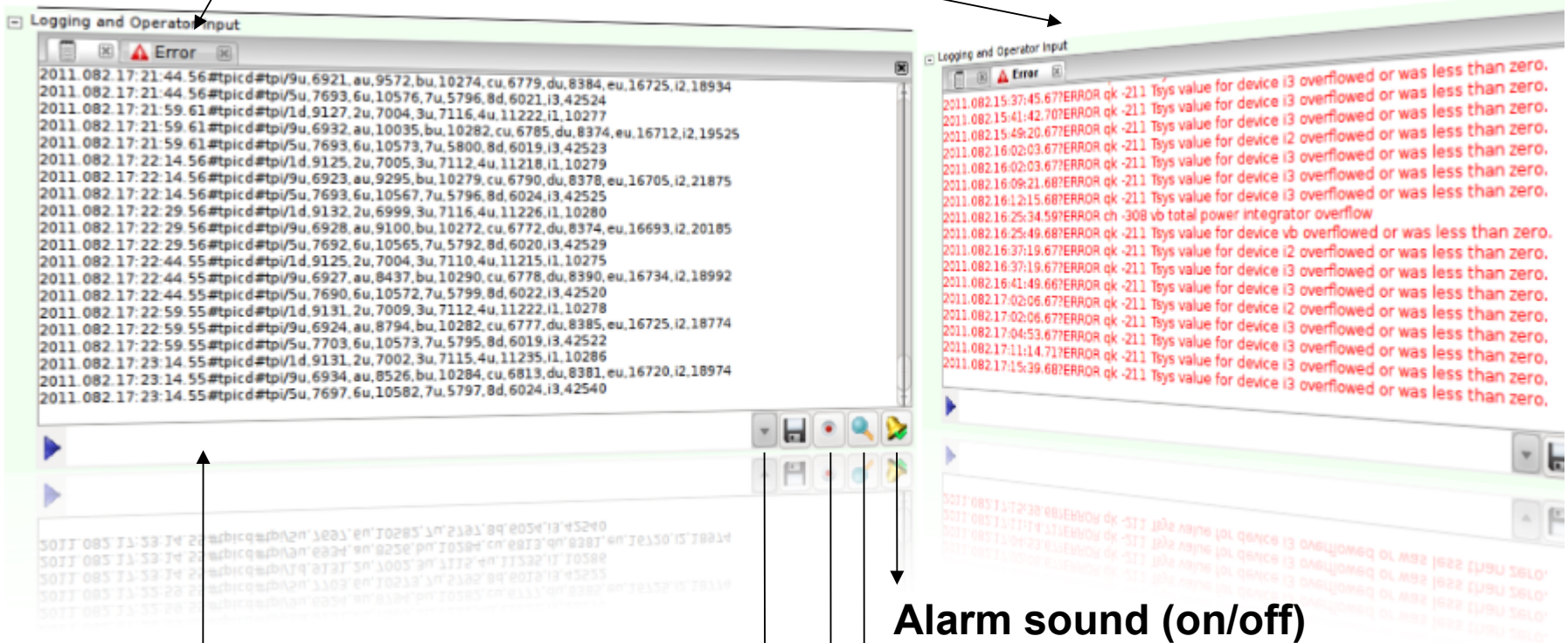
Connection information

Mark 5 capacity

System temperature

Connection state

e-RemoteCtrl-software (logging and operator input)

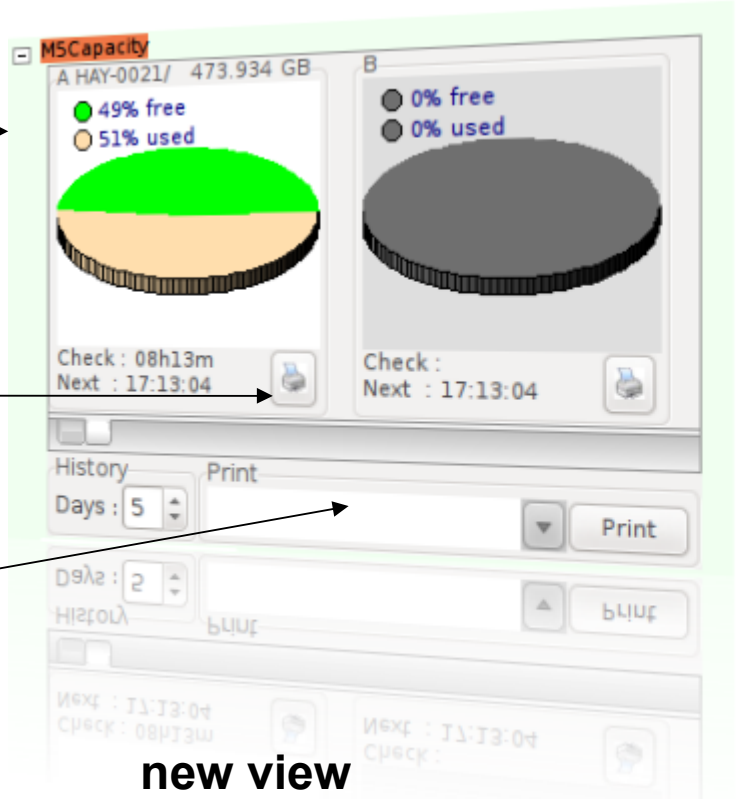


e-RemoteCtrl-software (mark5 capacity)

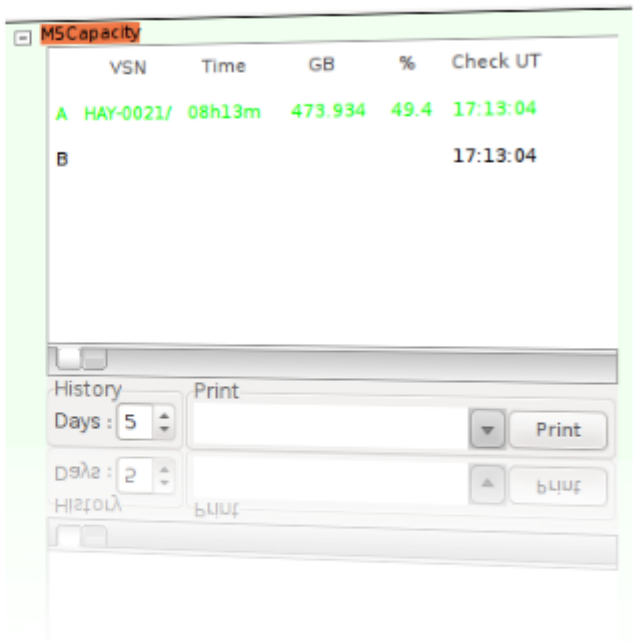
Pie-charts →

Direct-labelprint →

Label selection →

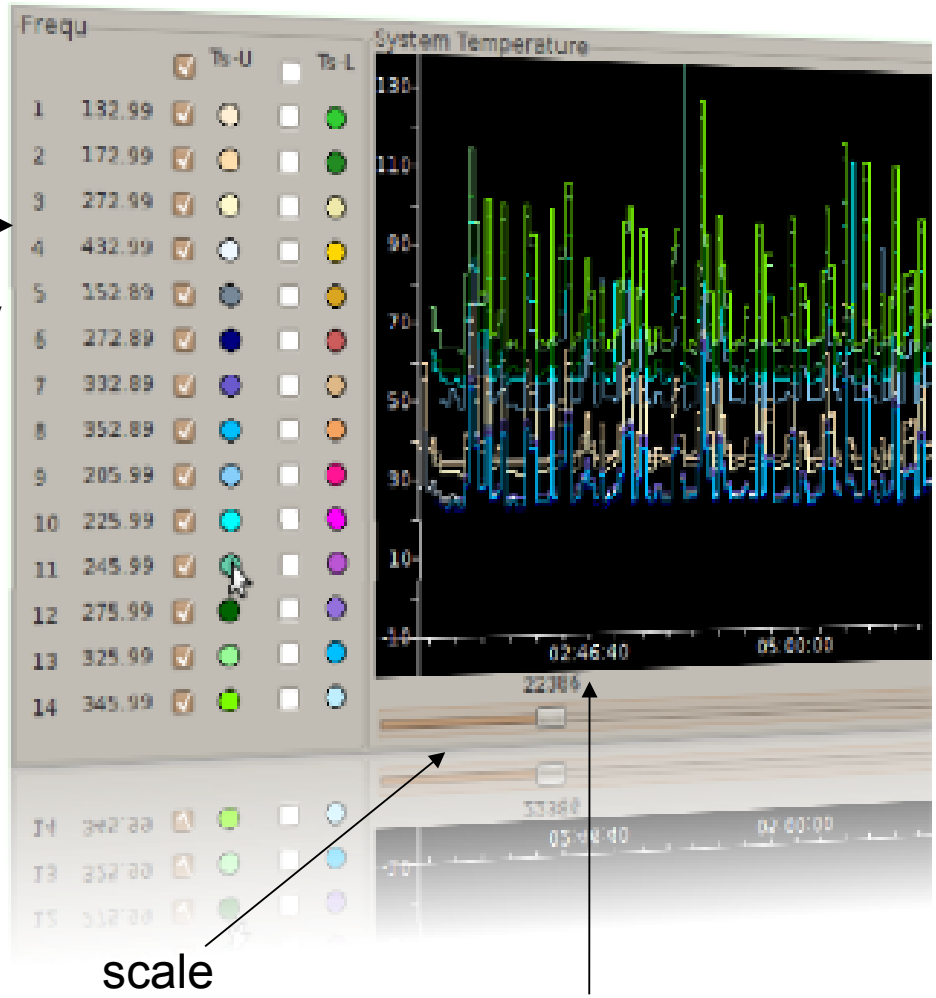


new view



classic view

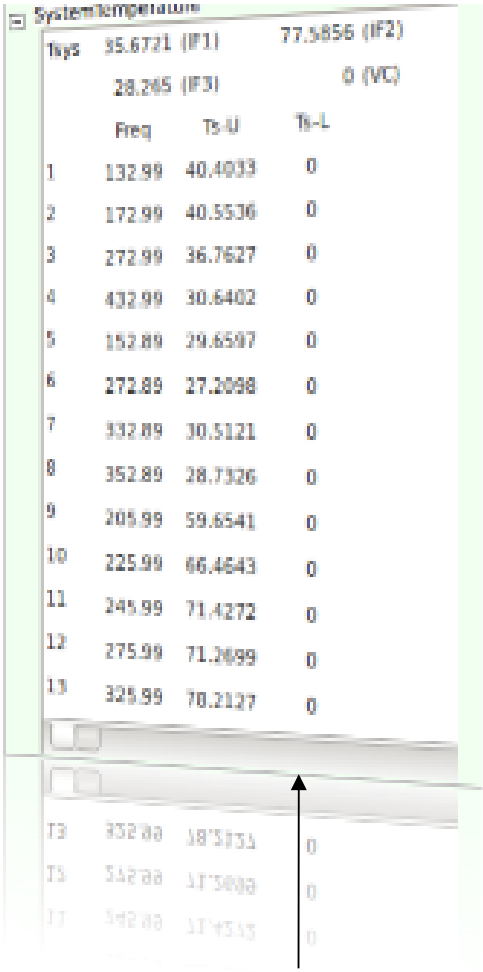
e-RemoteCtrl-software (system temperature)



select frequency

scale

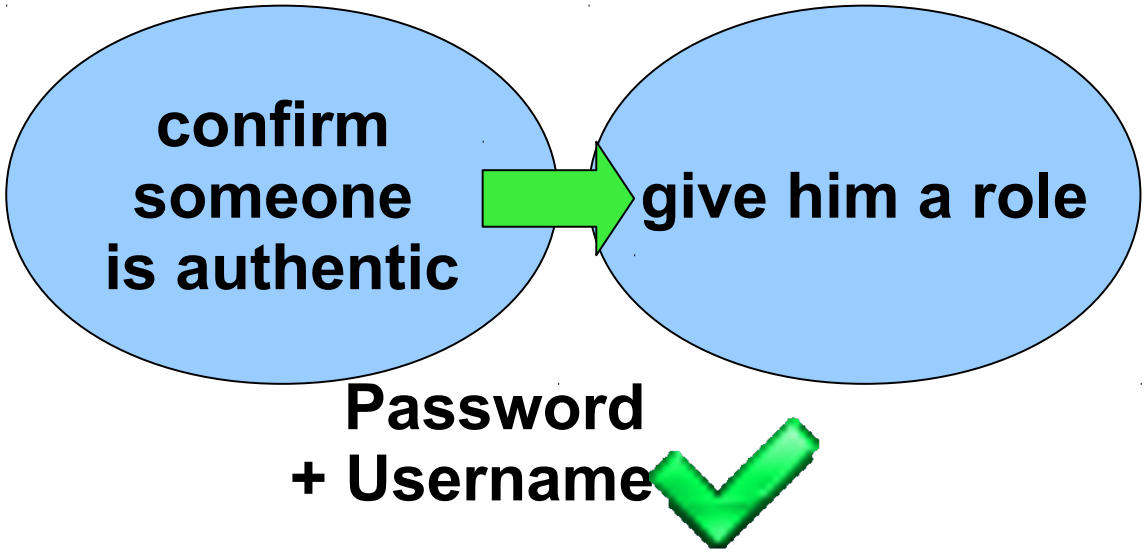
plot over time



classic view

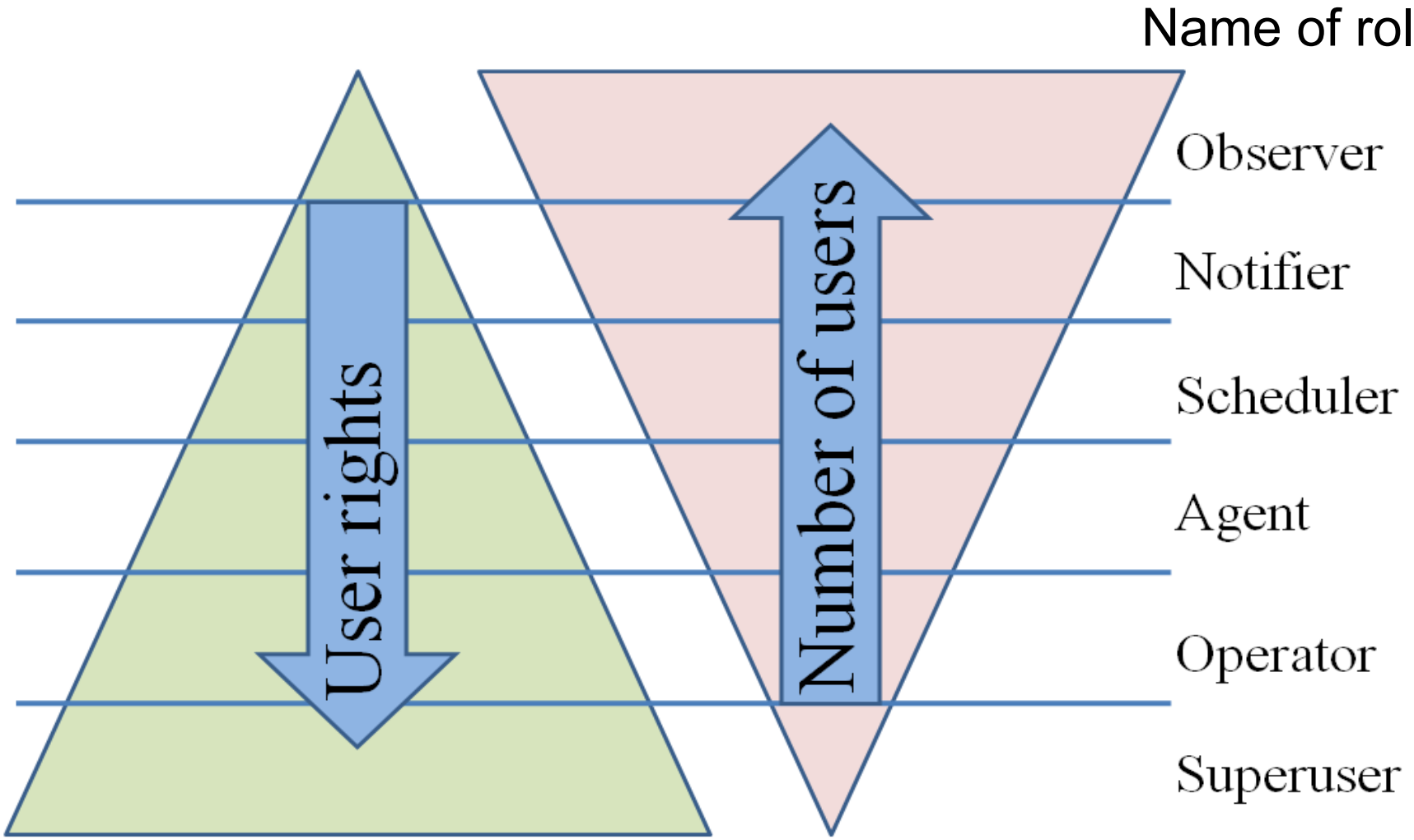
Authentication and authorization

- This requires an authentication and authorization mechanism.



- Each station manages dedicated access rights for every individual client.
- Configure fine grained access levels, e.g:
  - allow monitoring only
  - allow/deny changing source coordinates during session
  - ...

Role management



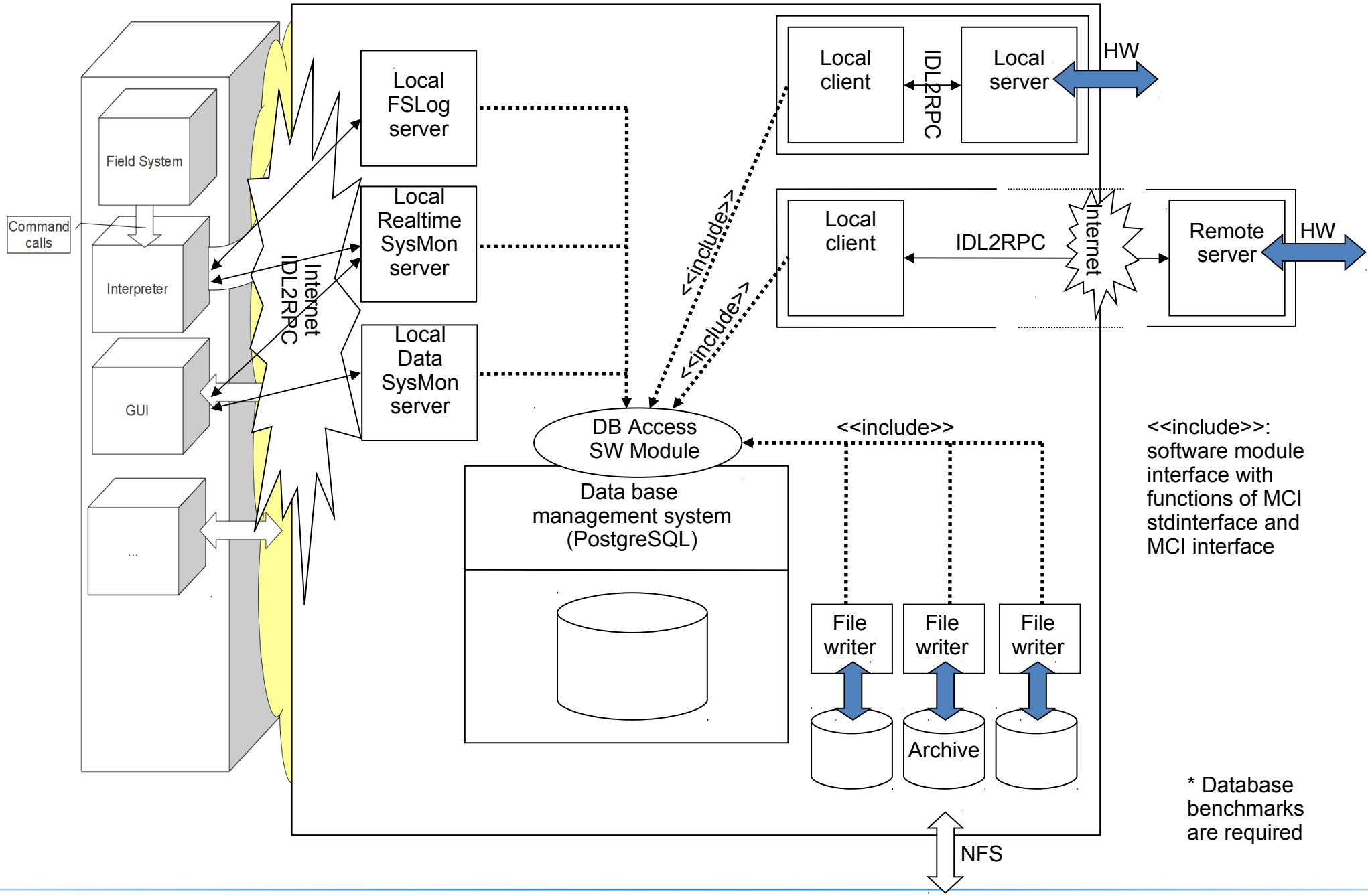
e-SysMon

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)

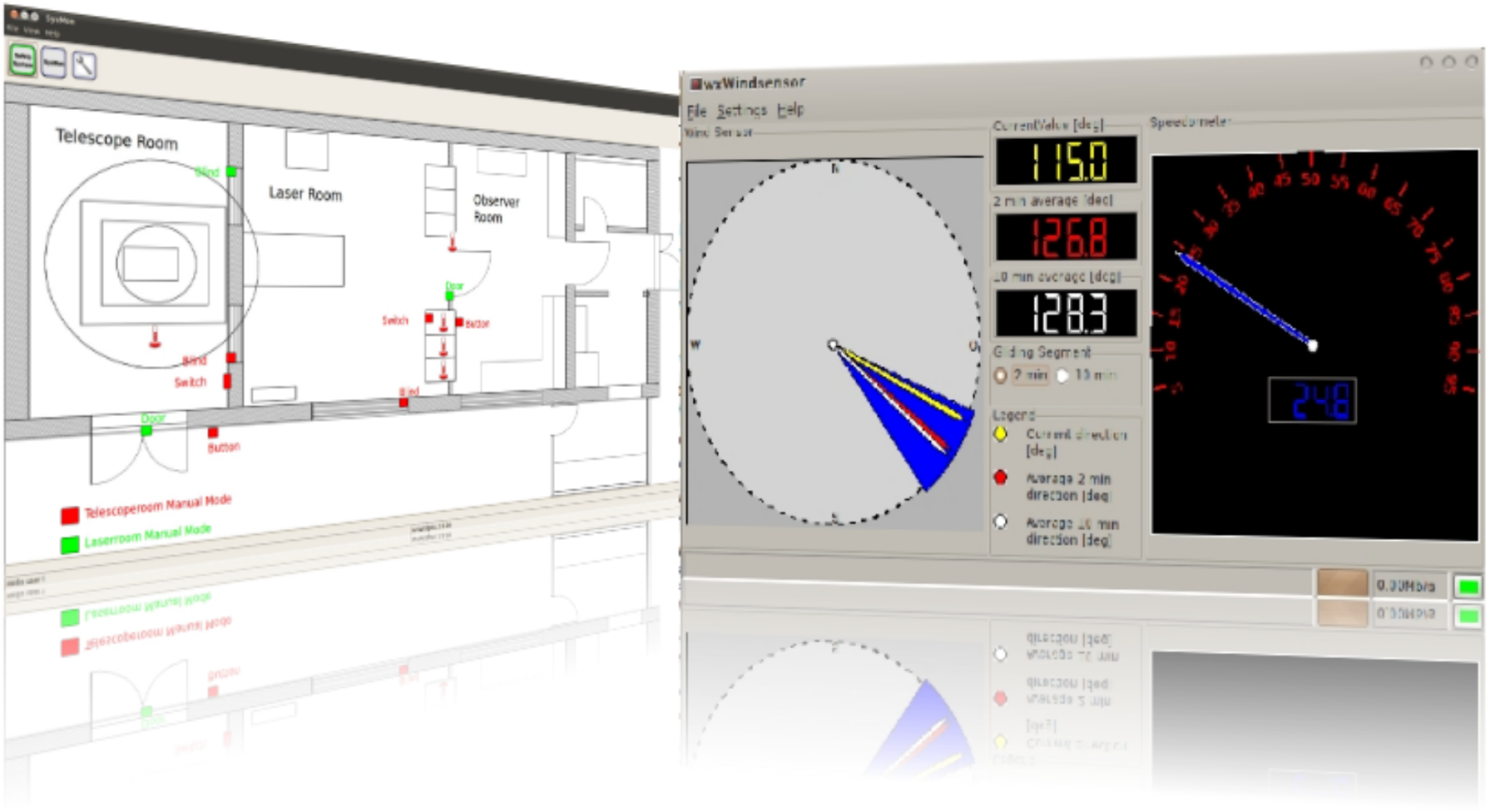
→ Get a better knowledge about the system behavior during
1. Session
2. Post processing



<<include>>: software module interface with functions of MCI stdinterface and MCI interface

* Database benchmarks are required

System monitoring

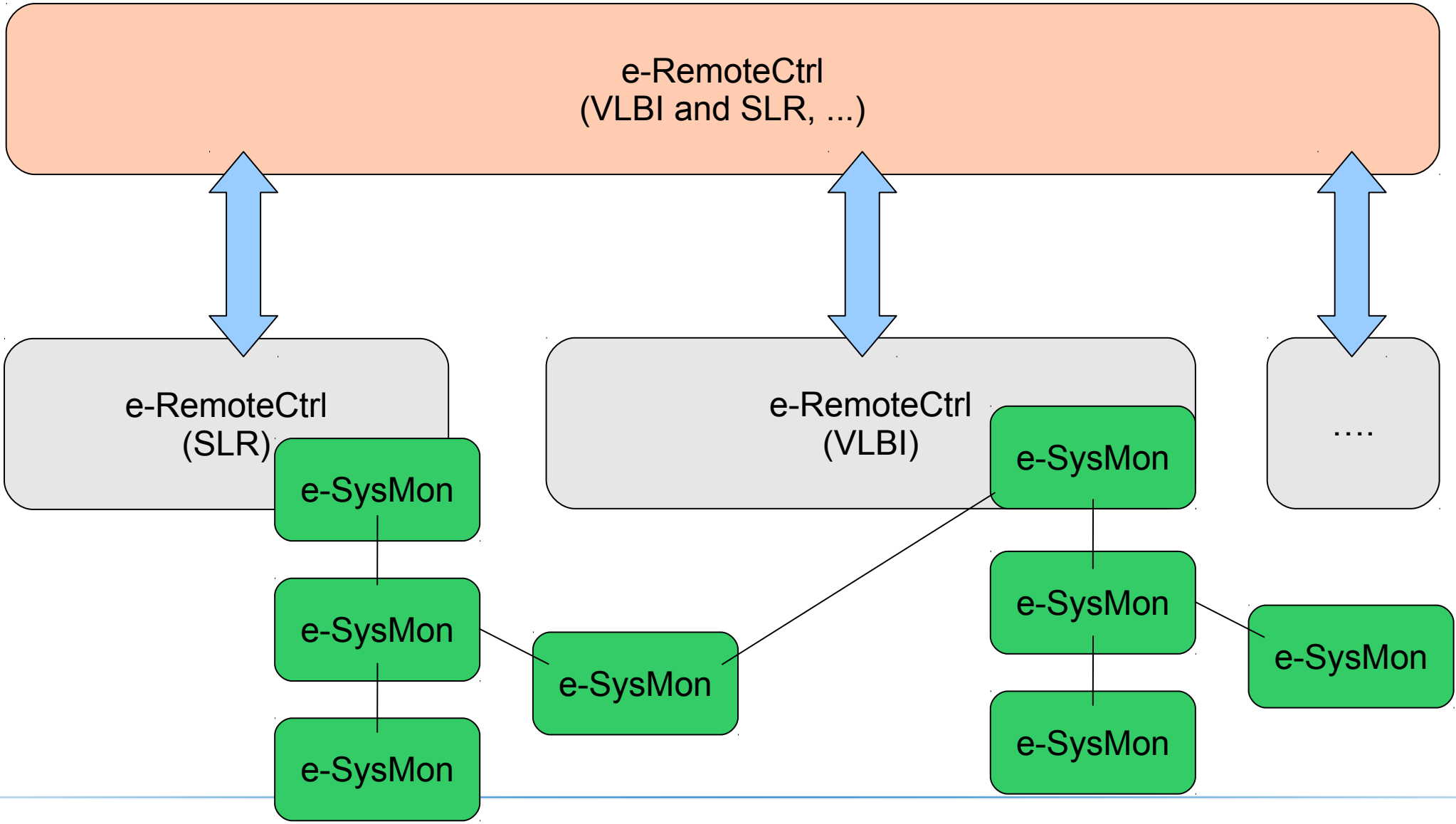


Safety-system display

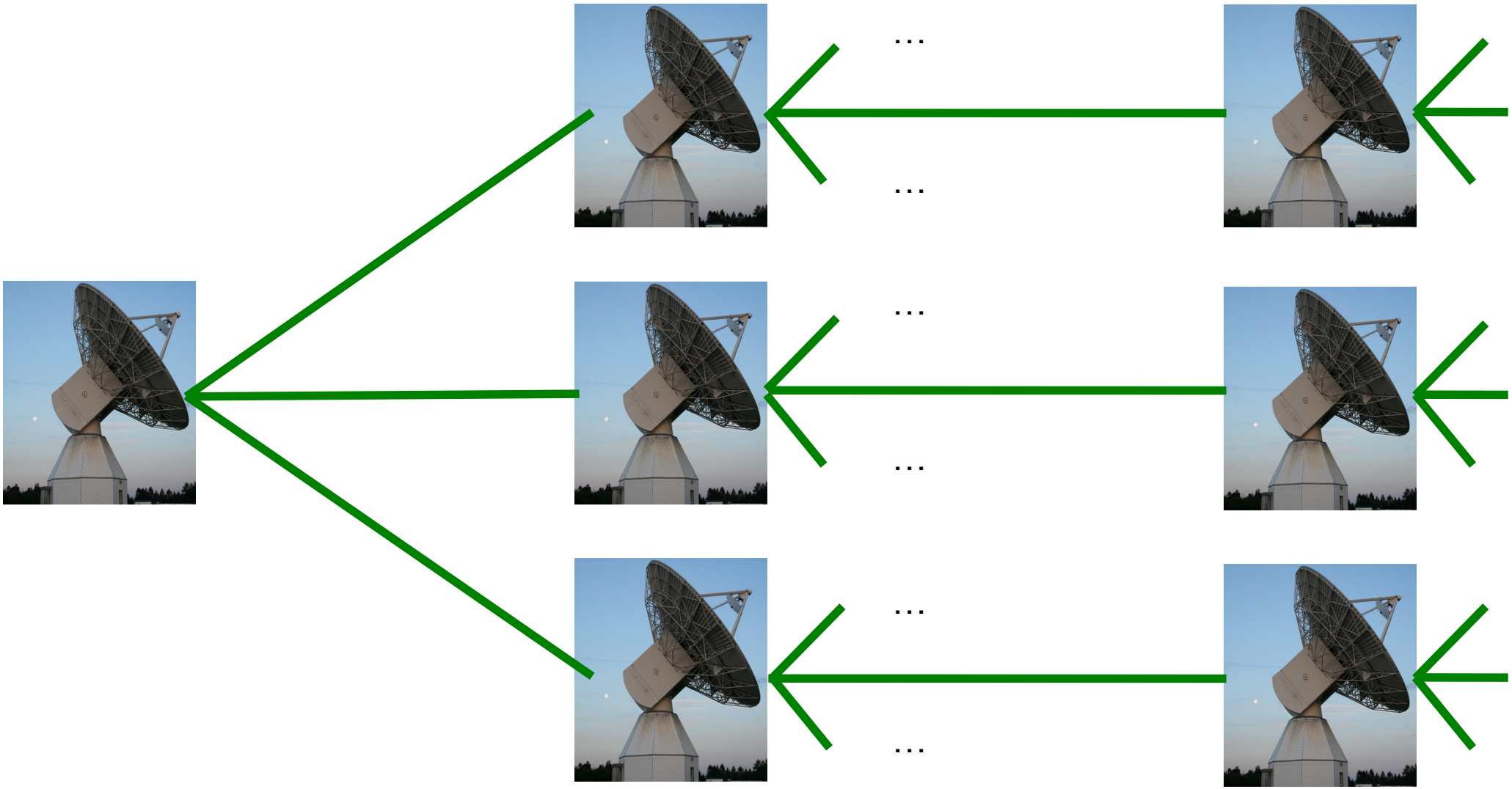
Windsensor display

→ **MCI Collaboration Group (Wettzell/Haystack)**

Hierarchical design

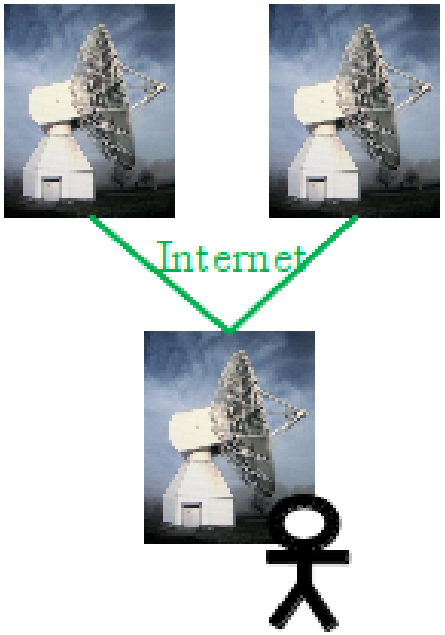


Hierarchical design for distributed systems



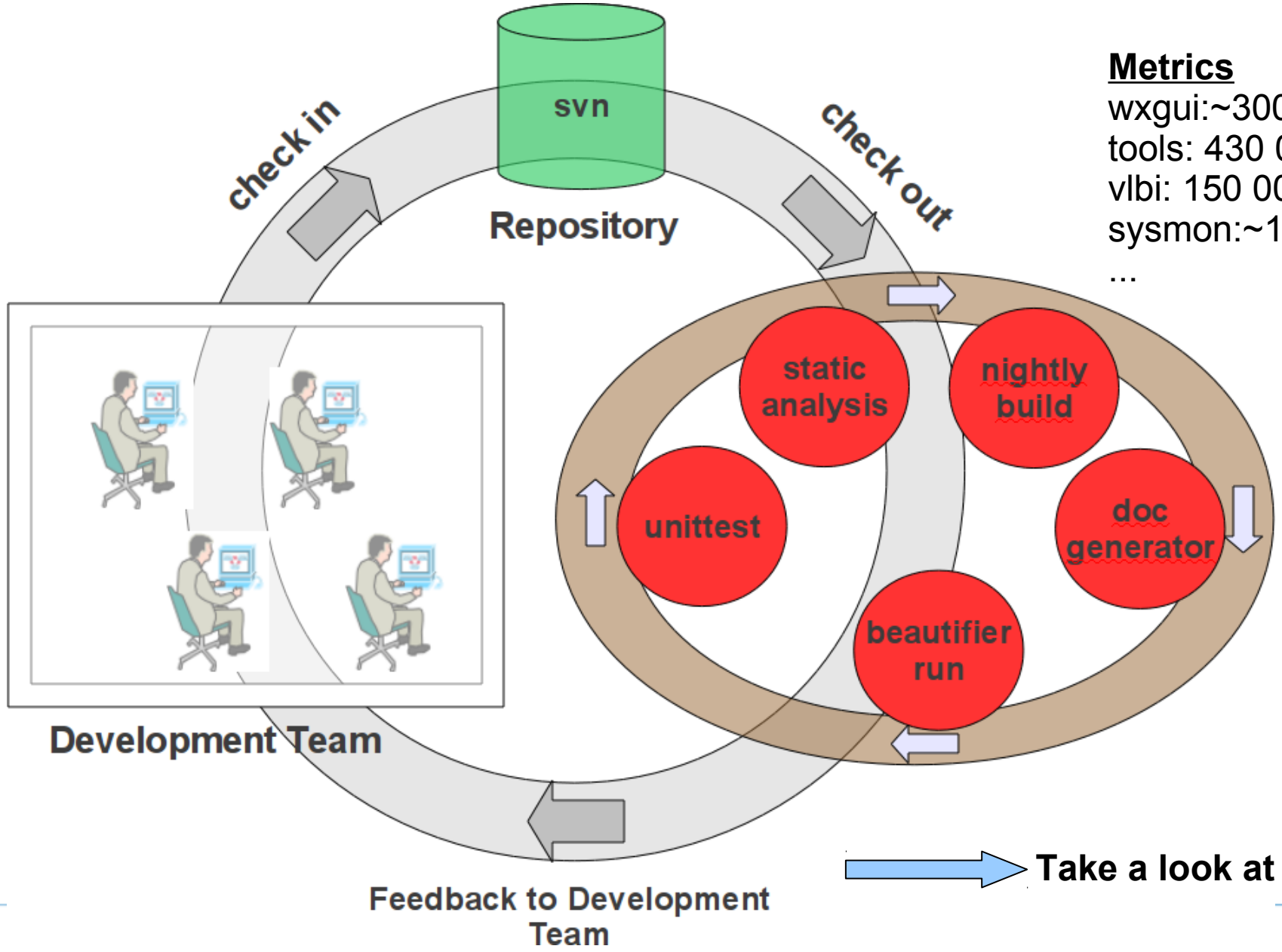
VLBI observation strategies

- Local Observation
- Remote Observation
- Shared Observation
- Unattended Observation



Take a look at our poster!

Development strategies: continuous integration

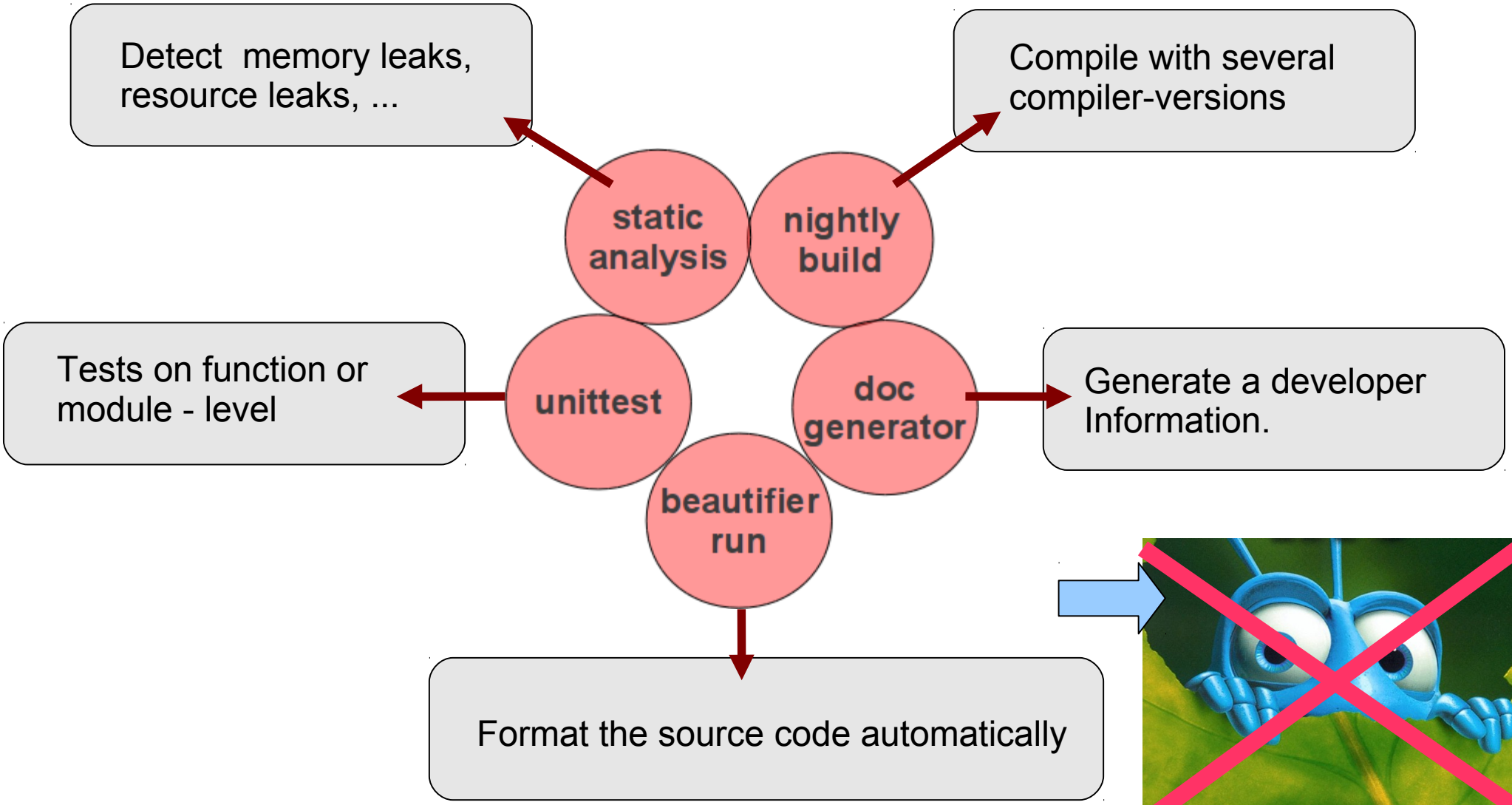


Metrics

wxgui:~300 000 LOC
tools: 430 000 LOC
vlbi: 150 000 LOC
sysmon:~117 000 LOC
...

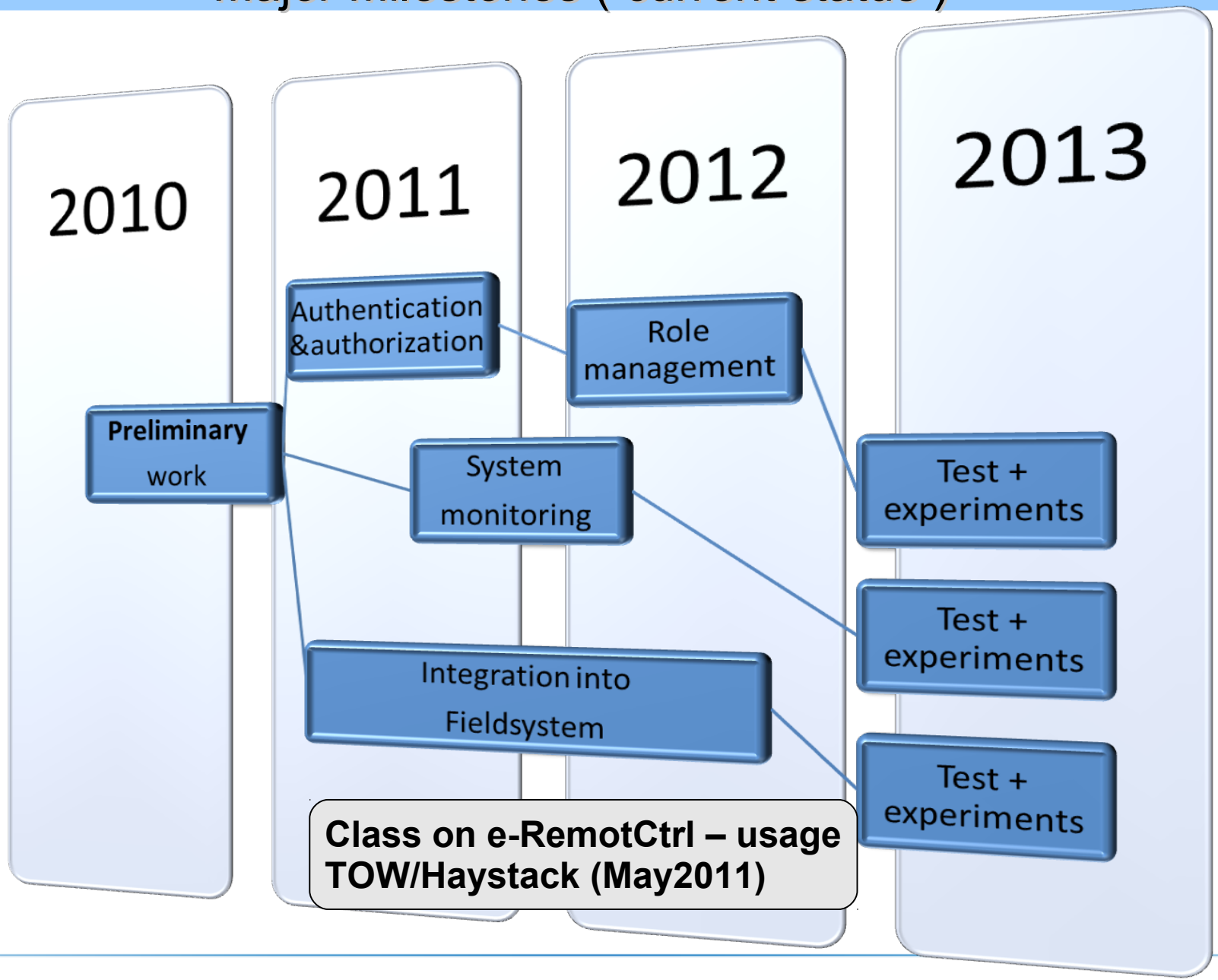
Take a look at our poster!

Development strategies: continuous integration



e-control-software homepage

Major Milestones (current status)



Thank you!