Federal Agency for Cartography and Geodesy

Web-based approach for system monitoring & remote SLR control

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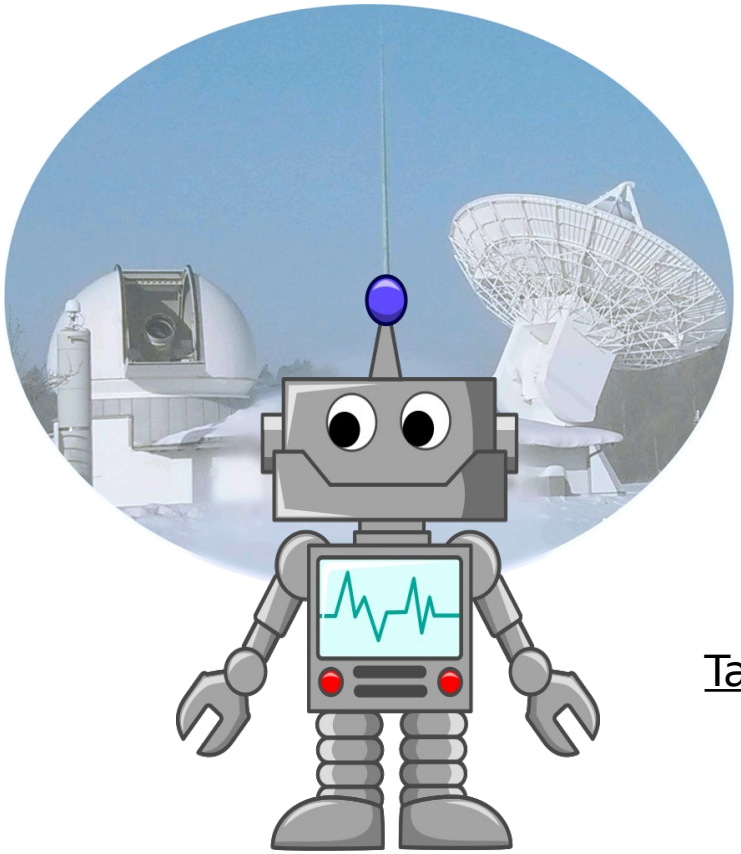
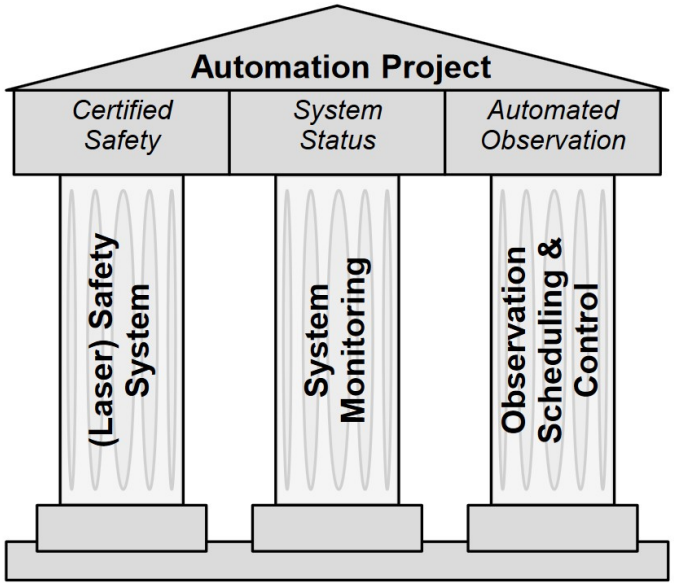
Automation Design Principle



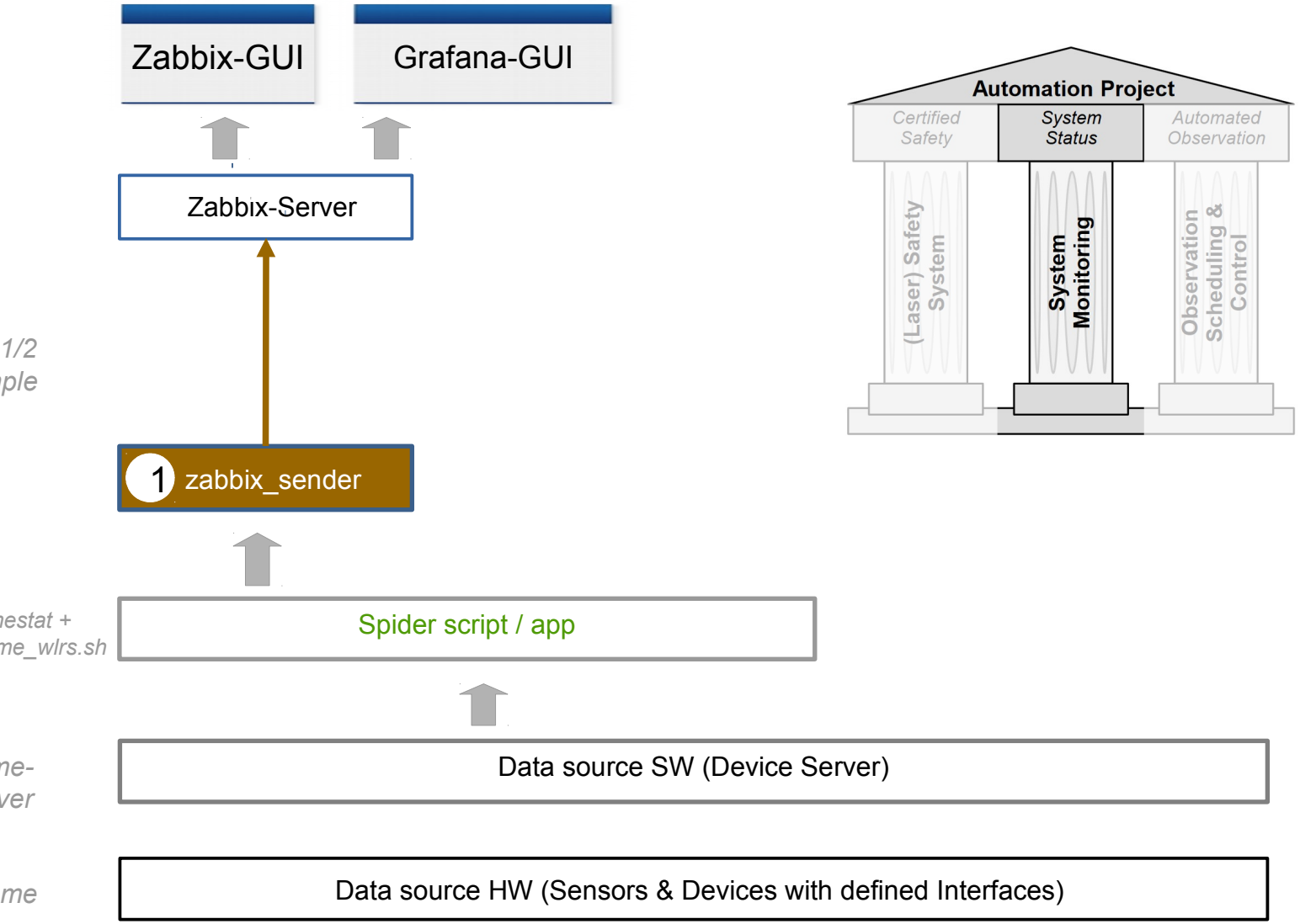
The three pillars of the automation project



Targets:

- Each pillar is independent from the others
- Prepared for Remote Control and Operation
- Maximum Safety and Reliability

System-Monitoring-Dataflow
Type 1: Zabbix only



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System-Monitoring - Grafana-Interface

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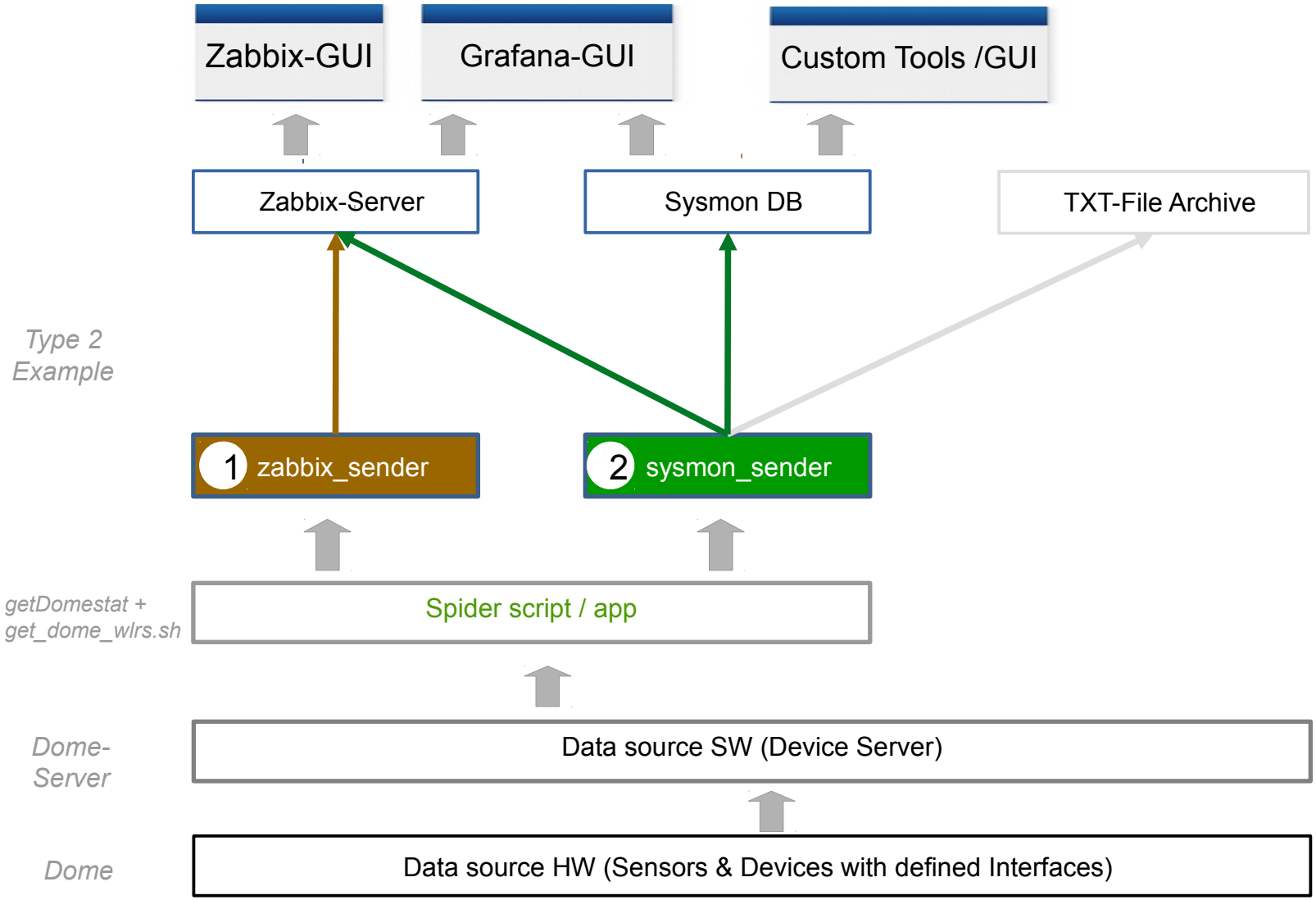
System-Monitoring-Dataflow
Type 2: With Sysmon API



System-Monitoring - Custom Tools / GUI

WLRS IR-Cam-Security-System Evaluation

Start date:	2019-01-01	MJD: 58484
End date:	2019-10-01	MJD: 58757
Min. Angle [deg]:	1.25	(•) DFS ( ) ADSB
Min. Elevation [deg]:	20	
Max. IR-Avg. [deg C]:	-20	
Max. IR-Delta(Min-Avg) [deg C]:	10	
Max. FO-range [m]:	10000	Update

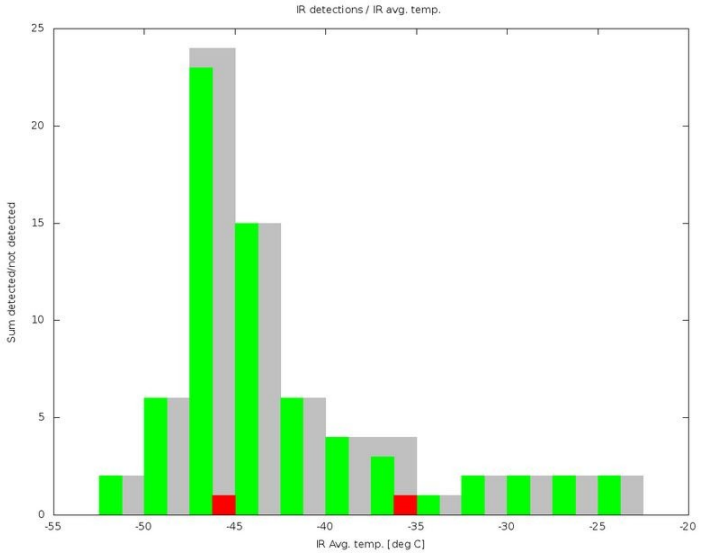
Total number of events:	70
Number of detected events:	68 (97%)
Number of not det. events:	2 (3%)

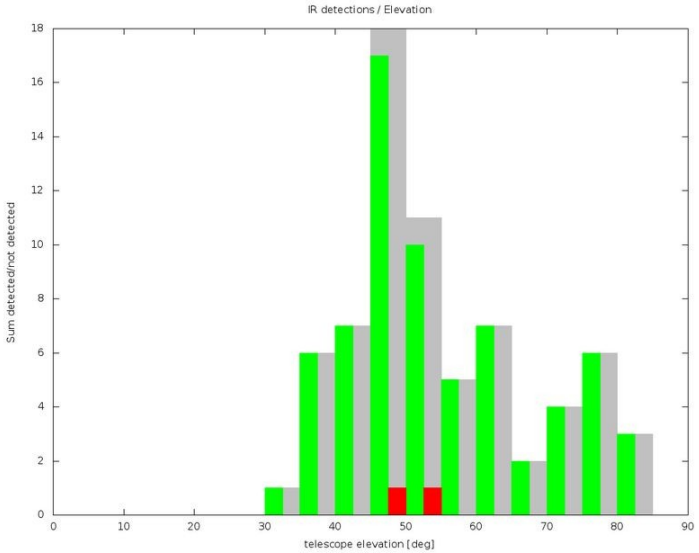
Result as CSV file

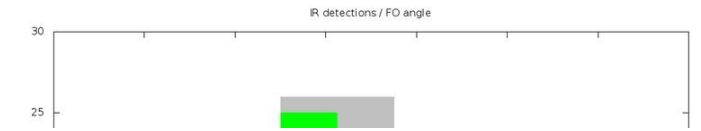
Notes This page shows statistics about detected or not detected flight-objects (FO) by the IR-Camera image recognition system. The maximum IR-camera recognition angle to the optical axis of the telescope is 3° vertical and 4° horizontal. The FO data are collected from the DFS or ADSB datastream. The earliest date when all necessary data were monitored is 2018-06-26.

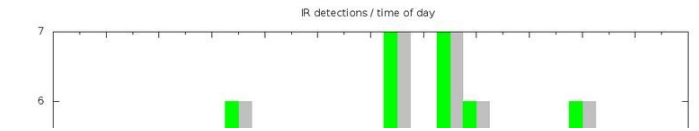
Legend

Detected by IR-cam
Not det. by IR-cam

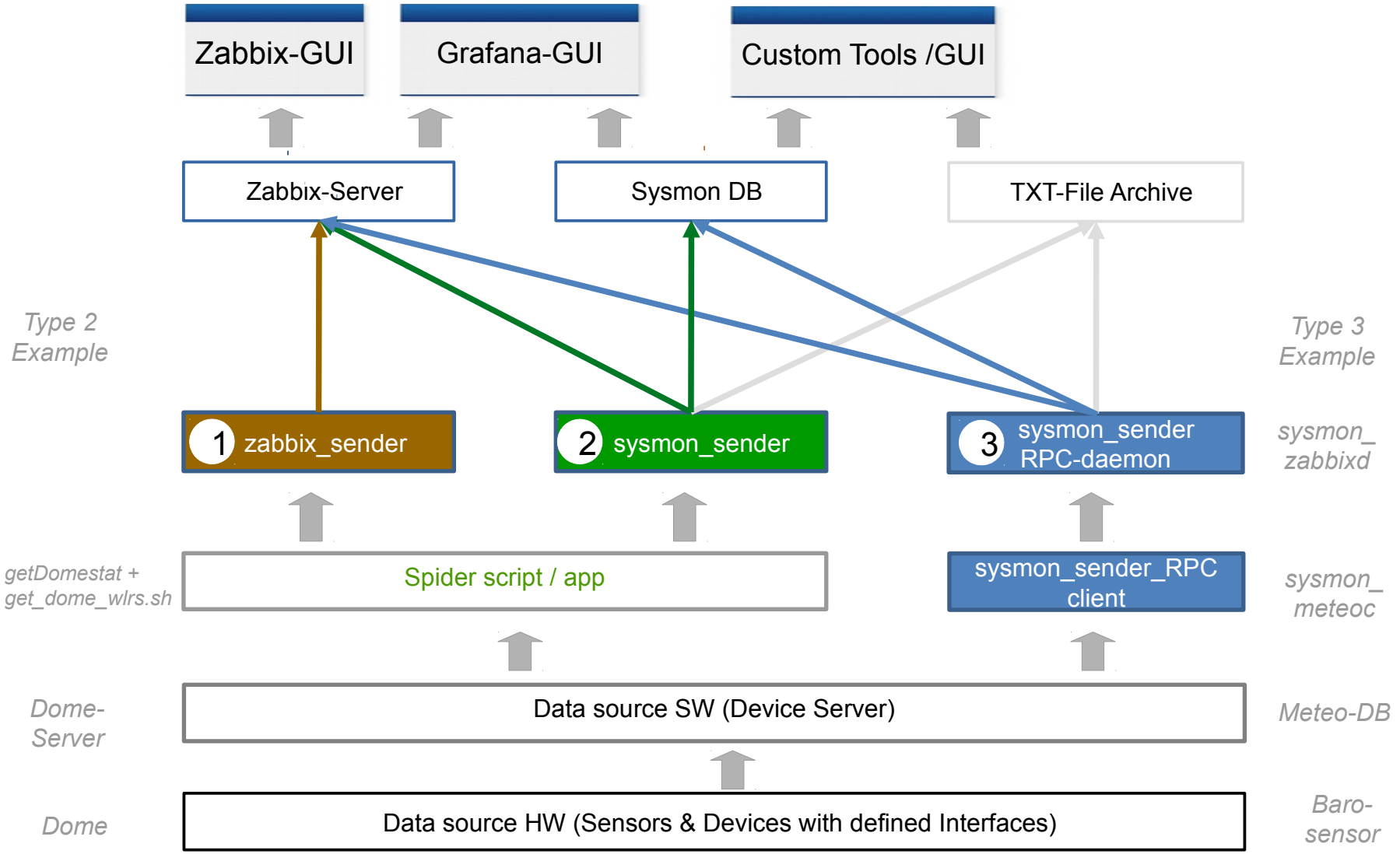




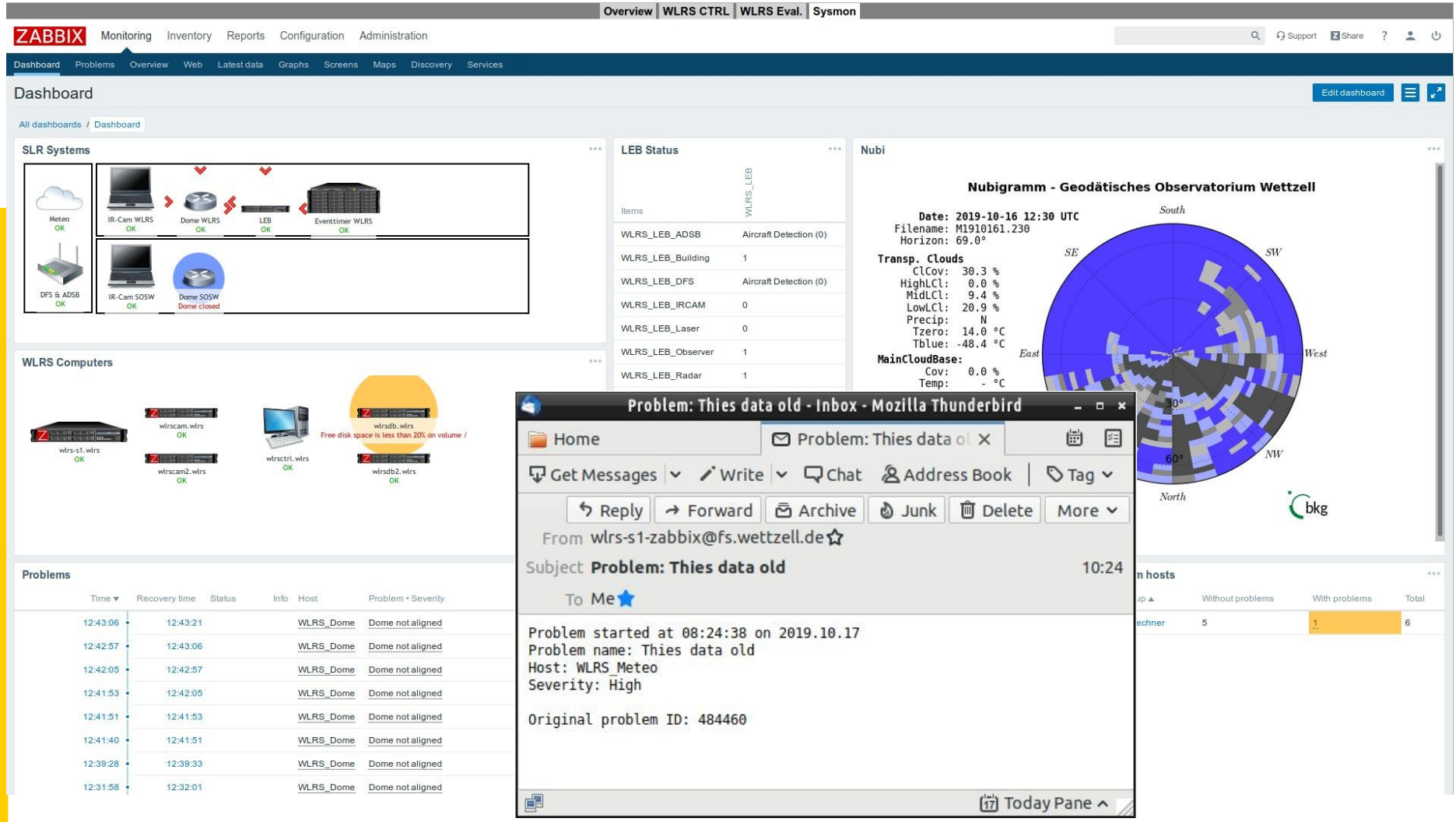




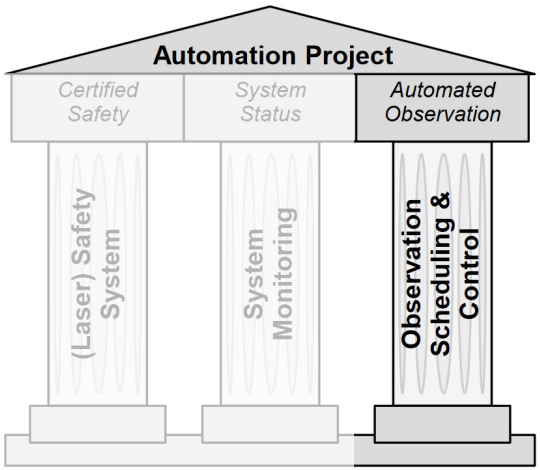
System-Monitoring-Dataflow
Type 3: Sysmon API via RPC



System-Monitoring - Zabbix-Interface



Observation, Scheduling & Control



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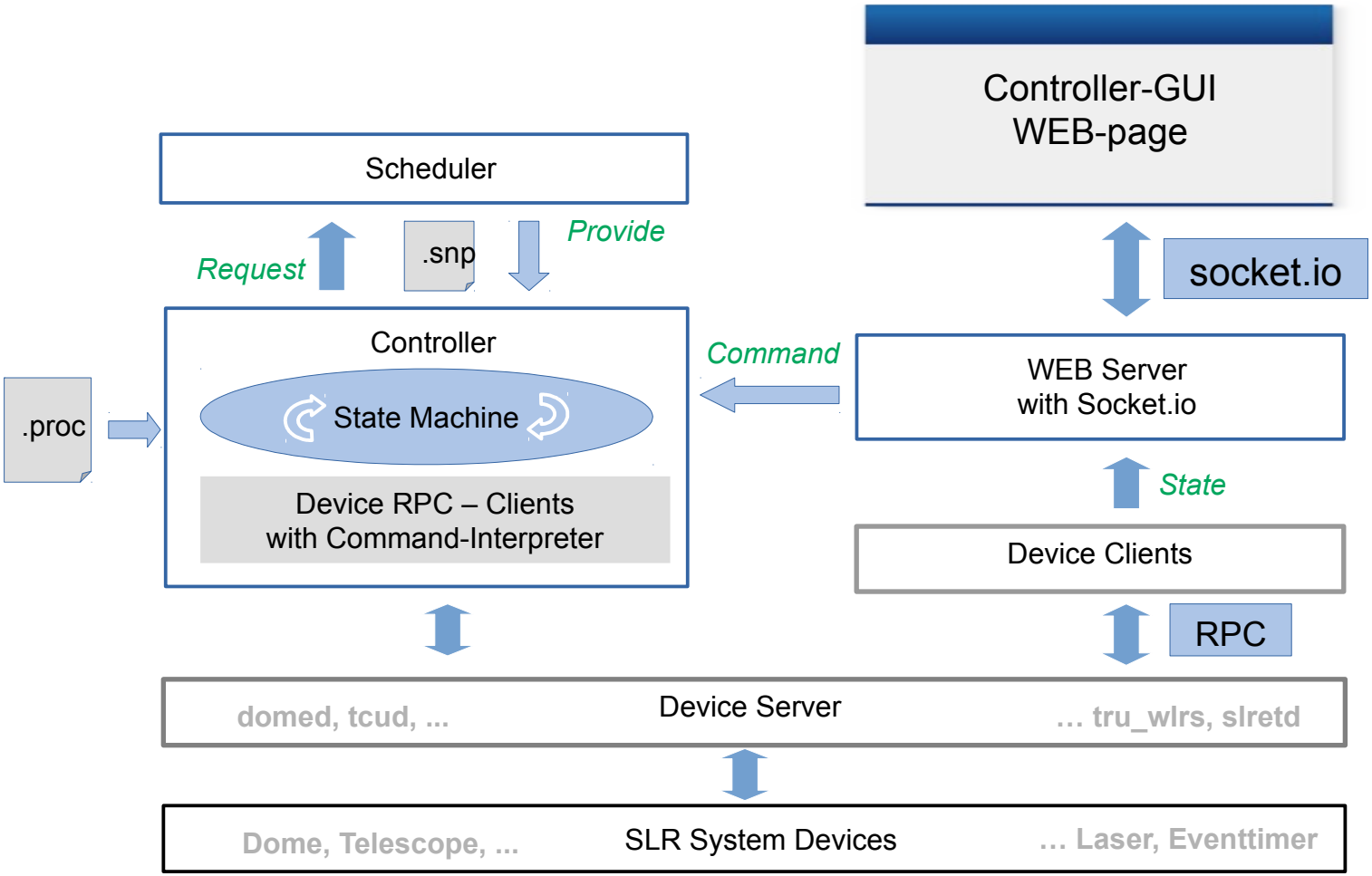
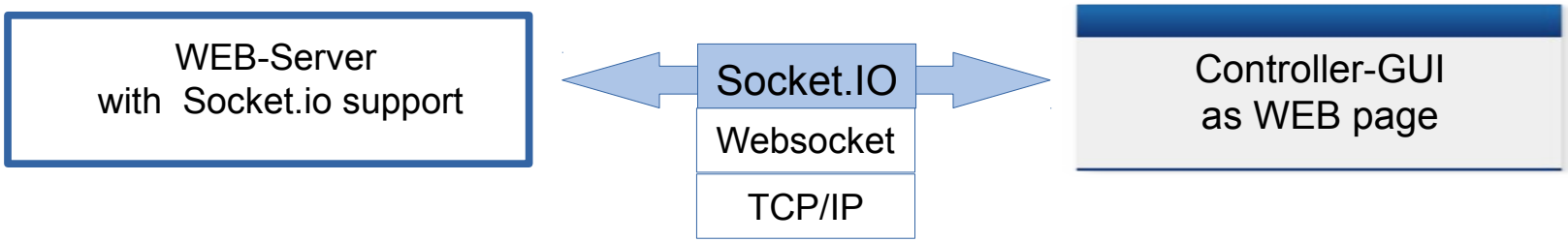


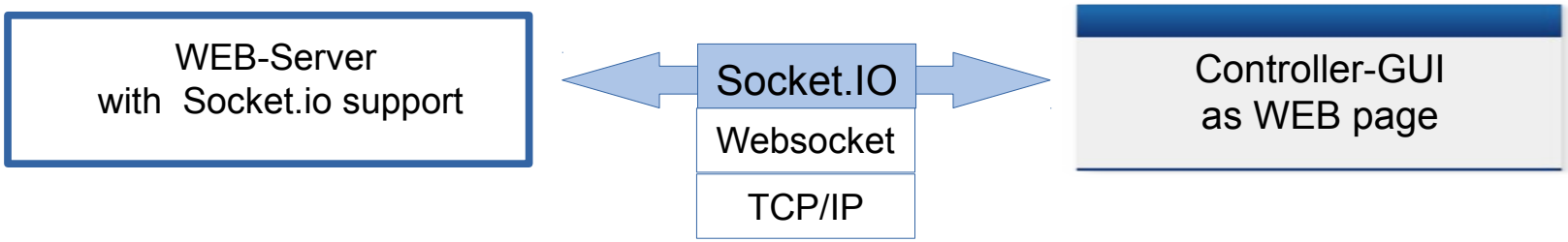
WEB-Control-GUI



- Javascript/Node, Python or ...
- Event driven
- Bidirectional realtime communiction
- Automatic Data encoding as JSON

- HTML+ CSS + Javascript
- Platform independent
- No installation required
- Works everywhere

WEB-Control-GUI



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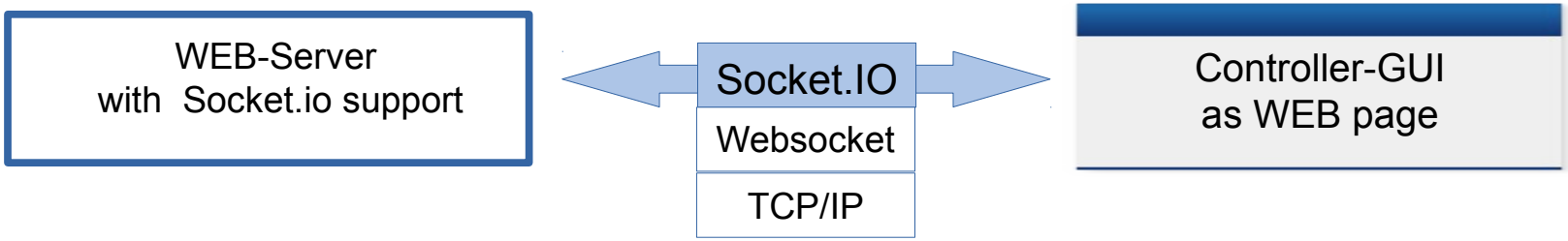
SEND

```
socket.emit('TCU', TCUInfo);
```

RECEIVE

```
socket.on('TCU', function(tcu) {
        $('#aziDisp').text(tcu.azi);
        $('#eleDisp').text(tcu.ele);
});
```

WEB-Control-GUI



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```

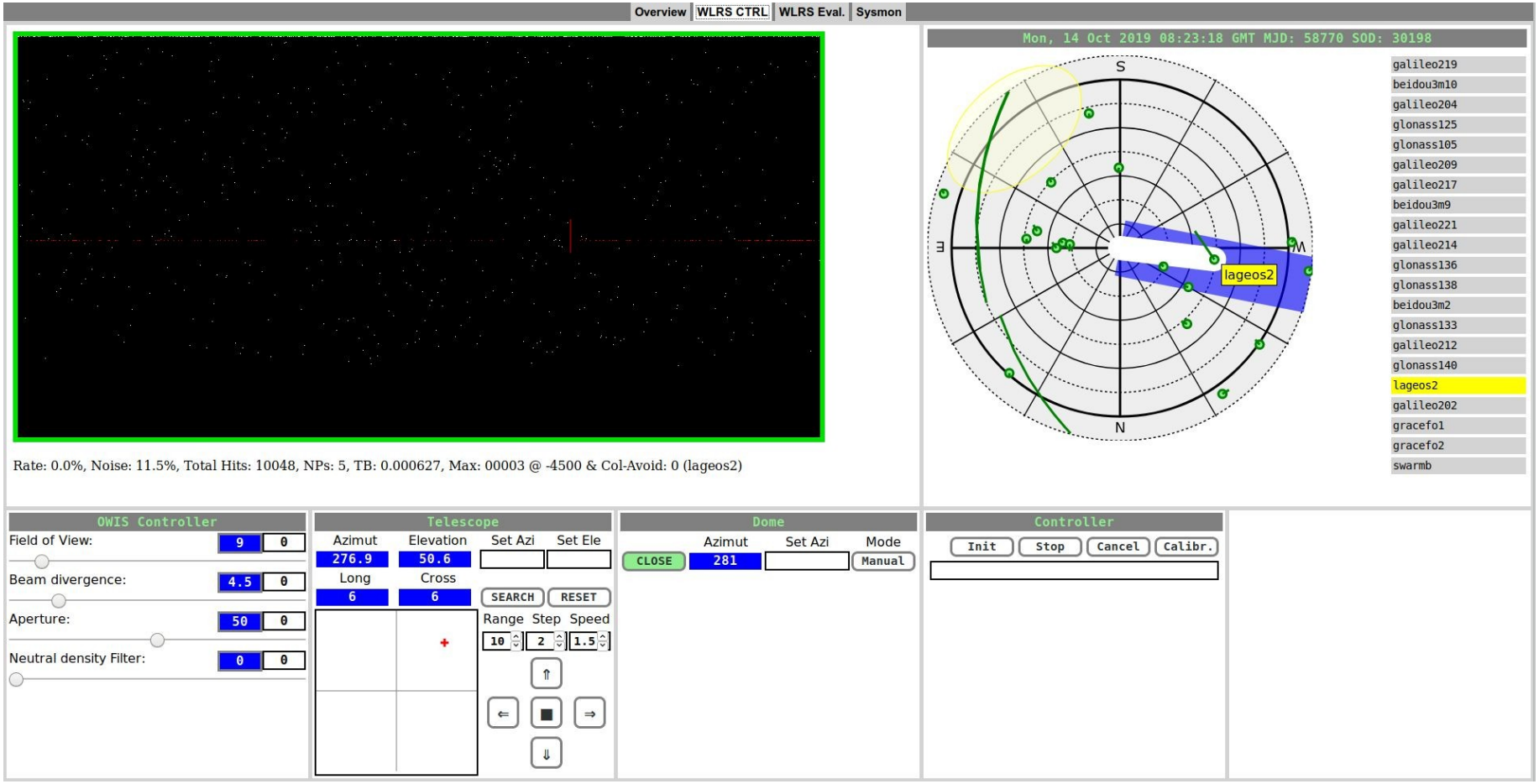
RECEIVE

```
socket.on('command', function(cmd){
                exec(cmd);
});
```

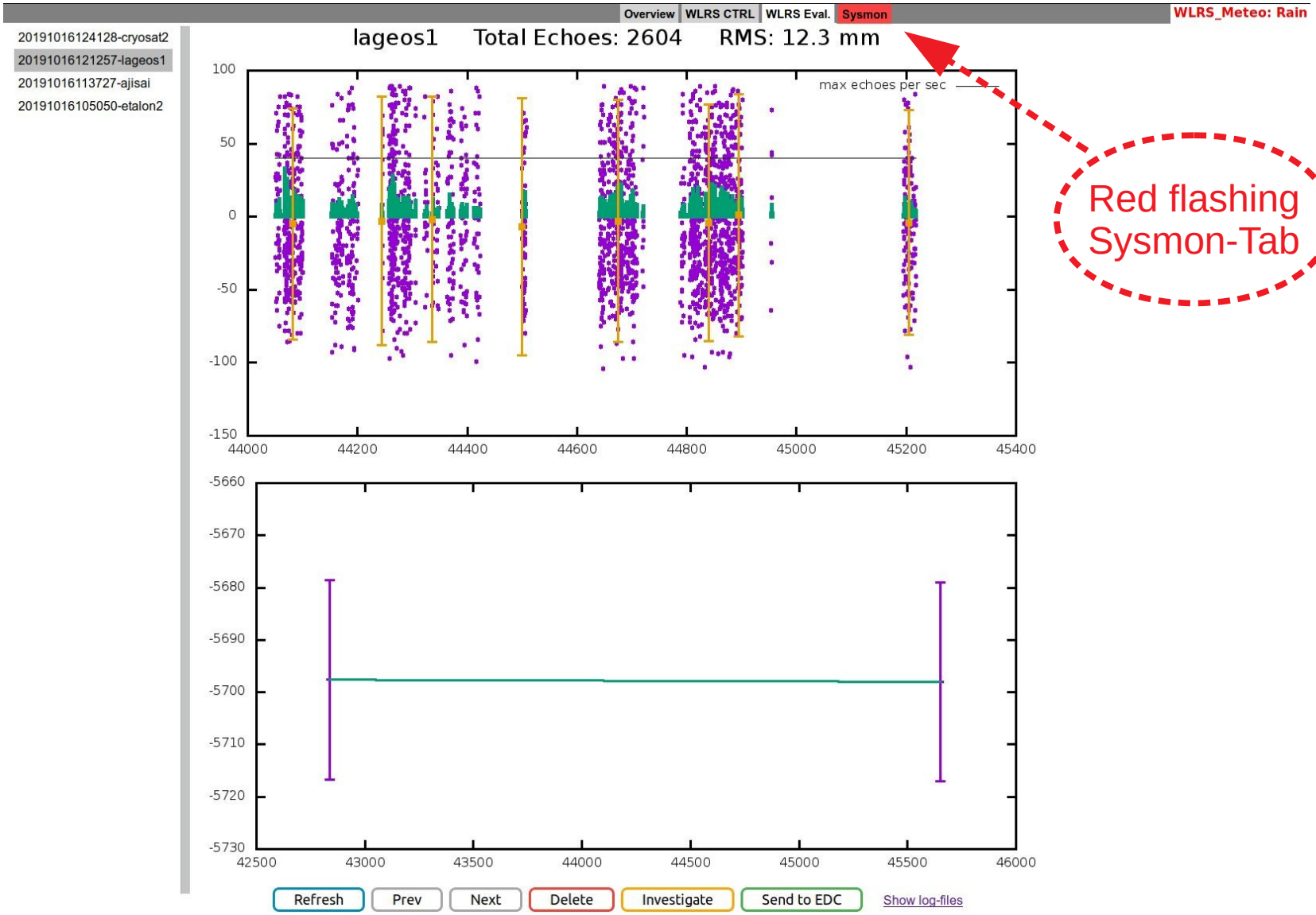
SEND

```
socket.emit('command',
         $('#ctrlInput).val());
```

Common GUI
System CTRL



Common GUI
Data evaluation & Sysmon Alarms



Red flashing
Sysmon-Tab

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