

Autonomous observations of VLBI radio telescopes

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FESG



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(¹FESG Wetzell, TU of Munich; ²BKG Wetzell; ³JIVE ERIC)

Goal

Goal

Autonomous Observation

Local prioritization and planning

Fetching of session schedules

Local preparation (drudg)

Local adaption and recorder selection

Automatic startup

Observation status notification

Quality and alarm management

Post-processing

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Interaction →
← Feedback

Controlling →
← Feedback

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Quality and alarm management

Post-processing

Interaction →
← Feedback

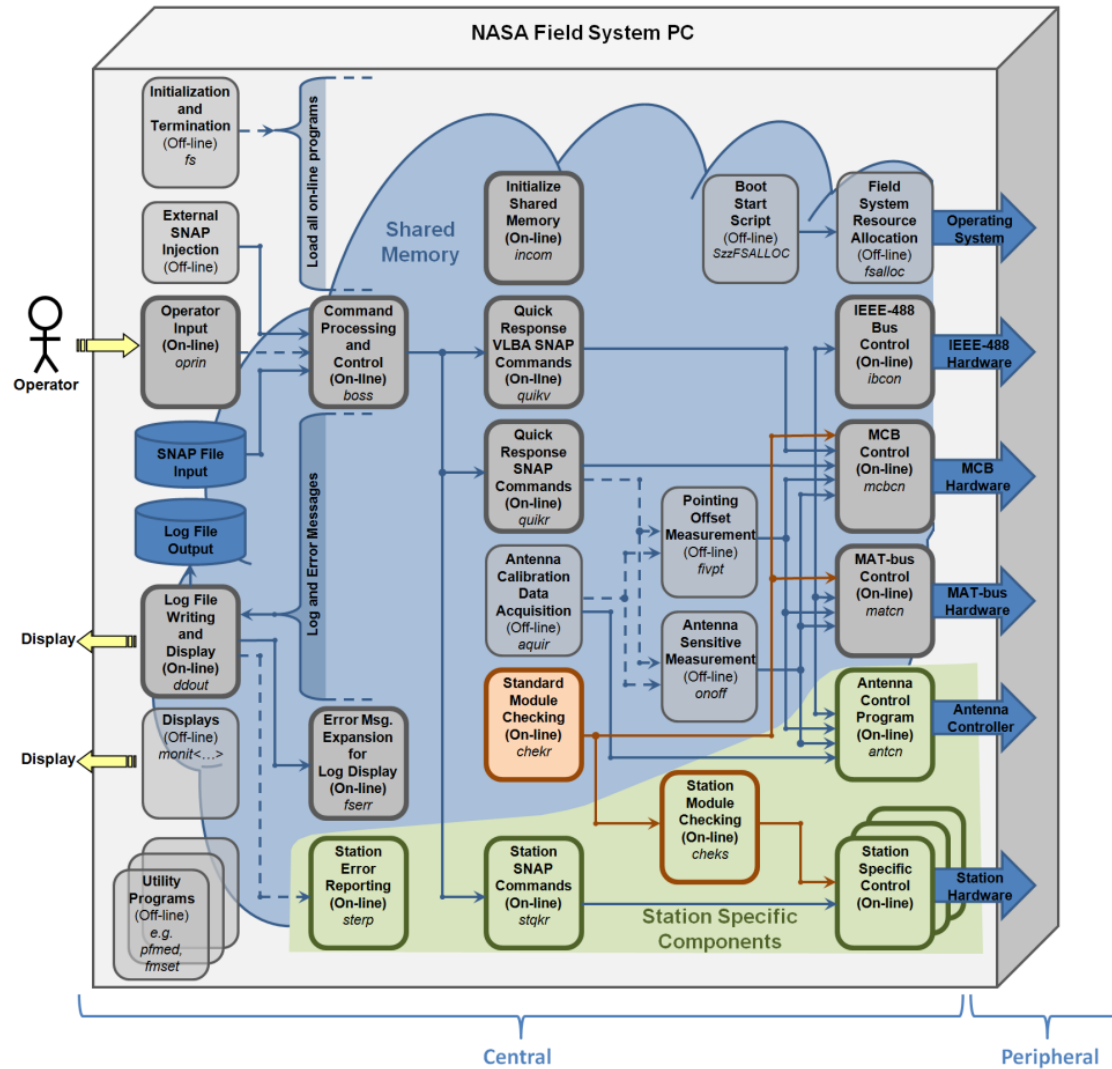
Controlling →
← Feedback

In a sense of a “Smart Observatory”

Goal

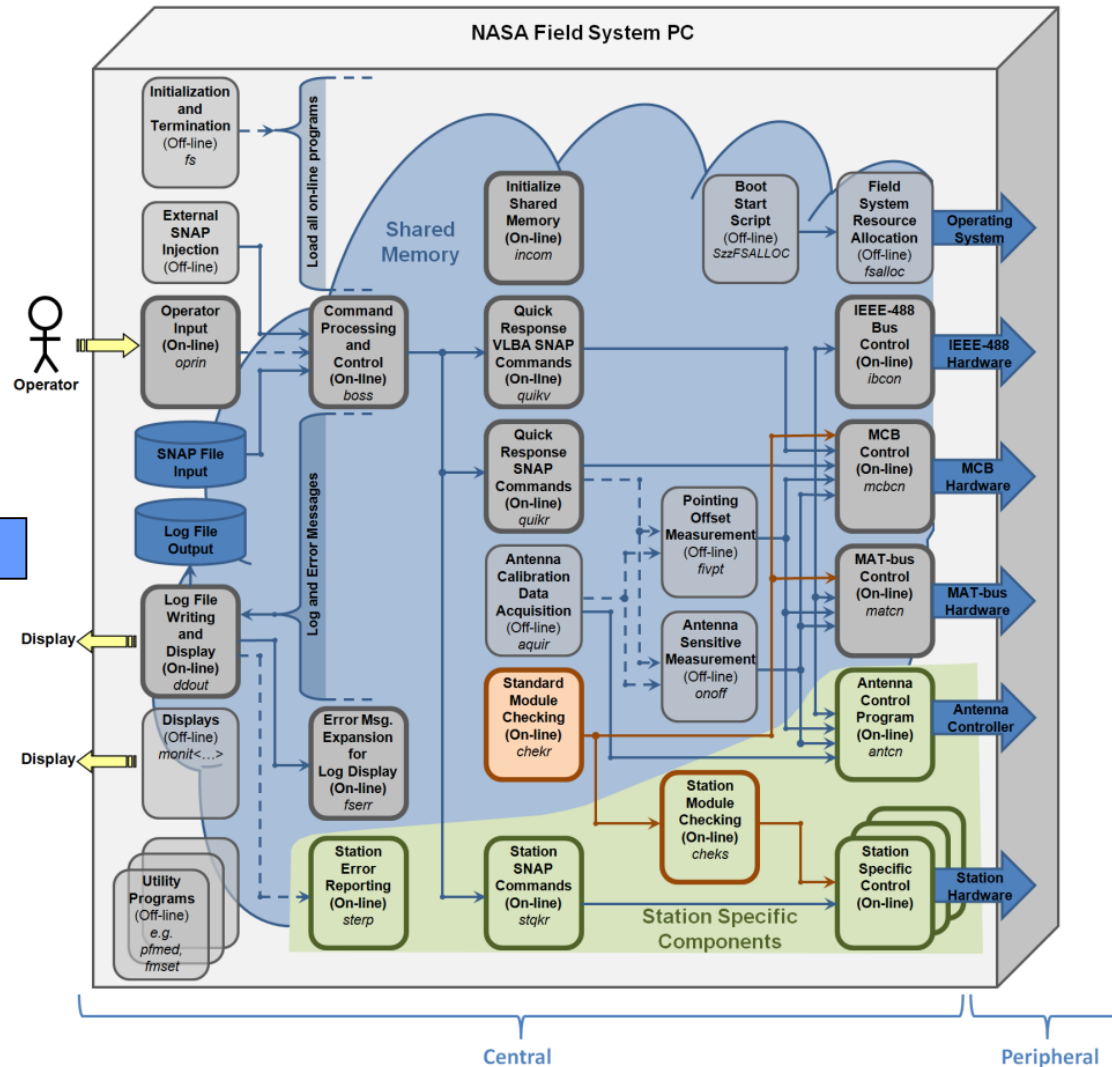
“Automating” the NASA Field System

“Automating” the NASA Field System

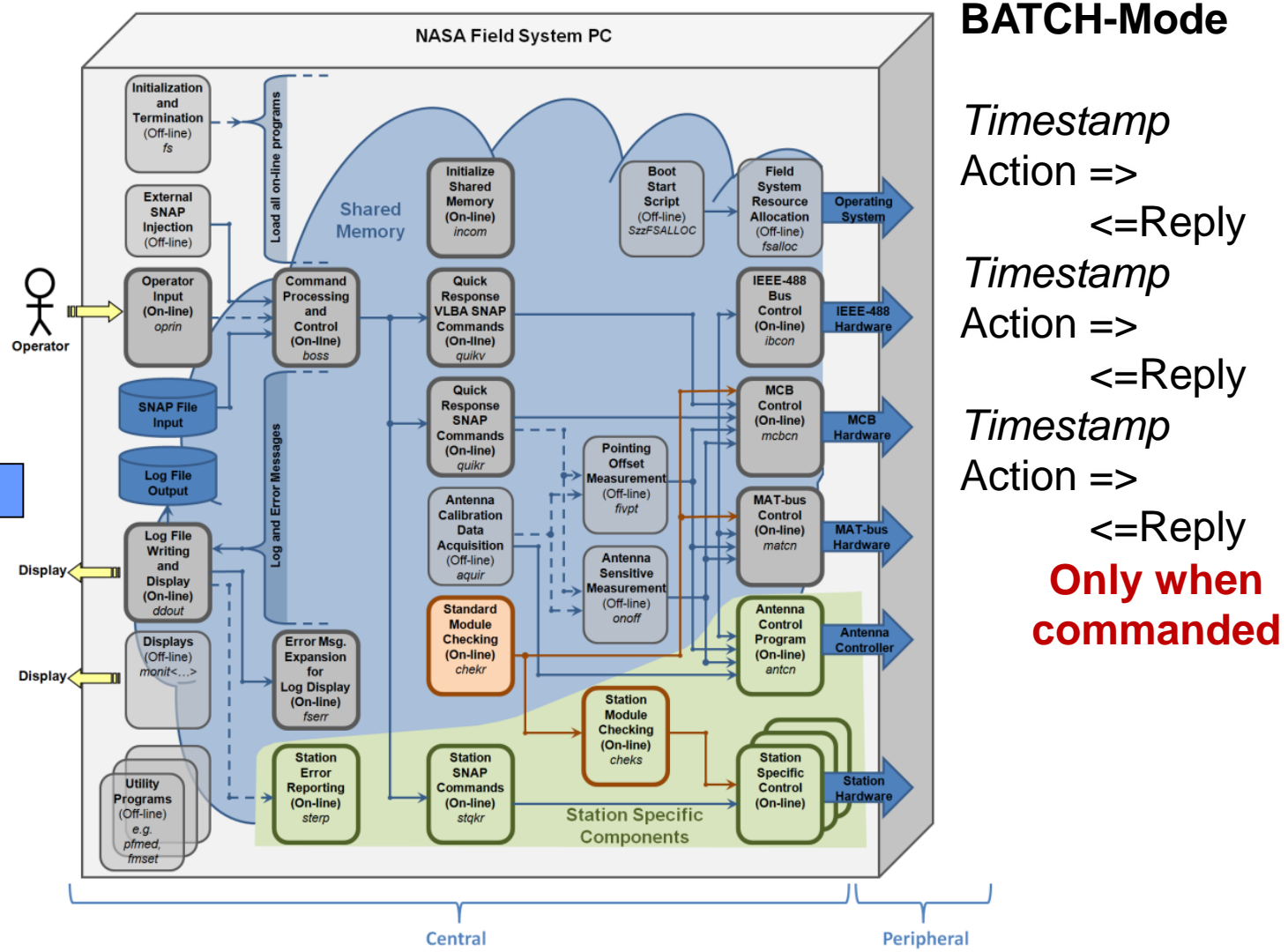


“Automating” the NASA Field System

Show current status to the user
Shared mem. specific, local GUI



“Automating” the NASA Field System



BATCH-Mode

Timestamp
Action =>
<=Reply

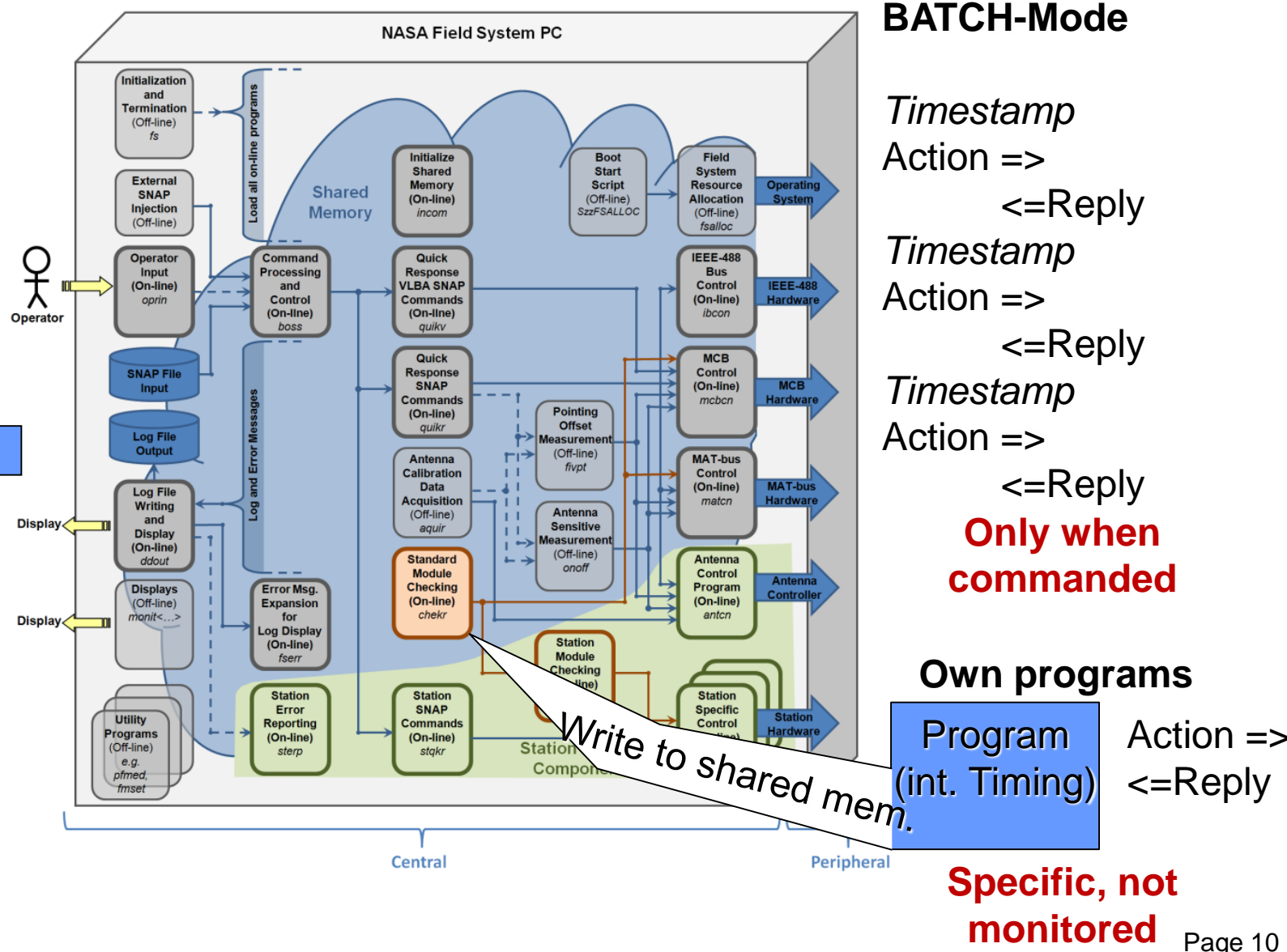
Timestamp
Action =>
<=Reply

Timestamp
Action =>
<=Reply

Only when commanded

Show current status to the user
←
Shared mem. specific, local GUI

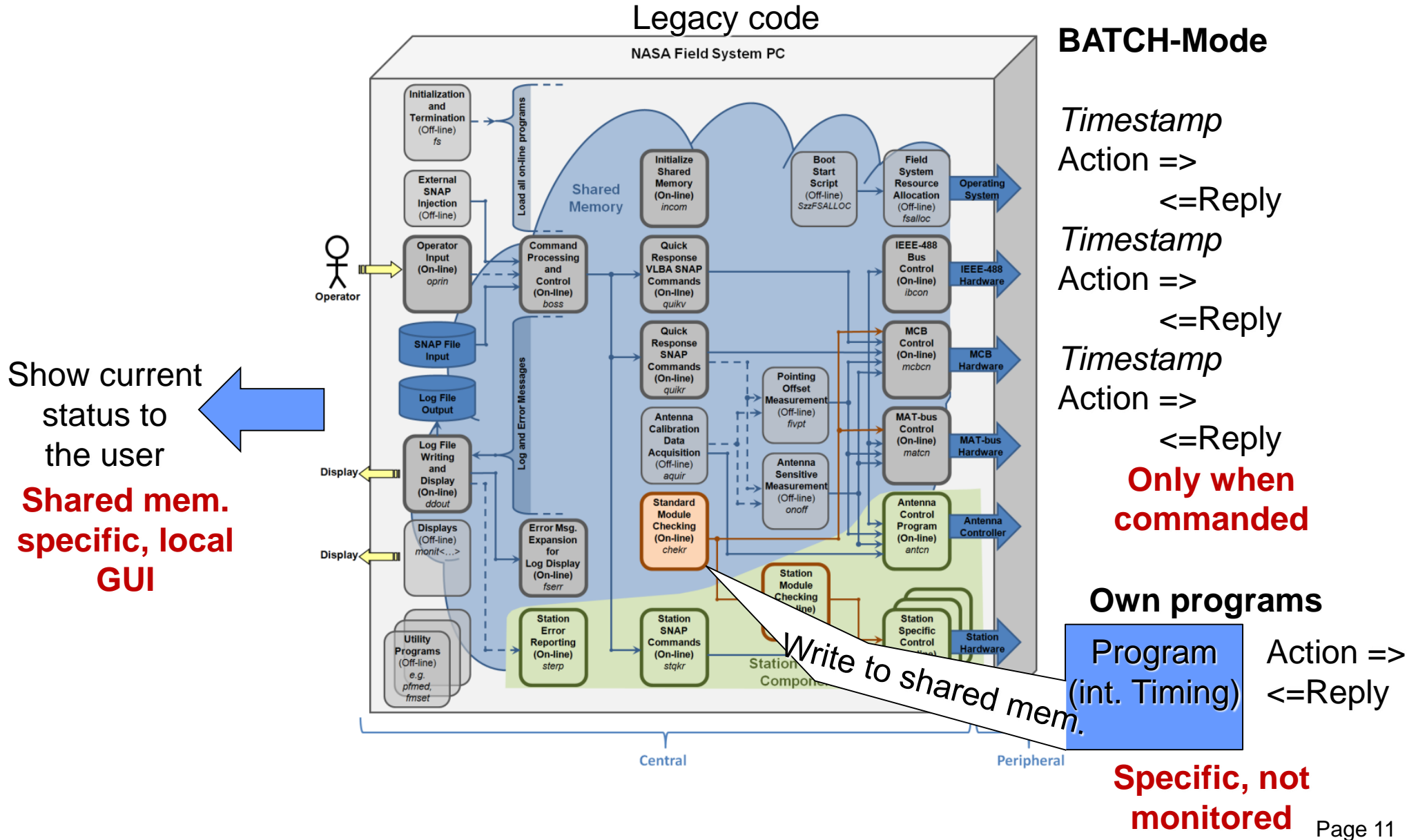
“Automating” the NASA Field System



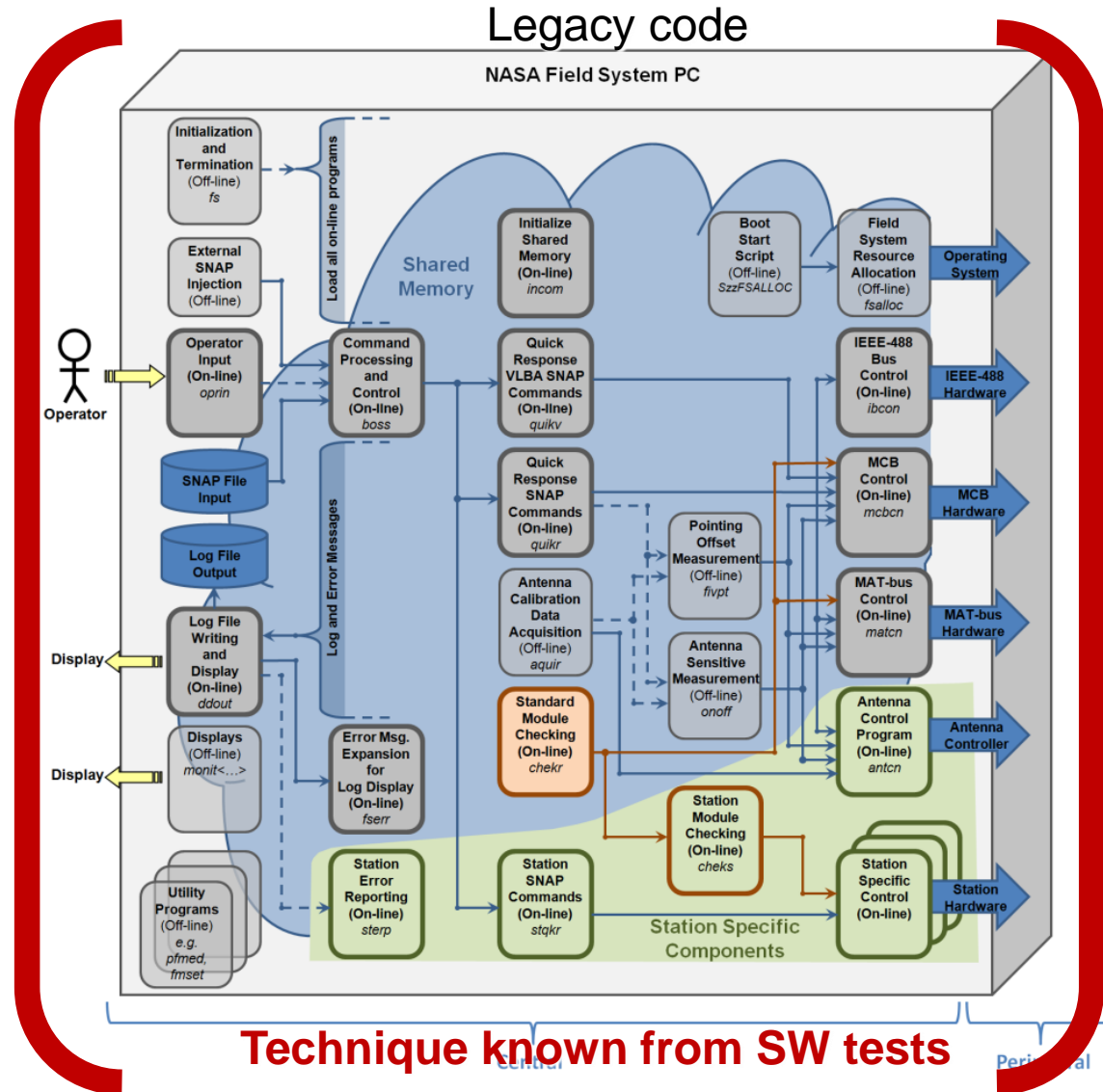
Show current status to the user
 Shared mem. specific, local GUI

Write to shared mem.

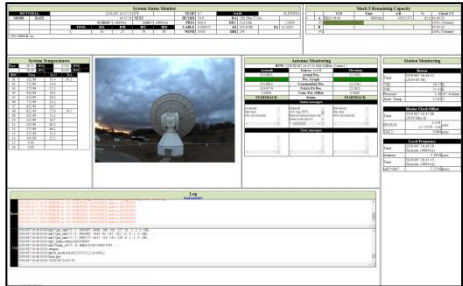
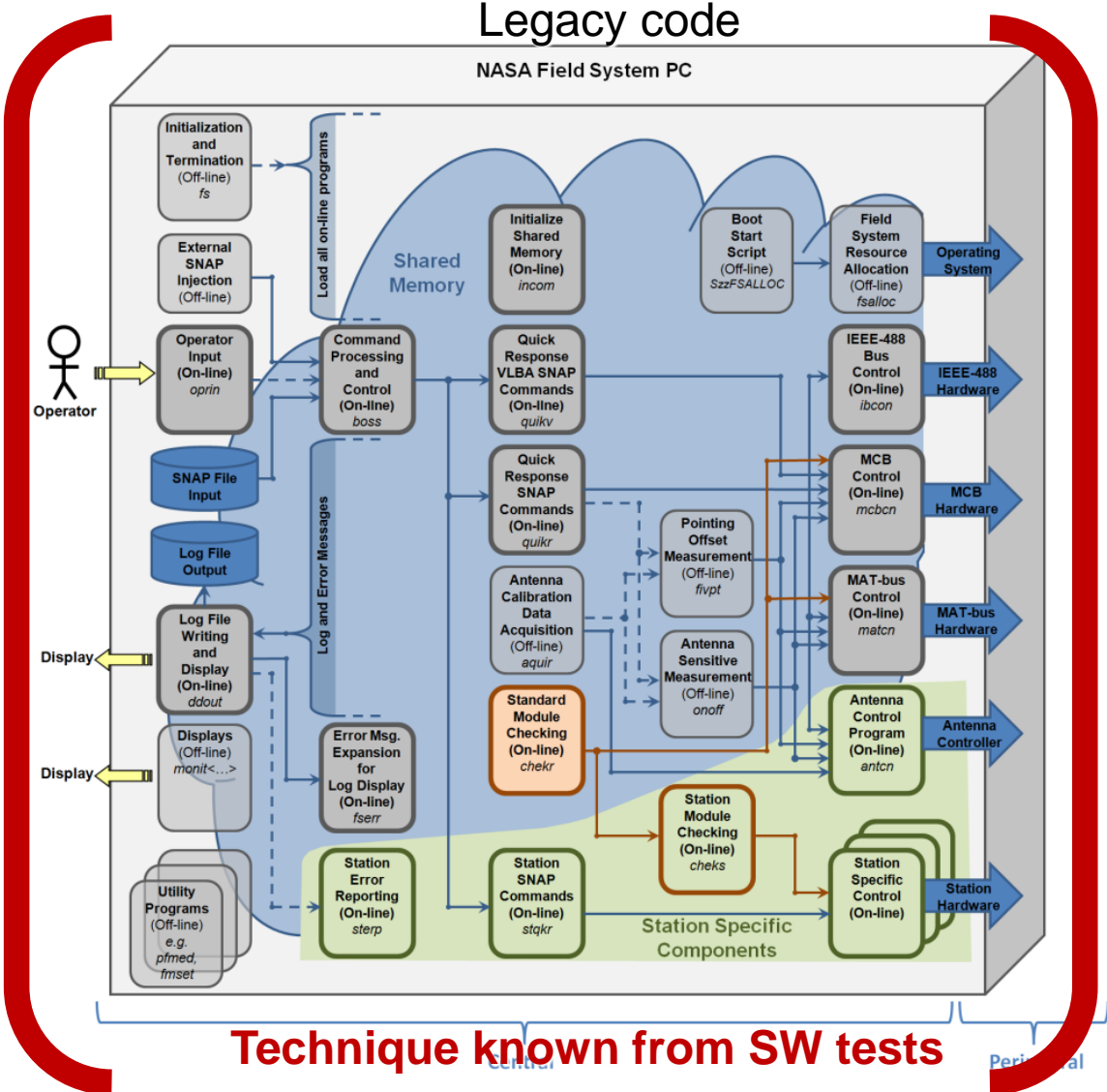
“Automating” the NASA Field System



“Automating” the NASA Field System



“Automating” the NASA Field System

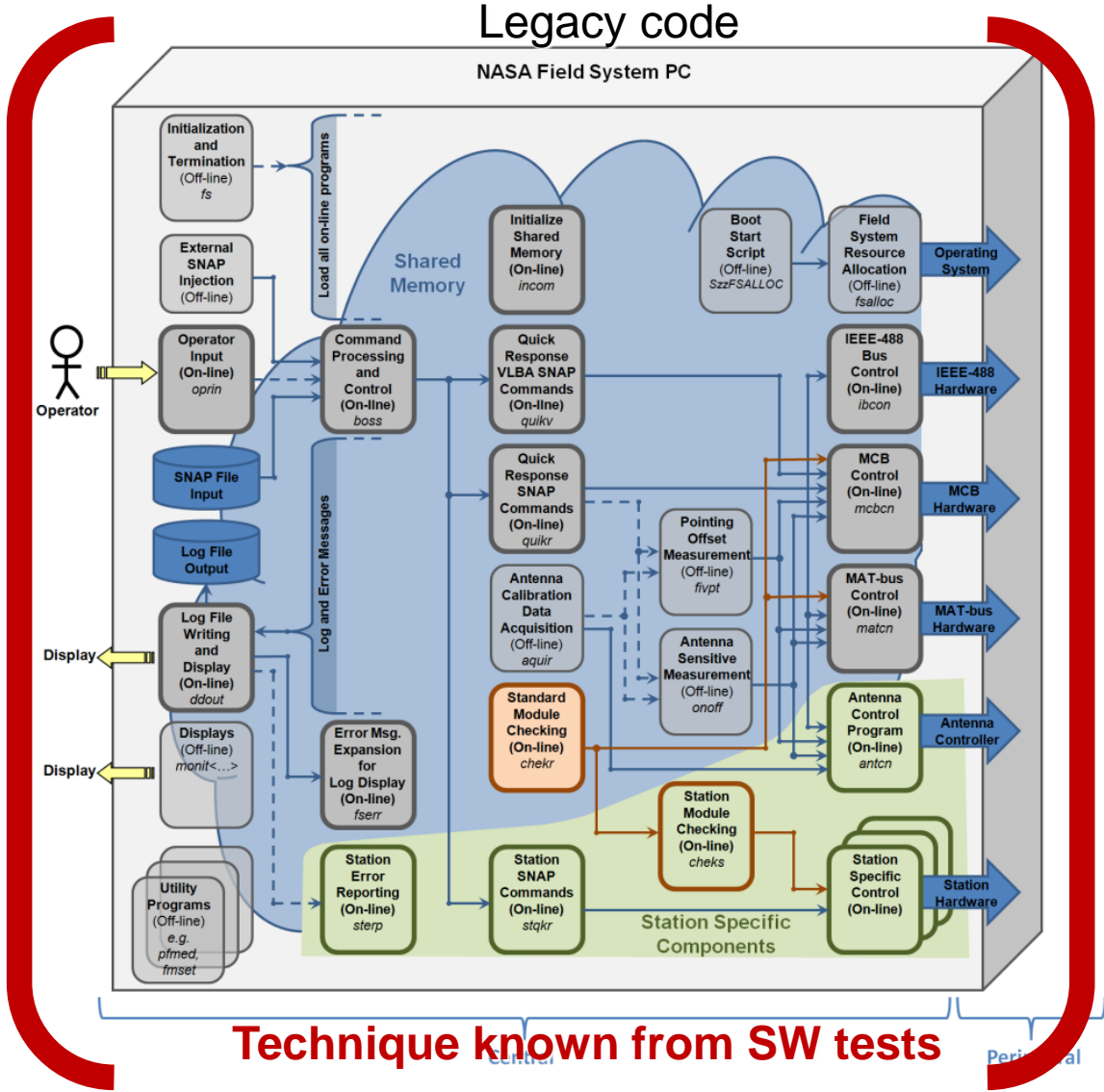


NASA FS Output remotely accessible

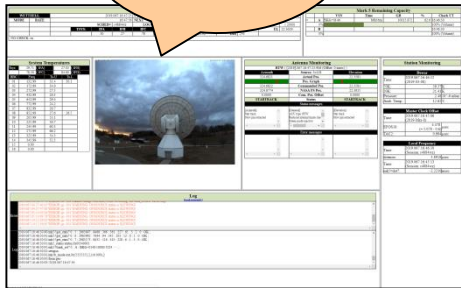
e.g. Logs Errors ...

Technique known from SW tests

“Automating” the NASA Field System



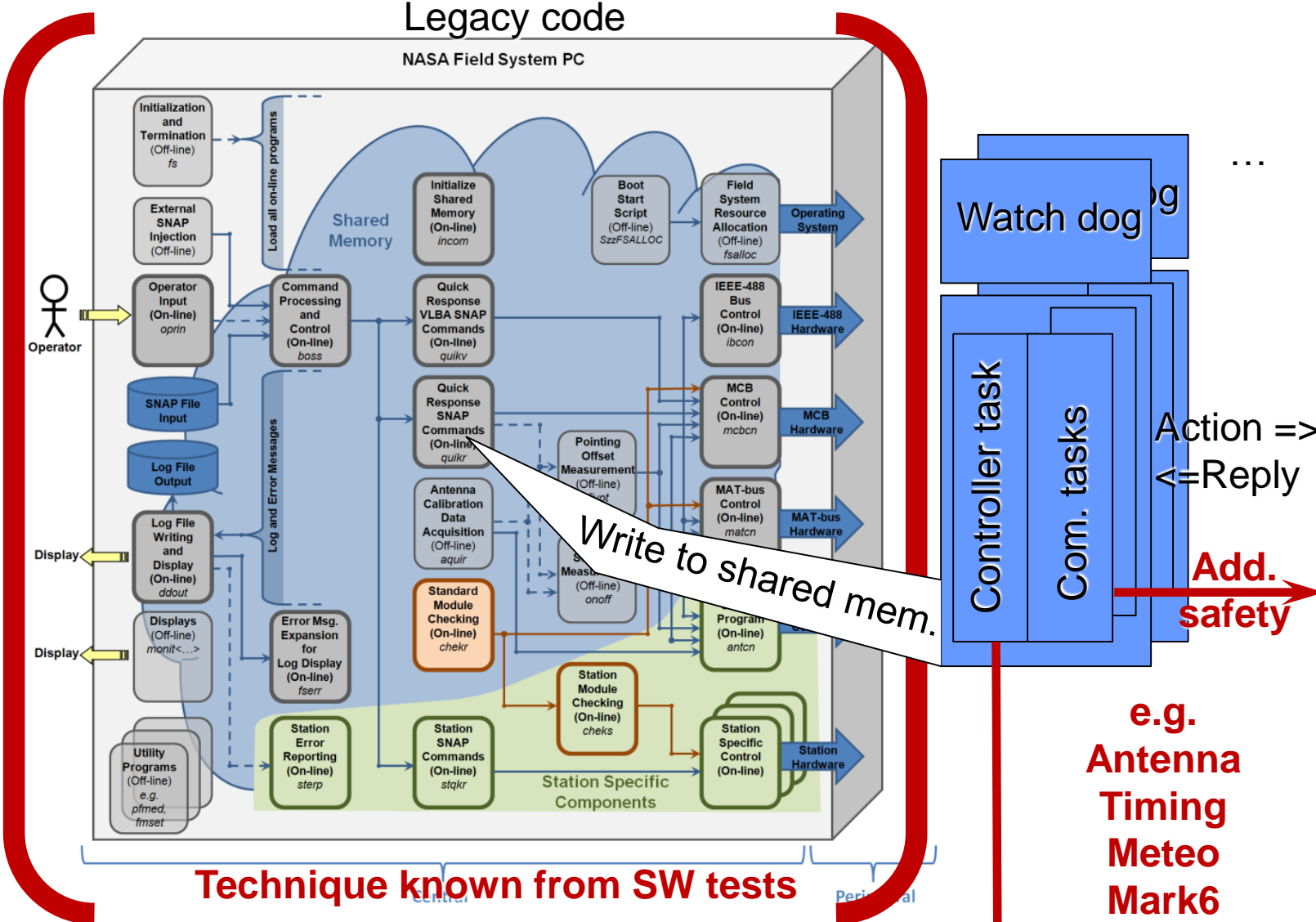
Poster P107



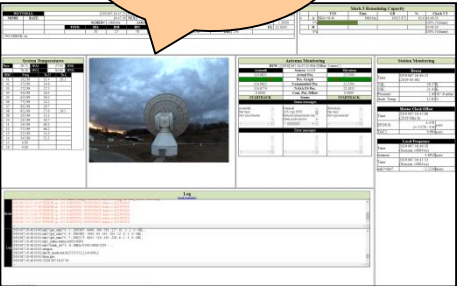
NASA FS Output remotely accessible

e.g. Logs Errors ...

“Automating” the NASA Field System



Poster P107

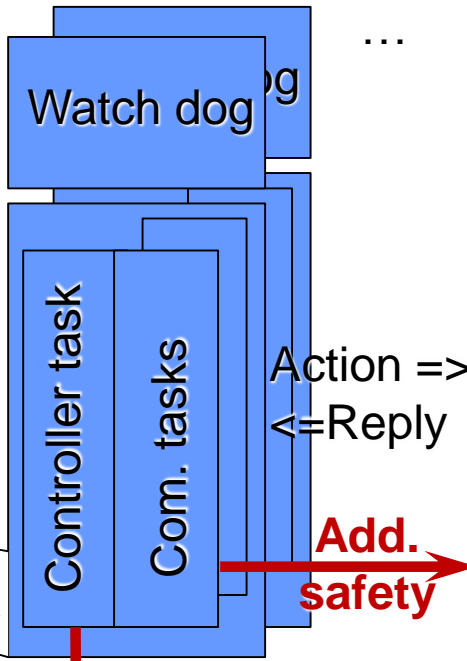


NASA FS Output remotely accessible

e.g. Logs Errors ...

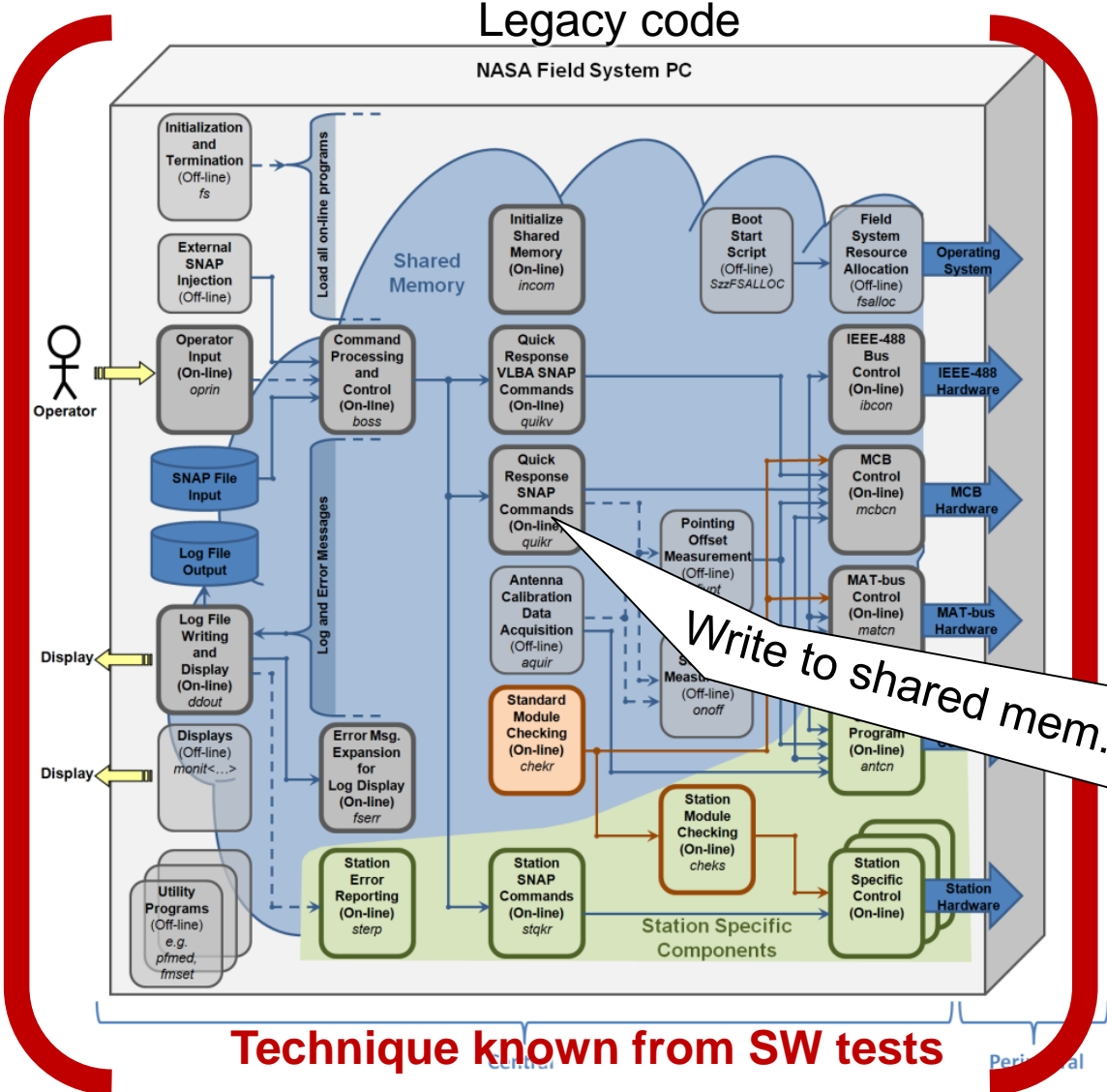
Technique known from SW tests

Monitoring-Bypass

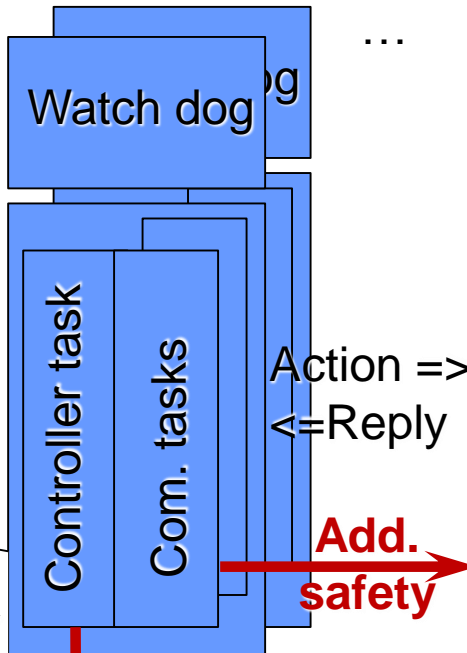


e.g. Antenna Timing Meteo Mark6

“Automating” the NASA Field System

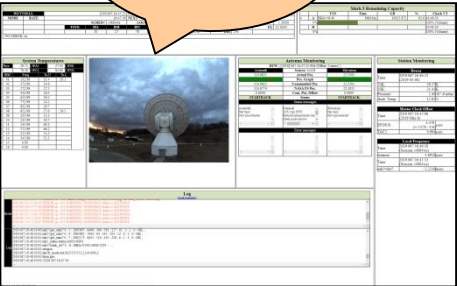


Human Safety is implemented in HW device



e.g. Antenna Timing Meteo Mark6

Poster P107



NASA FS Output remotely accessible

e.g. Logs Errors ...

Technique known from SW tests

Monitoring-Bypass

Goal

“Automating” the NASA Field System

Using the data from the monitored (NASA Field) System

Using the data from the monitored (NASA Field) System

**NASA FS
Output
remotely
accessible**



**Monitoring-
Bypass**

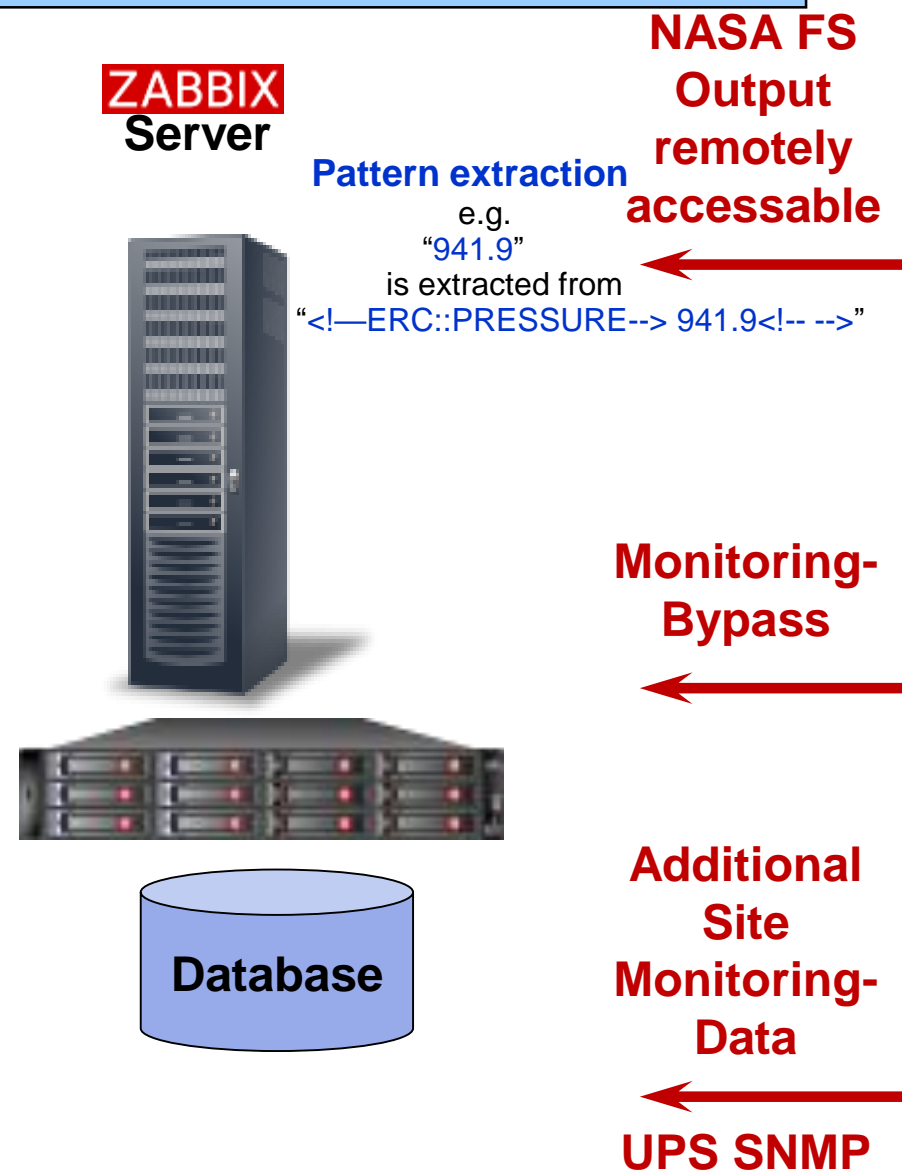


**Additional
Site
Monitoring-
Data**

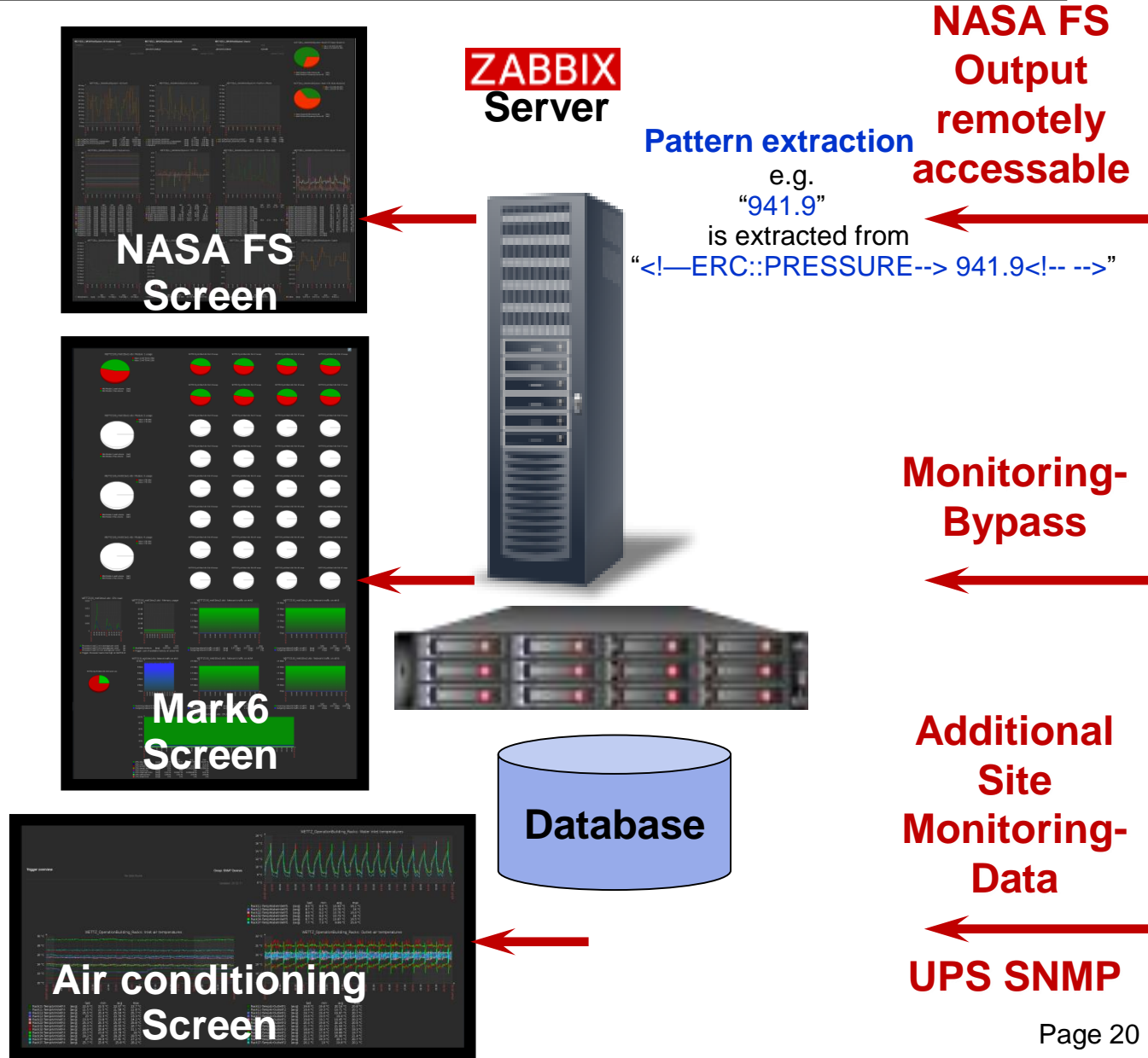


UPS SNMP

Using the data from the monitored (NASA Field) System



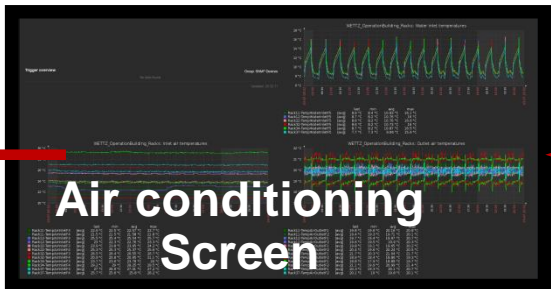
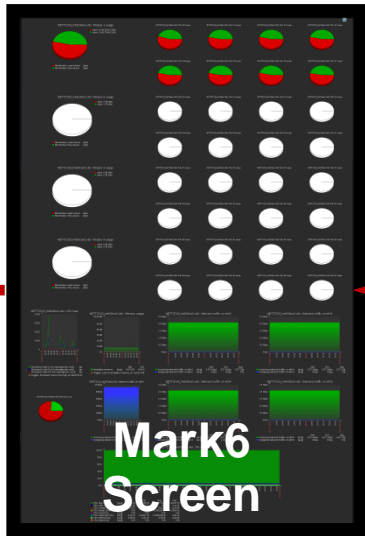
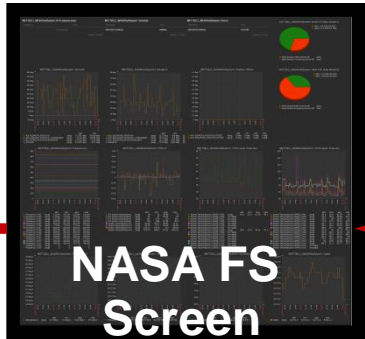
Using the data from the monitored (NASA Field) System



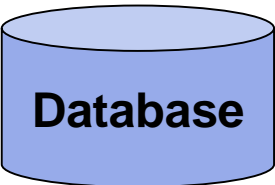
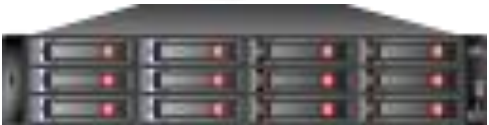
Using the data from the monitored (NASA Field) System

Global Network Status

Time	Recovery time	Host	Description	Value	Severity
2019-03-15 12:59:38	13:11:38	Zabbix server	Zabbix housekeeper processes more than 75% busy	RESOLVED	Average
2019-03-15 12:45:50	12:46:50	ZABBIX_vbiaysmon.evbi.wetzell.de	Disk I/O is overloaded on ZABBIX_vbiaysmon.evbi.wetzell.de	RESOLVED	Warning
2019-03-15 12:43:50	12:44:50	ZABBIX_vbiaysmon.evbi.wetzell.de	Disk I/O is overloaded on ZABBIX_vbiaysmon.evbi.wetzell.de	RESOLVED	Warning
2019-03-15 12:02:42	12:07:25	OHIGGINS_EFOSS0	No EFOSS0 data within last 15 min	RESOLVED	Warning
2019-03-15 11:57:49	12:07:21	OHIGGINS_METEO	No wind data from Ties within last 10 min	RESOLVED	High
2019-03-15 11:57:17	12:08:01	OHIGGINS_METEO	No wind data from Chile tower within last 10 min	RESOLVED	High
2019-03-15 11:52:53	12:07:25	OHIGGINS_ZABBIXServer_oper_w1	Zabbix agent on OHIGGINS_ZABBIXServer_oper_w1 is unreachable for 5 minutes	RESOLVED	Average
2019-03-15 11:52:15	12:08:05	OHIGGINS_FSPC	Zabbix agent on OHIGGINS_FSPC is unreachable for 5 minutes	RESOLVED	Average
2019-03-15 11:50:48	12:07:21	OHIGGINS_METEO	No wind data from Ties within last 3 min	RESOLVED	Warning
2019-03-15 11:50:16	12:08:01	OHIGGINS_METEO	No wind data from Chile tower within last 3 min	RESOLVED	Warning



ZABBIX Server



NASA FS Output remotely accessible

Pattern extraction
e.g. "941.9" is extracted from

```
<!--ERC::PRESSURE--> 941.9<!-- -->
```

Monitoring-Bypass

Additional Site Monitoring-Data

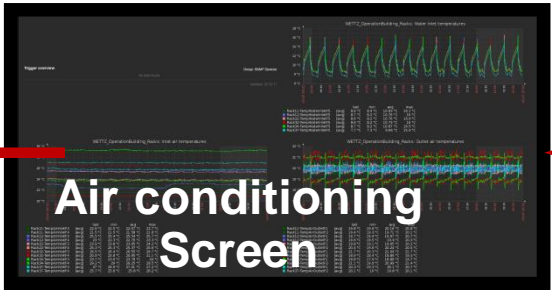
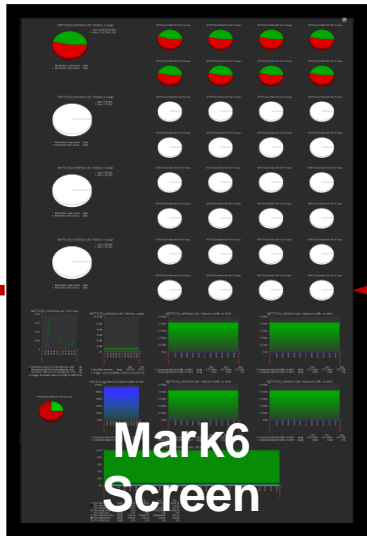
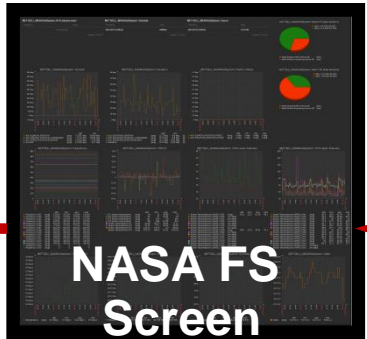
UPS SNMP

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730884 - JUMPING JIVE

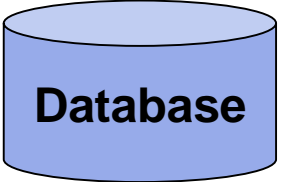
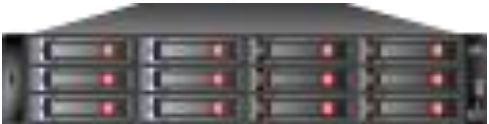
Using the data from the monitored (NASA Field) System

Global Network Status

Time	Recovery time	Host	Description	Value	Severity
2019-03-15 12:59:38	13:11:38	Zabbix server	Zabbix housekeeper processes more than 75% busy	RESOLVED	Average
2019-03-15 12:45:50	12:46:50	ZABBIX_vbiaysmon.evbi.wetzell.de	Disk I/O is overloaded on ZABBIX_vbiaysmon.evbi.wetzell.de	RESOLVED	Warning
2019-03-15 12:43:50	12:44:50	ZABBIX_vbiaysmon.evbi.wetzell.de	Disk I/O is overloaded on ZABBIX_vbiaysmon.evbi.wetzell.de	RESOLVED	Warning
2019-03-15 12:02:42	12:07:25	OHIGGINS_EFOSS0	No EFOSS0 data within last 15 min	RESOLVED	Warning
2019-03-15 11:57:49	12:07:21	OHIGGINS_METEO	No wind data from Ties within last 10 min	RESOLVED	High
2019-03-15 11:57:17	12:08:01	OHIGGINS_METEO	No wind data from Chile tower within last 10 min	RESOLVED	High
2019-03-15 11:52:53	12:07:25	OHIGGINS_ZABBIXServer_oper_w1	Zabbix agent on OHIGGINS_ZABBIXServer_oper_w1 is unreachable for 5 minutes	RESOLVED	Average
2019-03-15 11:52:15	12:08:05	OHIGGINS_FSPC	Zabbix agent on OHIGGINS_FSPC is unreachable for 5 minutes	RESOLVED	Average
2019-03-15 11:50:48	12:07:21	OHIGGINS_METEO	No wind data from Ties within last 3 min	RESOLVED	Warning
2019-03-15 11:50:16	12:08:01	OHIGGINS_METEO	No wind data from Chile tower within last 3 min	RESOLVED	Warning



ZABBIX Server



NASA FS Output remotely accessible

Pattern extraction
e.g.
"941.9"
is extracted from
"<!--ERC::PRESSURE--> 941.9<!-- -->"

Monitoring-Bypass

Additional Site Monitoring-Data

UPS SNMP



Poster P106

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730884 - JUMPING JIVE

Goal

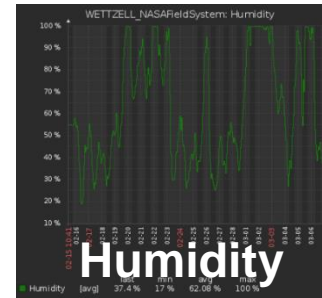
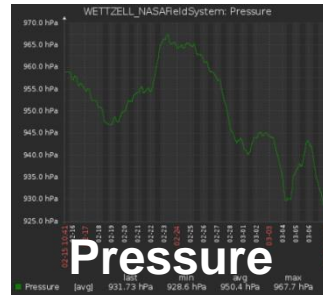
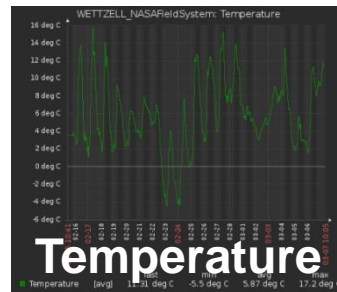
“Automating” the NASA Field System

Using the data from the monitored (NASA Field) System

Towards a data archive for seamless auxiliary data

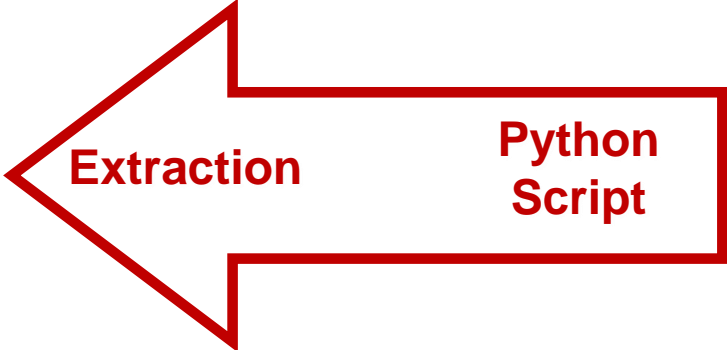
Towards a data archive for seamless auxiliary data

**Data Archive
for
Seamless Auxiliary
Data**



**Global
Network
Status**

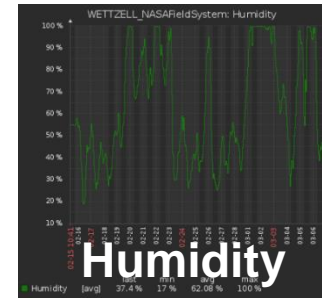
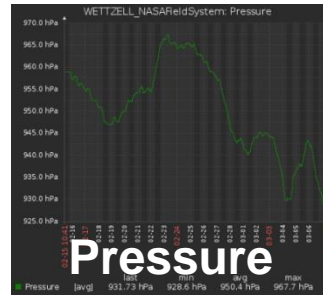
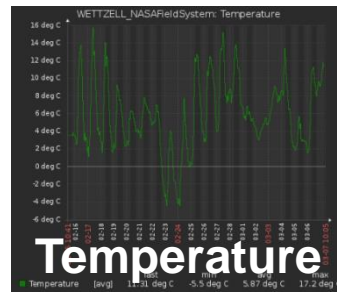
Time	Category	Description	Status
2019-03-15 11:56:01	Zabbix_watcher	Zabbix monitoring processes more than 70% busy	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-01	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-01	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-02	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-02	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-03	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-03	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-04	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-04	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-05	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-05	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-06	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-06	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-07	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-07	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-08	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-08	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-09	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-09	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-10	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-10	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-11	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-11	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-12	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-12	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-13	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-13	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-14	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-14	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-15	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-15	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-16	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-16	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-17	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-17	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-18	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-18	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-19	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-19	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-20	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-20	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-21	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-21	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-22	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-22	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-23	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-23	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-24	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-24	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-25	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-25	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-26	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-26	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-27	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-27	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-28	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-28	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-29	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-29	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-30	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-30	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-31	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-31	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-32	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-32	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-33	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-33	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-34	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-34	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-35	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-35	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-36	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-36	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-37	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-37	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-38	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-38	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-39	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-39	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-40	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-40	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-41	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-41	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-42	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-42	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-43	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-43	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-44	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-44	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-45	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-45	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-46	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-46	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-47	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-47	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-48	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-48	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-49	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-49	RESOLVED
2019-03-15 12:48:53	Zabbix_whoopsia-locks-external-50	DBA_IP is unreachable on Zabbix_whoopsia-locks-external-50	RESOLVED



ITEM	CLOCK	DATETIME (UTC)	VALUE
26733	1551996101	2019-03-07 22:01:41	5.8000
26733	1551995801	2019-03-07 21:56:41	6.1000
26733	1551995501	2019-03-07 21:51:41	5.9000
26733	1551995201	2019-03-07 21:46:41	5.7000
26733	1551994902	2019-03-07 21:41:42	5.7000
26733	1551994602	2019-03-07 21:36:42	5.8000
26733	1551994301	2019-03-07 21:31:41	5.6000
26733	1551994002	2019-03-07 21:26:42	5.6000
26733	1551993700	2019-03-07 21:21:40	5.5000
26733	1551993401	2019-03-07 21:16:41	5.5000

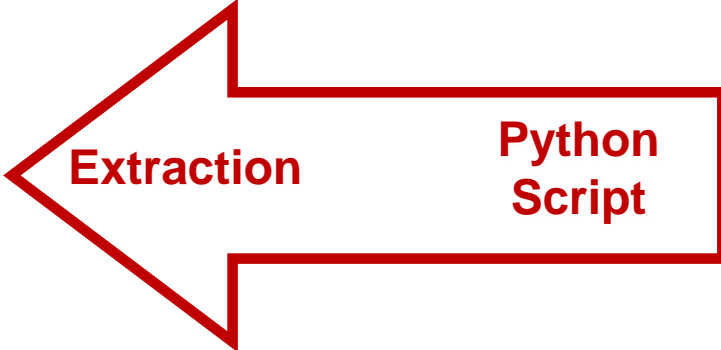
Towards a data archive for seamless auxiliary data

**Data Archive
for
Seamless Auxiliary
Data**



**Global
Network
Status**

Time	Category	Description	Status
2019-03-15 01:56:00	Zabbix server	Zabbix monitoring processes down for 17h 56m	RESOLVED
2019-03-15 01:56:00	Zabbix_whoami-check-external	Zabbix_whoami-check-external is unreachable on 174.101.10.10	RESOLVED
2019-03-15 01:56:00	Zabbix_whoami-check-external	Zabbix_whoami-check-external is unreachable on 174.101.10.10	RESOLVED
2019-03-15 01:56:00	Zabbix_whoami-check-external	Zabbix_whoami-check-external is unreachable on 174.101.10.10	RESOLVED
2019-03-15 01:56:00	CHORDING_EPICOP	no EPICOP data since 2019-03-15 12:07:25	RESOLVED
2019-03-15 01:56:00	CHORDING_METRO	no met data from 'The white owl' 12:07:25	RESOLVED
2019-03-15 01:56:00	CHORDING_METRO	no met data from 'Duke brown with hat' 12:07:25	RESOLVED
2019-03-15 01:56:00	CHORDING_ZabbixServer_whoami	Zabbix agent on CHORDING_ZabbixServer_whoami is unreachable on 174.101.10.10	RESOLVED
2019-03-15 01:56:00	CHORDING_FIPC	Zabbix agent on CHORDING_FIPC is unreachable for 174.101.10.10	RESOLVED
2019-03-15 01:56:00	CHORDING_METRO	no met data from 'The white owl' 12:07:25	RESOLVED
2019-03-15 01:56:00	CHORDING_METRO	no met data from 'Duke brown with hat' 12:07:25	RESOLVED



ITEM	CLOCK	DATETIME (UTC)	VALUE
26733	1551996101	2019-03-07 22:01:41	5.8000
26733	1551995801	2019-03-07 21:56:41	6.1000
26733	1551995501	2019-03-07 21:51:41	5.9000
26733	1551995201	2019-03-07 21:46:41	5.7000
26733	1551994902	2019-03-07 21:41:42	5.7000
26733	1551994602	2019-03-07 21:36:42	5.8000
26733	1551994301	2019-03-07 21:31:41	5.6000
26733	1551994002	2019-03-07 21:26:42	5.6000
26733	1551993700	2019-03-07 21:21:40	
26733	1551993401	2019-03-07 21:16:41	

IVS Task Force

A first technical solution for continuous data acquisition is now available. Now is the time to start a discussion about:

- which parameters are required by analysis
- which time intervals are required
- which format is required in best case
- which stations can and will participate
- which station log books with meta-data are useful
- ...

**Interested?
Join!**

Goal

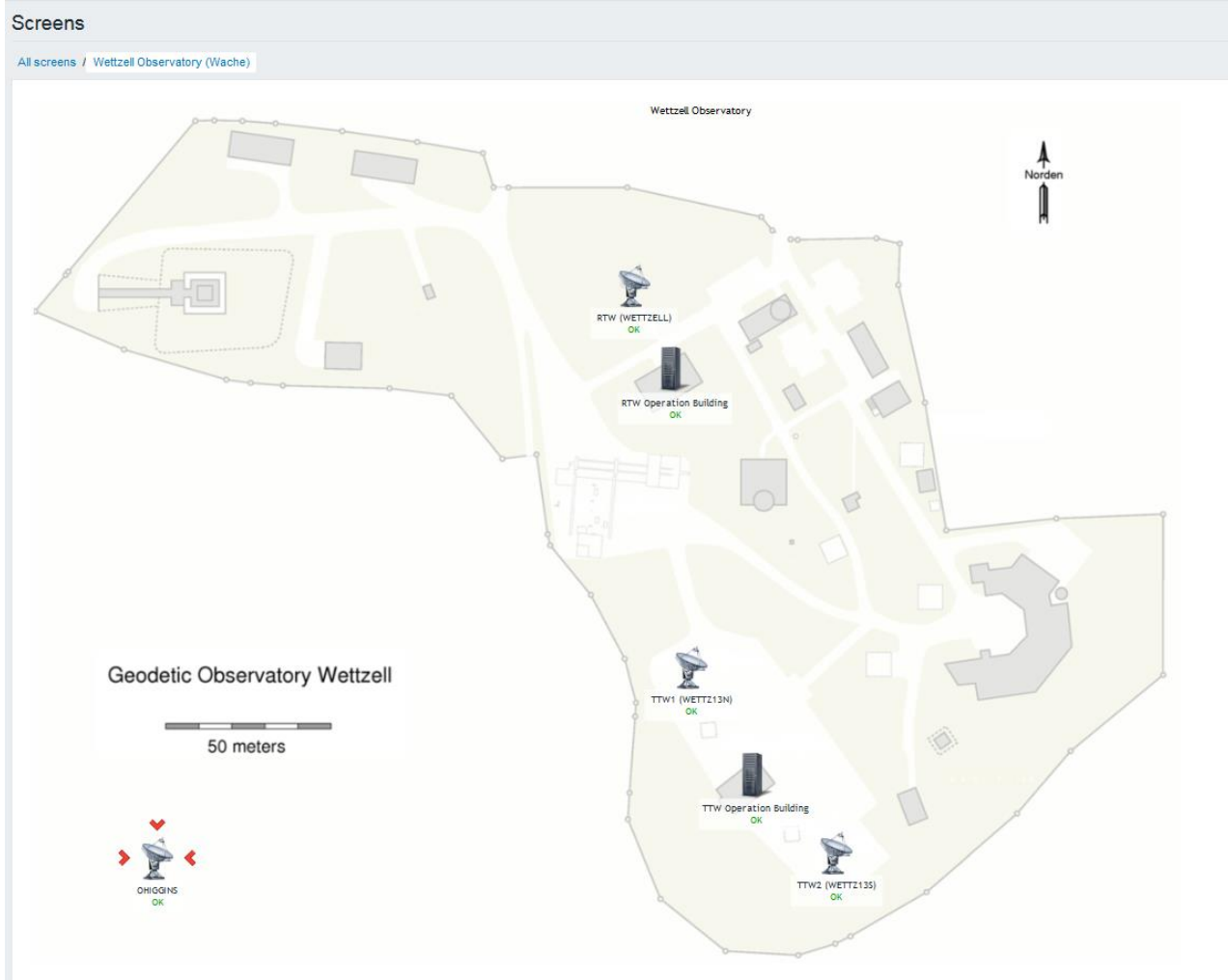
“Automating” the NASA Field System

Using the data from the monitored (NASA Field) System

Towards a data archive for seamless auxiliary data

Benefit: Central alerting at the guard of the Wettzell observatory

Benefit: Central alerting at the guard of the Wettzell observatory



Improving the visibility of error situations while reducing the complexity of error feedbacks

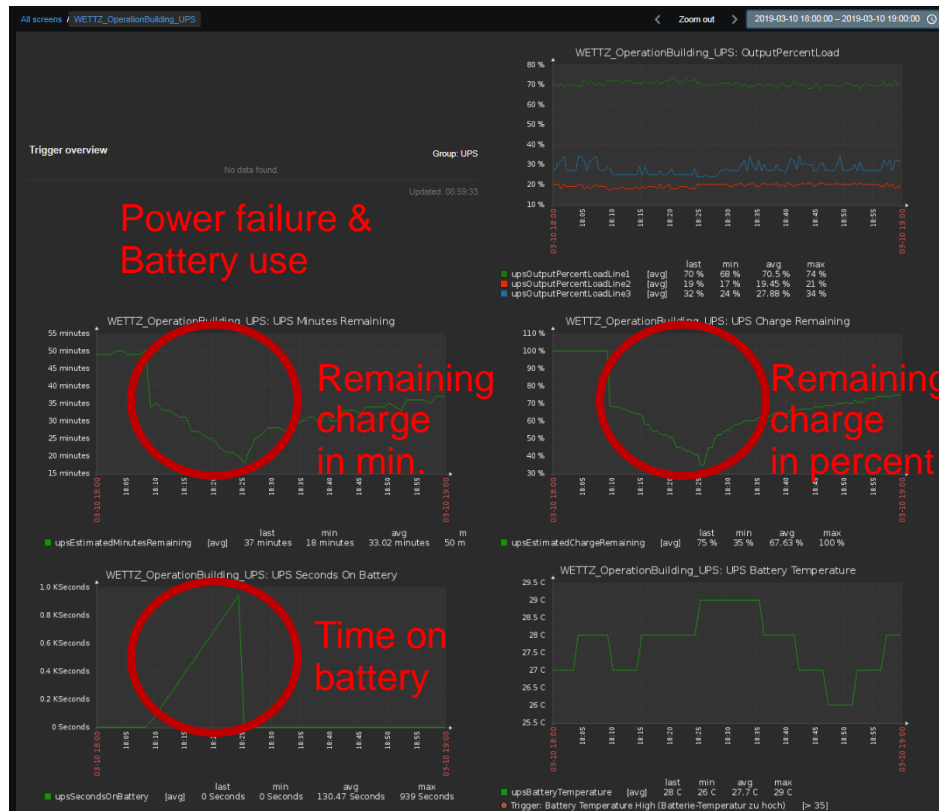
Benefit: Central alerting - Real alert scenario I (reconstruction)

Partial power blackout during storm "Eberhard" on March 10th, 2019
from 18:09 til 18:30 local time

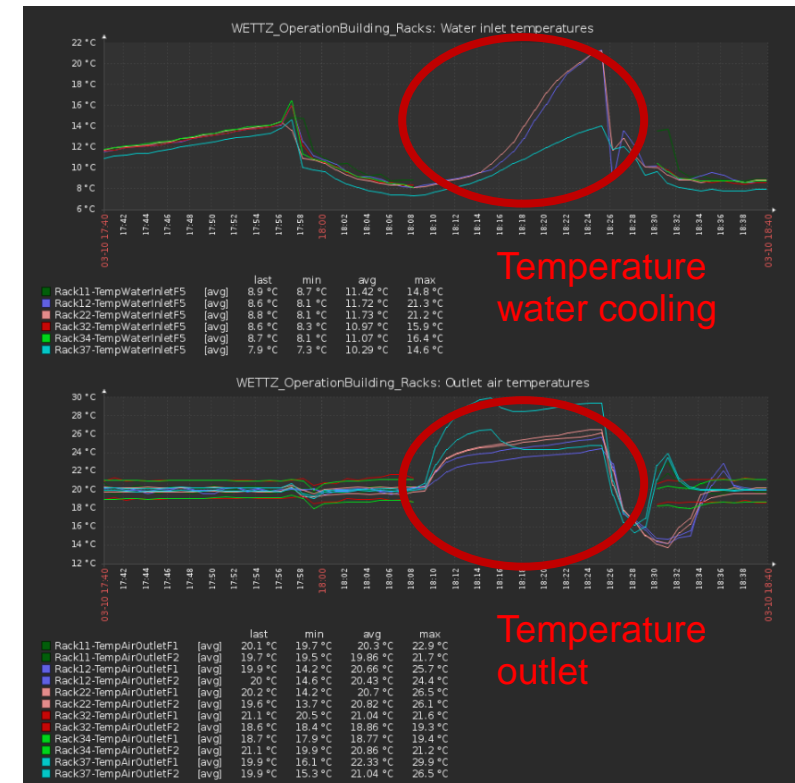
Time	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-03-10 18:09:37	High	2019-03-10 18:25:37	RESOLVED		WETTZ_OperationBuilding_UPS	Servers Are Running On Battery (Server laufen auf Batteriebetrieb)	16m	No		
2019-03-10 18:09:37	High	2019-03-10 18:10:37	RESOLVED		WETTZ_OperationBuilding_UPS	Input Line Failure Detected (Fehler in Eingangsleitung)	1m	No		

Displaying 2 of 2 found

UPS

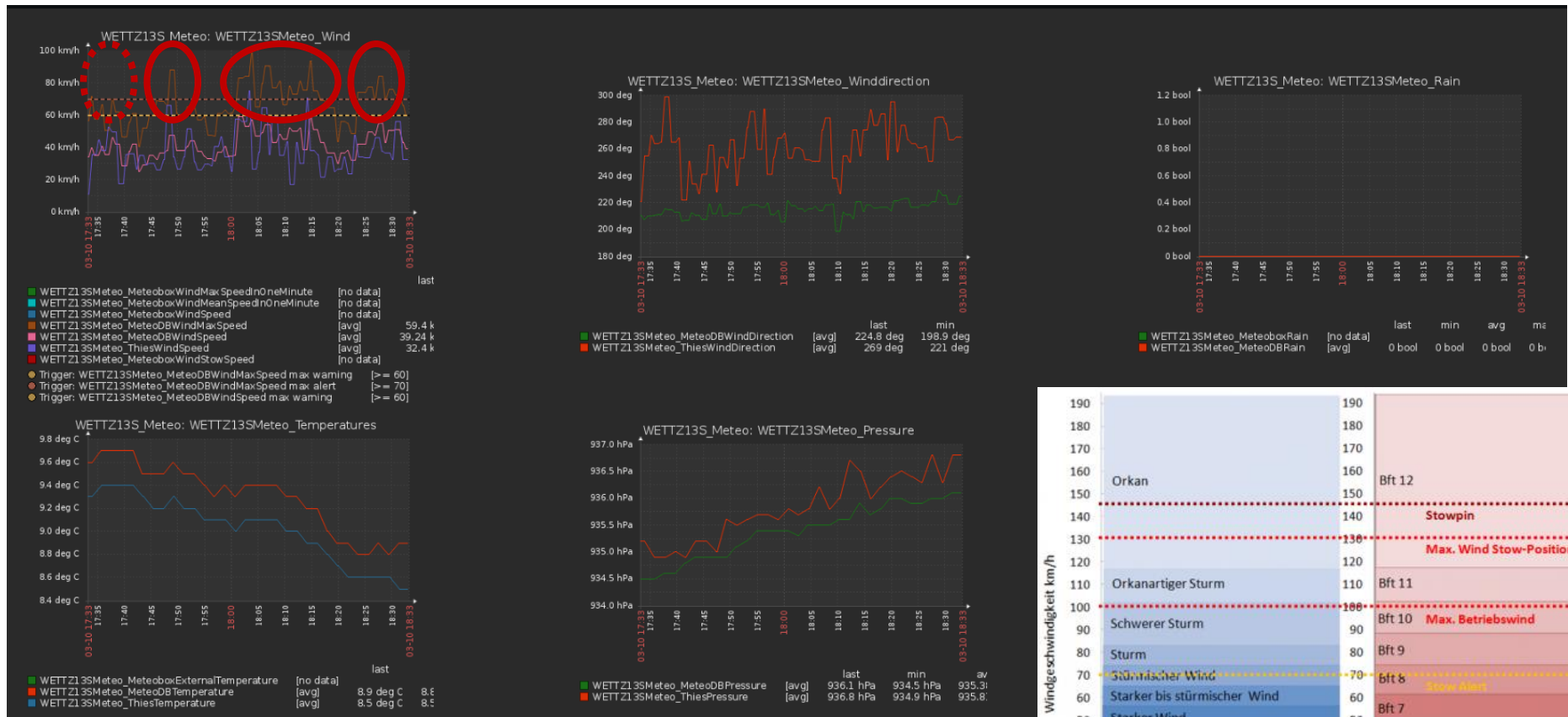


Cooling of the server racks



Benefit: Central alerting - Real alert scenario II

Wind stow warning during storm "Eberhard" on March 10th, 2019
from 18:09 til 18:30 local time



Benefit: Central alerting - Real alert scenario II

Wind stow warning during storm “Eberhard” on March 10th, 2019
from 18:09 til 18:30 local time

Time	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-03-10 18:41:24	Warning	2019-03-10 18:42:36	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_ThiesWindSpeed_max warning	1m 12s	No		
2019-03-10 18:41:19	High	2019-03-10 18:43:14	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	1m 55s	No		
2019-03-10 18:36:49	Warning	2019-03-10 18:43:54	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	7m 5s	No		
2019-03-10 18:36:49	High	2019-03-10 18:38:44	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	1m 55s	No		
2019-03-10 18:34:54	High	2019-03-10 18:36:13	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	1m 19s	No		
2019-03-10 18:34:18	Warning	2019-03-10 18:36:13	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	1m 55s	No		
2019-03-10 18:29:49	High	2019-03-10 18:32:24	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	2m 35s	No		
2019-03-10 18:27:54	High	2019-03-10 18:29:09	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	1m 15s	No		
2019-03-10 18:24:04	Warning	2019-03-10 18:32:59	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	8m 55s	No		
2019-03-10 18:24:04	High	2019-03-10 18:27:14	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	3m 10s	No		
2019-03-10 18:14:33	Warning	2019-03-10 18:15:10	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_ThiesWindSpeed_max warning	37s	No		
2019-03-10 18:14:33	High	2019-03-10 18:15:10	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_ThiesWindSpeed_max alert	37s	No		
2019-03-10 18:11:18	High	2019-03-10 18:17:03	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	5m 45s	No		
2019-03-10 18:06:10	Warning	2019-03-10 18:07:30	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_ThiesWindSpeed_max warning	1m 20s	No		
2019-03-10 18:06:09	High	2019-03-10 18:09:59	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	3m 50s	No		
2019-03-10 18:03:40	Warning	2019-03-10 18:04:16	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_ThiesWindSpeed_max warning	36s	No		
2019-03-10 18:03:40	High	2019-03-10 18:04:16	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_ThiesWindSpeed_max alert	36s	No		
2019-03-10 18:01:43	High	2019-03-10 18:04:53	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	3m 10s	No		
2019-03-10 17:57:54	Warning	2019-03-10 18:20:13	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	22m 19s	No		
2019-03-10 17:52:09	Warning	2019-03-10 17:54:04	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	1m 55s	No		
2019-03-10 17:48:55	High	2019-03-10 17:50:14	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	1m 19s	No		
2019-03-10 17:48:21	Warning	2019-03-10 17:49:39	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_ThiesWindSpeed_max warning	1m 18s	No		
2019-03-10 17:46:24	Warning	2019-03-10 17:50:50	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	4m 26s	No		
2019-03-10 17:41:55	Warning	2019-03-10 17:43:10	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	1m 15s	No		
2019-03-10 17:38:05	Warning	2019-03-10 17:40:00	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	1m 55s	No		
2019-03-10 17:38:05	High	2019-03-10 17:38:45	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	40s	No		
2019-03-10 17:36:10	Warning	2019-03-10 17:36:50	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	40s	No		
2019-03-10 17:34:15	Warning	2019-03-10 17:34:55	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max warning	40s	No		
2019-03-10 17:34:15	High	2019-03-10 17:34:55	RESOLVED		WETTZ13S_Meteo	WETTZ13SMeteo_MeteoDBWindMaxSpeed_max alert	40s	No		

Benefit: Central alerting – next steps

- Automatic safety mechanisms
 - Shutdown PCs and servers after specific UPS time interval
 - Activate automatic wind stow

 **Using error situations as feedback
for autonomous activities**

- Integrate tested scripts and programs for autonomy
 - Automatic session preparation with status feedback
 - Automatic startup and recorder selection
 - Automatic status emails and log file entries
 - e.g. WX (meteo): 50 percent coverage, no rain, light wind Bft 3*
- Detailed risk analysis
- ...

Benefit: Central alerting – Risk analysis / comparison

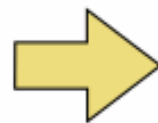
ALARP - as low as reasonably practicable

Risk matrix NOHL		Level of consequences			
		Light injuries	Medium injuries	Heavy injuries	Death or catastrophe
Probability	very low	1	2	3	4
	low	2	3	4	5
	medium	3	4	5	6
	high	4	5	6	7

With operator

Without operator ?

www.maschinen-sicherheit.net



- 1-2: Nothing to do
- 3-4: Risk reduction suggested
- 5-7: Risk reduction required

Goal

“Automating” the NASA Field System

Using the data from the monitored (NASA Field) System

Towards a data archive for seamless auxiliary data

Benefit: Central alerting at the guard of the Wettzell observatory

Conclusion

Conclusion

Central alerting is on a good way to come to a first usable mode

Central alerting showed several times its benefits

Central monitoring will be installed at JIVE ERIC soon

Adaption for automated NASA Field System tasks are on a good way

Almost each part with tested scripts/progs. now => bring them together

Autonomous operation (test) will hopefully follow this year

Thank you for your attention!!!

Being a VLBI operator ...

