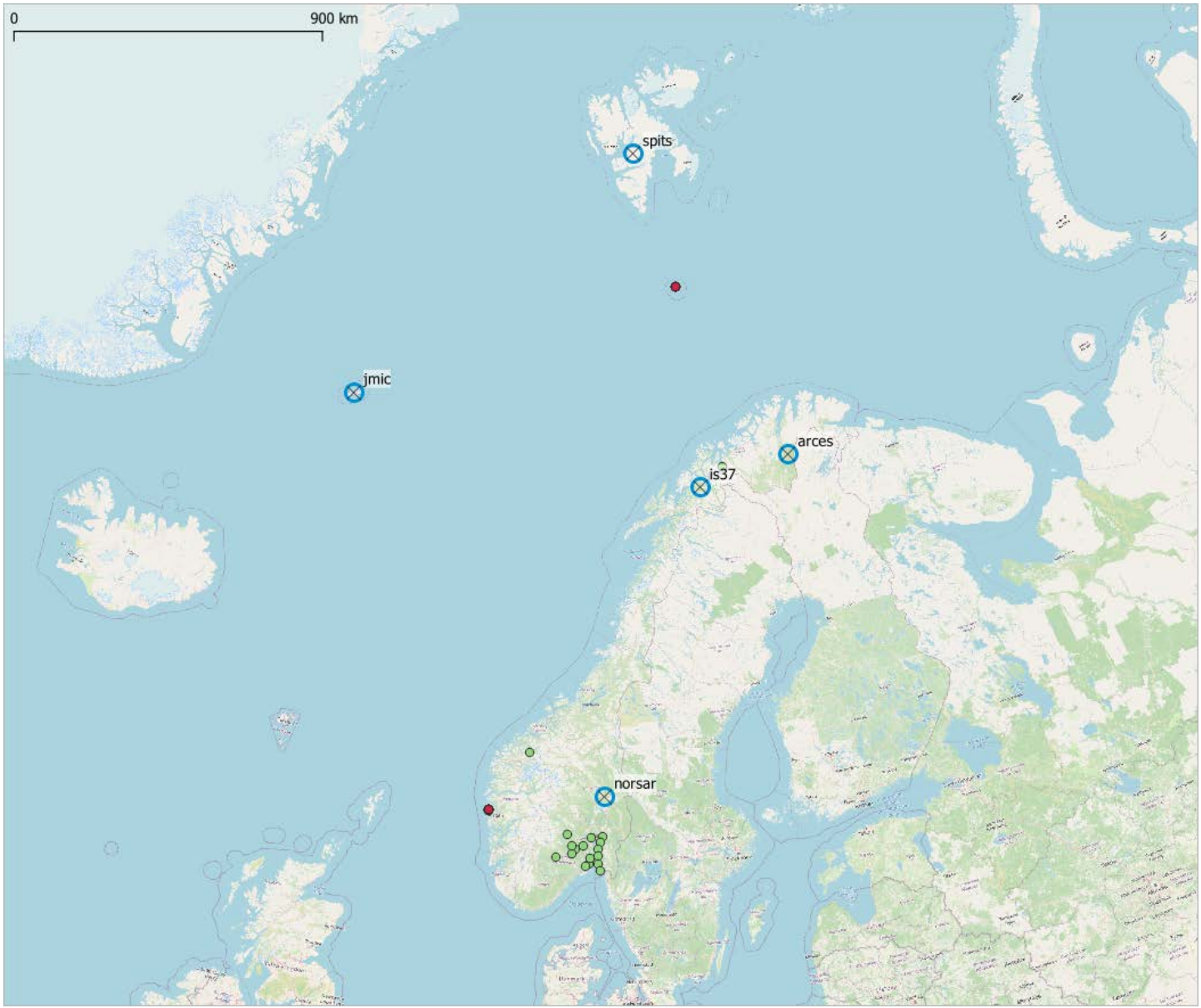


SoH monitoring at NORSAR

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NORSAR, NDC



NORSAR



- Until autumn 2018:
 - Using different systems, no logging
- Autumn 2018:
 - Started using an integrated system
- Spring 2019:
 - Logging all SoH monitoring in a data base



Nagios - Host and Service Status Details

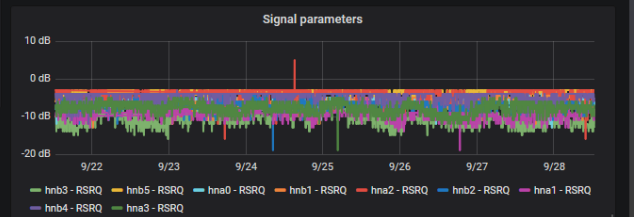
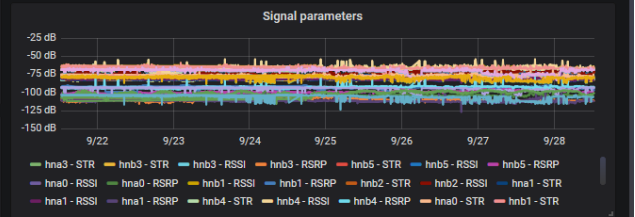
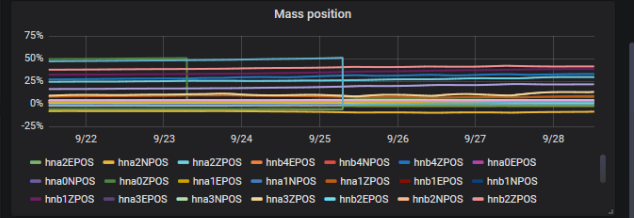
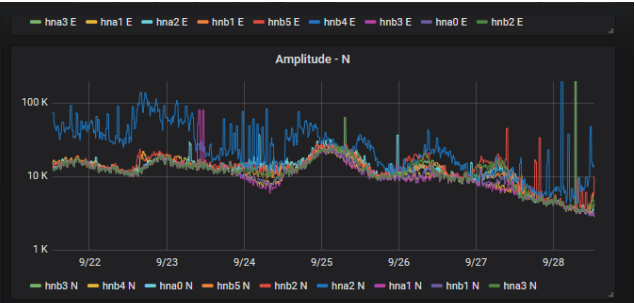
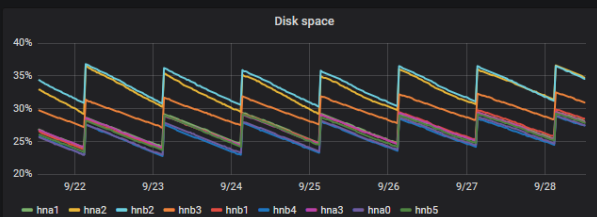
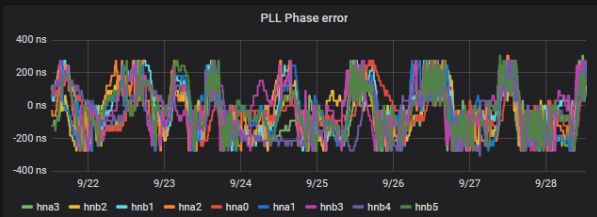
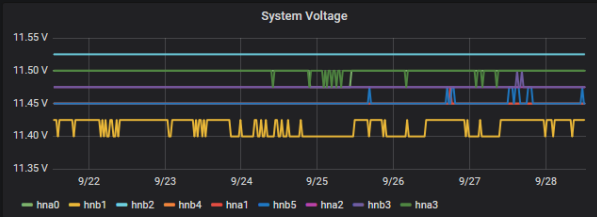
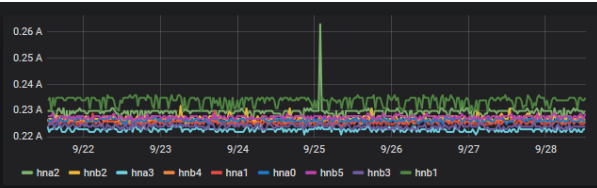
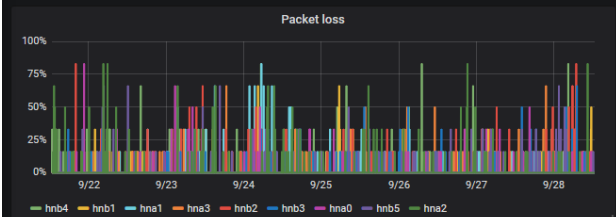
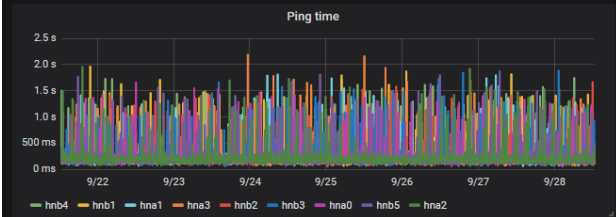
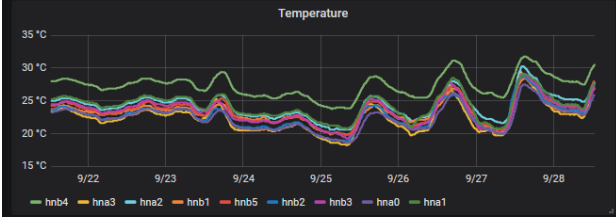
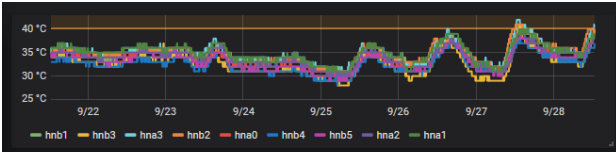
Last update: 2020/09/23 12:37:49 Hide acknowledged Hide unknown Hide warning Hide unreachable Hide new

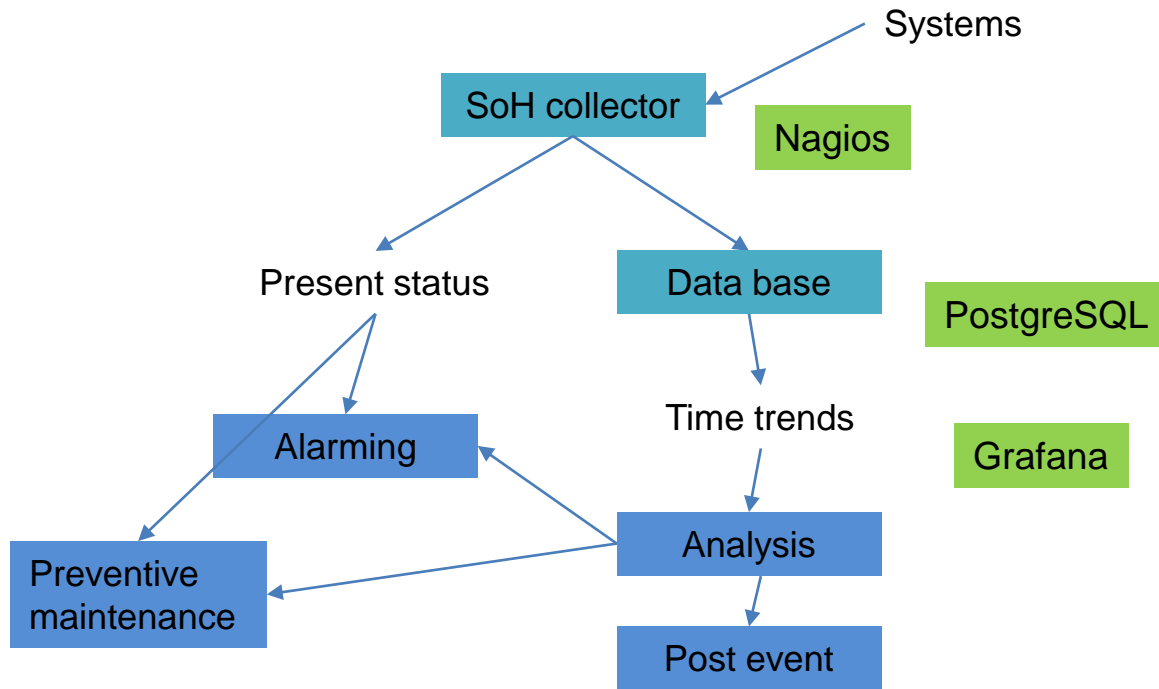
3 hosts down - 0 hosts unreachable - 4 services critical - 10 services warning - 5 services unknown

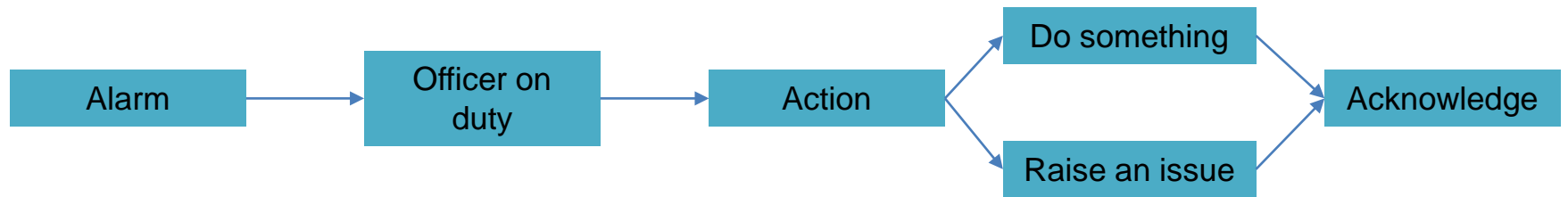
Host	Service	State	Problem start	Duration	Status information	Ack	
bea4		Down	2020/09/23 10:05:03	02:32:46		<input checked="" type="checkbox"/>	Digitizer tatt ned, returners til Kjeller
is37-lte		Down	2020/09/18 11:27:36	5d 01:10:13		<input checked="" type="checkbox"/>	LTE-modemet sendt til Kjeller for testing
ofsn6-digi		Down	2020/06/22 21:18:18	92d 15:19:31		<input checked="" type="checkbox"/>	Skadet instrument, tatt ned
divk	TTA_hfa1	Critical	2020/08/08 02:04:29	46d 10:33:20	ARRIVAL = No data	<input checked="" type="checkbox"/>	Har kontaktet Hagfors
divk	TTA_hfa2	Critical	2020/06/22 21:24:18	92d 15:13:31	ARRIVAL = No data	<input checked="" type="checkbox"/>	Problem med strømforsyning
kon08	GPSSTATUS	Critical	2020/09/06 03:28:50	17d 09:08:59	Satellites in use = 0 or more	<input checked="" type="checkbox"/>	Mistet intern kontakt med GPSmodul. Må til reparasjon
nc405	SystemCurrent	Critical	2020/08/26 09:16:53	28d 03:20:56	System current:3.84 A	<input checked="" type="checkbox"/>	Feil med strømmåling
cproc1	DELAY_dps_noa	Warning	2020/09/21 10:36:46	2d 02:01:03	dps_noa = 181970 sek	<input type="checkbox"/> ack	
cproc1	DELAY_dps_ksrs	Warning	2020/09/21 03:50:55	2d 08:46:54	dps_ksrs = 205130 sek	<input type="checkbox"/> ack	
cproc1	DELAY_dps_mja	Warning	2020/09/21 02:20:33	2d 10:17:16	dps_mja = 210550 sek	<input type="checkbox"/> ack	
divk	TTA_hfb2	Warning	2020/09/23 12:05:45	00:32:04	ARRIVAL = 2530 sek	<input type="checkbox"/> ack	Klokkefeil
kon08	TTA	Warning	2020/06/29 05:00:30	86d 07:37:19	ARRIVAL = 982 sek	<input checked="" type="checkbox"/>	Følgefeil av GPSSTATUS
nb2-asa	SIGNAL	Warning	2020/09/23 11:18:02	01:19:47	SIGNAL = -40.5 dBm	<input type="checkbox"/> ack	
nb201	CTVDOOR	Warning	2020/09/22 18:12:02	18:25:47	CTVDOOR = 1	<input type="checkbox"/> ack	
nc303	CTVDOOR	Warning	2020/09/22 18:13:00	18:24:49	CTVDOOR = 1	<input type="checkbox"/> ack	
nc405	CTVDOOR	Warning	2020/09/22 21:54:15	14:43:34	CTVDOOR = 1	<input type="checkbox"/> ack	
nc605	GPSSTATUS	Warning	2020/09/23 12:24:47	00:13:02	GPS fix:2D fix	<input type="checkbox"/> ack	

Nagios - Hostgroup summary - Status summary - Grafana - Processmap - Dashboard





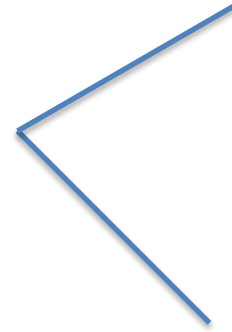






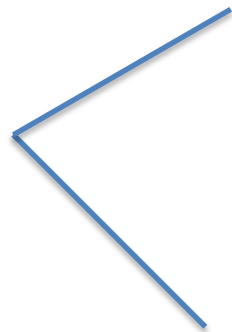
SoH parameters

Mainly alarms



- Process status
- Data delay
- Host down
- Disk space
- GPS failure
- Communication link type
- Login failure
- Door open

Mainly logging



- Communication parameters
- Voltage
- Power consumption
- Temperature
- Timing data
- Signal amplitude
- Auxilliary processes



Experiences so far

- Good to have all alarms and logging through one system
- Need to tweak alarm levels
- Need to write scripts
- Alarm policy makes it easier to decide on what and when to alarm



Future development

- Signal quality parameters
- Water ingress monitoring
- Battery capacity monitoring
- More use of data
 - Automatic reporting
 - Time trend analysis
 - Predictive maintenance

need feedback from seismologists

may need extra hardware





NORSAR

Exploring the Earth



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