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Netherlands Institute for Radio Astronomy

LOFAR2.0 Monitoring and Control Status Update

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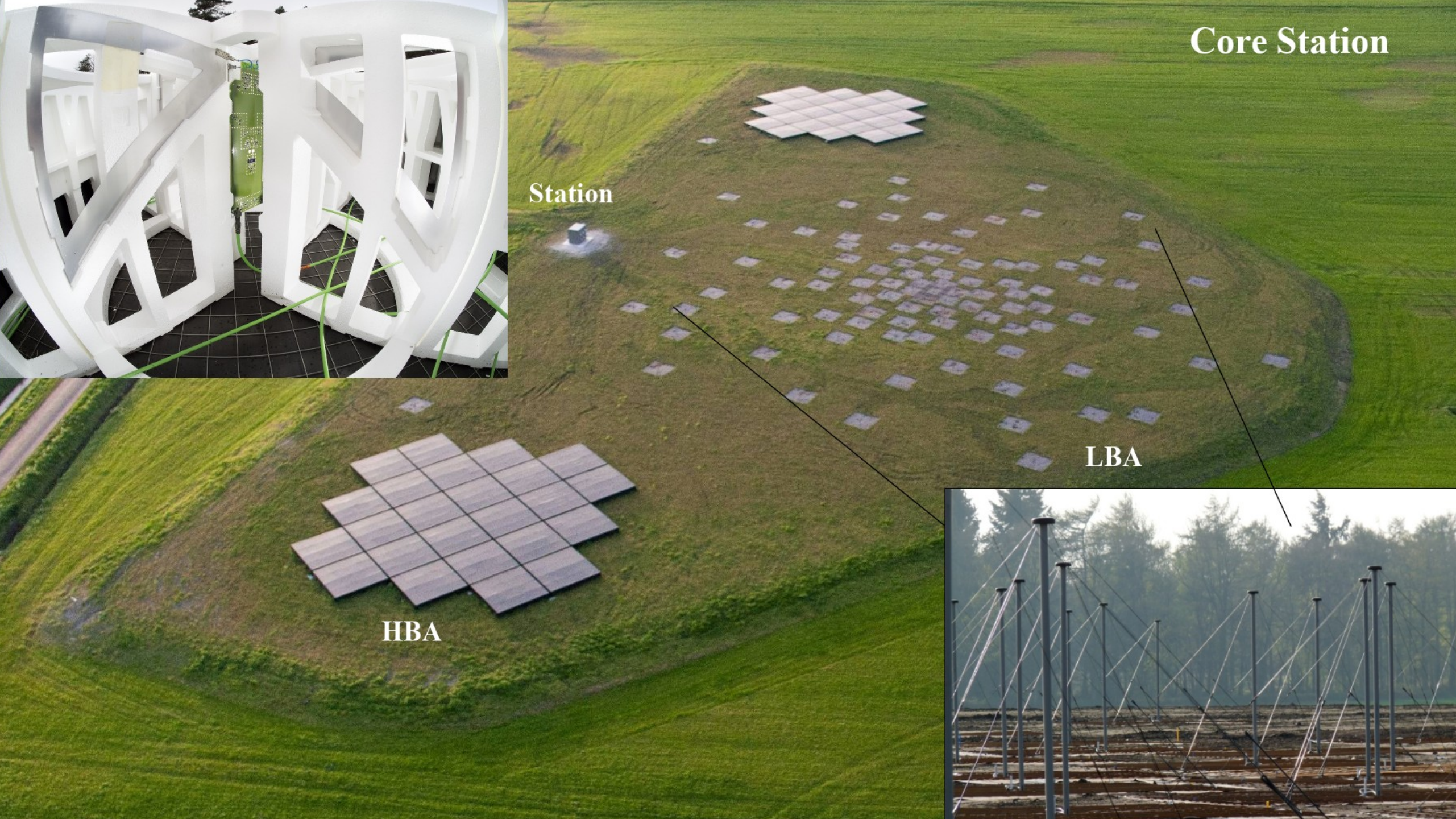
Corne Lukken (Dantali0n, PD3SU)

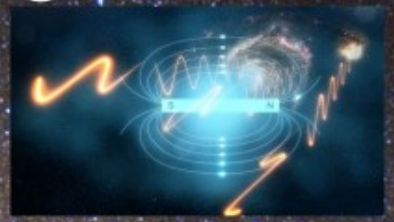
Contents

- What is LOFAR
- LOFAR2.0
  - Hardware
  - Data Flow (Astronomical Data Products)
  - Software Components
  - Demonstration


Onsala
Birr
Irbene
Dutch stations
Chilbolton
Norderstedt
Bałdy
Potsdam
Borówiec
Jülich
Effelsberg
Tautenburg
Łazy
Nançay
Unterweilenbach
Medicina
Rozhen


Core Station
Station
LBA
HBA

Cosmic magnetism



Supermassive black holes

Early Universe

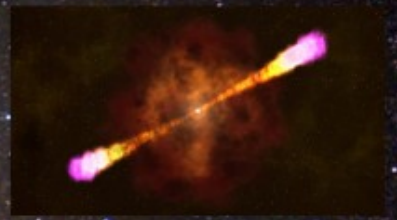
Supernovae

Galaxy clusters

Sun

Pulsars

Gravitational wave events



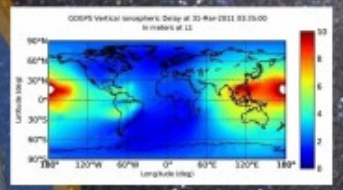
Solar System Planets

Meteors

Nearby galaxies

Cosmic rays

Ionosphere

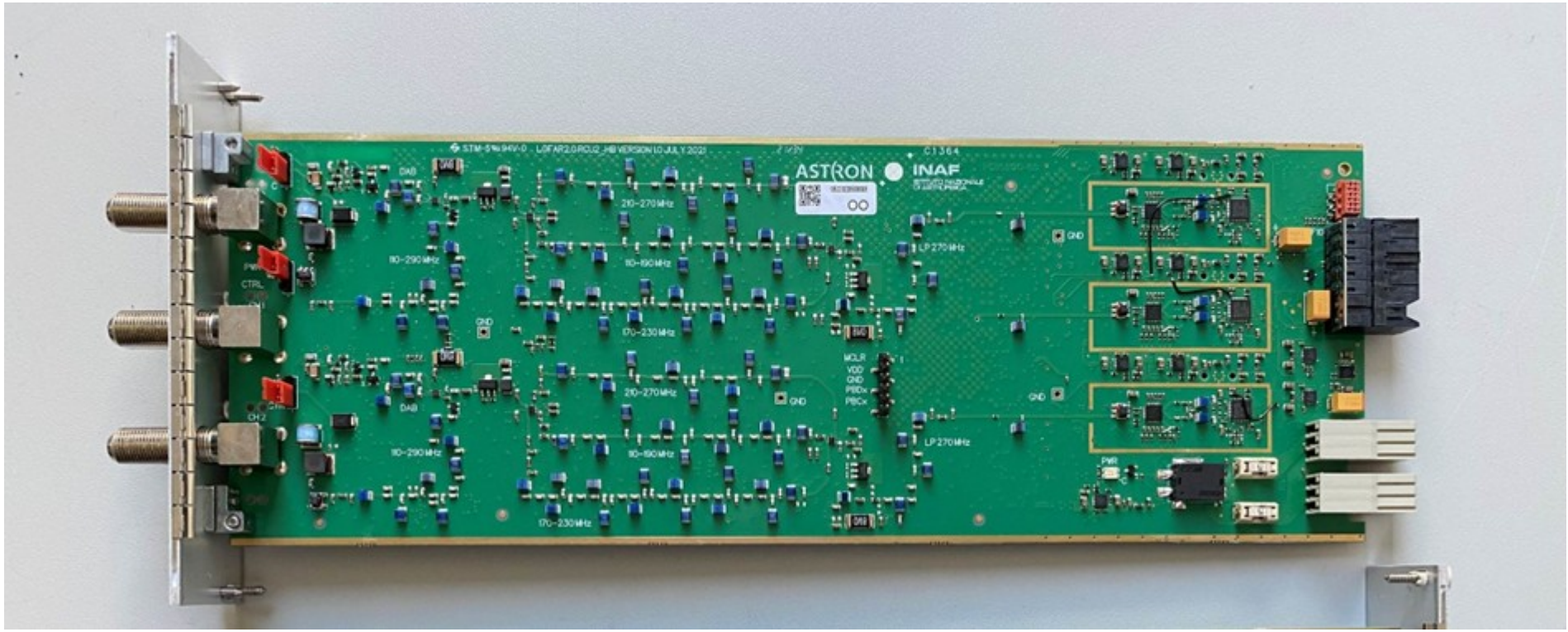


Interstellar medium

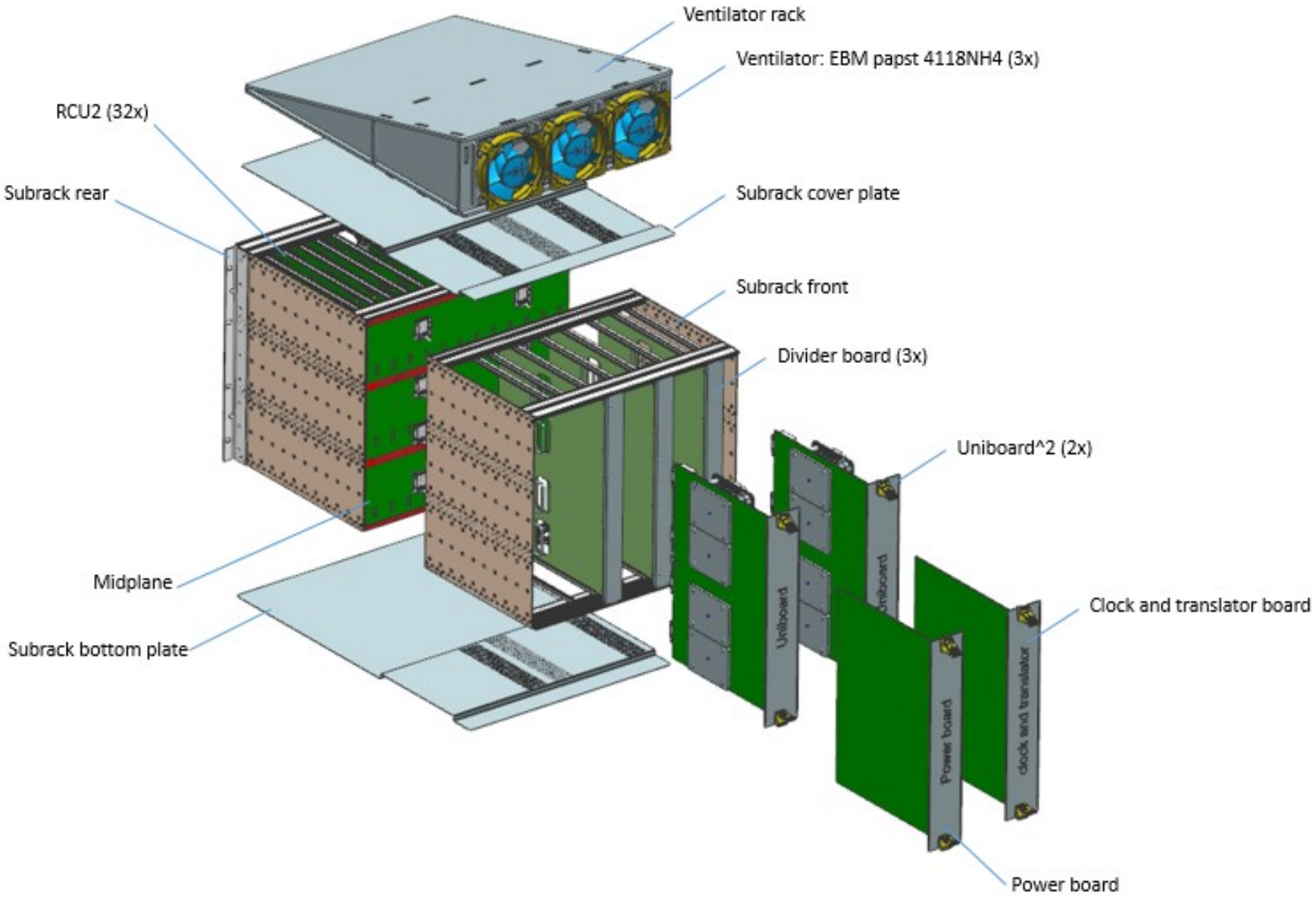
Lightning

Space weather

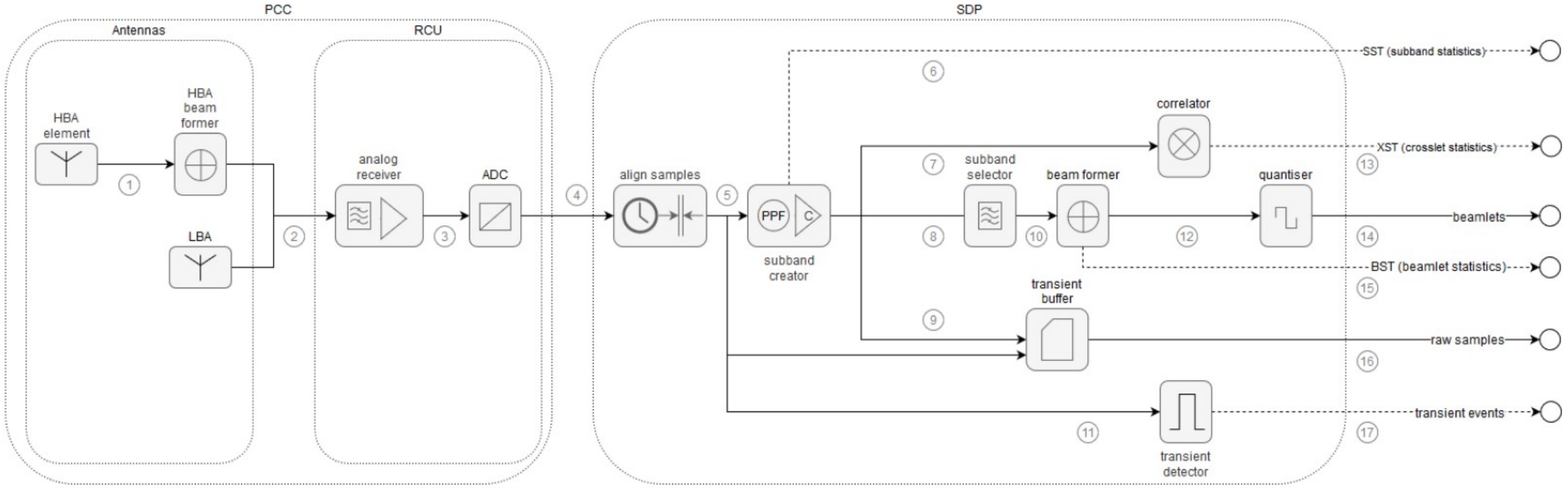
Hardware



Hardware


Ventilator rack
Ventilator: EBM papst 4118NH4 (3x)
RCU2 (32x)
Subrack rear
Subrack cover plate
Subrack front
Divider board (3x)
Uniboard^2 (2x)
Midplane
Clock and translator board
Subrack bottom plate
Power board
Uniboard
Uniboard
Power board
clock and translator

Data flow - Station



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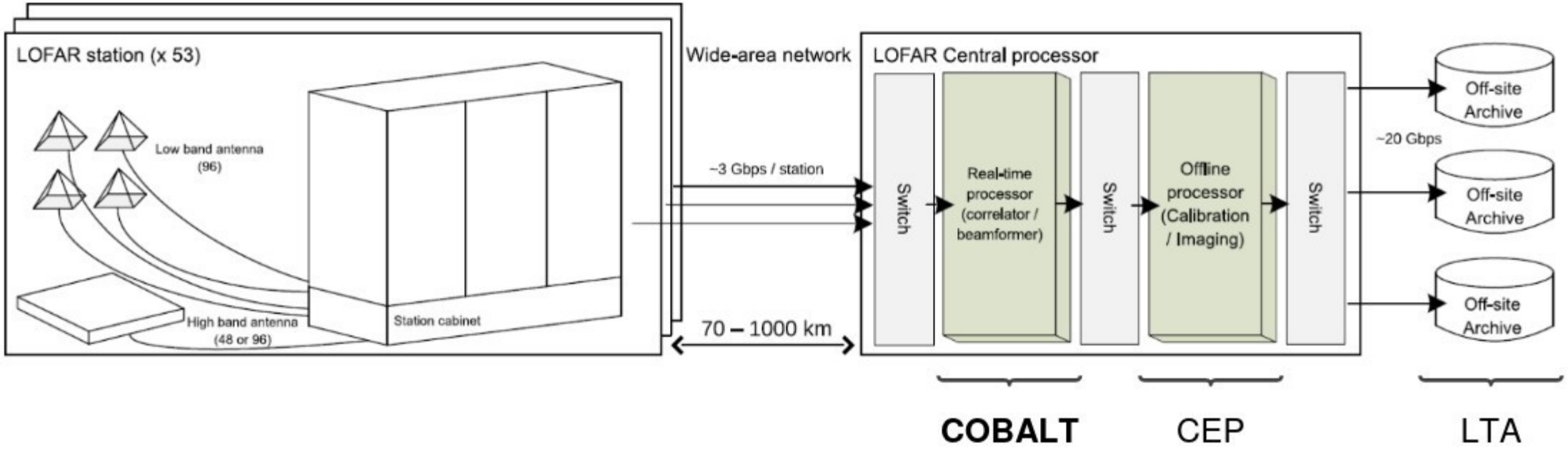
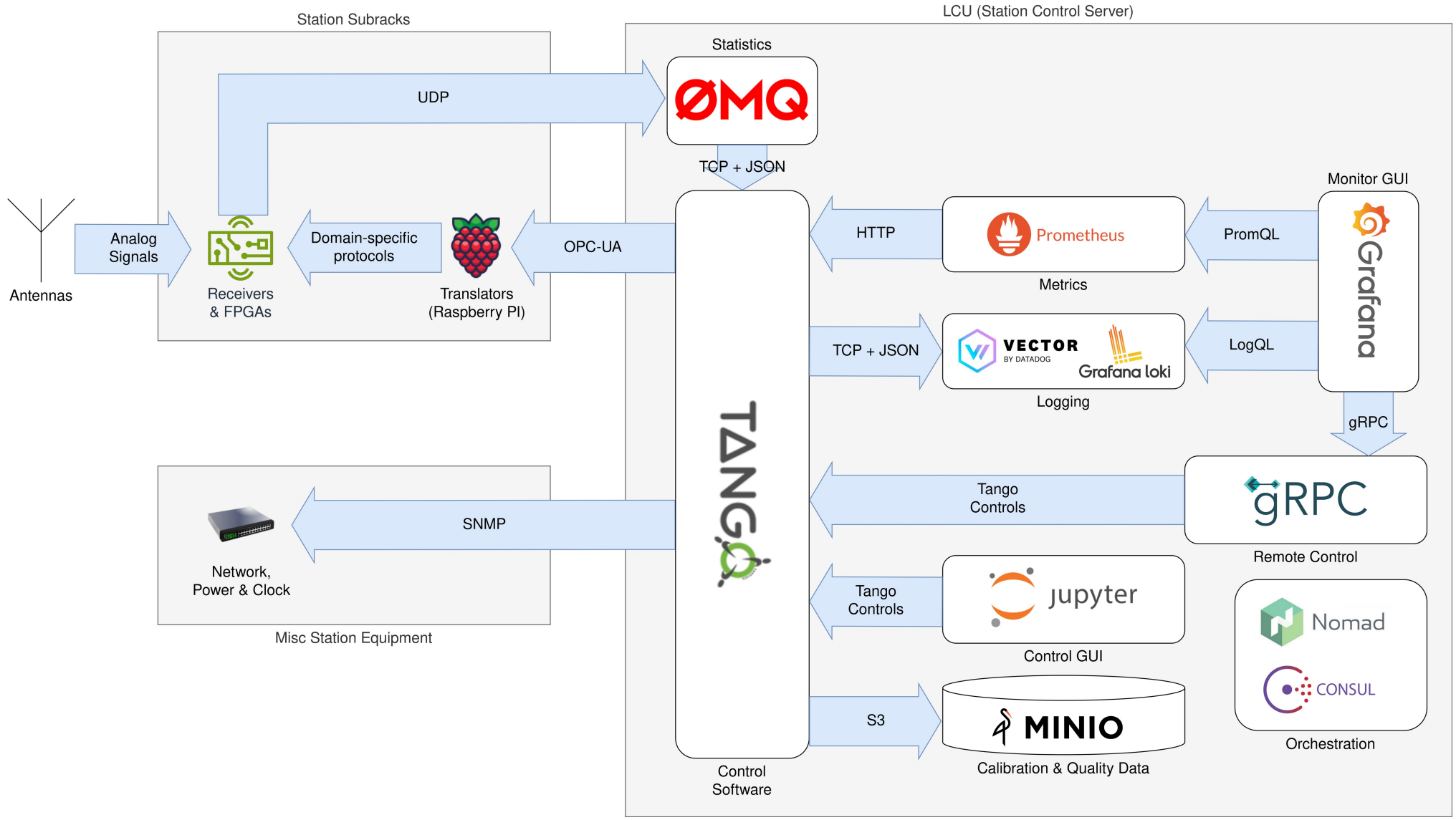
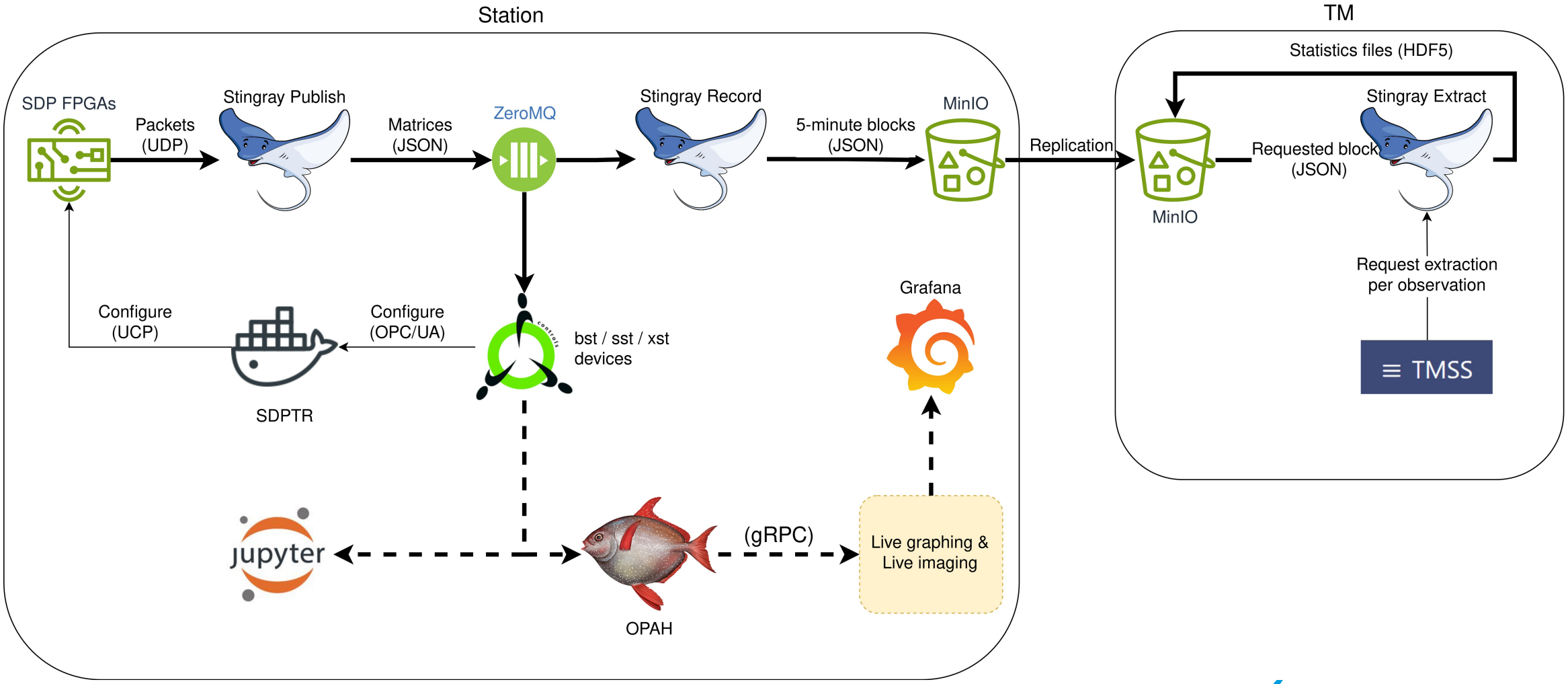
Data flow - Central



Software Components - Station



Software Components - Statistics



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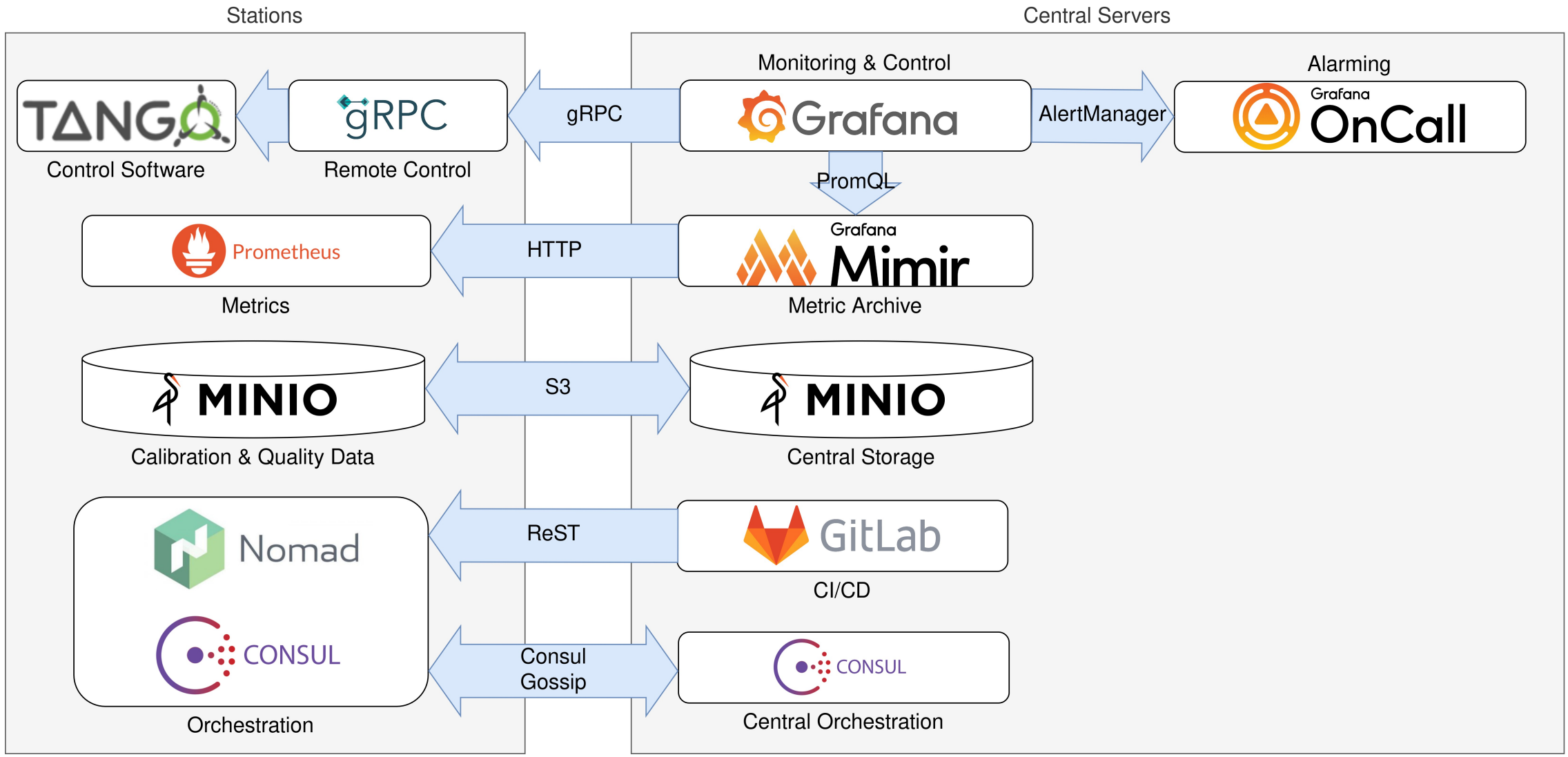
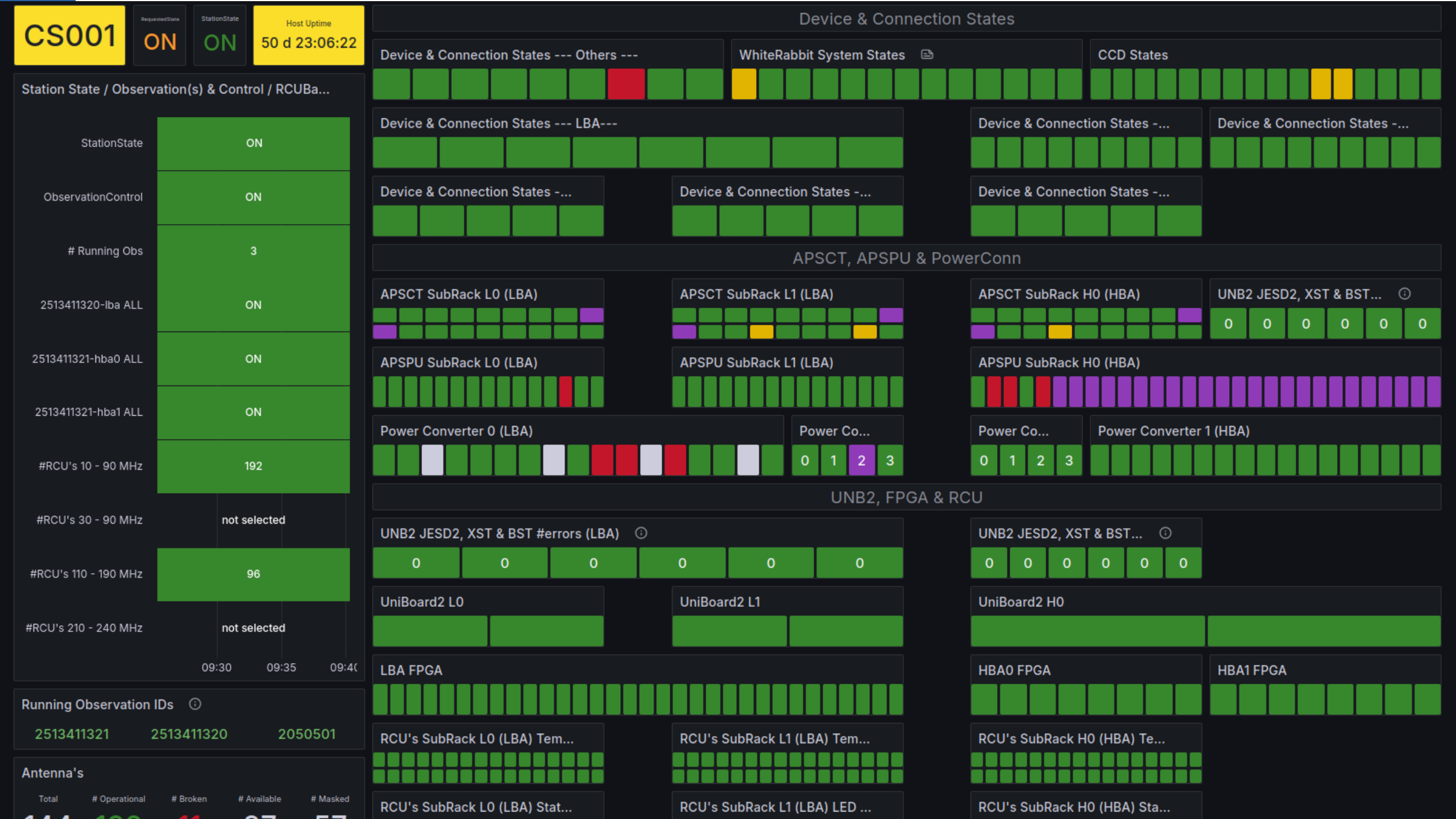
Software Components - Central




CS001
RequestedState
ON
StationState
ON
Host Uptime
50 d 23:06:22
Station State / Observation(s) & Control / RCUBa...
StationState
ON
ObservationControl
ON
Running Obs
3
2513411320-lba ALL
ON
2513411321-hba0 ALL
ON
2513411321-hba1 ALL
ON
#RCU's 10 - 90 MHz
192
#RCU's 30 - 90 MHz
not selected
#RCU's 110 - 190 MHz
96
#RCU's 210 - 240 MHz
not selected
09:30
09:35
09:40
Running Observation IDs
2513411321
2513411320
2050501
Antenna's
Total
Operational
Broken
Available
Masked
Device & Connection States
Device & Connection States --- Others ---
WhiteRabbit System States
CCD States
Device & Connection States --- LBA---
Device & Connection States -...
Device & Connection States -...
Device & Connection States -...
Device & Connection States -...
Device & Connection States -...
APSCT, APSPU & PowerConn
APSCT SubRack L0 (LBA)
APSCT SubRack L1 (LBA)
APSCT SubRack H0 (HBA)
UNB2 JESD2, XST & BST...
0 0 0 0 0 0
APSPU SubRack L0 (LBA)
APSPU SubRack L1 (LBA)
APSPU SubRack H0 (HBA)
Power Converter 0 (LBA)
Power Co...
0 1 2 3
Power Co...
0 1 2 3
Power Converter 1 (HBA)
UNB2, FPGA & RCU
UNB2 JESD2, XST & BST #errors (LBA)
0 0 0 0 0 0
UNB2 JESD2, XST & BST...
0 0 0 0 0 0
UniBoard2 L0
UniBoard2 L1
UniBoard2 H0
LBA FPGA
HBA0 FPGA
HBA1 FPGA
RCU's SubRack L0 (LBA) Tem...
RCU's SubRack L1 (LBA) Tem...
RCU's SubRack H0 (HBA) Te...
RCU's SubRack L0 (LBA) Stat...
RCU's SubRack L1 (LBA) LED ...
RCU's SubRack H0 (HBA) Sta...

tationTempMap

PowerConverter 0 (LBA)

Temperature

Module 0 35.00 °C

Module 1 35.00 °C

Module 2 No Data -1

Module 3 36.00 °C

. . L0 SubRack

ON & CONNECTED

L0 Fanspeed

FAN 1 : 1920.93 rpm

FAN 2 : 6030.88 rpm

FAN 3 : 6241.49 rpm

APSPU L0 (Segment 0)

ON & CONNECTED

Temperature

LBA : 57.75 °C

RCU2A : 79.75 °C

RCU2D : 64.50 °C

APSCT L0

ON & CONNECTED

40.32 °C

L0 RCU

suspicious

32

Temp : 0

L0 UNB 0/1

ON & CONNECTED

ON & CONNECTED

. . L1 SubRack

ON & CONNECTED

L1 Fanspeed

FAN 1 : 6115.30 rpm

FAN 2 : 6003.26 rpm

FAN 3 : 6115.30 rpm

APSPU L1 (Segment 0)

ON & CONNECTED

Temperature

LBA : 63.00 °C

RCU2A : 85.25 °C

RCU2D : 70.25 °C

APSCT L1

ON & CONNECTED

44.48 °C

L1 RCU

suspicious

32

Temp : 0

L1 UNB 0/1

ON & CONNECTED

ON & CONNECTED

LBA AntennaField

FPGA suspicious

16

Temp : 0

System :

Peripheral :

NIC :

CPU :

CPU VRMIN :

CPU VRMON :

CPU VRMHV :

DIMMA-D :

DIMME-H :

PCH :

MS_SSD1 :

PowerConverter 1 (HBA)

Temperature

Module 0 36.00 °C

. . H0 SubRack

ON & CONNECTED

H0 Fanspeed

APSPU H0 (Segment 0)

ON & CONNECTED

Temperature

LBA : No Data Null

RCU2A : No Data Null

RCU2D : No Data Null

APSCT H0

ON & CONNECTED

H0 RCU

suspicious

32

HBA(0/1) AntennaField

FPGA suspicious

8

Temp : 0

Grafana + gRPC + plotly = Live Graphs

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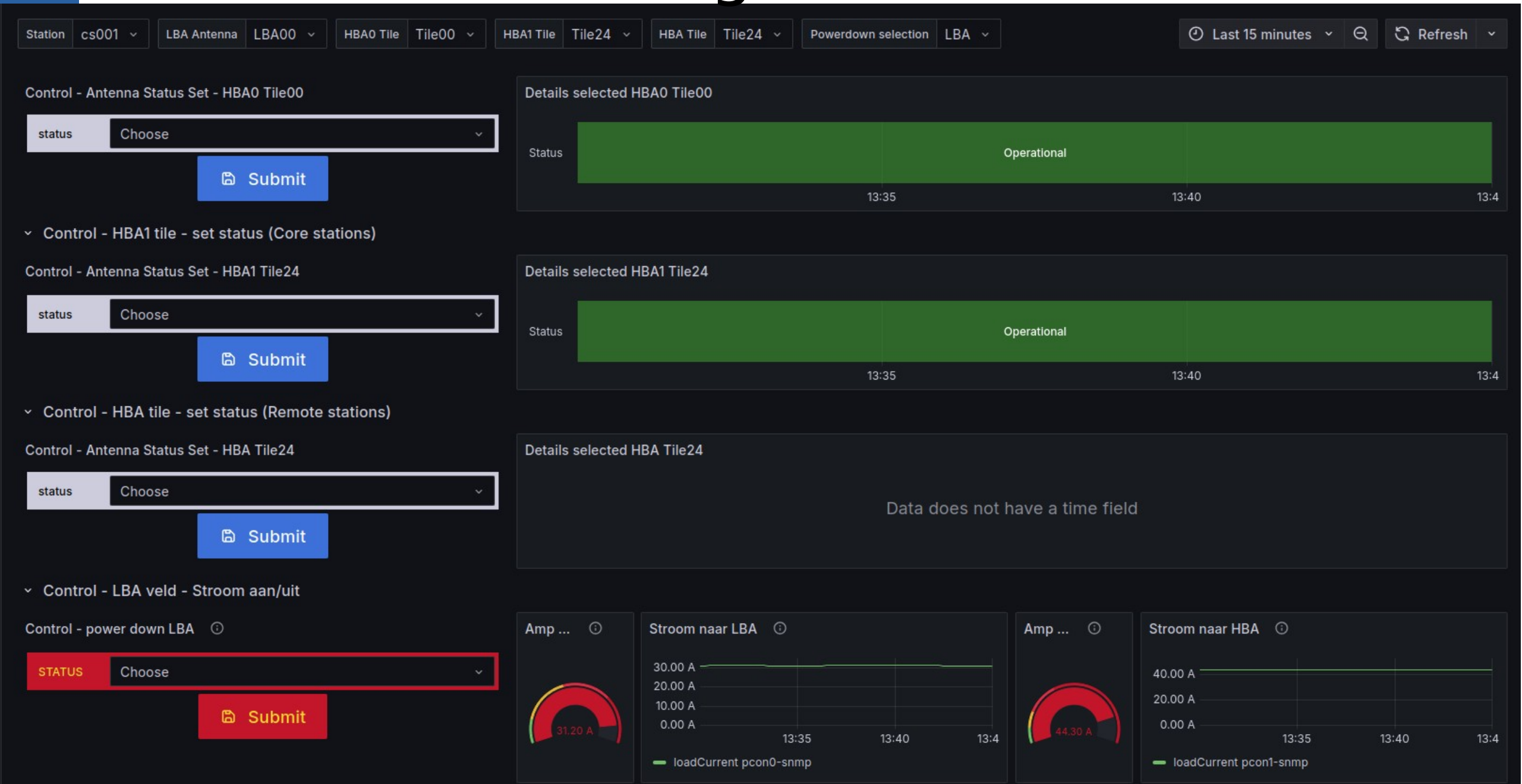
Grafana + gRPC + plotly = Live Graphs

Grafana + innius gRPC = Control




Birr
Dutch stations
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Potsdam
Borówiec
Łazy
Nançay
Medicina
LOFAR
ERIC

The end

Thanks to the team!

- Jorrit Schaap
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