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Netherlands Institute for Radio Astronomy

LOFAR is ready to Tango

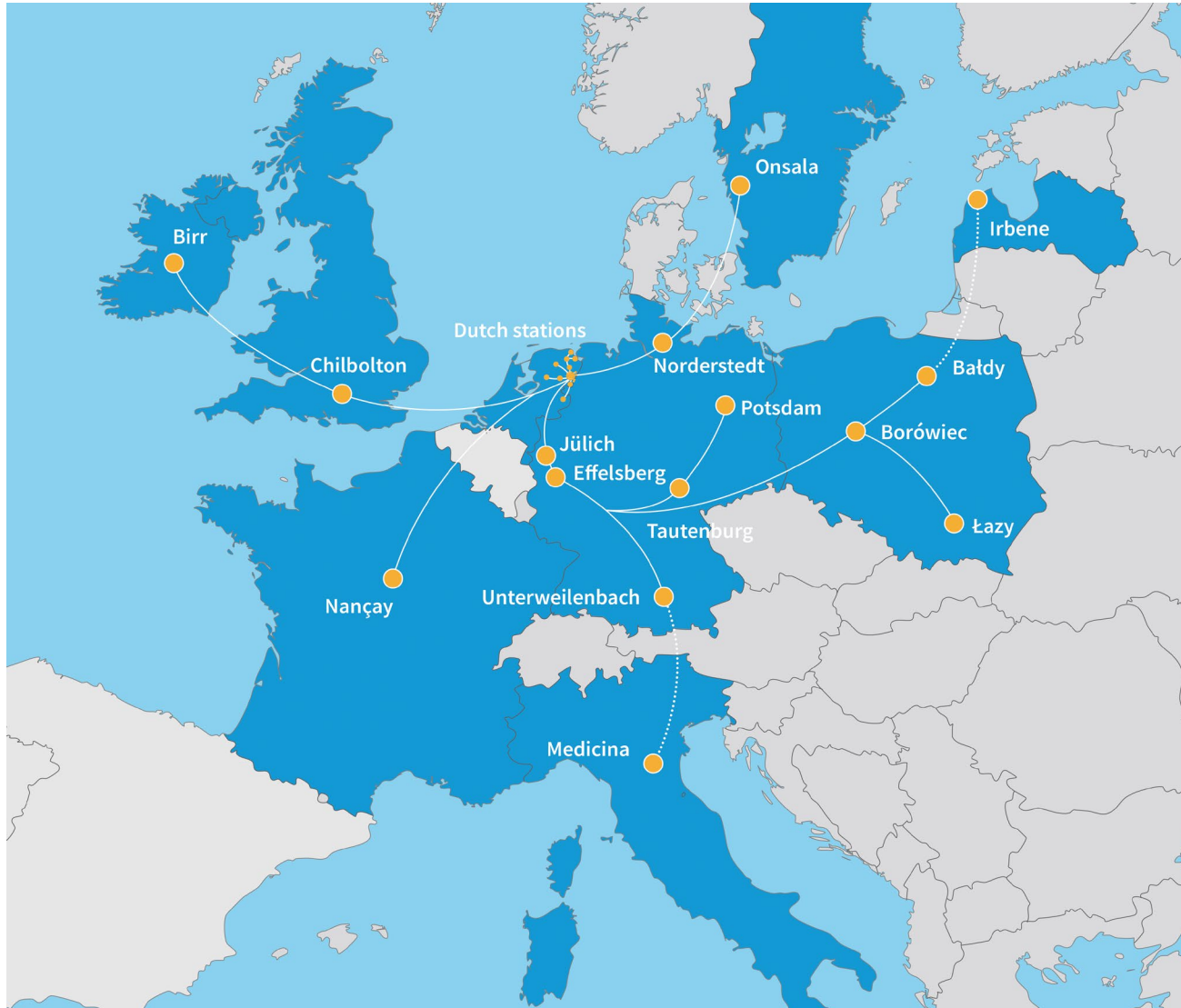
Jan David Mol, Thomas Jürges, Arno Schoenmakers, Lars Venema
Tango 2020 November Status Update Meeting

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LOFAR



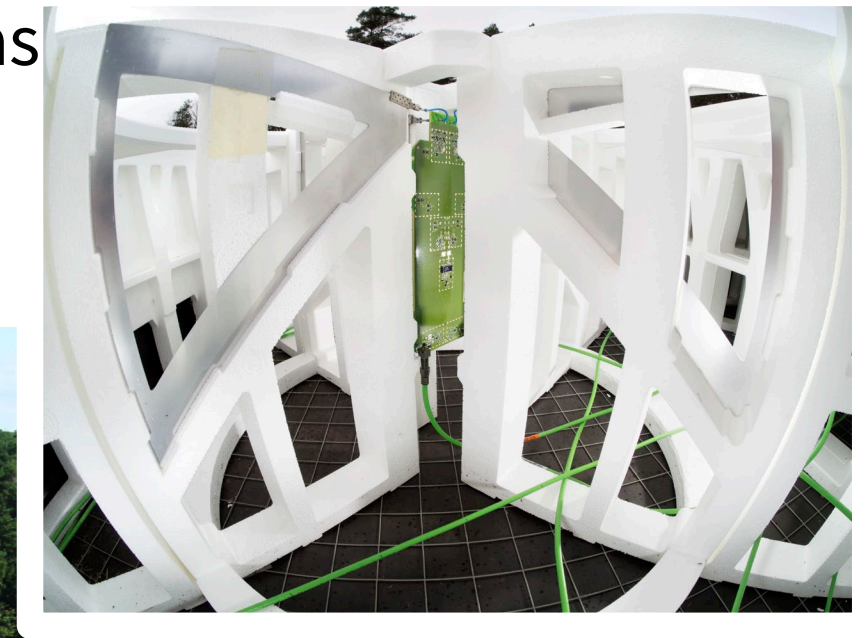
- 10 – 270 MHz
- 38 Dutch stations + 14 Intl
 - EU and non-EU now...
- Central Processing
 - 225 – 390 Gbit/s input
 - GPU & CPU clusters (NL)
- Archives
 - ~20PB
 - 3 locations (NL, DE, PL)



LOFAR

LOFAR Station

- 96 low-band antennas
- 48-96 high-band tiles
- Digital processor

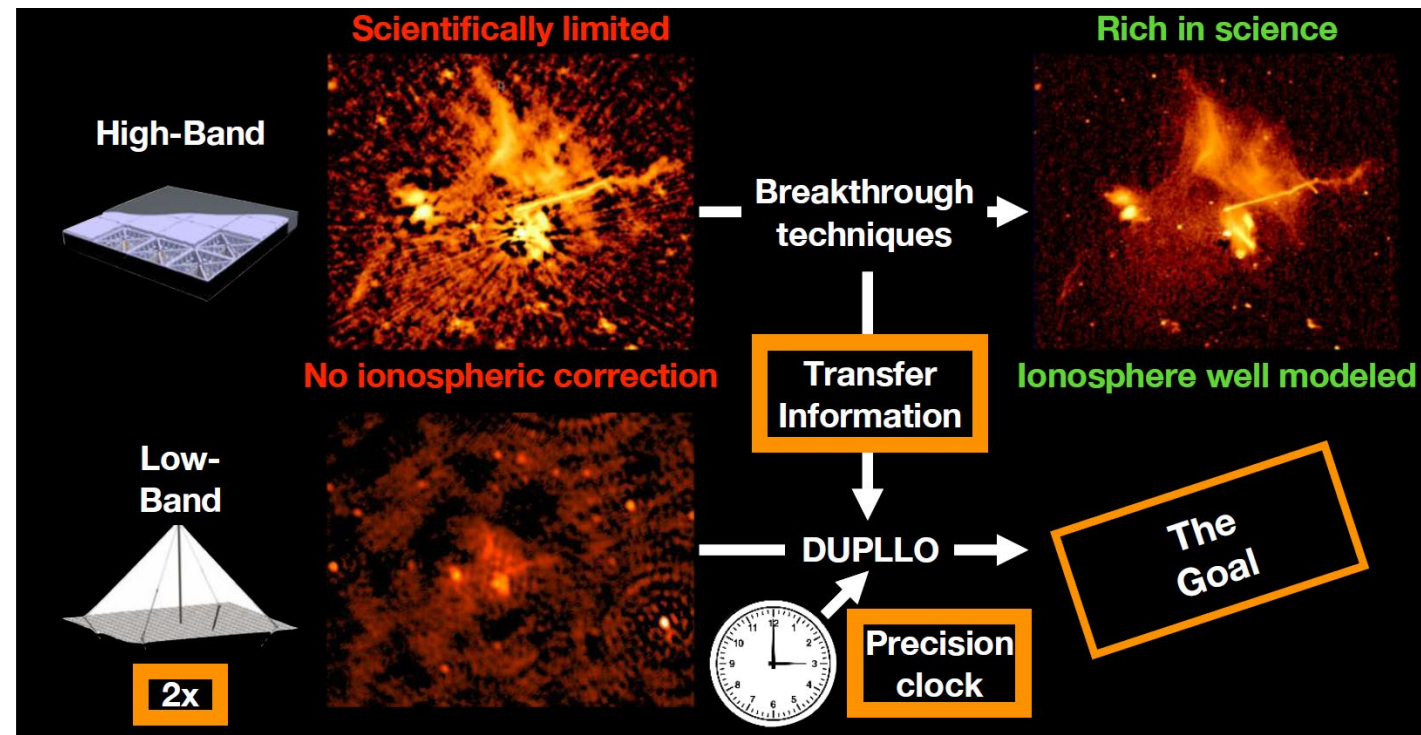
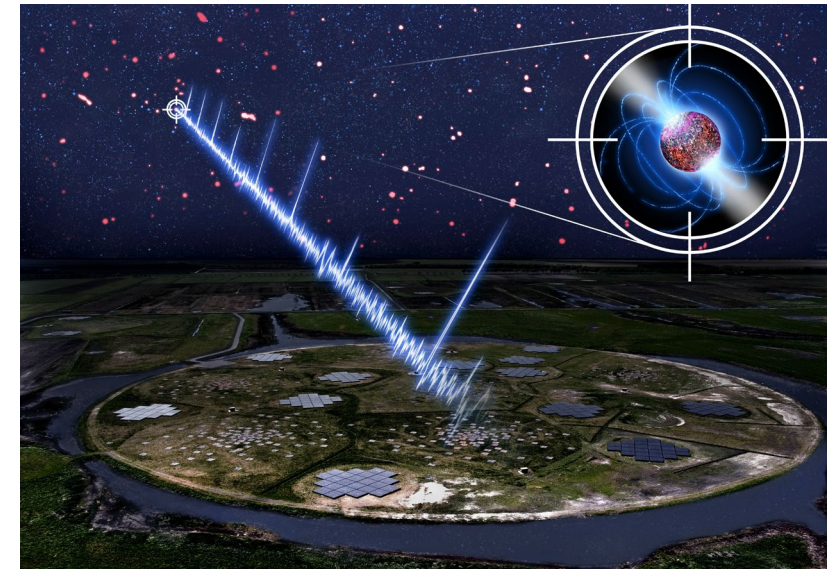


LOFAR Superterp

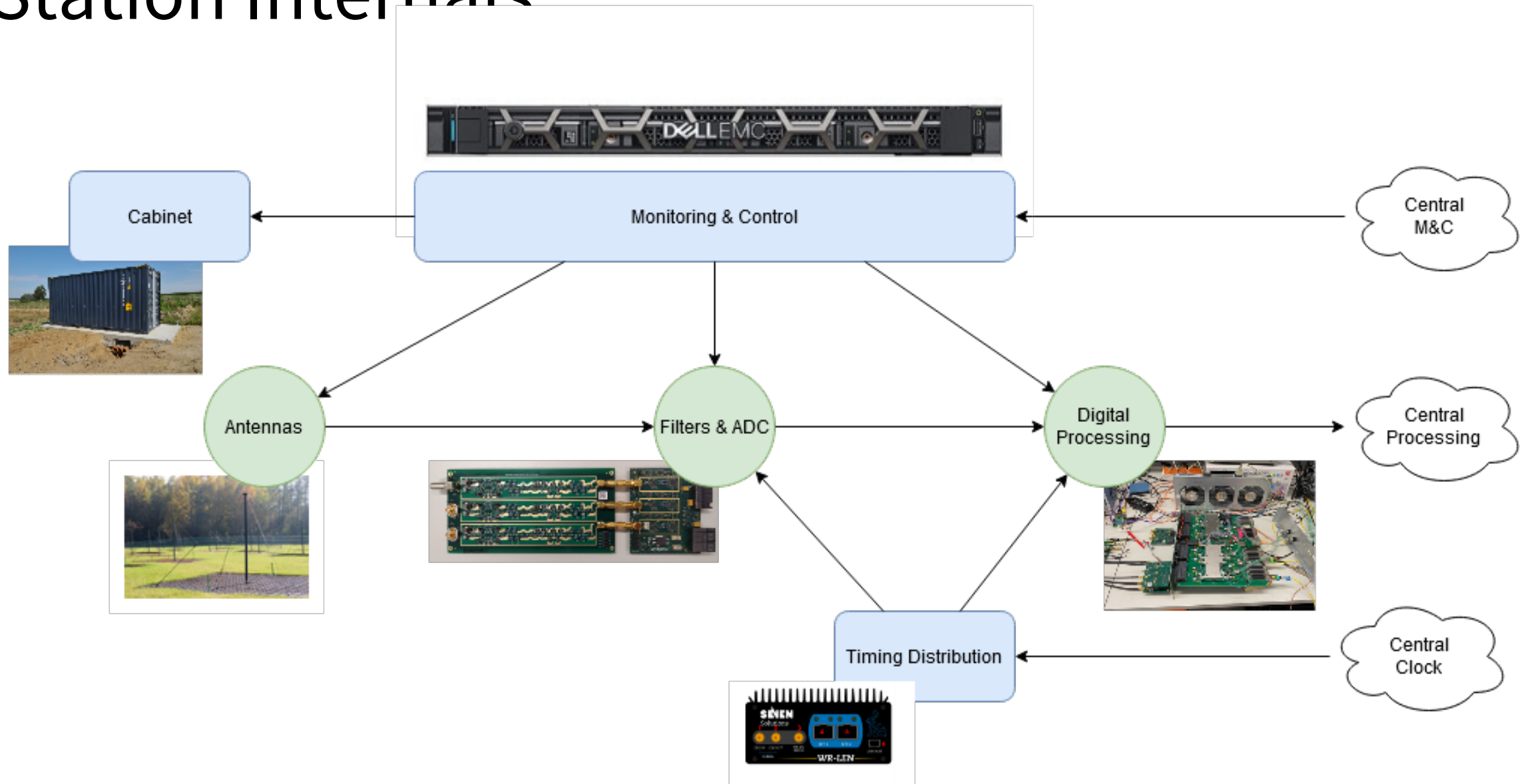


LOFAR 2.0

- Upgrade to new generation
 - Software & hardware
 - *Tango Controls as new monitoring & control system*
- Stations first
 - All inputs simultaneously
 - 2-3x increase
- Deployment: 2022 - 2023



Station Internals



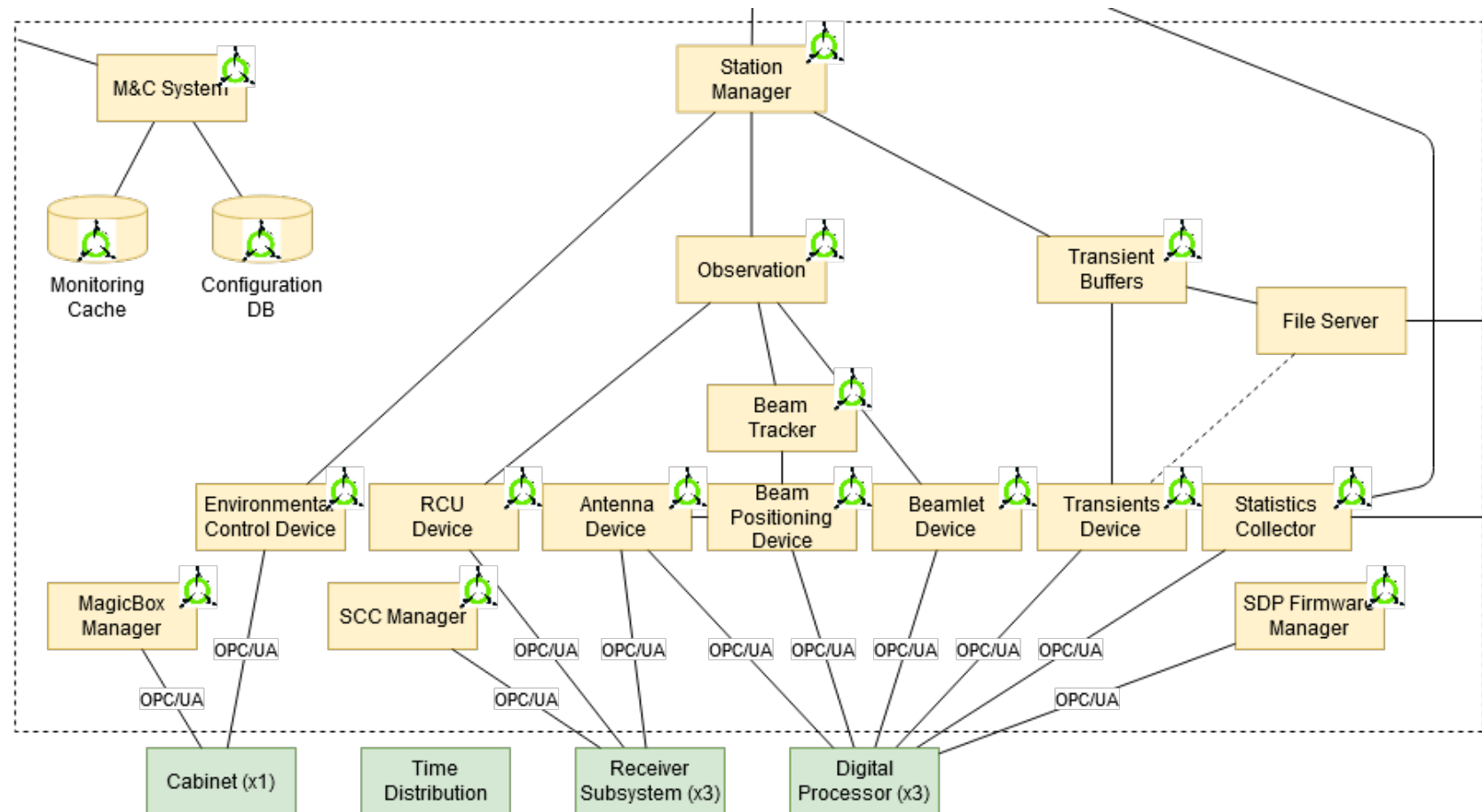
New Software & Interface Design

Property	LOFAR1	LOFAR2
Control	Custom	Tango Controls
Monitoring	Custom + WinCC/OA	Tango Controls
Software interfaces	Custom	Tango Controls
Hardware interfaces	Custom (raw Ethernet)	OPC/UA + TCP/IP
Software language	C++98	Python 3

- Easier to operate
- Easier to maintain
- Easier to debug
- Easier to integrate
- Easier to extend

Software Architecture

- Model functionality
- Software devices
- Open interfaces



Collaborations

- INAF:
 - Front-end (RCU2) co-development
 - 1 FTE software development
- SKA:
 - Informal contacts for expertise & advice
 - Docker images!



Expected Tango Benefits

- Better modelling of software & functionality
- Better integration into Python landscape
- Better integration into CI/CD
- Better collaboration with partners



Thanks for listening

Software Architect: Jan David Mol (mol@astron.nl)
Tango Lead: Thomas Jürges (juerges@astron.nl)

Station Project Lead: Arno Schoenmakers (schoenmakers@astron.nl)
Software Manager: Lars Venema (venema@astron.nl)

We're looking for Tango programmers! See http://tiny.cc/help_lofar_tango

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