Ericsson RBS6000 Series

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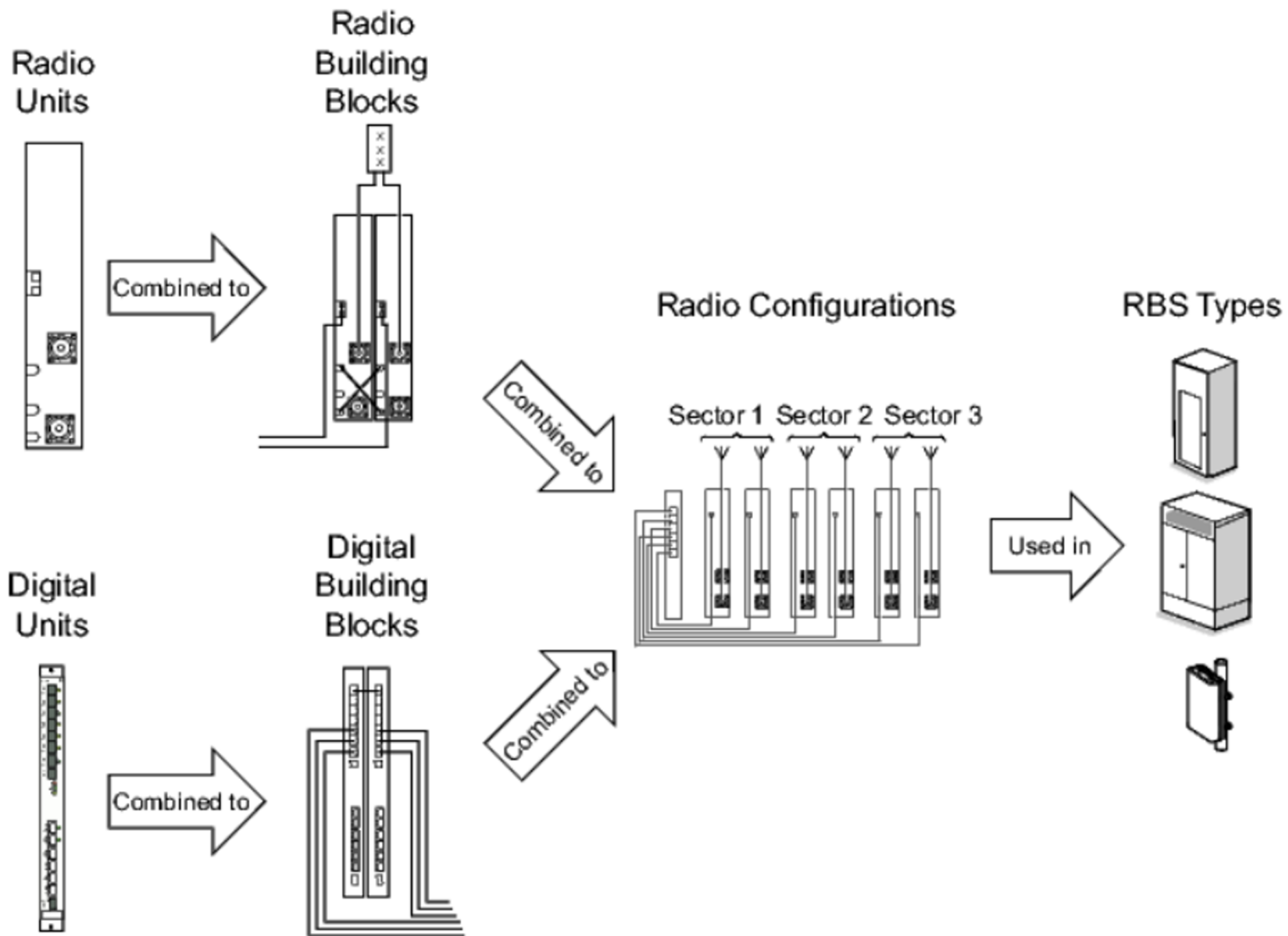
Ericsson RBS 6000 Series

- very popular series of Radio Base Stations (RBS) during last decade
- supports *many* different configurations built from various modules
  - **Digital Units** (DU)
  - **Radio Units** (DU)
  - miscellaneous bits like shelves / racks, fans, fuses, OVP, cables, PSU, ...
- supports both
  - classic BTS cabinets with radio
  - remote (tower mounted) radio heads
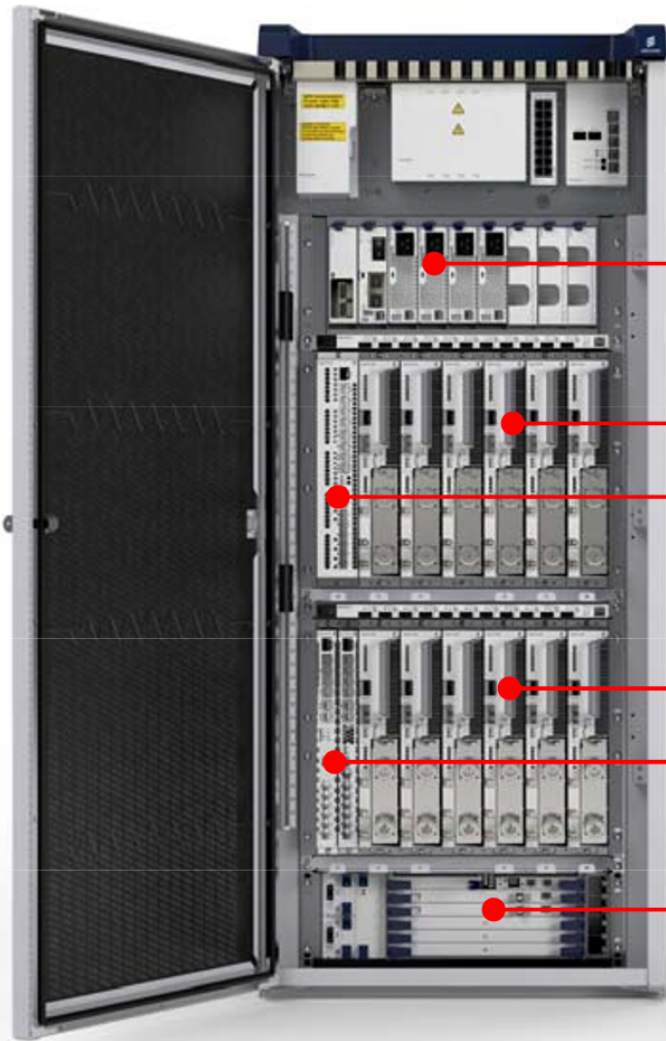
RBS 6000 Series Overview

The RBS 6000 base station family is designed to meet the increasingly complex challenges facing operators today. RBS 6000 is built with tomorrow's technology and at the same provide backwards-compatibility with the highly successful RBS 2000 and RBS 3000 product lines. RBS 6000 base stations offer a seamless, integrated and environmentally friendly solution and a safe, smart and sound roadmap for whatever tomorrow holds.

Think of it as "Lego"

Radio Units → Combined to → Radio Building Blocks

Digital Units → Combined to → Digital Building Blocks

Radio Building Blocks → Combined to → Radio Configurations

Digital Building Blocks → Combined to → Radio Configurations

Radio Configurations

Sector 1   Sector 2   Sector 3

Used in → RBS Types

Example: RBS6201 Rack
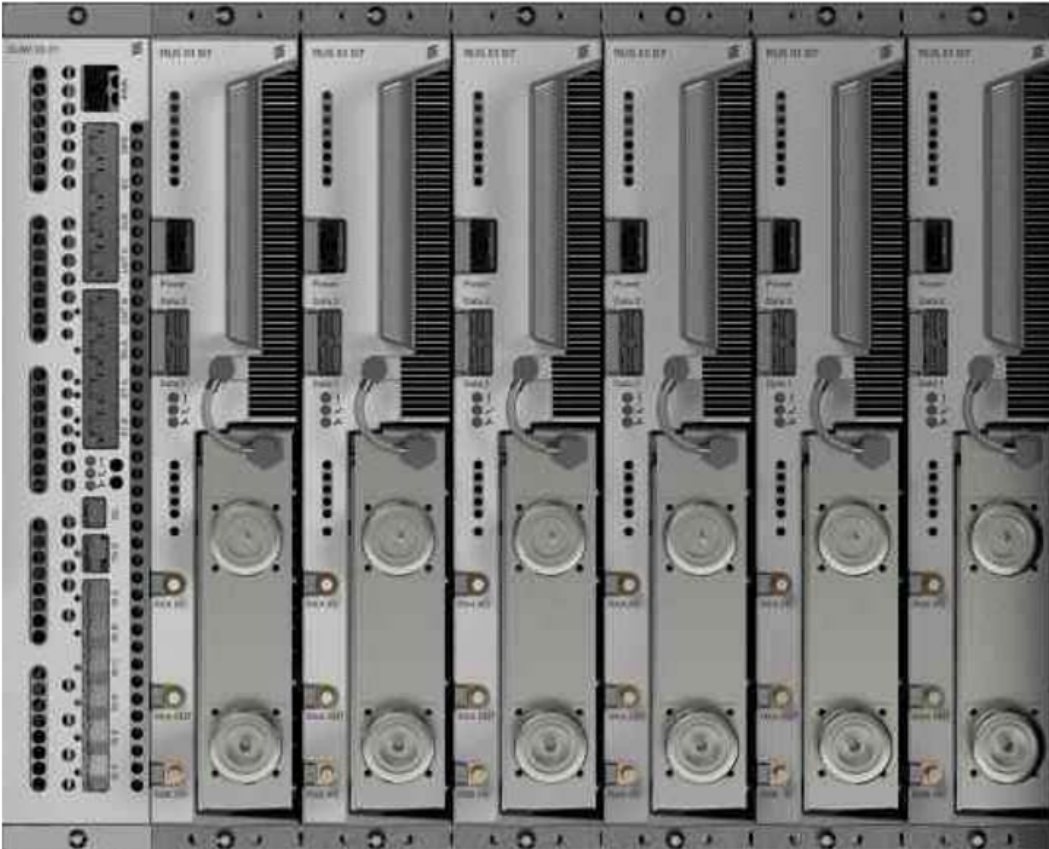
Site Power

Radio Units

Digital Unit

Radio Units

Digital Unit

Transmission

Example: RBS6201 Shelf

Example shelf with 6x radio unit and 1x WCDMA digital unit

GSM: DUG 10 + RUG

- first generation GSM modules for RBS6000

- closely resembles RBS2000 architecture

  - **DUG 10** like RBS2000 IXU/DXU

  - **RUG** like RBS2000 RRU: TRX

- interconnection between DUG 10 + RUG is still TDM, not baseband samples!

Digital Unit GSM DUG 10

- up to 12 TRX, grouped in 1..6 logical BTS

- matches most closely IXU or DXU of previous RBS2xxx series

- no baseband processing inside, just protocol logic (LAPDm + RSL + OM2000)

- 6x HSIO connector for interface towards **RUG**

- 4x E1/T1 ports exposed on RJ45 connectors

Radio Unit GSM DUG

- GSM only
- 2 TRX in hardware
  - any of them can be GSM, WCDMA or LTE
- 48W per TRX un-combined
- 22W per TRX combined (internal hybrid combiner)

dug.png

GSM: DUG 20 + RUS

- second generation GSM modules for RBS6000

- more closely resembles the UMTS + LTE modules

- all baseband processing in **DUG 20**

  - digital baseband I/Q samples between **DUG 20** and **RUS**

- interconnection uses CPRI (Common Public Radio Interface)

- connectors typically SFP format.

  - can be used with SFP optics + fiber (many km long)

  - can be used with direct copper SFP interconnect cables (few m)

Digital Unit GSM DUG 20

- up to 12 TRX, gruoped in 1..6 logical BTS
- includes baseband processing, unlike DUG 10
- 6 SFP slots with CPRI towards Radio Units (**RUS**)
- 4x E1/T1/J1 ports exposed on two RJ45 connectors

Radio Unit Mulit-Standard RUS 01

- GSM WCDMA and LTE

- 4 carriers over 20 MHz IBW
  - any of them can be GSM, WCDMA or LTE

- up to 1x 80W (one multi-channel PA)
  - 20W without special license key
  - up to 80W with license keys
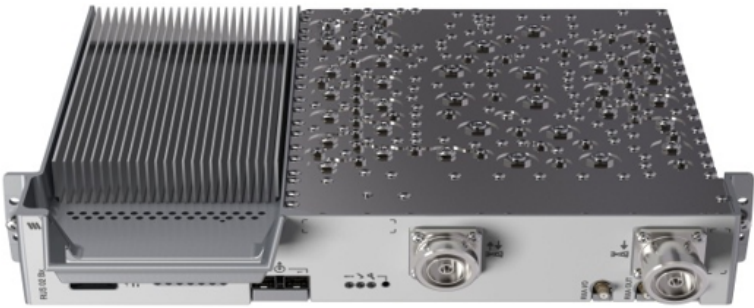
- RUS 02 has 40 MHz IBW
  - up to 8 GSM carriers
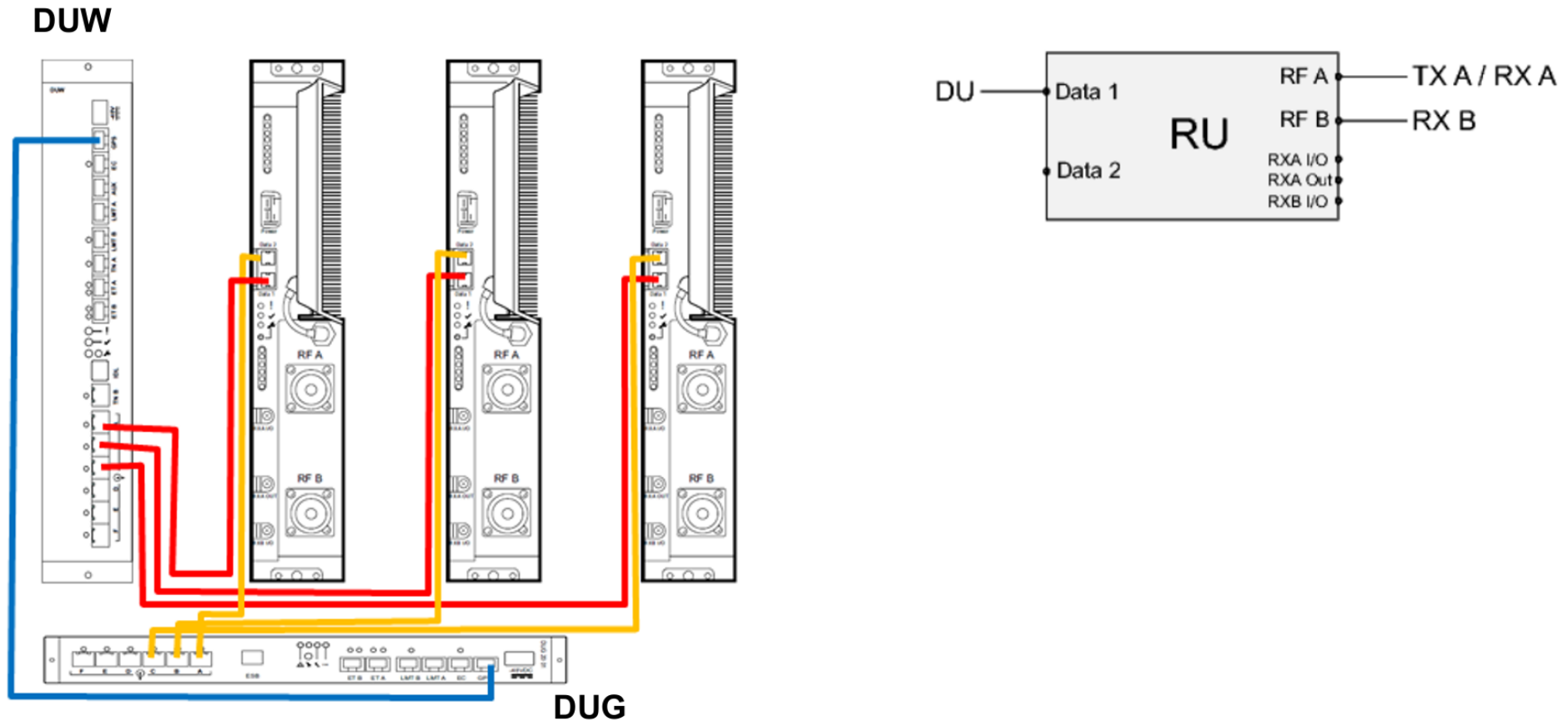 - up to 4 WCDMA or LTE carriers

UMTS: DUW + RUS

- **DUW** is Digital Unit WCDMA
- is used with RUS or RRUS (like DUG 20)
- offers Iub interface to RNC
- no FOSS RNC, so not very interesting :(

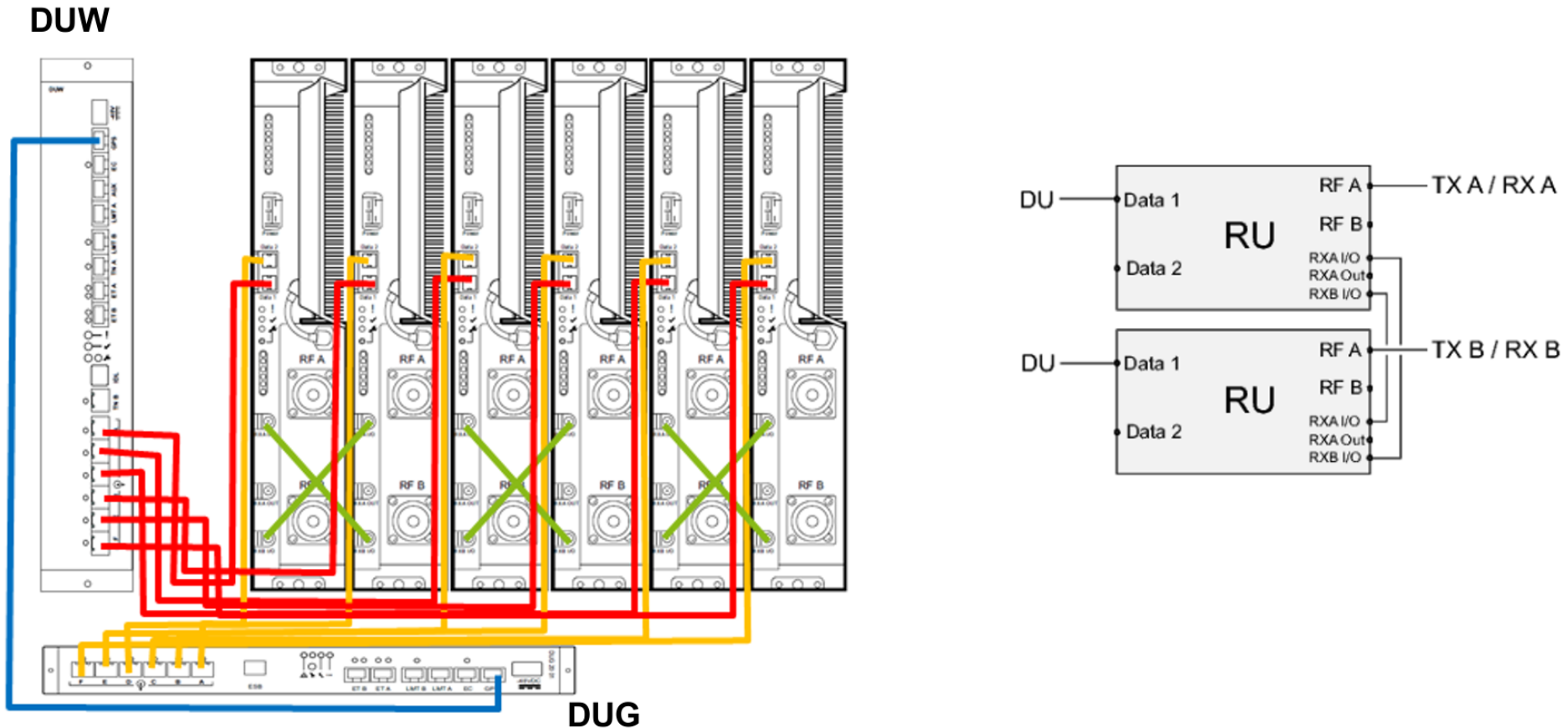# LTE: DUL + RUS

- **DUL** is Digital Unit LTE

Combined UMTS + GSM setup (classic approach)

- works the same way with DUL + DUG for LTE + GSM

Combined UMTS + GSM setup (classic approach)

- works the same way with DUL + DUG for LTE + GSM

GSM/UMTS/LTE in one: DUS 31 / 41

- **DUS** are *multi-standard DU* (GSM/UMTS/LTE)

- DUS 31 capacity up to 24 GSM TRX
  - or up to 12 GSM TRX combined with LTE

- DUS 41 capacity up to 48 GSM TRX
  - or up to 12 GSM TRX combined with LTE

- Back-haul is Ethernet only, no E1/T1/J1 anymore
  - it is presumed that it's like an internal software-only SIU-02

Ericsson + Osmocom

We do have some history of RBS2000 support

- OsmoNITB has OM2000 implementation proven with RBS2000

- OsmoBSC inherits that, but breaks voice (no E1 in `osmo-mgw` yet)

- OsmoBSC has `pcu_sock` interface for BSC-colocated PCU

- Adding E1/TDM user plane support to osmo-mgw would enable using Ericsson RBS again

- All that's missing for low-cost macro BTS with Osmocm is an inexpensive E1 interface
    - see separate talk

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