Testing Challenges in 5G

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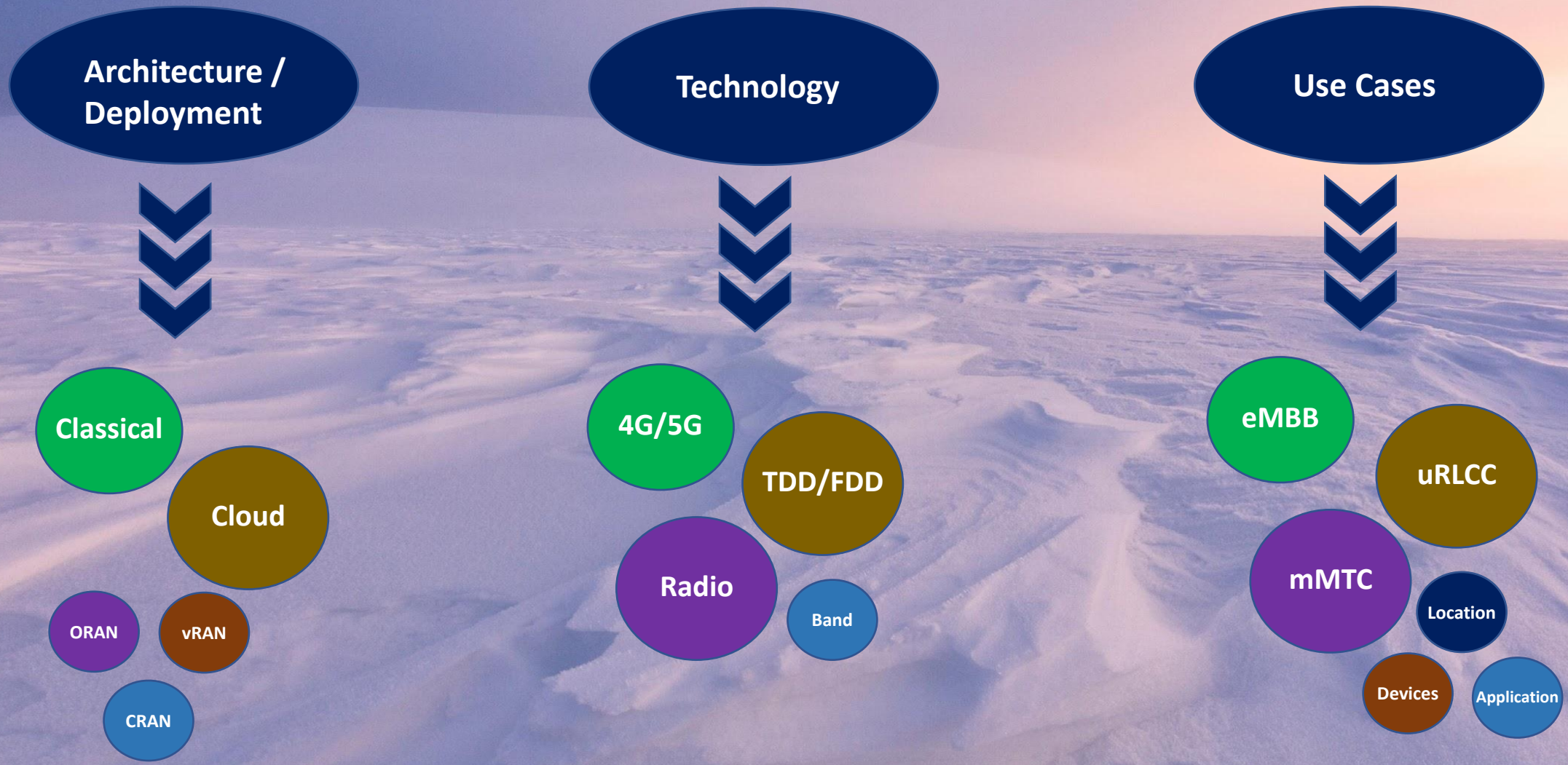
Note

The contents of this presentation are generic and does not represent details of work done in any specific organization.

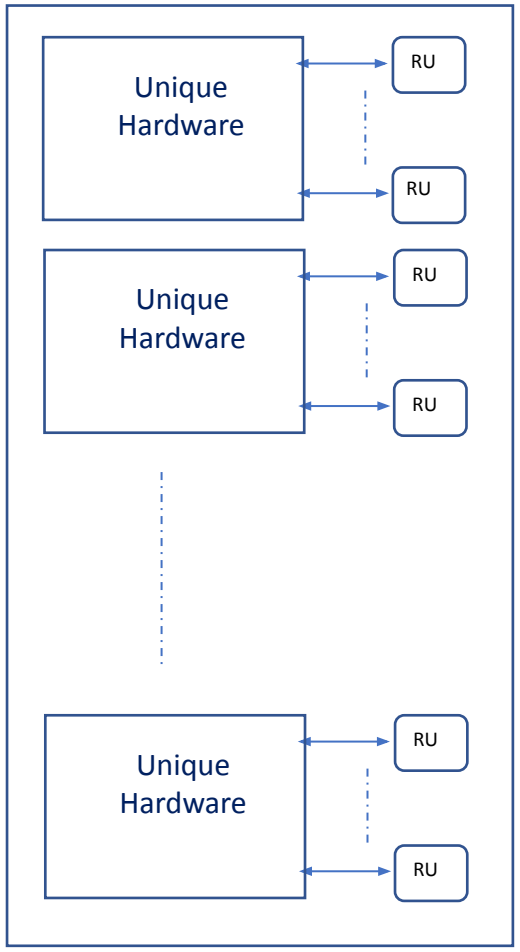
Data presented in the slides are indicative values and not a reference to any specific vendor product

Radio Access Network



Architecture/Deployment

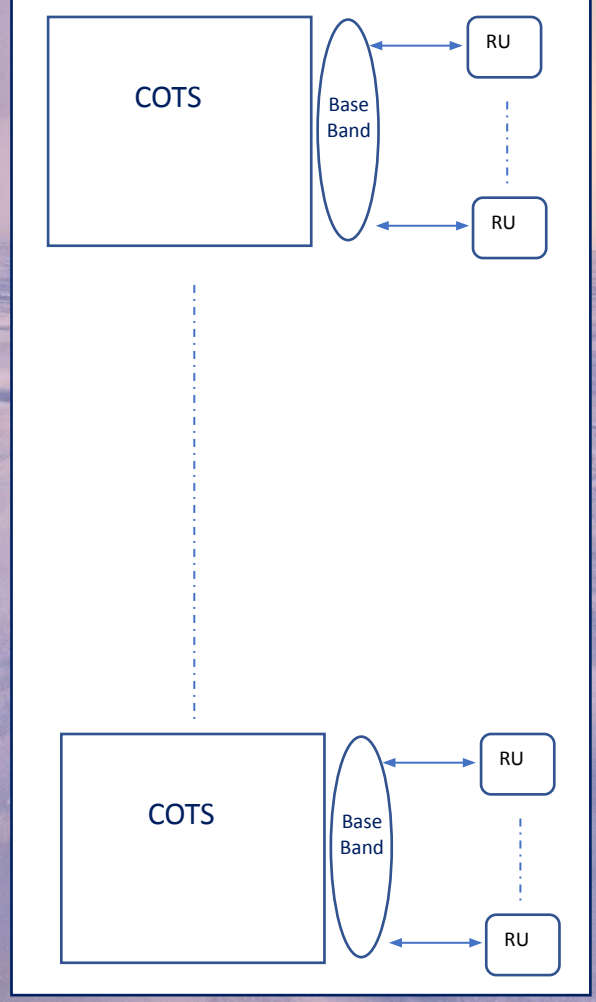
Classical configuration



Unique & Vendor dependent

- Single card handling all functions
- Different cards handing split functions
- Cards and RU typically from same vendor (exception – ORAN)
- Limited capacity (# cells* ~ 40 to 60)
- Limited scalability

Cloud configuration



Reduced vendor dependency

- COTS handling vDU/vCU functions
- Vendor dependency on
  - Baseband
  - RU

  (exception – ORAN)
- Higher capacity (# cells* > 100 cells)
- Flexible and scalable

Challenges

- **Device ecosystem**

  Are there options to minimise issues from Customers ?

- **Multi Cell Configuration**

  What options are available for testing ?

- **Use Case**

  How do I test use cases for Customer deployment ?

- **ORAN**

  Integration ?

Device Ecosystem

Ecosystem supports different variety of devices and interpretation of standards by each vendor can be different

- Mobile vendor interprets a functionality in one way

- RAN vendor interprets same functionality in another way

Question is – Who will adapt to Customer reported problems ?

Solution

- Testing with devices of different vendors
- Creation of automated test environment with mix of devices
- Test environment need to be flexible to keep plugging in and removing devices as new variants enter market

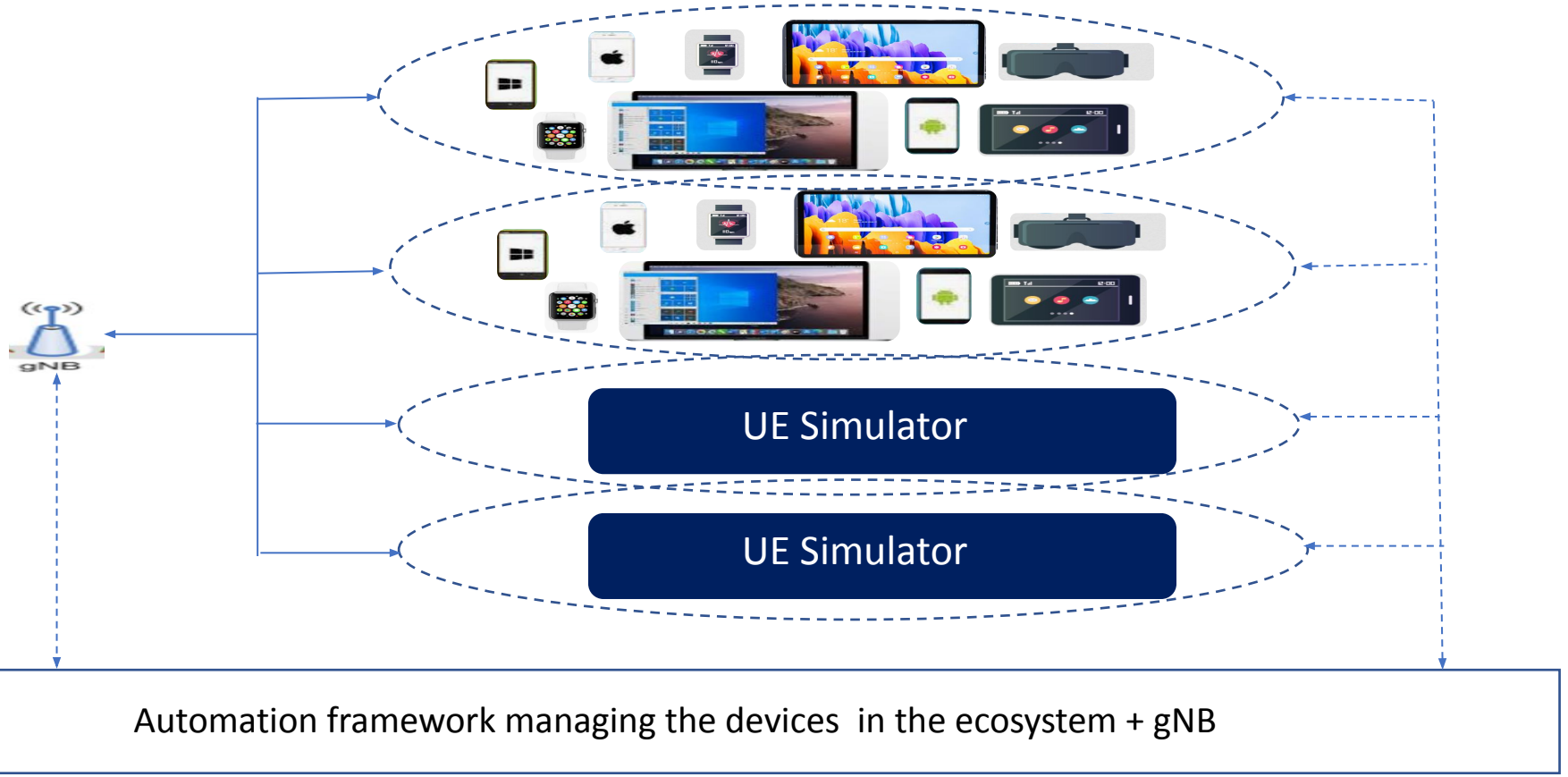
Automation framework managing the devices
in the ecosystem + gNB

Different profiles can be created to cover different scenario’s

Device Ecosystem

Why are unique issues observed at Customer location but not in lab?

- Load gNB with mix of real UE's and UE simulator



Multi Cell Configuration

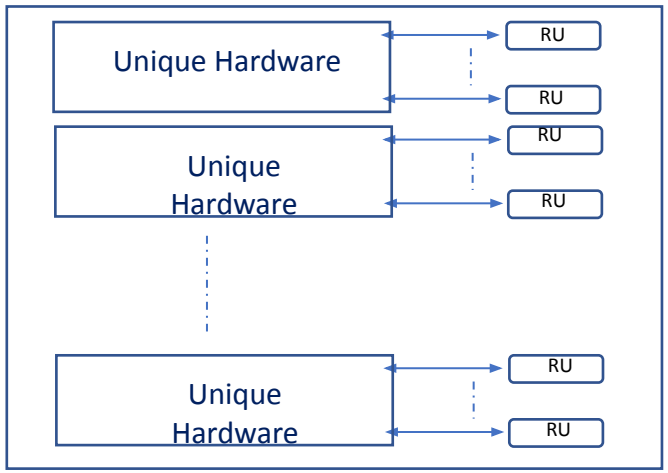
Challenge

- Replicate the multi cell configuration on multiple setups in lab.

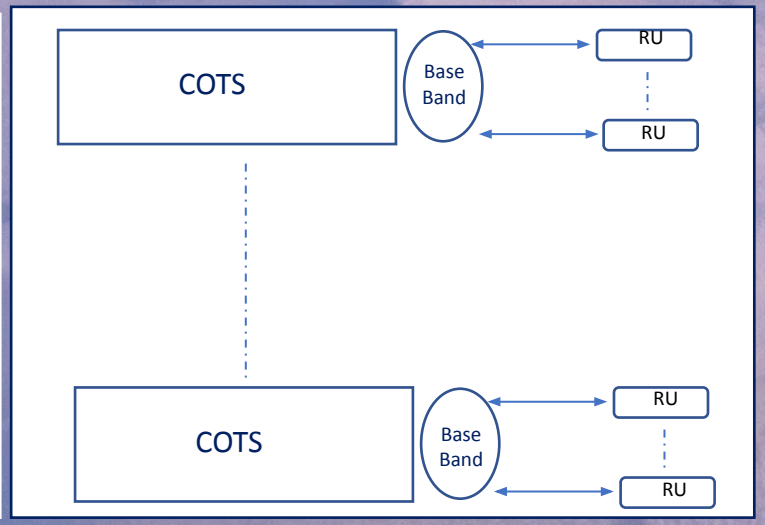
Need for Virtualised Radio clusters – Minimise # Physical RU's

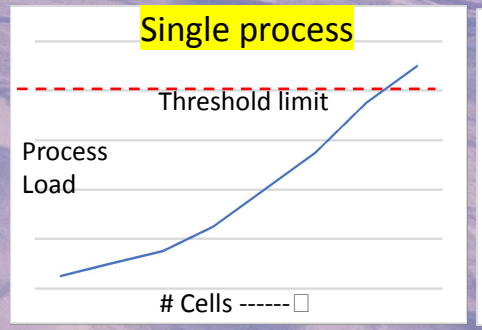
Architecture & design

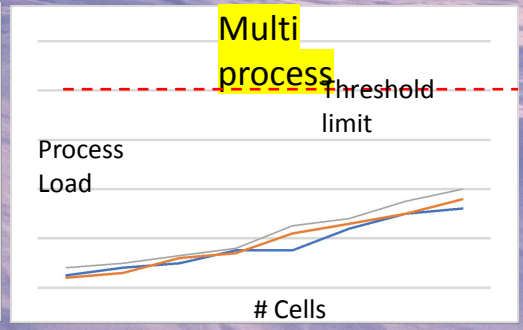
- **Classical Configuration**
  # Cells ~ 40 to 60 cells *
  # RU ~ 20 to 30 *



- **Cloud Configuration**
  # Cells~ >100 cells *
  # RU ~ >50 *







O&M

SLM

CM/PM

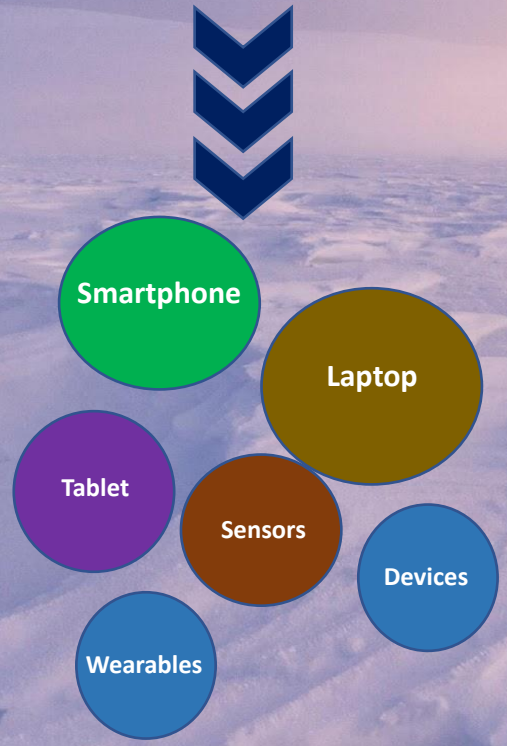
Load

Use Cases

Challenge – Testing the right mix of call and traffic pattern

Applications

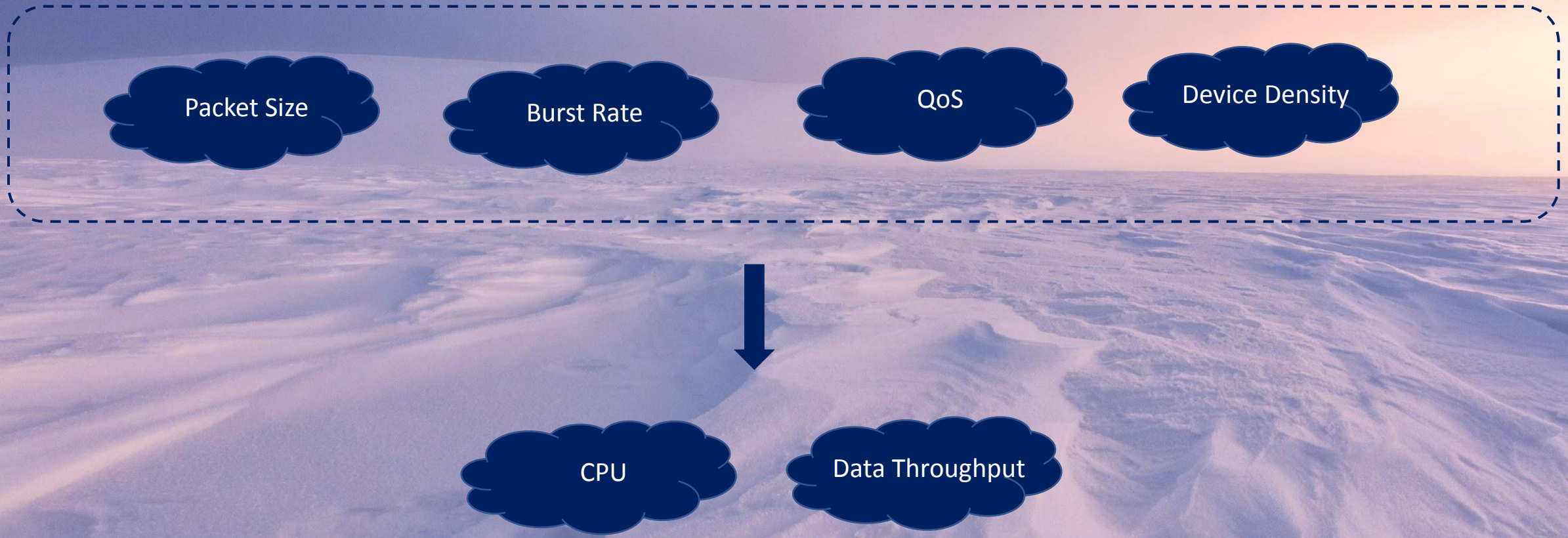
Devices



Deployment Location

Use Cases

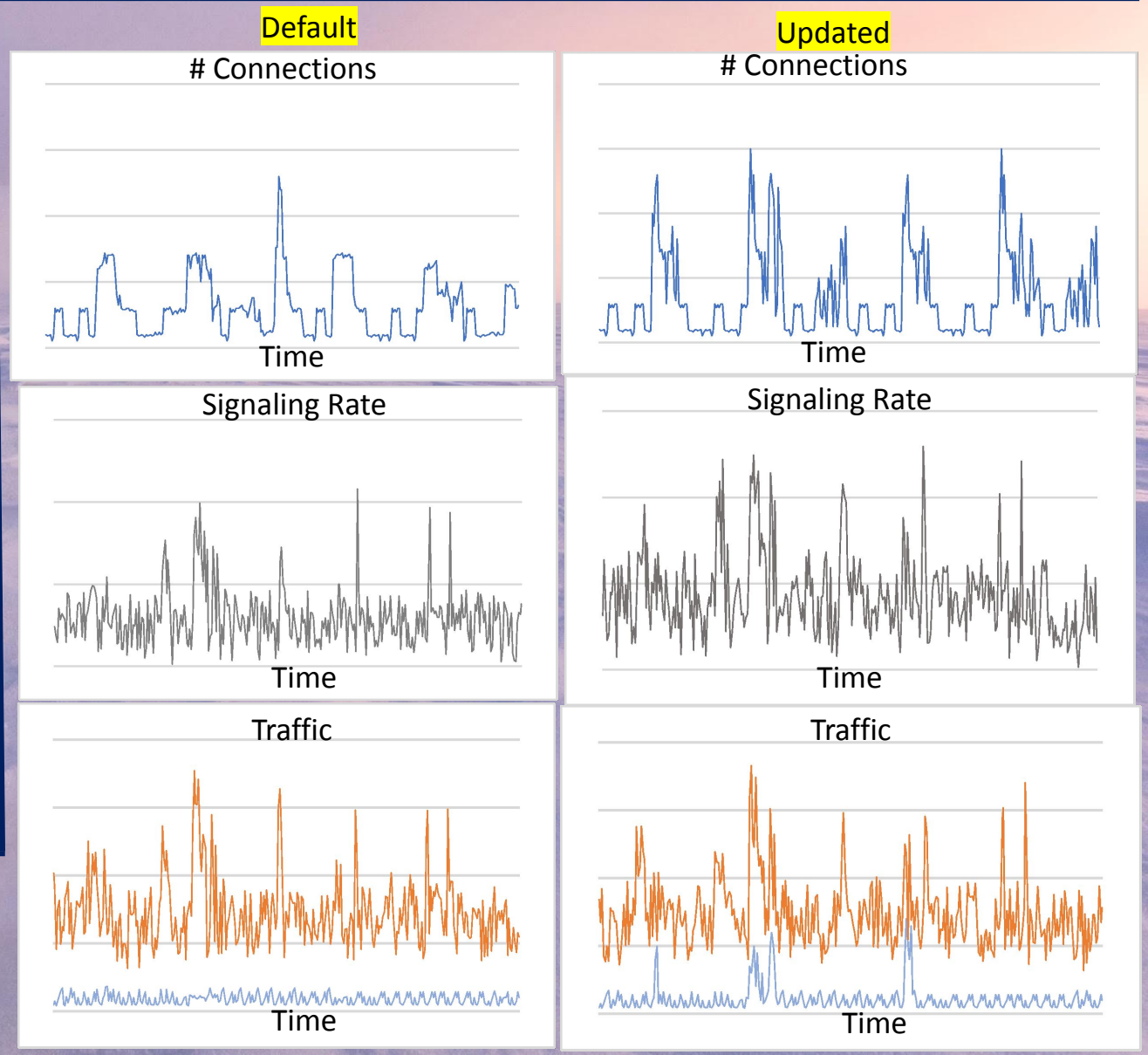
Challenge – Testing the right mix of call and traffic pattern



Use Cases

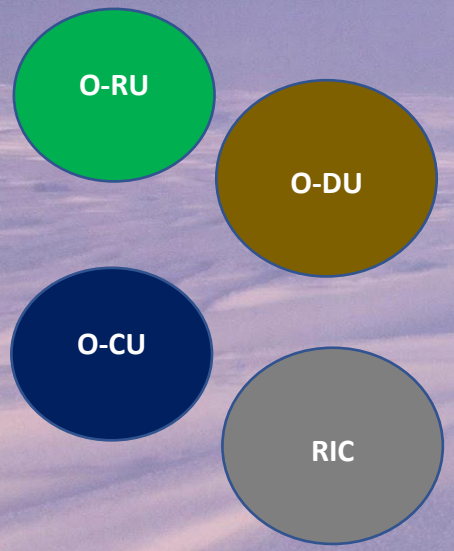
Challenge – Testing the right mix of call and traffic pattern

1. Default Traffic Model(s) defined
2. System capability to handle the defined traffic model is verified
3. System deployed in Customer location
4. Statistics collection from deployed network
5. Update Traffic model(s), define new traffic models



ORAN

ORAN allows operators to build networks using best in class network elements from a mix of vendors



Integration O-RU & O-DU

O-DU tested against O-RU simulator

O-RU tested against O-DU simulator

Integration of real O-DU + O-RU