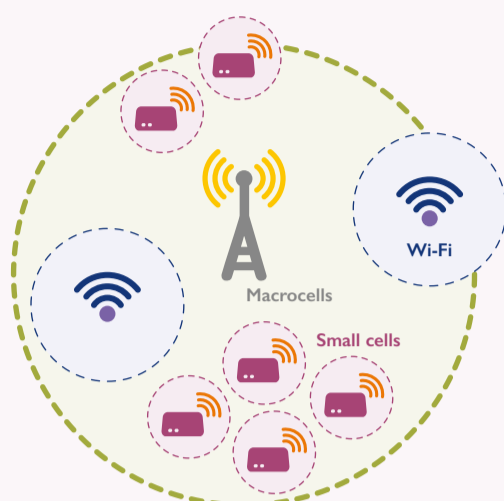# Solving the HetNet puzzle

Planning virtualization across the entire HetNet – including small cells – will deliver improved ROI.

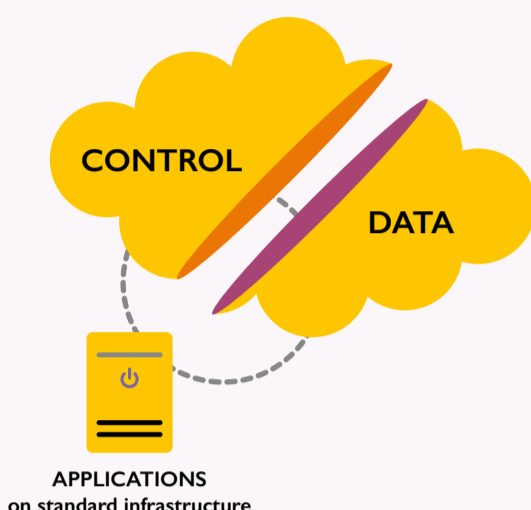## 2 BIG innovations revolutionising the design and economics of mobile networks:

HetNets

Macrocells
Wi-Fi
Small cells

Networks with complex interoperation between macrocell, small cell and, in some cases, Wi-Fi elements

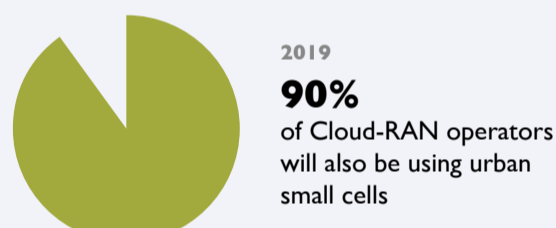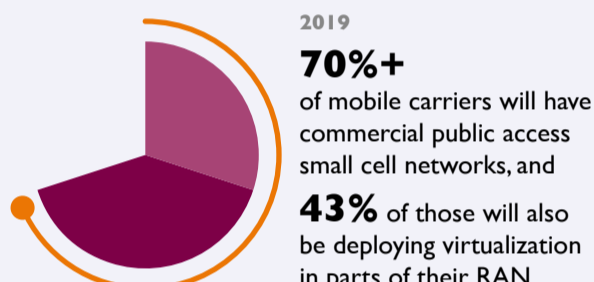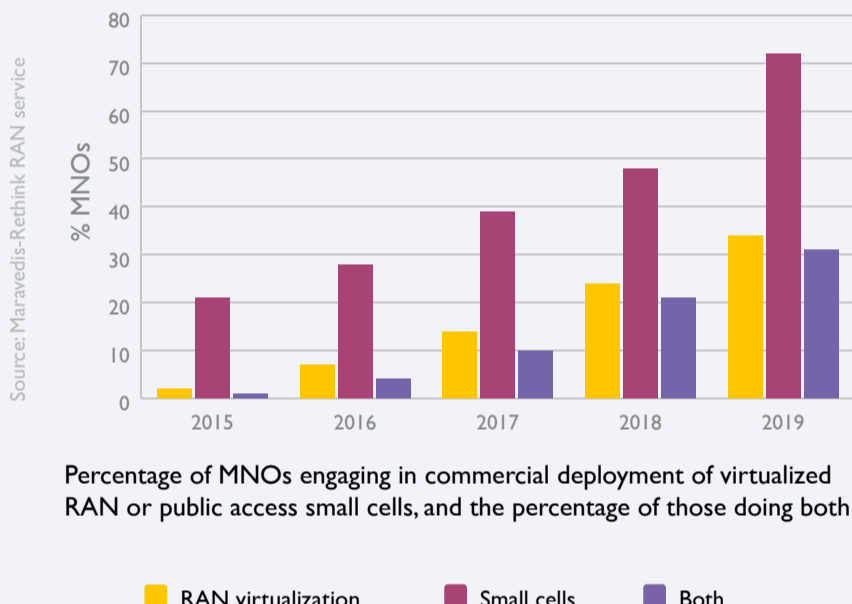### Network function virtualization

CONTROL
DATA
APPLICATIONS
on standard infrastructure

An industry initiative that moves functions from specialized hardware to standard data centre infrastructure

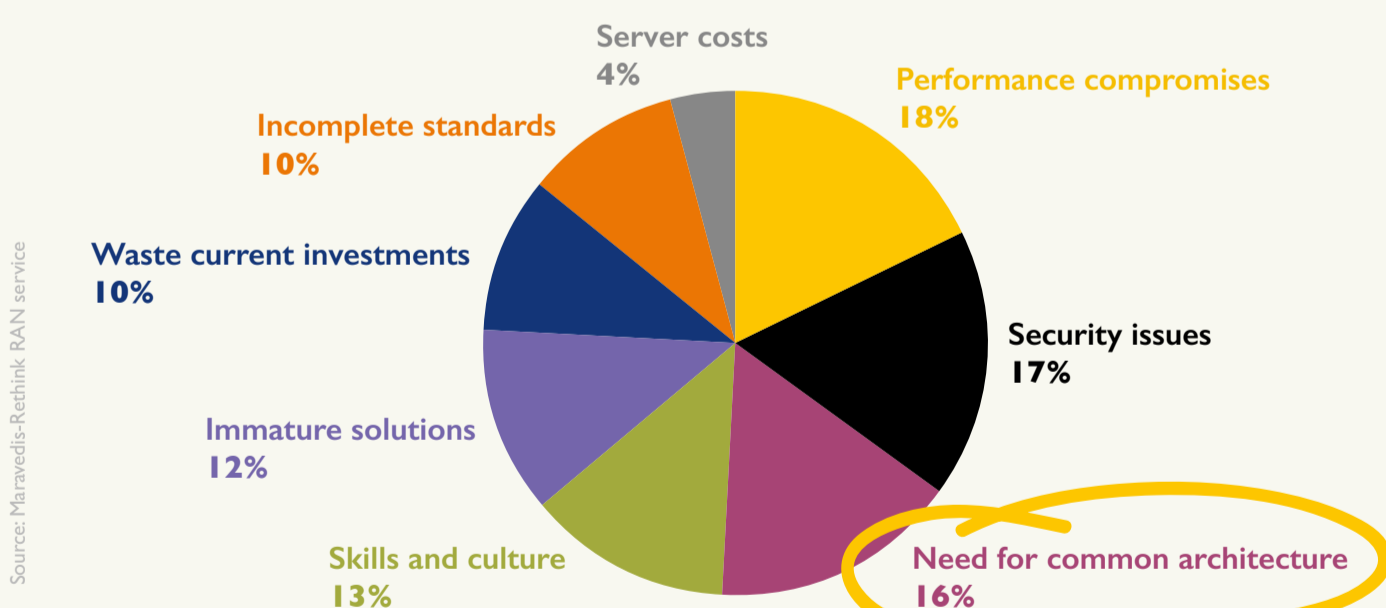Virtualization in the radio access network = **Cloud-RAN**

Who's planning what?

Source: Maravedis-Rethink RAN service

% MNOs

80
70
60
50
40
30
20
10
0

2015   2016   2017   2018   2019

Percentage of MNOs engaging in commercial deployment of virtualized RAN or public access small cells, and the percentage of those doing both

- RAN virtualization
- Small cells
- Both

2019
70%+
of mobile carriers will have commercial public access small cell networks, and
43% of those will also be deploying virtualization in parts of their RAN

2019
90%
of Cloud-RAN operators will also be using urban small cells

Current Cloud-RAN approaches require 'ideal' fronthaul networks that may limit their broader applicability to today's diverse range of small cell deployments

NOW is the time to evaluate virtualization to understand the optimal approach to apply to the small cell layer

Why virtualization matters

Source: Maravedis-Rethink RAN service

Server costs
4%

Incomplete standards
10%

Waste current investments
10%

Immature solutions
12%

Skills and culture
13%

Need for common architecture
16%

Security issues
17%

Performance compromises
18%

Factors identified by MNOs as the key barriers to adopting virtualization in the access network (%)

In a survey of operators that are deploying or planning small cells, one main reason to delay the move to a very dense network was **uncertainty about future architectures**

Why virtualization matters to Small Cell Forum:

- Cloud-RAN and small cells have often been presented as alternatives. We believe that **virtualization techniques can be re-applied to small cell architectures**.

- Virtualization can be used to **enhance co-operation** within clusters of small cells.

- Small cell clusters may be required to **interwork** with a virtualized macro layer.

- In dense HetNets, **small cells will deliver maximum ROI** if they are fully interworking with other platforms to create the broadest pool of capacity and most efficient use of shared resources.

Our aim is to provide leadership in creating a unified view of the evolving role of virtualized architectures for dense HetNet.

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