

Introduction

The In-Building Challenge
Micro C-RAN Bridges the Gap
Managing Dynamics

KATHREIN

First steps in Rosenheim:

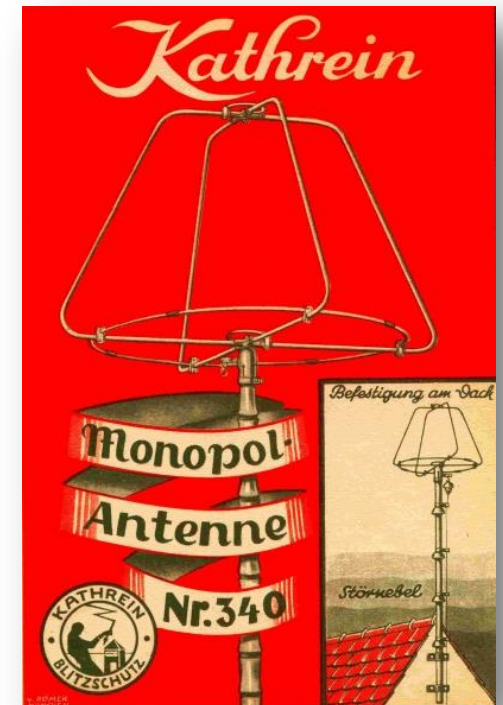
Founded 1919 by engineer A. Kathrein (1888 – 1972)

Lightning arresters, overvoltage protectors



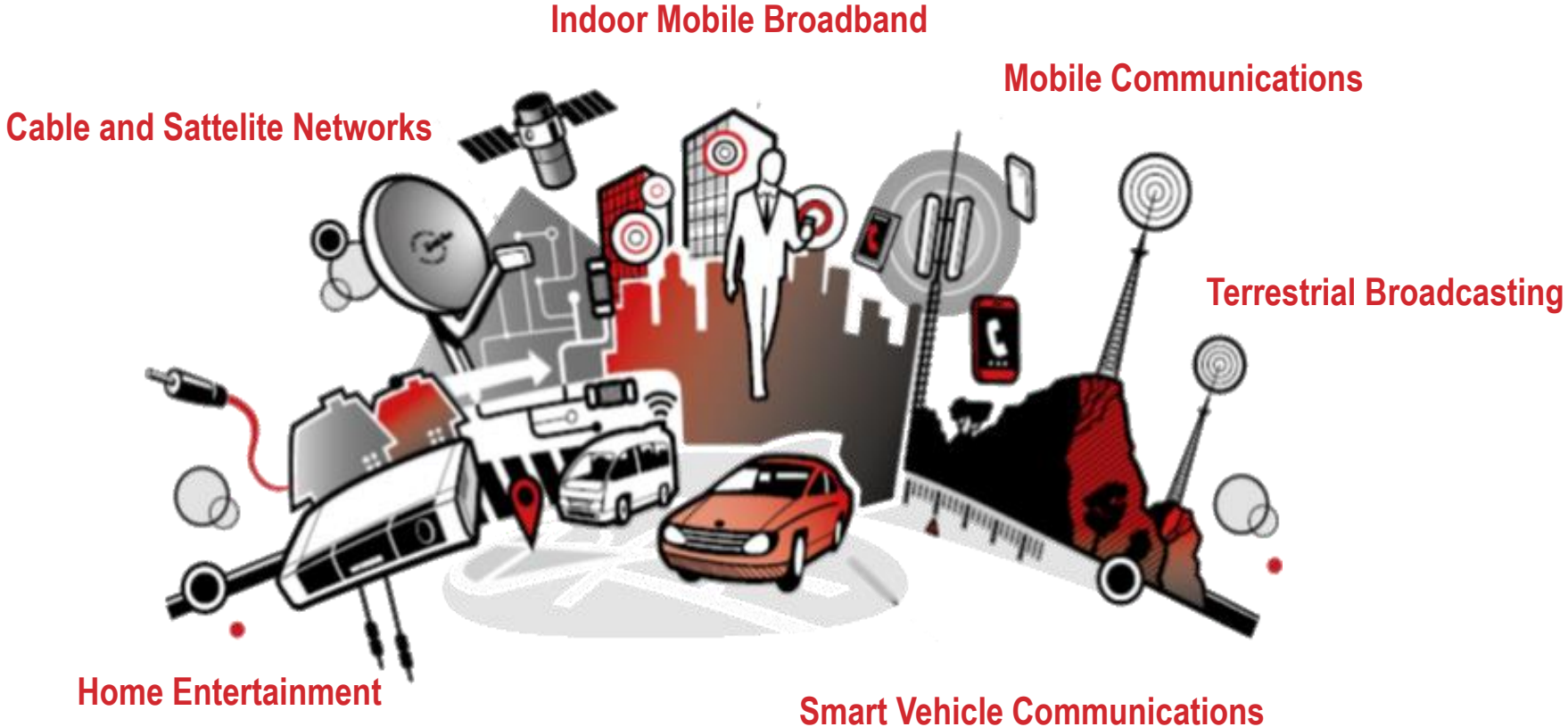
1926 First antenna:

Medium wave reception antenna



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The Creation of a Smart Connected World



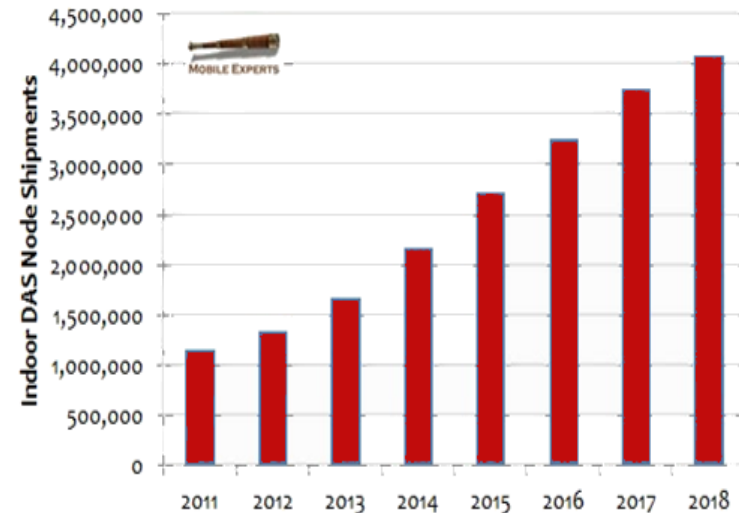
The In-Building Challenge

Mobile data happens indoor: **80%** of all traffic is today indoors, industry experts expect this to grow to over 90%

Source: Cisco, Senza Fili Consulting

This increase needs to be seen in conjunction of overall **exponential increase of mobile traffic**

Source: Senza Fili Consulting



Source: Mobile Experts

The indoor situation however gets worse:

- **Energy saving mechanisms** isolate in-building areas from outdoor mobile signals increasingly
- Site Sharing moving indoors, which requires **multi-operator solutions, which are costly**
- Complexity of DAS solutions require **highly skilled teams and long cycles** from planning to launch

Micro C-RAN Bridges the Gap



Small Cells

- Easy integration
- SON ready
- Fast Deployment
- Single Band
- Single Operator

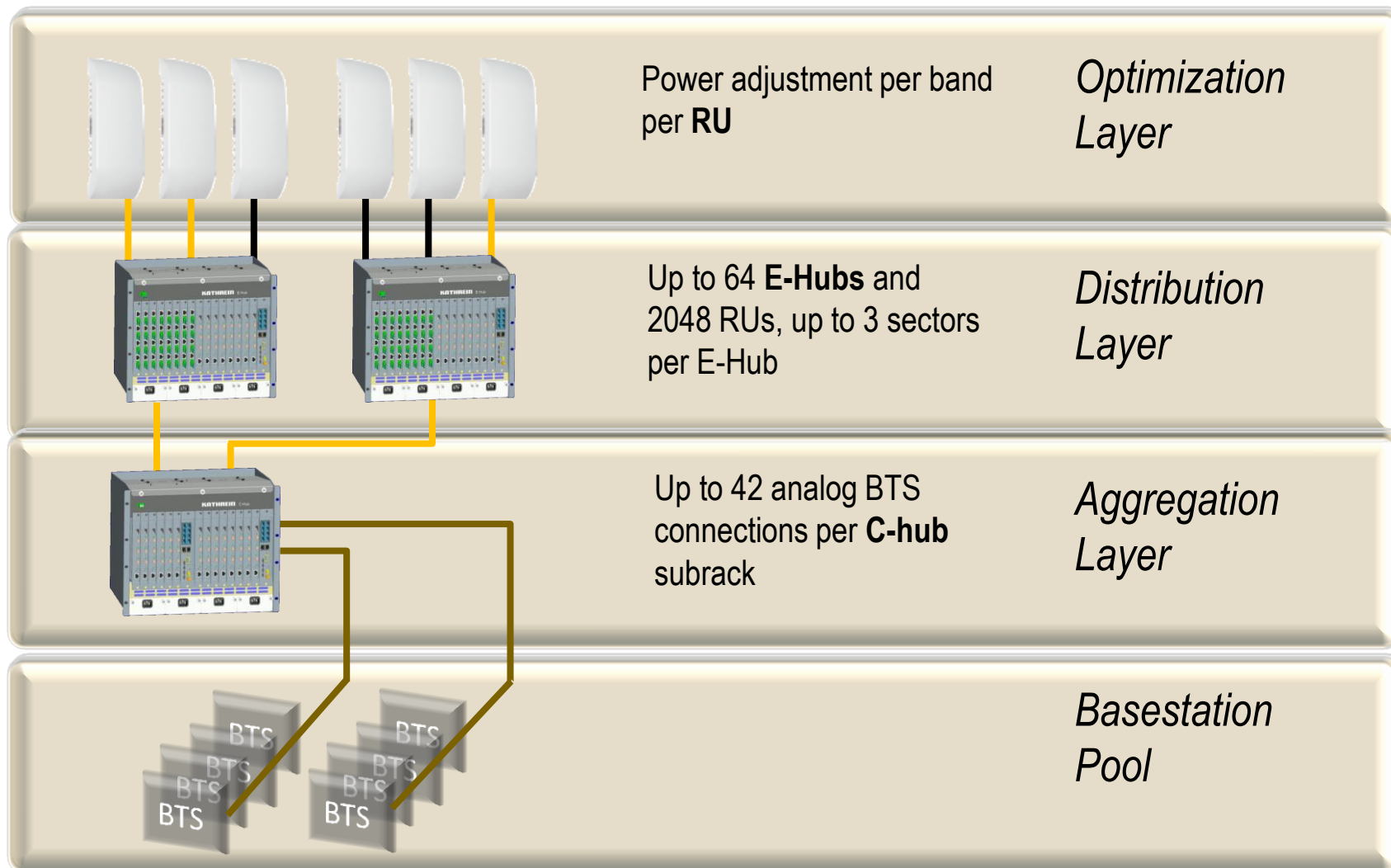
Micro C-RAN

- Easy integration
- SON ready
- Fast Deployment
- Multi Band
- Multi Operator

DAS

- Multi Operator
- Multi Band
- Multi Standard
- Complex Planning
- Lengthy Projects

System Architecture



Indoor MIMO for future proofed solutions

Integrated MIMO 2x2

- LTE 1800MHz (Band 3)
- LTE 2600MHz (Band 7)



Scenario Management: Example

Exhibition area Munich: Messe München

- Largest event: BAUMA: 450.000 visitors
- 180.000 m² exhibition area in halls
- 425.000m² free area (partly used also as exhibition area)
- 16 halls

Conference area: ICM

- up to 15.000 seats
- Up to 7.000m² exhibition area



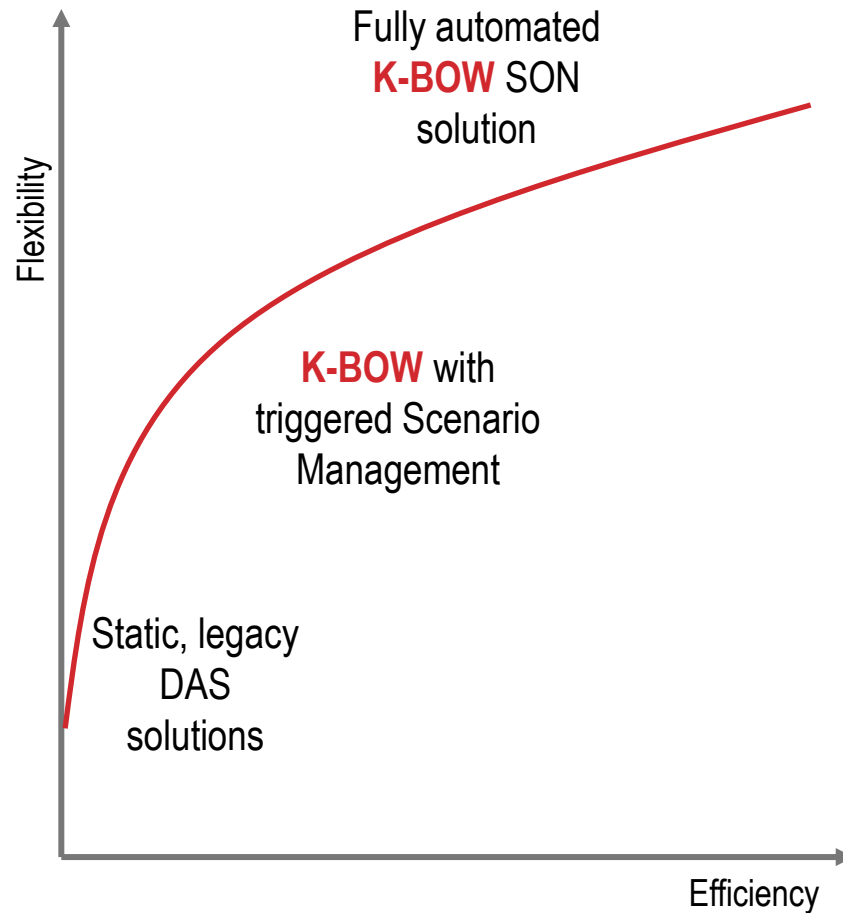
Scenario Management: High level planning



- Parking
- Conference
- Administration
- Exhibition

# of Sectors					Total
Default	4 sectors	4 sectors	2 sectors	8 sectors	18 sectors
Night	1 sector	1 sector	2 sectors	1 sector	5 sectors
50% exhibition	4 sectors	4 sectors	2 sectors	17 sectors	27 sectors
100% exhibition	8 sectors	6 sectors	2 sectors	32 sectors	48 sectors
# of BTSs					Total
Default	9/18/21	9/18/21/ 26	9/18/21/ 26	9/18/21/ 26	68 BTSs
Night	21	21	21	21	5 BTSs
50% exhibition	9/18/21	9/18/21/ 26	9/18/21/ 26	9/18/21/ 26	104 BTSs
100% exhibition	9/18/21	9/18/21/ 26	9/18/21/ 26	9/18/21/ 26	184 BTSs
Conference only	9/18/21	9/18/21/ 26	9/18/21/ 26	9/18/21/ 26	56 BTSs

Path to SON



K-BOW is a SON enabler

- Active and Micro-Controller based units up to the RU level
- Fully controlled by management systems
- Scenario Management being just the half-static beginning
- K-BOW follows a fully automated SON is the vision

K-BOW Summary

- ✓ OEM basestation vendor agnostic
- ✓ Multi-operator, multi-band, multi-standard solution
- ✓ Future proof: MIMO integrated, LTE-A feature prepared
- ✓ Installation benefits compared to DAS
- ✓ Flexibility to remotely manage capacity demand
- ✓ Power saving options
- ✓ Indoor optimization, automation and SON

www.kathrein.de/k-bow

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