

ITU Thematic Priorities

Experts presentations

Future Networks & Spectrum management
a.k.a Infrastructure team

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About the division



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About the division

- Reliable Connectivity to Everyone

Products and services such as assessment studies, publications, workshops, guidelines, and best practices on telecommunication/ICT infrastructure including wireless and fixed broadband, connecting rural and remote areas, conformance and interoperability, spectrum management, transition to digital broadcasting, the effective and efficient management and proper use of telecommunication resources within the mandate of ITU.

- The objective of the Network & Digital Infrastructure program

Is to assist ITU Member States and ITU-D Sector Members and Associates in maximizing the use of new technologies for the development of their information and communication infrastructures and services and building global telecommunication/ICT infrastructure. It will be reached through: Increased usage of connectivity by citizens for socio-economic activities; Efficient spectrum management by professionals using advanced technics and Adoption of modern ICT infrastructure, based on international ICT standards by governmental bodies.

Our work in this field

- Spectrum Management and radio monitoring
- Satellite communications
- Rural communications
- Broadband networks: wired and wireless including IMT
- Broadband Mapping
- Connectivity Tools and Analysis for: connectivity of schools, refugee camps,
- Broadcasting: Analogue to Digital transition
- Conformance and Interoperability
- Next Generation Networks: IPv4 to IPv6 transition, etc
- Electromagnetic Fields
- Emerging Technologies

Present and future priorities

- **Broadband Mapping and Connectivity Analysis**



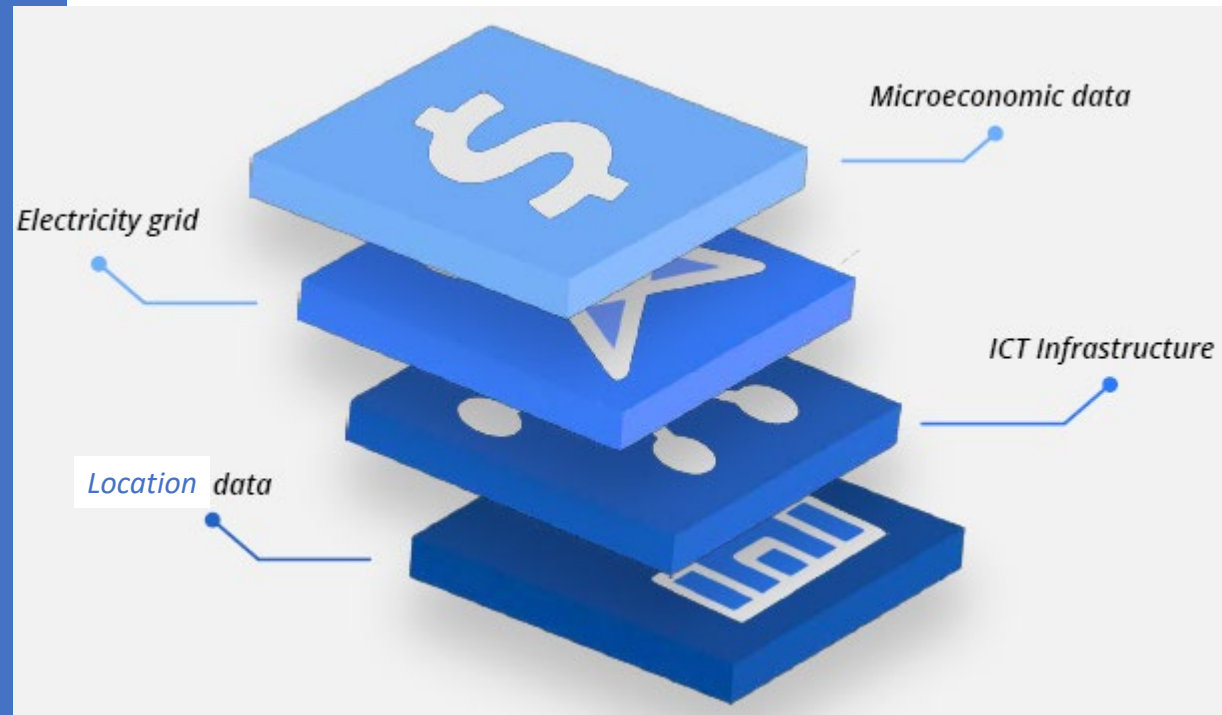
www.itu.int/go/maps



www.itu.int/go/schoolmap

FNS Catalogue

CONNECTIVITY STACK

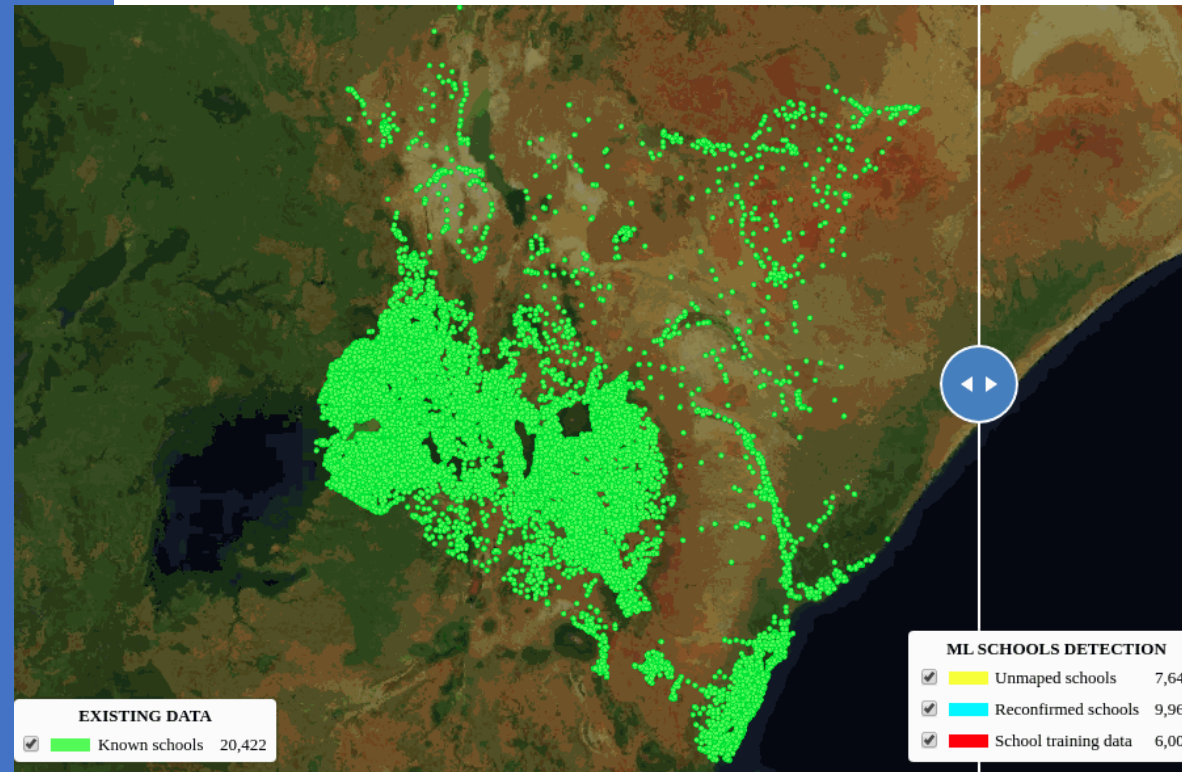


A suite of software tools and digital goods (DPGs) to help connectivity design, planning, deployments and cost estimations

FNS Catalogue

AI FOR INFRASTRUCTURE

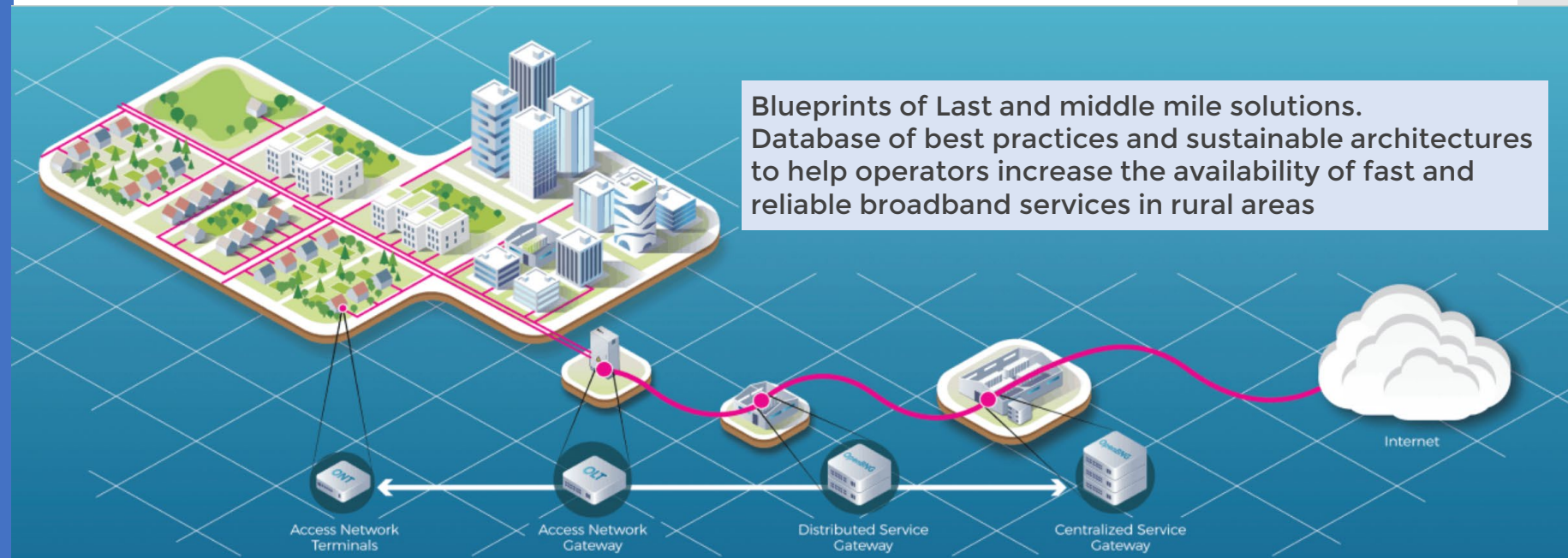
Using artificial intelligence,
we can accelerate Infrastructure Mapping



Open-source Tools and DPGs:
Using machine learning algorithms and high-resolution satellite imagery, **more than 23,000 unmapped schools were identified** in Kenya, Rwanda, Sierra Leone, Niger, Honduras, Ghana, Kazakhstan and Uzbekistan

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LAST/MIDDLE MILE TOOLKITS



IPv6 and IXP DEPLOYMENTS OPEN DATA INFRASTRUCTURE

Open Fibre Data Standard

CoVE Convert, Validate, Explore Standard Documentation

[Load New File](#)

Schema Version

Your data was checked against schema version: 0.2

Data Conversion

Download the data that you submitted in either its original format or in alternative formats. For more information, see the [publication format reference](#). If you are investigating an error, you might find the alternative formats easier to use.

JSON (original)

- [network-package.json \(9.2 KB\)](#)

GeoJSON

Your data was successfully converted to GeoJSON format.

- [nodes.geojson \(14.9 KB\)](#)
- [spans.geojson \(12.5 KB\)](#)

CSV

Your data was successfully converted to CSV format.

- [data.zip \(compressed, 7.4 KB\)](#)

Uncompressed:

- [contracts.csv \(332 bytes\)](#)
- [contracts_documents.csv \(316 bytes\)](#)
- [contracts_relatedPhases.csv \(141 bytes\)](#)
- [links.csv \(192 bytes\)](#)
- [networks.csv \(756 bytes\)](#)
- [nodes.csv \(766 bytes\)](#)
- [nodes_internationalConnections.csv \(291 bytes\)](#)
- [nodes_networkProviders.csv \(211 bytes\)](#)
- [organisations.csv \(1.5 KB\)](#)
- [phases.csv \(168 bytes\)](#)
- [phases_funders.csv \(141 bytes\)](#)
- [spans.csv \(1.1 KB\)](#)
- [spans_networkProviders.csv \(144 bytes\)](#)

Spreadsheet

Your data was successfully converted to spreadsheet format.

- [data.ods \(3.7 KB\)](#)
- [data.xlsx \(13.6 KB\)](#)

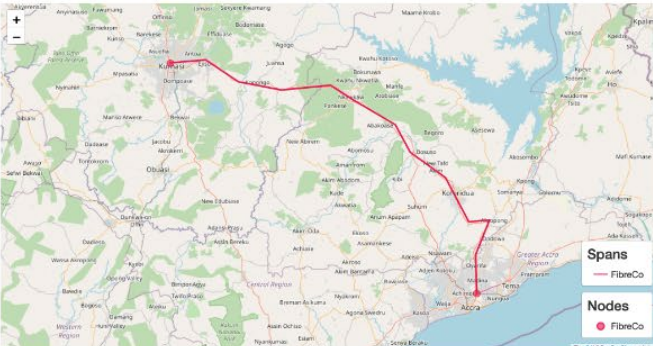
<https://ofds.cove.opendataservices.coop/>

Visualisation

The GeoJSON version of your data is visualised on the map below. You should check that nodes and spans appear in the correct location. If not, you should check that your coordinates are in longitude, latitude order. You may need to transform your coordinates to the correct coordinate reference system.

Colour nodes by:
Physical Infrastructure Provider

Colour spans by:
Physical Infrastructure Provider

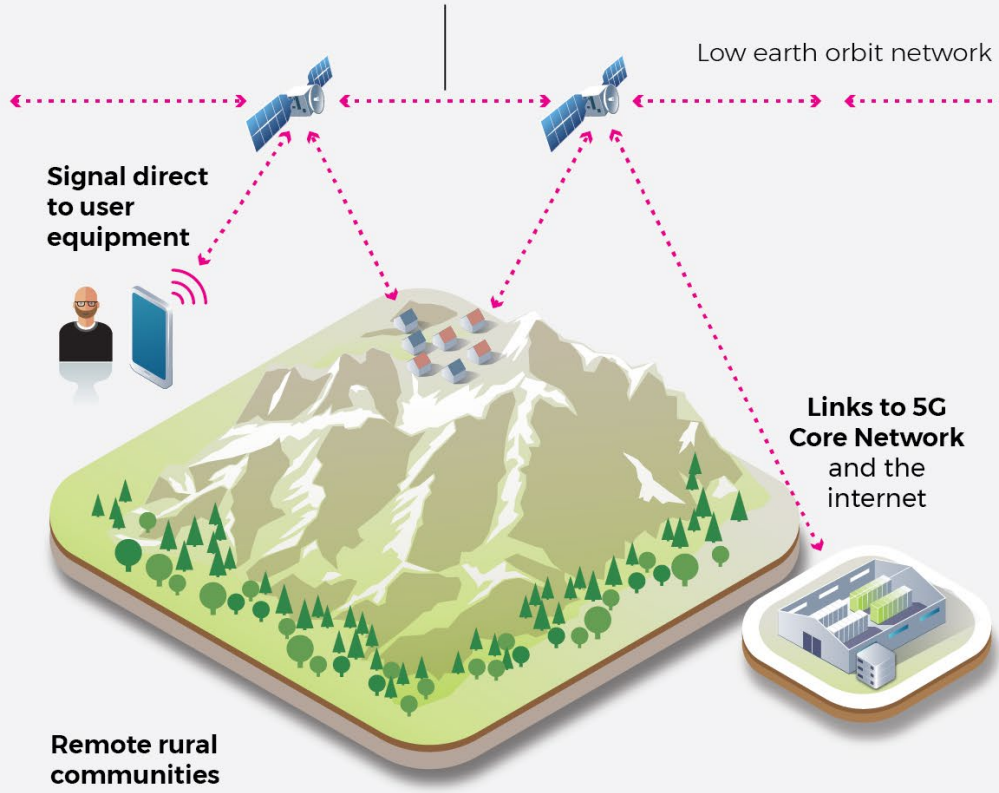


The map displays a geographical area with a network of red lines representing fibre spans and red dots representing nodes. The spans are labeled 'FibreCo' and the nodes are labeled 'FibreCo'. The map includes a legend in the bottom right corner with the following entries: 'Spans' with a red line icon and 'FibreCo', and 'Nodes' with a red dot icon and 'FibreCo'. The map also features a search bar at the top left and a zoom control on the left side.

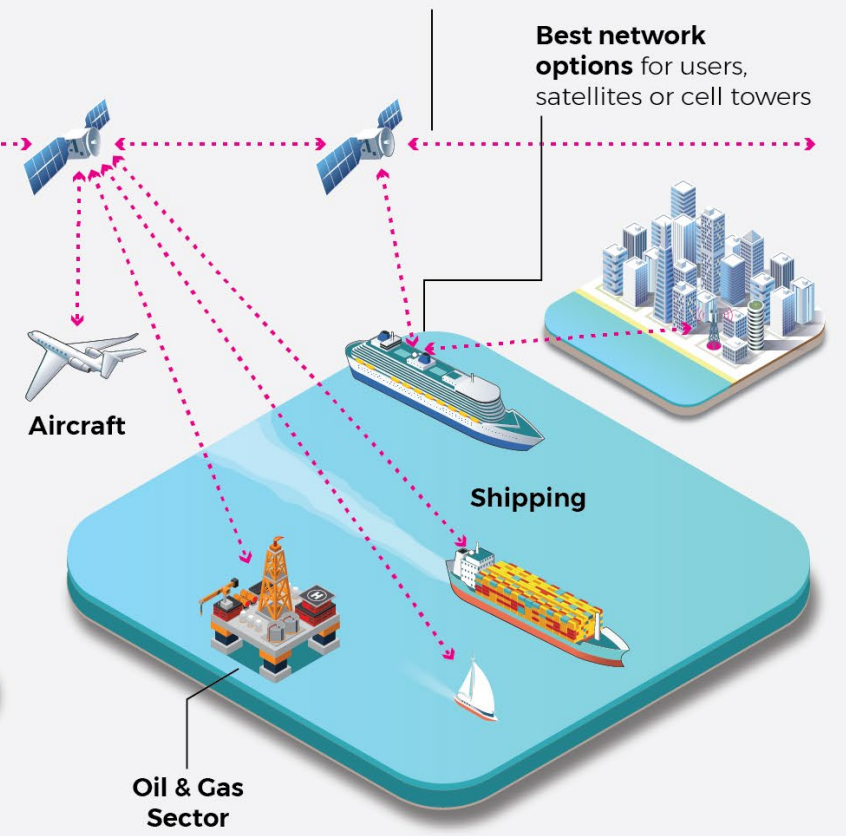
SATELLITE COMMUNICATIONS

The mission of the Non-Terrestrial Connectivity Solutions is to foster the emergence of open-source hardware and software ecosystem that supports emerging standards allowing IMT

RURAL COMMUNITIES / EMERGENCY RESPONSE NETWORKS

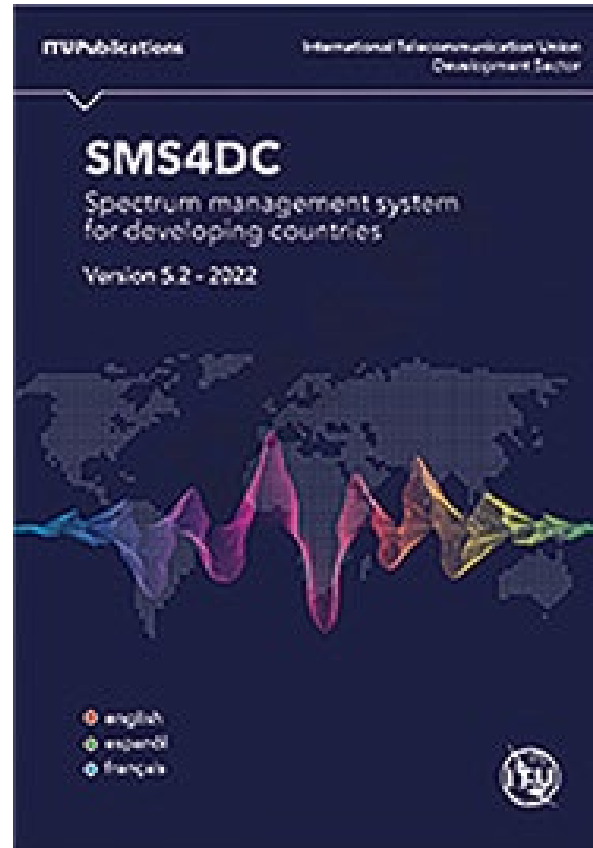


ENTERPRISE MOBILITY



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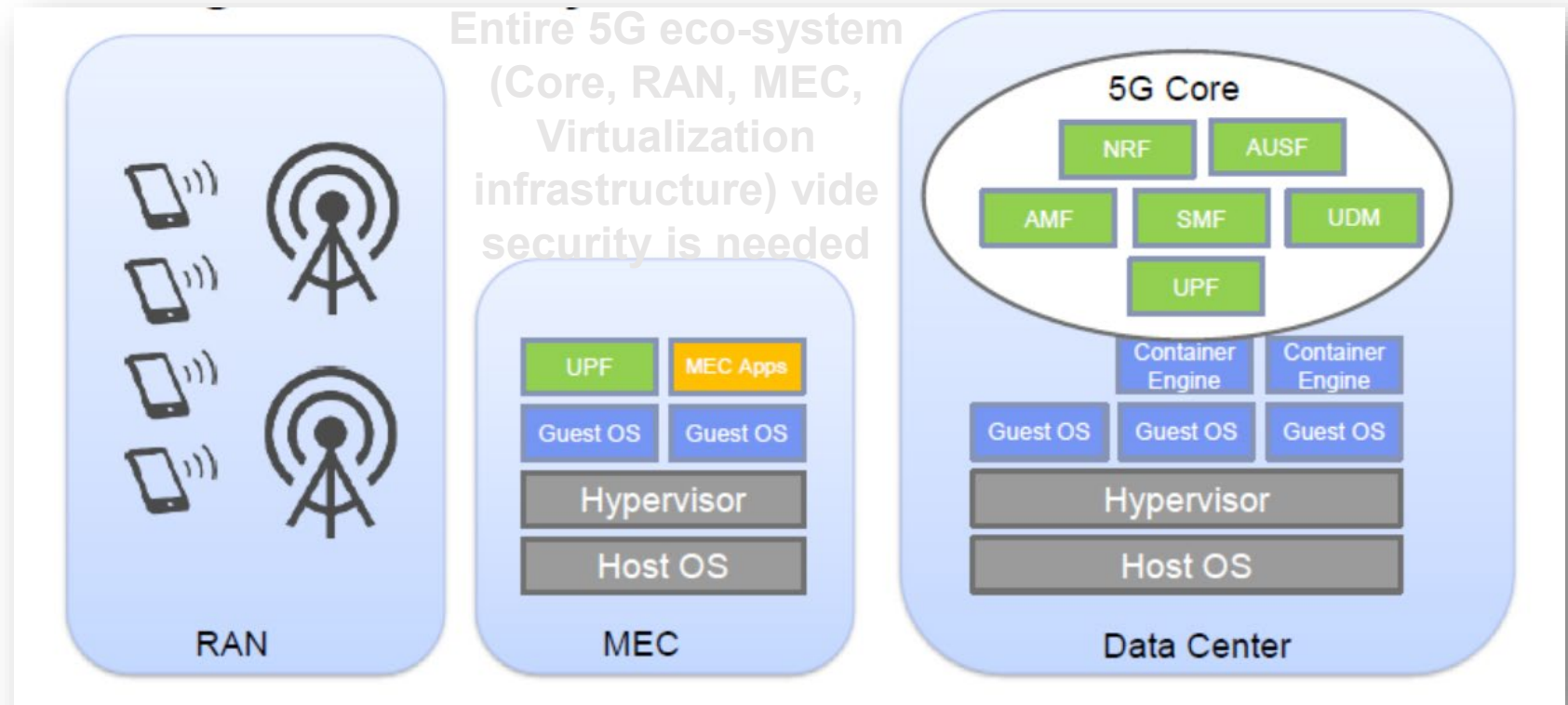
SPECTRUM MANAGEMENT FOR DEVELOPING COUNTRIES



Open-source
SMS4DC

Seek partnerships for
future

5G network Architecture and security



Source [ITU Workshop on "Security for 5G and beyond"](#), (KDDI)

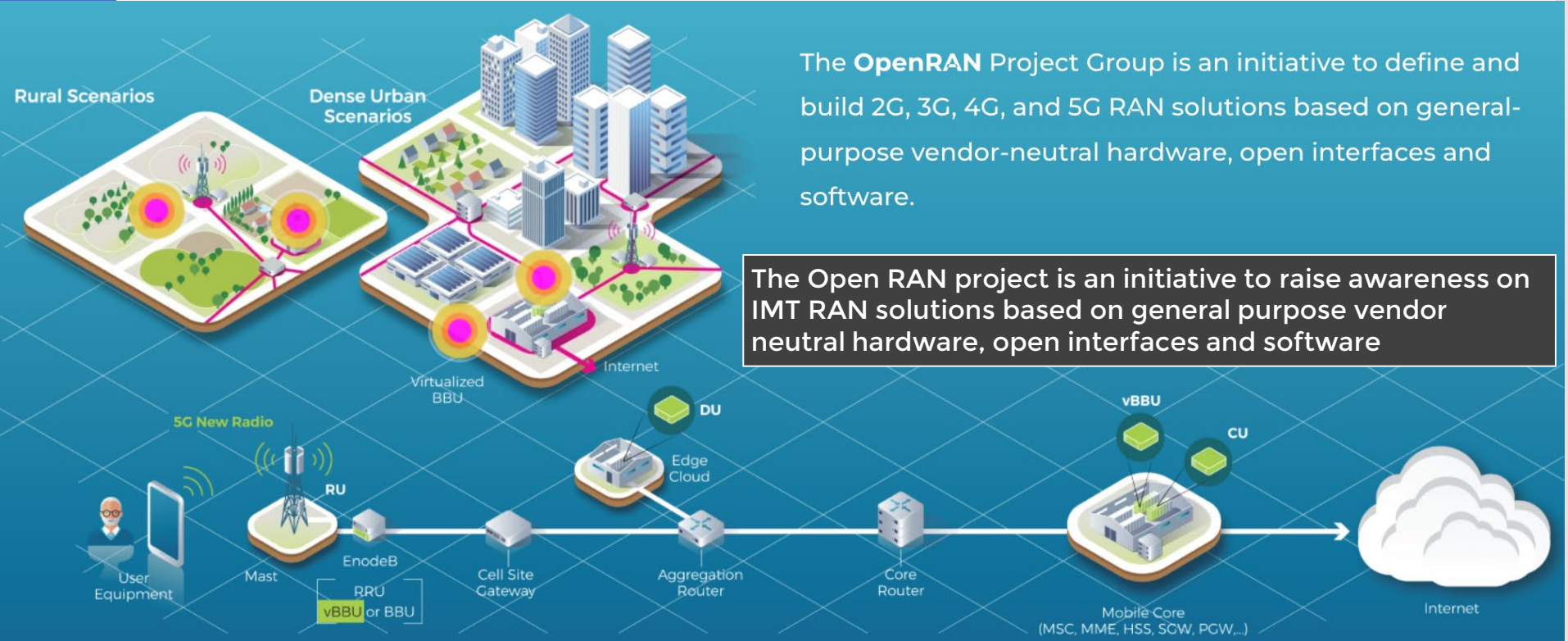
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SPECTRUM SHARING INNOVATION



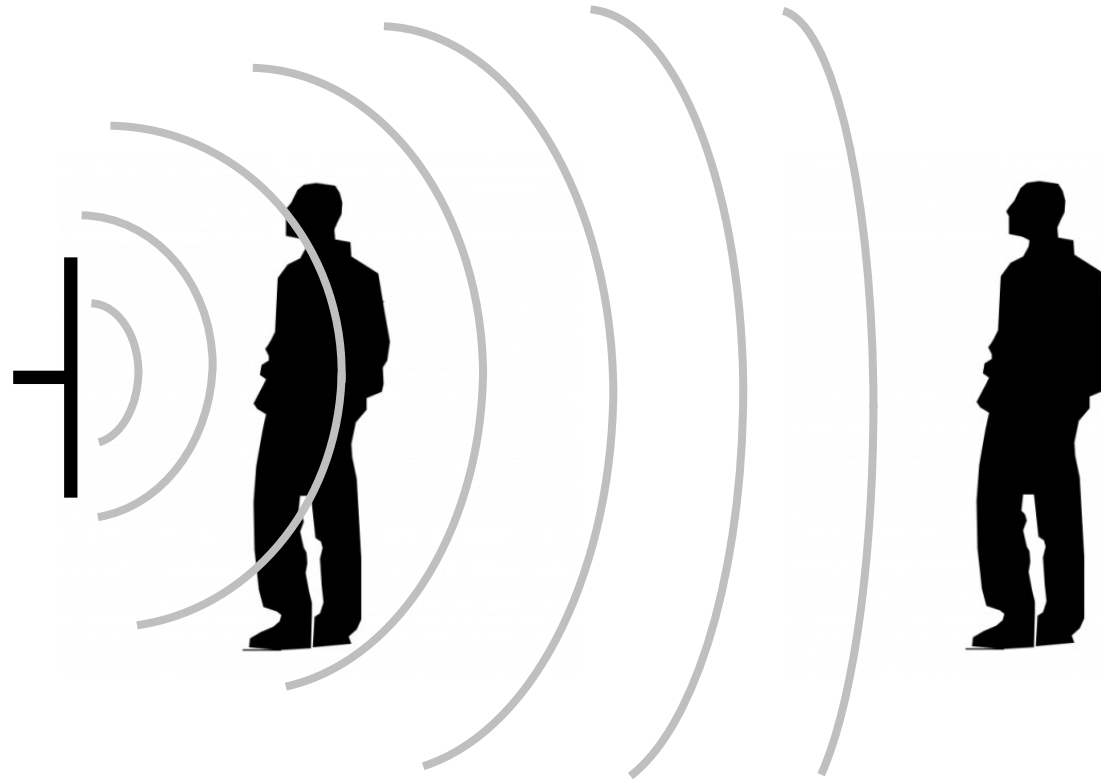
Creation of a secondary spectrum market whenever frequency bands are not used

OPEN RAN AWARENESS



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CONFORMANCE AND INTEROPERABILITY
BROADCASTING TECHNICAL ASSISTANCE
5G EMF COMPLIANCE AND AWARENESS



[ITU Publications on 5G and Human exposure to RF](#)

Our training activities (slide 1 of 3)

- Spectrum Management
 - [Spectrum Management Training Programme \(SMTP\)](#)
 - Modules
 - **OM1:** Legal Basis and Regulatory Framework of Spectrum Management
 - **OM2:** Spectrum Engineering Fundamentals
 - **OM3:** Wireless Telecommunications Technologies
 - **EM1-1:** Spectrum Monitoring
 - **EM1-2:** Enforcement and Type Approval of Equipment
 - **EM1-3:** SM for Satellite Systems
 - **EM1-4:** SM for HF Systems, Science, Maritime and Amateur Services
 - **EM1-5:** SM for Aeronautical and Radio Determination Services and Military Systems
 - **EM1-6:** Computer-aided Spectrum Management
 - **OM4:** Economic and Market Tools of Spectrum Management
 - **OM5:** Strategic Planning and Policies for Wireless Innovation
 - **EM2-1:** (Legal Specialization): Advanced Spectrum Authorization Regimes
 - **EM2-2:** (Legal Specialization): Socio-Economic Impact of Spectrum Regulation; Competition and Consumer
 - **EM2-3:** (Technical Specialization): Terrestrial TV Broadcasting Planning and Digital Transition
 - **EM2-4:** (Technical Specialization): Opportunistic Spectrum Access and Cognitive Radio
 - **EM2-5:** (Technical Specialization): Electro Magnetic Fields and Health
 - [Introduction to Spectrum Management](#) - Self-Paced Training

Our training activities (slide 2 of 3)

- Network Design
 - ICT Infrastructure Business Planning Toolkit
 - Broadband Mapping
 - [ITU academy course: Introduction to broadband mapping](#)
 - [Deep dives with ITU Membership in different countries on Connectivity Analysis](#)
 - [Open Fibre Standards](#)
 - Last Mile Connectivity solutions
- Conformance and Interoperability
 - Type Approval procedures, Testing Domains, Regional Technical Collaboration
 - Virtual and On-the-job training in collaboration with partner Testing Laboratories (e.g. CERT/Tunis, NCA/Ghana, CPqD/Brazil)
 - Example: [Conformity and interoperability on test reports analysis and regulatory aspect of electromagnetic compatibility testing \(EMC\)](#)



Our training activities (slide 3 of 3)

- Future networks
 - Mobile networks IMT-2020, 5G
 - Satellite Communication
 - Transition to IPv6
 - Optical Fibres
 - Internet of Things
 - Emerging Technologies
 - Artificial Intelligence applied for network designed

