ITU Thematic Priorities
Experts presentations

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

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ITUAcademy TRAINING CENTRES

About the division

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Head FNS

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ITU Academy TRAINING CENTRES

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.

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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

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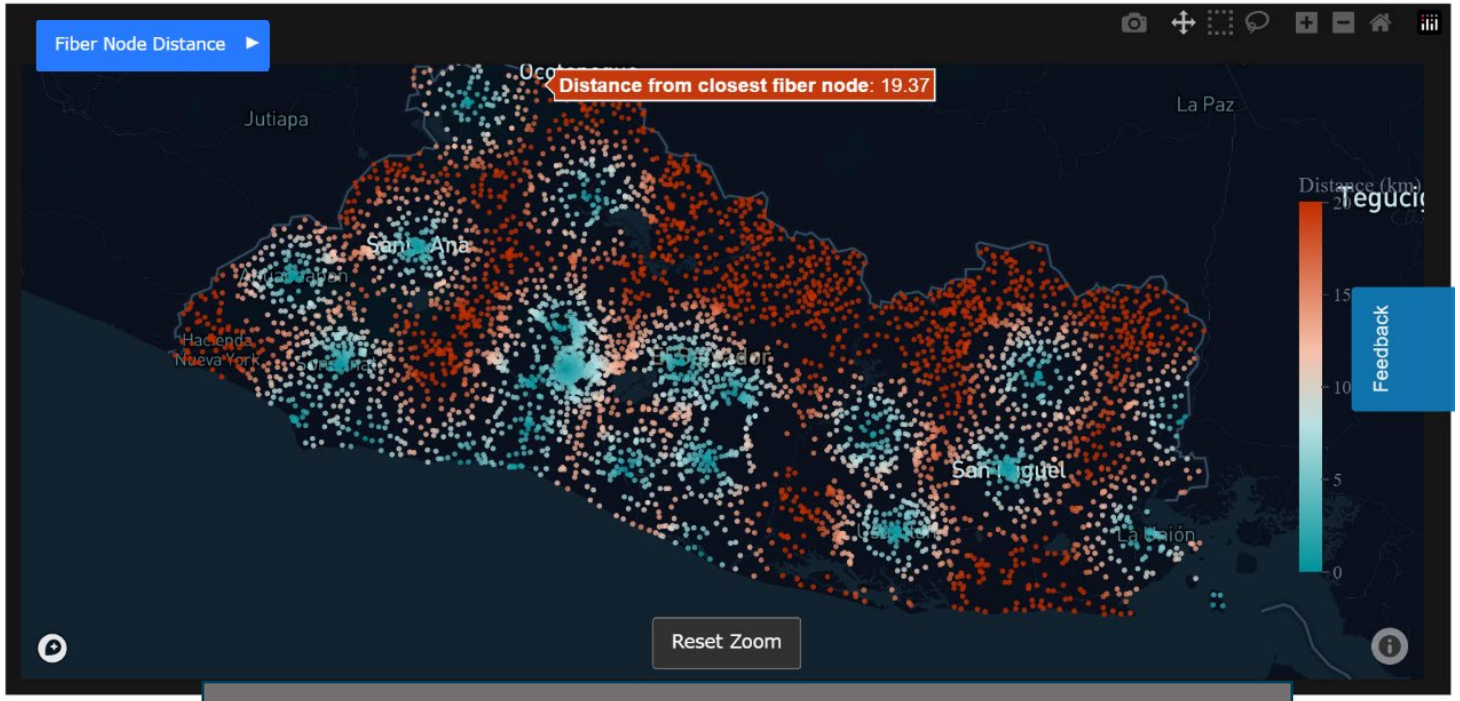
Present and future priorities

- **Broadband Mapping and Connectivity Analysis**

www.itu.int/go/maps



www.itu.int/go/schoolmap

https://academy.itu.int/

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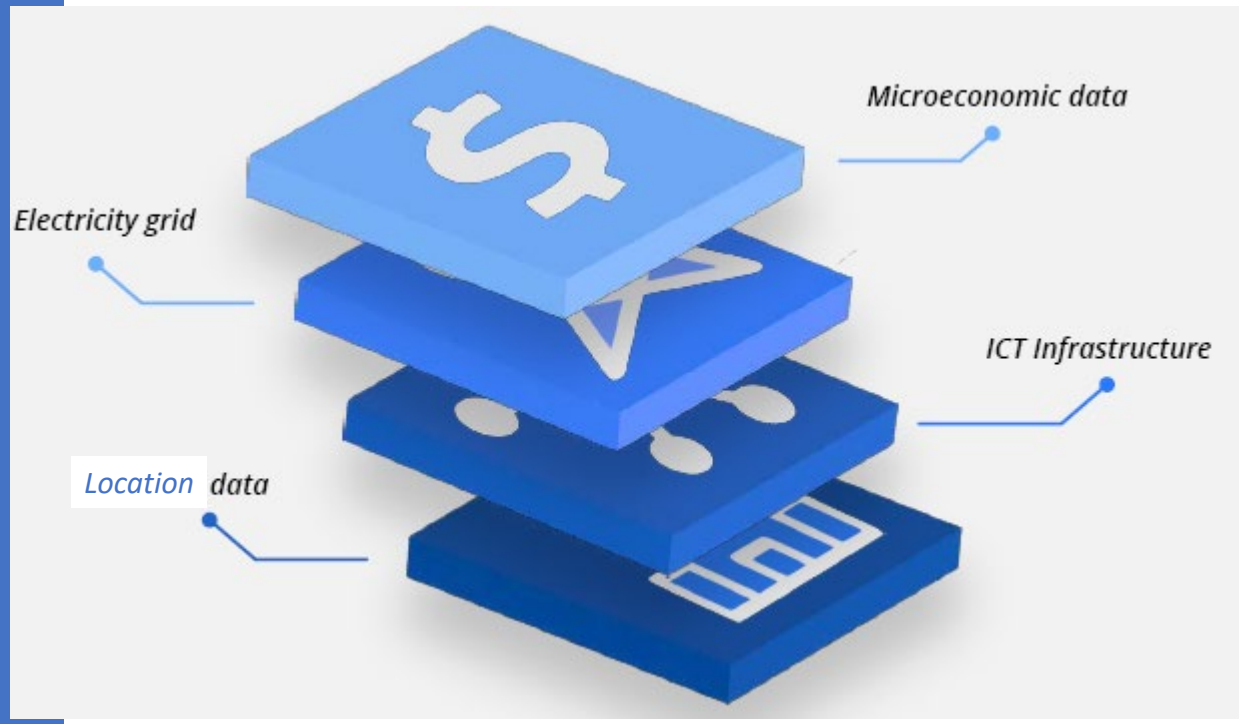
CONNECTIVITY STACK



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

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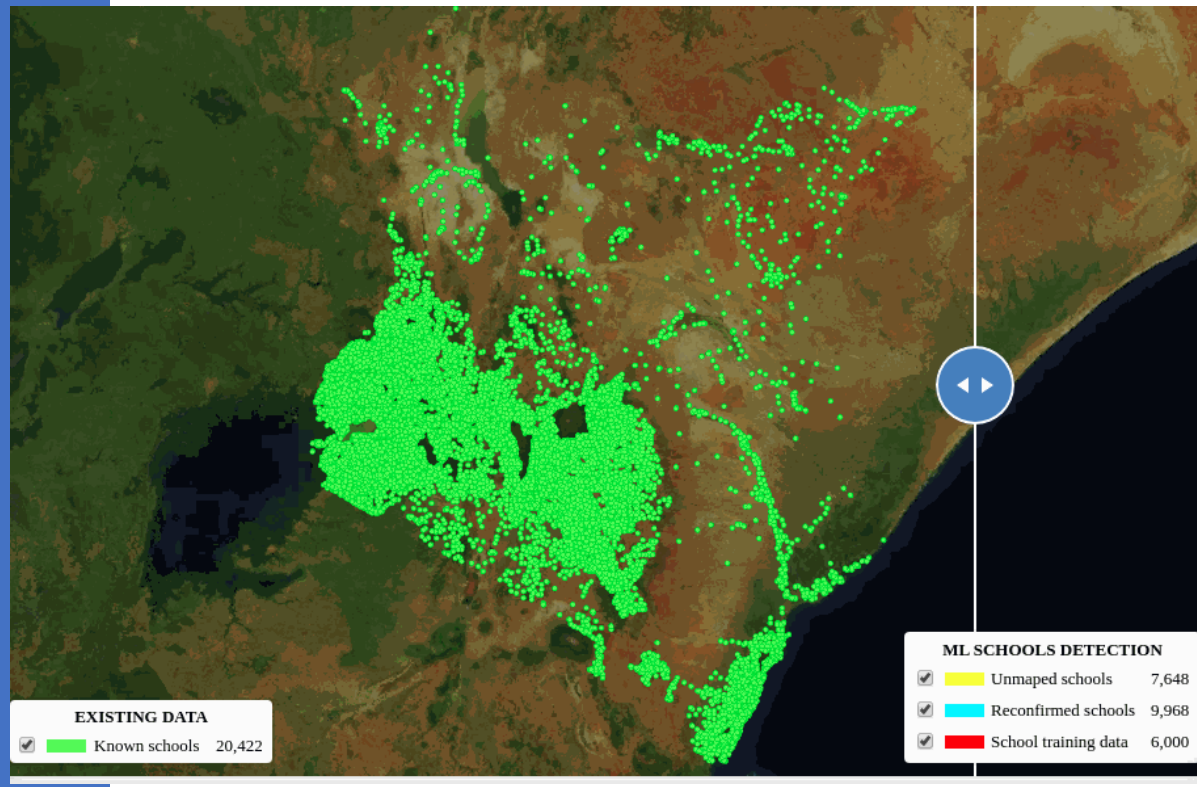
AI FOR INFRASTRUCTURE

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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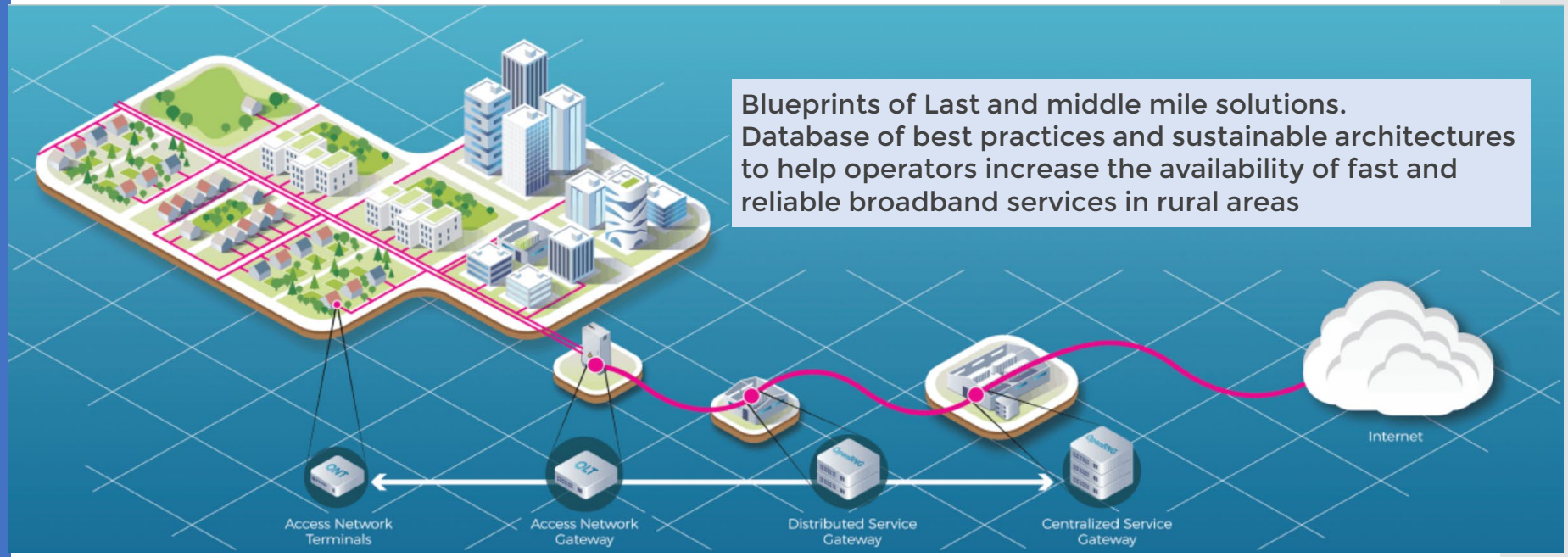
LAST/MIDDLE MILE TOOLKITS



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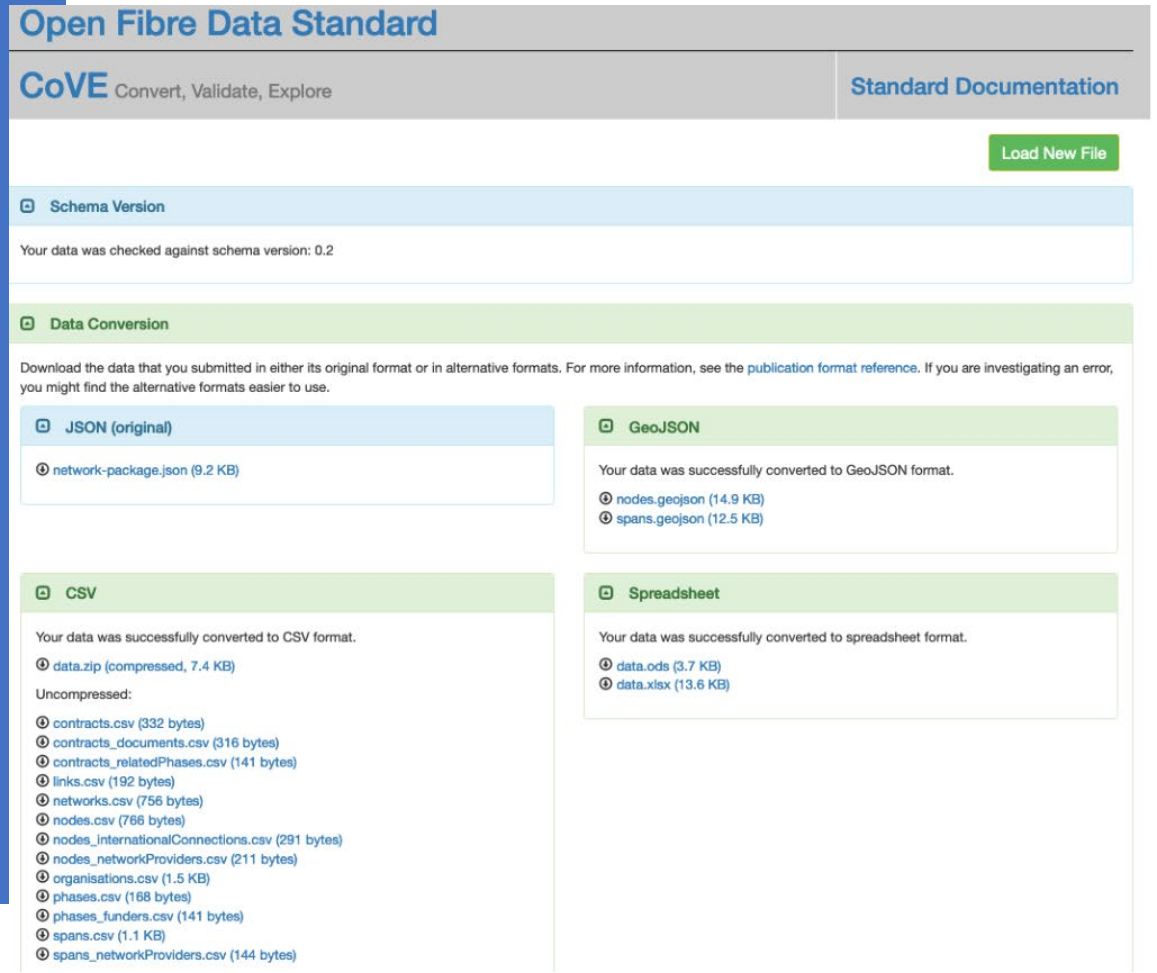
IPv6 and IXP DEPLOYMENTS

OPEN DATA INFRASTRUCTURE



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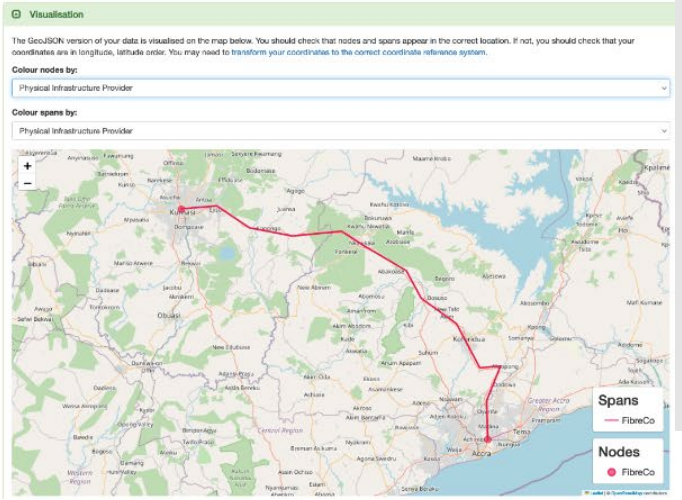

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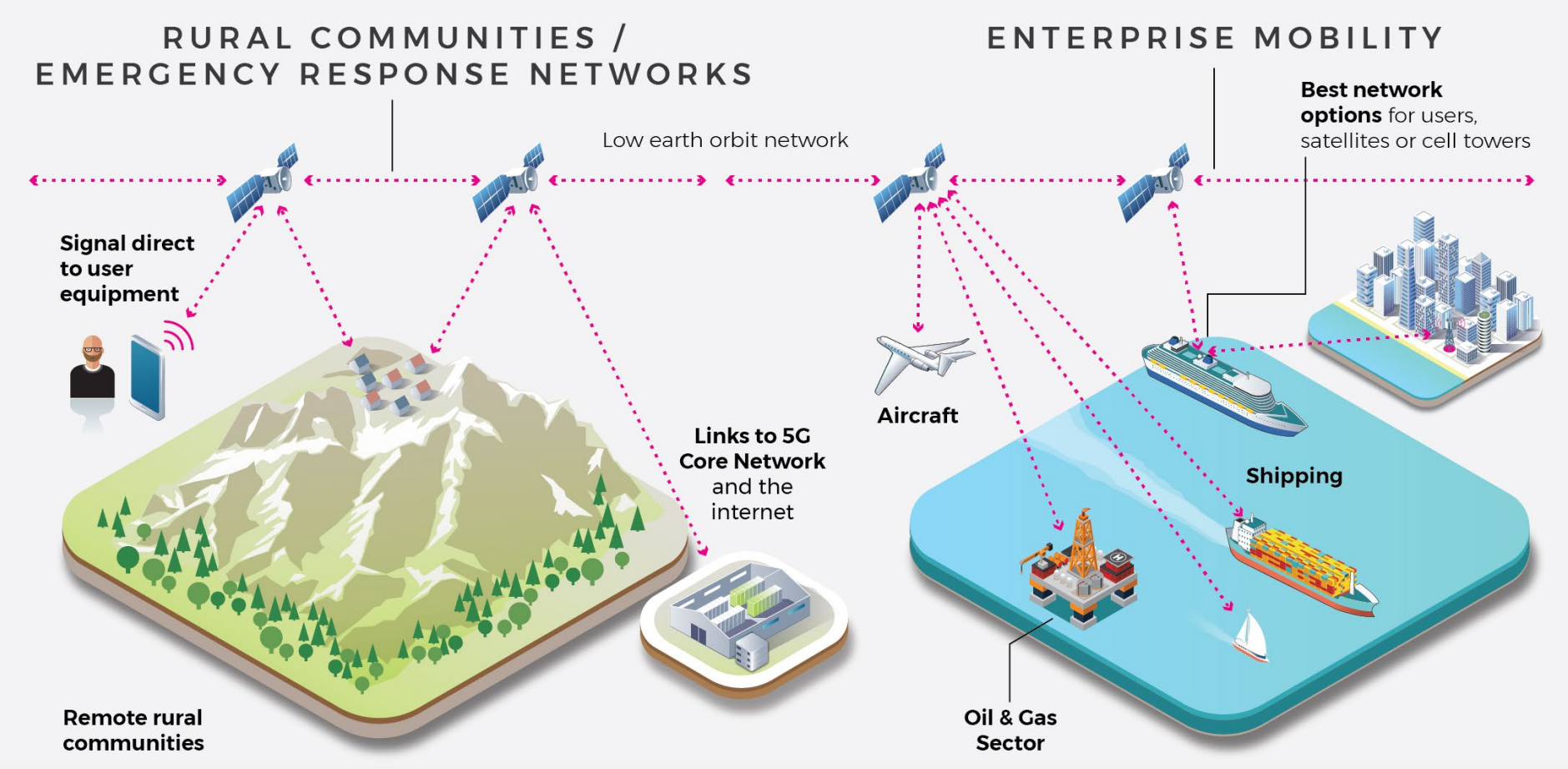
SATELLITE COMMUNICATIONS

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



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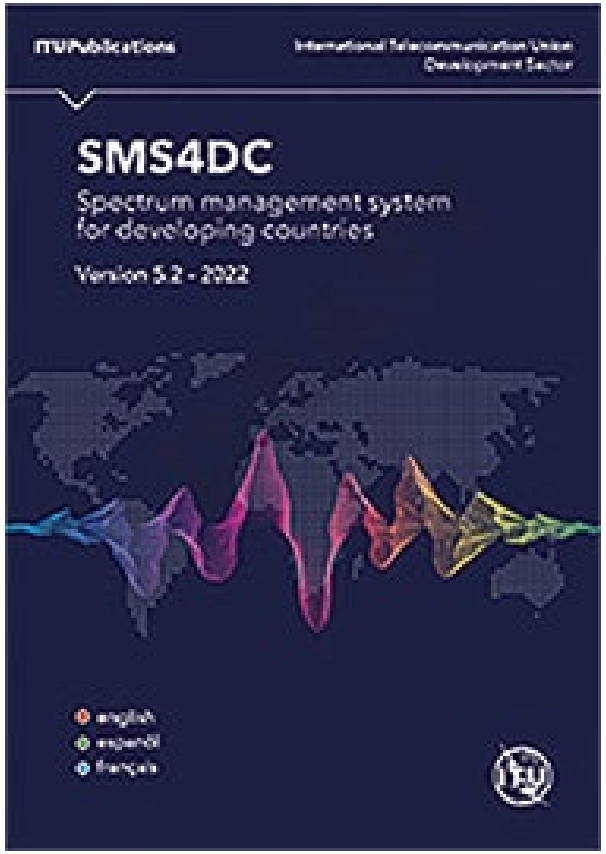
SPECTRUM MANAGEMENT FOR DEVELOPING COUNTRIES



Open-source SMS4DC

Seek partnerships for future

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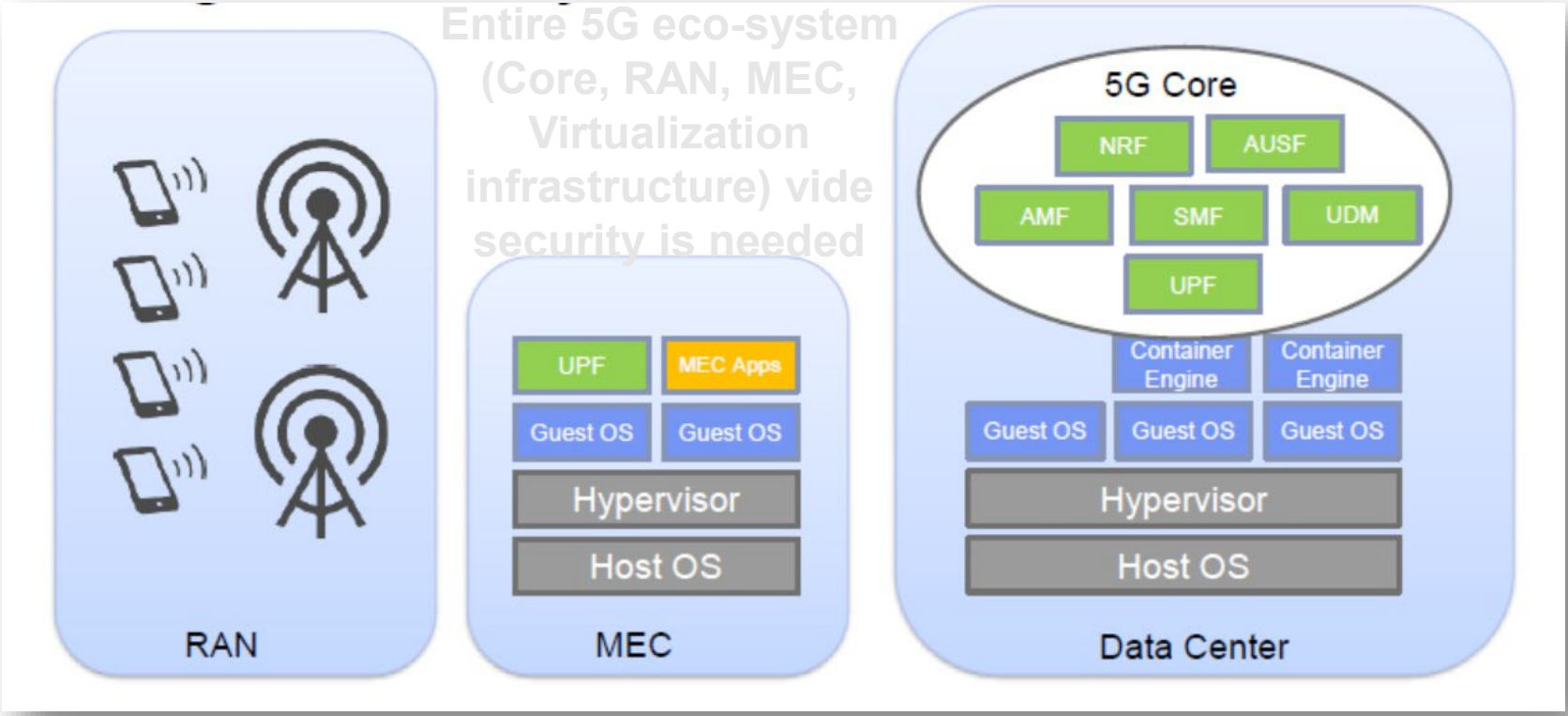
5G network Architecture and security



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

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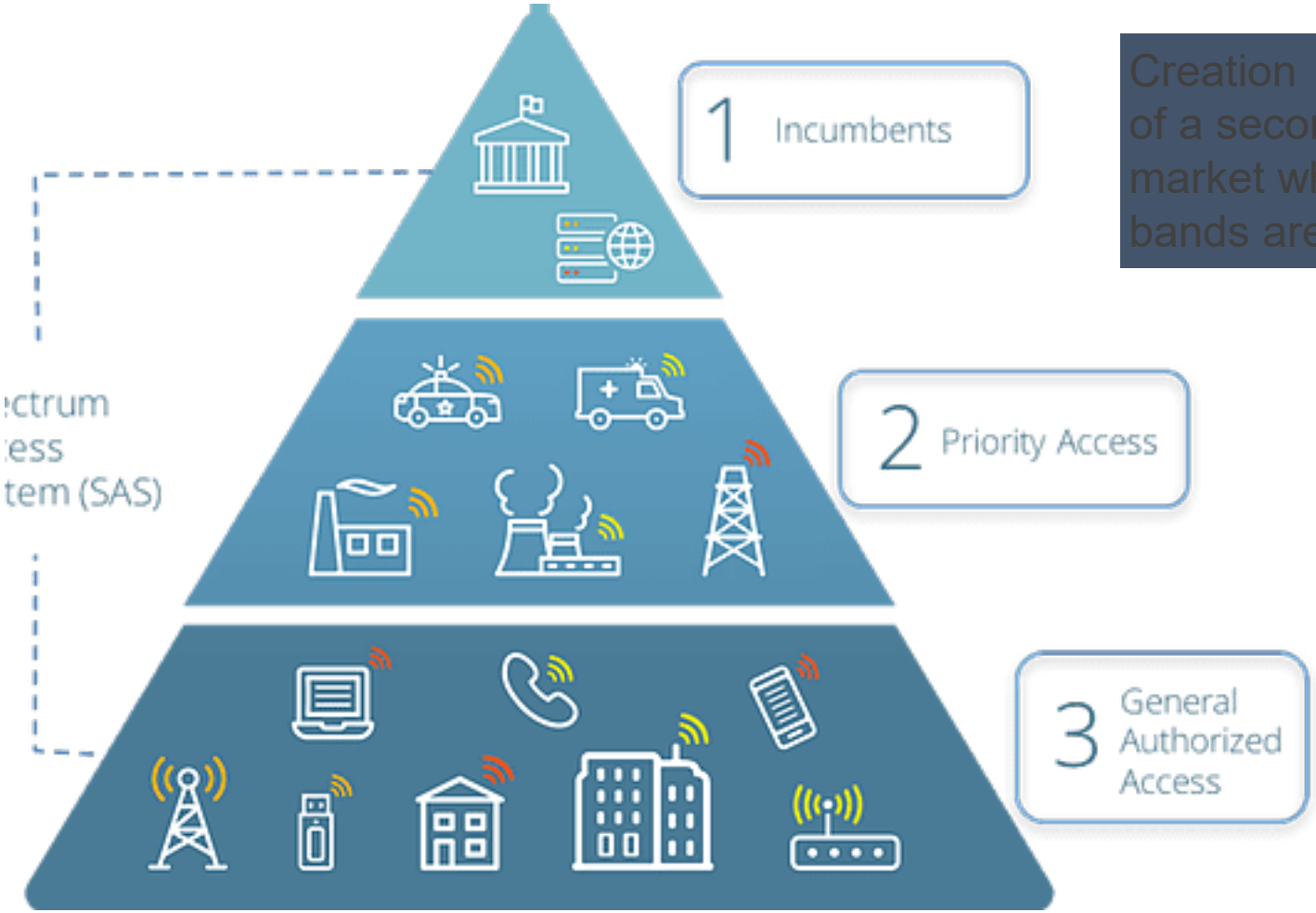
SPECTRUM SHARING INNOVATION



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

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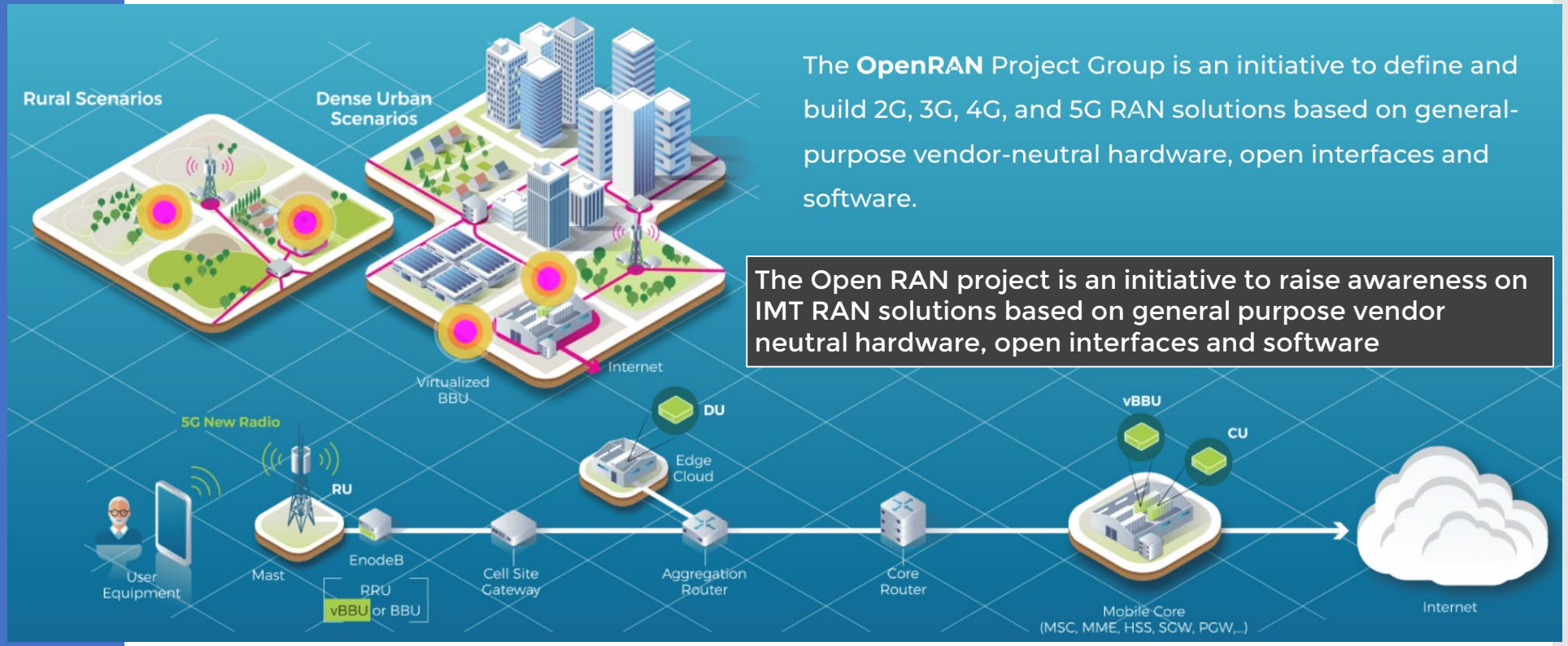
OPEN RAN AWARENESS



The **OpenRAN** Project Group is an initiative to define and build 2G, 3G, 4G, and 5G RAN solutions based on general-purpose vendor-neutral hardware, open interfaces and software.

The Open RAN project is an initiative to raise awareness on IMT RAN solutions based on general purpose vendor neutral hardware, open interfaces and software

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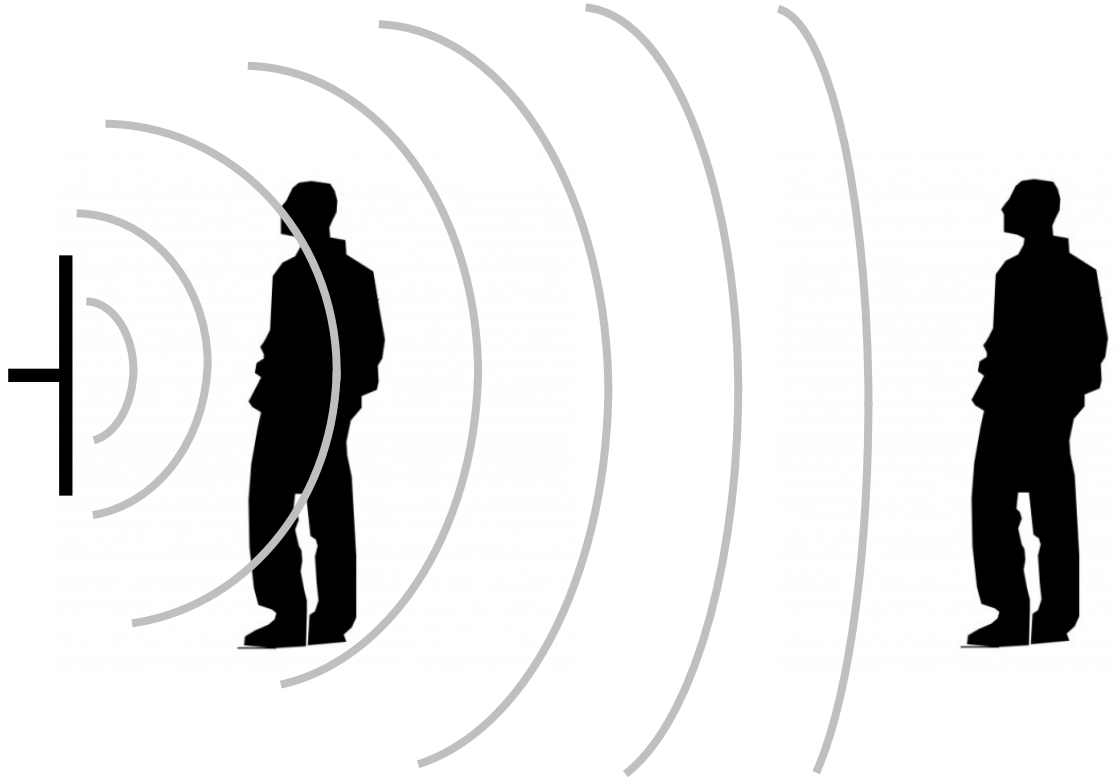
CONFORMANCE AND INTEROPERABILITY
BROADCASTING TECHNICAL ASSISTANCE
5G EMF COMPLIANCE AND AWARENESS



ITU Publications on 5G and Human exposure to RF

ITU Academy TRAINING CENTRES

Our training activities (slide 1 of 3)

- Spectrum Managment
  - Spectrum Management Training Progamme (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

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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)

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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