Enabling IoT Through Dynamic Spectrum Access Technologies

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Dynamic Spectrum Sharing
For the 50 Billion IoT Networking

Network Capacity = Spectral Efficiency \times Amount of Spectrum \times Number of Base Stations

Circumventing the Network Capacity Limit

\[ C = B \log_2 \left(1 + \frac{S}{N}\right) \]
• RF spectrum is a scarce national resource
• Dynamic Spectrum Sharing (DSS)
  – Co-existence Toolbox (GL-DSA) and sharing in: \{F, S, T, P\} dimensions
Smart Networks Provided by 5G for M2M & IoTs

- Instrumented + Interconnected + Intelligence = Smarter Data

- Embedded computing + Network computing + Cloud computing = Reliable real-time & statistical data

- Sensor (efficiency) | Network (reliability) | Gateway (availability)

- Cloud (ubiquitous) | Data (scalable) | Storage (availability)

LOW POWER NETWORK

BIG DATA HANDLING
DSA for Smart Communities in Africa

- **Fixed Wireless TVWS Base Station:** 
  - Network trial in Western Cape Results:
    - Connected 10 schools some already had ADSL connectivity
    - Served over 16000 students with 4Mbps (average) ~ 16 Mbps peak
    - GLSD Co-existent Operation for over 2 years

- TVWS networks for M2M & IoT
- TVWS Network:
  - Ghana, Accra – GTUC
  - Botswana, BITRI

- Capacity Building!
Enabling Affordable Broadband & IoT with DSA Networks in an African Context

Working Closely With ICASA, DTPS, Universities,…! To build the R&D Supported Policy Decisions and Expert HCD Locally.

CSIR a Local Research & Development Institute
Ensuring a Sustainable Deployment of DSA!
It is in Our Hands to Make a Difference!....N Mandela

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Thank you!
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