

Broadband Access and Connectivity

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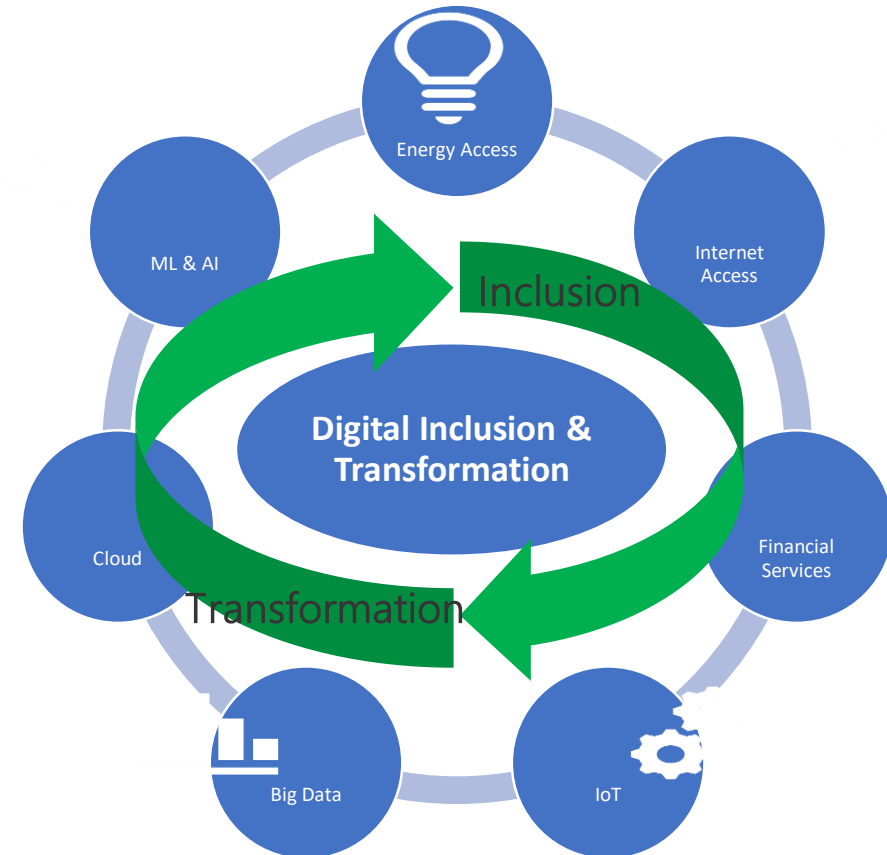
Microsoft Mission

Empower every person and every
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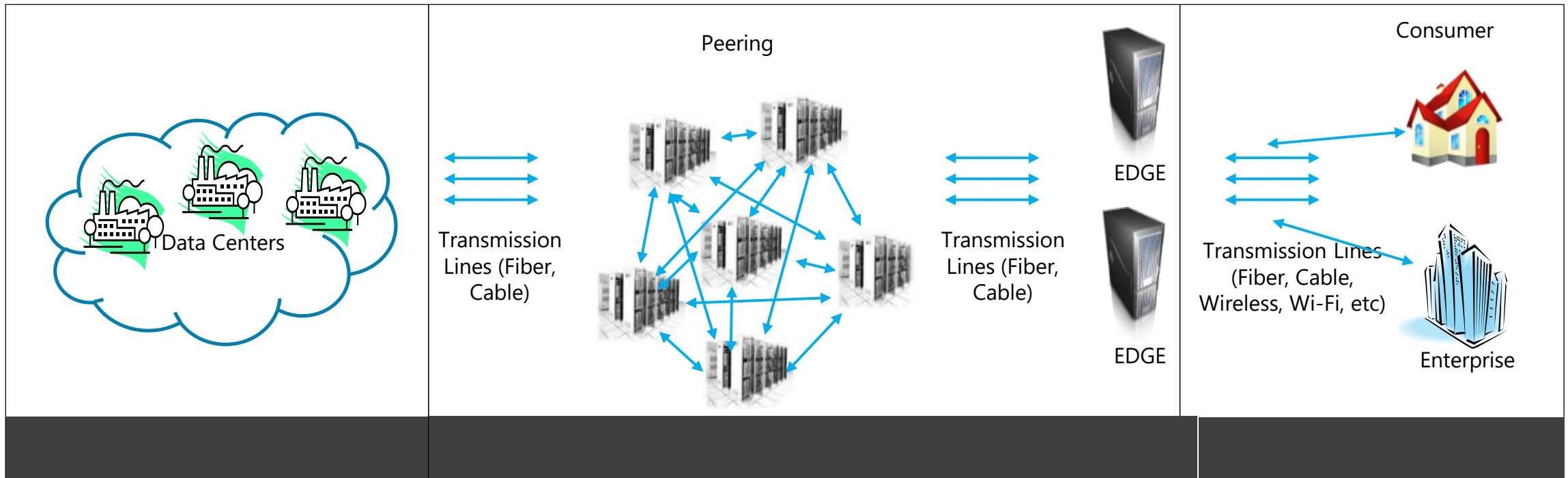
Satya Nadella



- **Digital Transformation**
- **The Digital Transformation Begins With Digital Inclusion**
- **Digital Inclusion Begins With Internet Access, Ideally at Broadband Speeds**



End-to-end Connectivity Underpins Cloud Computing



BROADBAND ACCESS, SUBSCRIBERSHIP AND AFFORDABILITY

- Wireline and wireless (terrestrial, mobile, and satellite) means
- Need to consider end-to-end costs including interconnection
- Role for both licensed and license-exempt operations
- Bandwidth requirements depends on the application
- Heterogenous networks lead to toolbox approach

∴ Access that is not affordable is no access at all.

Television white spaces (TVWS)

“A portion of spectrum in a band allocated to the broadcasting service and used for television broadcasting that is identified by an administration as available for wireless communication at a given time in a given geographical area on a non-interfering and non-protected basis with regard to other services with a higher priority on a national basis” (Source ITU)

National Authorization of TV White Space Operations is Within ITU-R Framework

- **ITU Radio Regulation RR 4.4**
 - "...except on the express condition that such a station shall not cause harmful interference to, and shall not claim protection from, harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations."
- **ITU-R Resolutions 805 (WRC-07) and 956 (WRC-07)**
 - ITU Study Groups instructed to examine whether software defined radio and cognitive radio could operate under the existing international regulatory framework, i.e. the Radio Regulations
- **ITU-R Recommendation 76 (WRC-12)**
 - No new international framework was necessary. Radio services incorporating these spectrum sharing technologies must operate according to the Radio Regulations and protect stations operating according to the Radio Regulations.

Countries with TVWS rules

- Canada
- Colombia
- Ghana
- Korea
- Philippines
- Singapore
- South Africa
- **Trinidad & Tobago**
- United Kingdom
- United States

There is a need for more licensed and license-exempt spectrum in the low-, mid-, and high-frequency spectrum bands

Licensed Exempt WRC-19 Issues of Interest

- AI 1.13 – Item J (66-71 GHz band)
- AI 1.16 – Covering RLAN use in the 5150-5825 MHz frequency bands
- AI 9.1.5 – Covering RLAN use in the 5250-5350 MHz and 5470-5725 MHz bands
- Possible AI 10 for WRC-23

- **AI 1.13 – Item J (66-71 GHz)**
 - DIAP for NOC – Belize, Colombia, U.S., Guatemala, and Mexico
 - Preliminary Proposal Brazil

- **AI 1.16**
 - 5150-5250 MHz – IAP + Preliminary Proposals from Brazil and Canada
 - 5250-5350 MHz – IAP for NOC *
 - 5350-5470 MHz – IAP for NOC *
 - 5725-5850 MHz – IAP for NOC + Preliminary Proposals from Mexico and Argentina
 - 5850-5925 MHz – IAP for NOC *

- **AI 9.1.5**
 - IAP – Modify footnotes to effectively decouple ITU-R Recommendation from underlying ITU-R Report in frequency bands requiring Dynamic Frequency Selection (5250-5350 MHz and 5470-5725 MHz)

Reasons for a No Change to AI 1.13 Item J (66-71 GHz)

- Creates certainty in the marketplace and supports investment in MGWS ecosystem
- Supports a technology neutral approach.
- Studies to demonstrate IMT can share the 66-71 GHz band with other services were not completed even though there was time to do so during the WRC-19 preparatory process.
- The Radio Regulations (Footnote 5.553) require mobile use of the 66-71 GHz band not to cause interference to systems of space services allocated in this band. This make any IMT use secondary and unattractive for an IMT identification unless the band is removed from the Footnote – which is outside of WRC-19 AI 1.13 and Resolution 238 (WRC-15)
- The ITU-R is not the right place to work out difference between standards developed by IEEE and 3GPP
- An IMT identification would create unnecessary work at ITU-R by having WP 5A and WP 5D work in parallel.

Status of the U.S. Domestic “6 GHz” Proceeding

- The FCC issued a Notice of Proposed Rulemaking for authorizing the 5925-7125 MHz band for licence-exempt use.
- As a secondary service, license-exempt use must protect the incumbents from harmful interference and will not constrain the future growth of the existing services.
- The cycle of Comments and Reply Comments have been completed
- There are ongoing technical discussions between the license-exempt advocates and the services that need to be protected.
- The Report and Order is expected by the end of the calendar year

Thank you!