WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

Fixed Wireless Systems for Rural Backhaul Solutions

20th April, 2022

NEC Corporation, Japan

WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

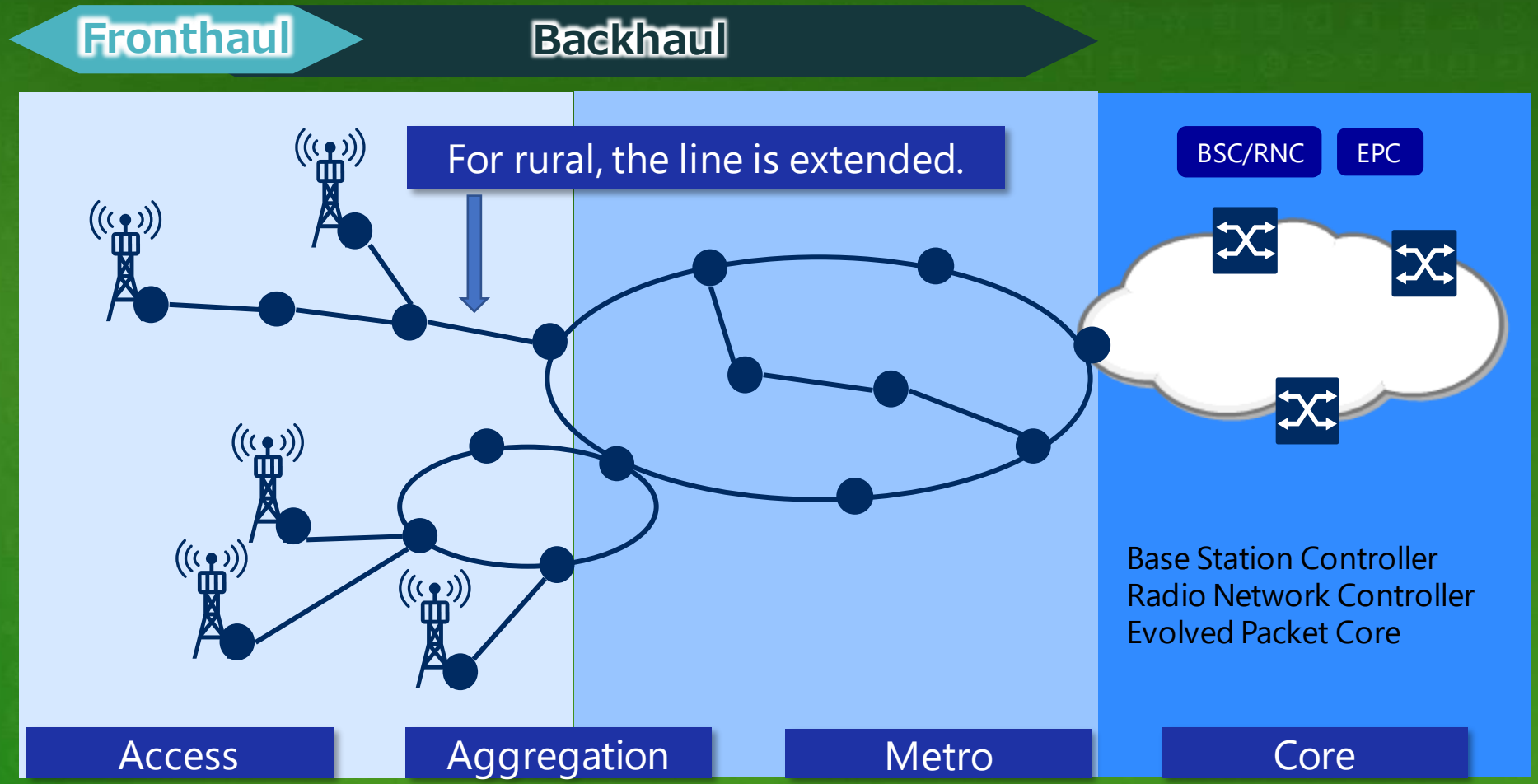
Outline

1. System Overview
2. System Specifications
3. Technologies for High Capacity
4. Requirements for Rural Backhaul
5. Benefits of FWS and Summary

WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

FWS in Mobile Network

FWS Application Areas



WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

Lineup

Outdoor

All Outdoor Type (Short Haul)

iPASOLINK EX Advanced

iPASOLINK iX Advanced

Split Type (Short Haul)

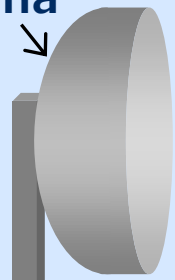
Antenna

ODU (Outdoor unit)

Coaxial Cable

Long Haul

Antenna



Wave Guide

Indoor

IDU (Indoor unit)

Depends on the required capacity and functions

iPASOLINK VR2

iPASOLINK VR4

iPASOLINK VR10

7000iP series

WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

System Specifications

	Microwave	Millimeter-wave
RF frequency	6 GHz to 42 GHz	71-76/81-86 GHz
Signal Bandwidth	7/14/28/56/112/224 MHz	250 MHz x N (N=1 to 18)
Modulation *1	QPSK to 4096QAM	QPSK to 256QAM
Maximum Capacity/Carrier	1 Gbps	10 Gbps
Multiplexing *1	Polarization, LOS-MIMO	Polarization
Link Distance *2	several km to several tens of km	several km
Power Consumption *3	50 to 150 W	70 W
Available temperature range	-33 to +55 ℃	-33 to +55 ℃
	High Efficiency, Long Distance	High Capacity, Short Distance

*1 : Commercialized as of 2022
*2 : Depends on the required availability and channel conditions
*3 : Depends on the configuration

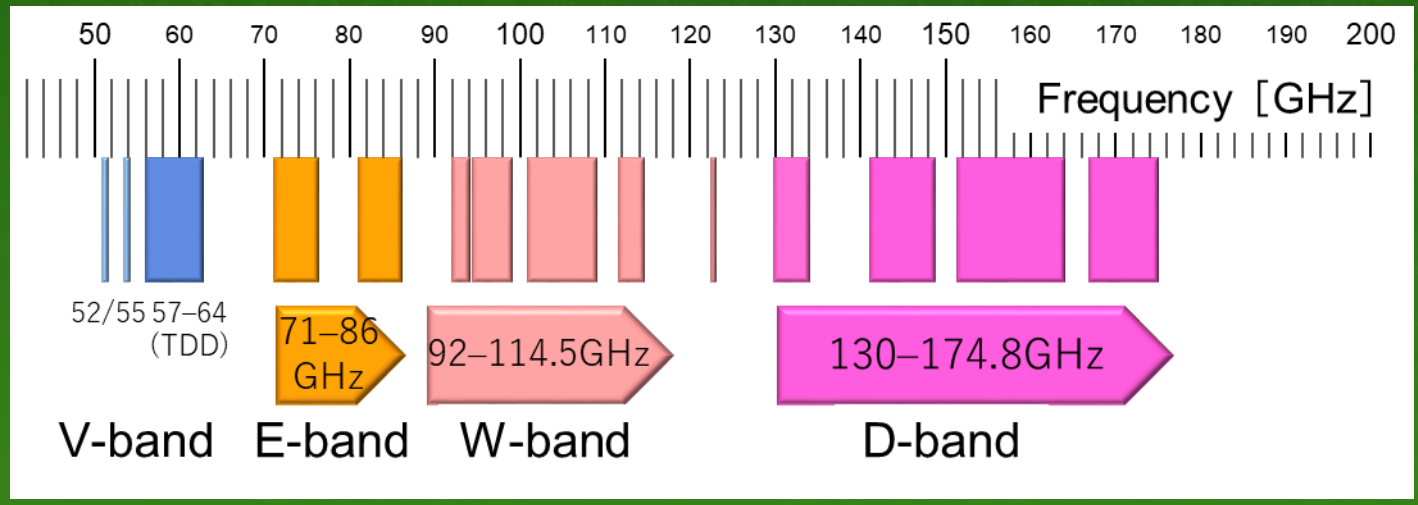
WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

Technologies for High Capacity

WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

mmW for Wider Bandwidth

- mmW Bands
  - E-band is already in service.
  - W-band and D-band are under standardization.

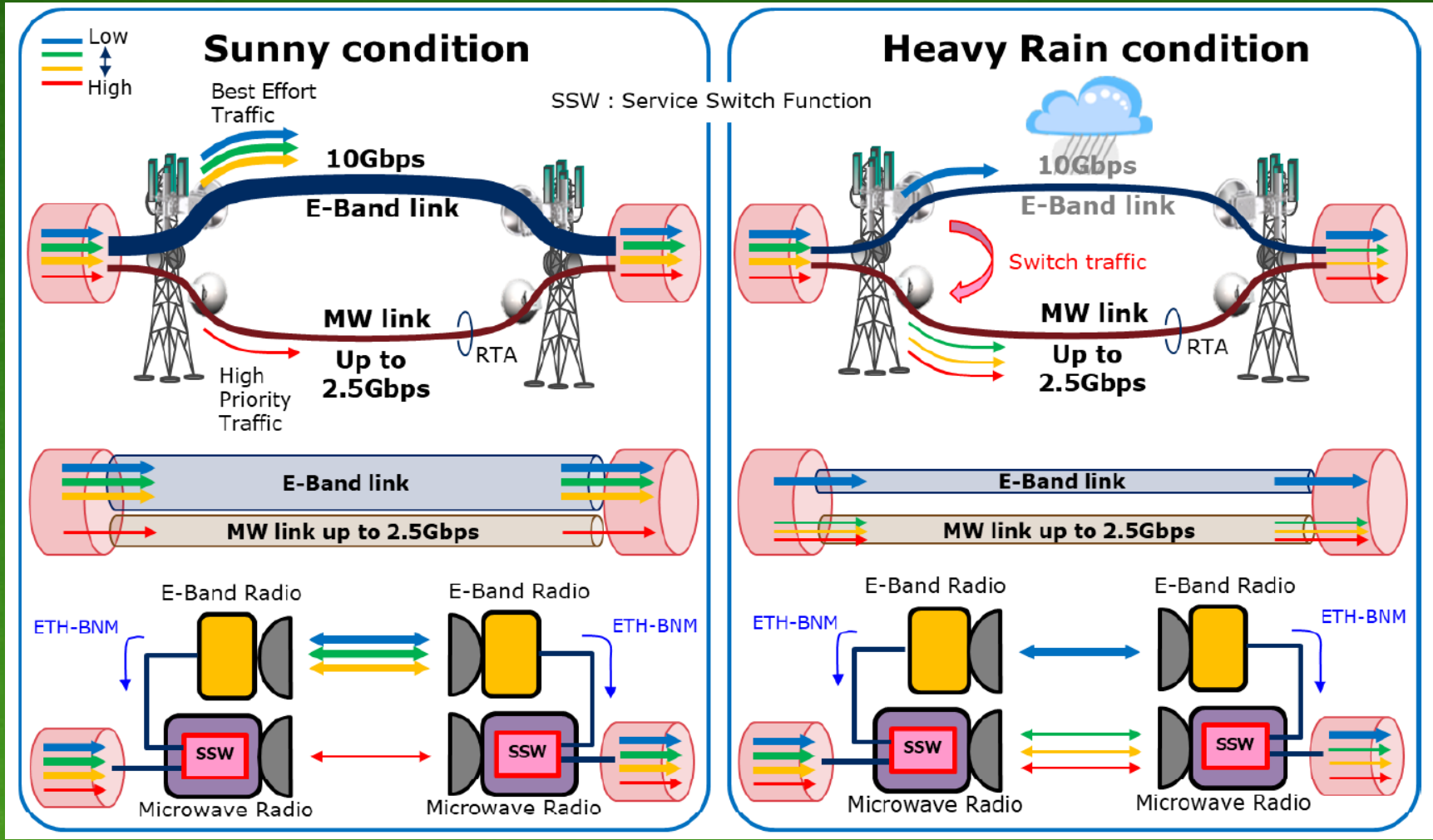


- Features
  - High capacity achievable due to wider bandwidth, 2GHz or moreover.
  - Short link distance limited up to 2km in rainy weather due to large rain attenuation.
  - But more than 5km on sunny days.

WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

Concept of Multi-band Solution

- Combining Advantage of MW and mmW
  - Long distance of MW.
  - High capacity of mmW.
- Benefits
  - Possible to arrange capacity and distance according to area and weather.



WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

Requirements for Rural Backhaul

- Low CAPEX
  - Low cost equipment
  - Low cost, short term construction
- Low OPEX
  - Low electricity bill
    - Low power consumption
  - Maintenance free
    - High reliability (Long MTBF)
    - Remote operation, monitoring
- Appropriate High Capacity for B5G-era.

WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

Benefits of FWS, and Summary

- FWS has the following benefits.
  - High economic efficiency in construction.
    - Rapid deployment, Work on points, not lines.
  - Low cost in operation
    - Low power consumption with the latest LSIs.
    - Remote operation, monitoring by NMS.
  - High Reliability and High performance
    - Proven track records of extremely low failure rate.
    - Coexistence of High-capacity and Long hop by Multi-band system.
- FWS is one of the most useful options for Rural Area Backhaul.

WSIS FORUM 2022
Starting on 15 March
Final week 30 May - 3 June

Thank you for your attention!