Commissioned Research (#014) of NICT, Japan
"Metro/Access Optical Technologies for Highly-Efficient Beyond 5G Infrastructure Architecture"

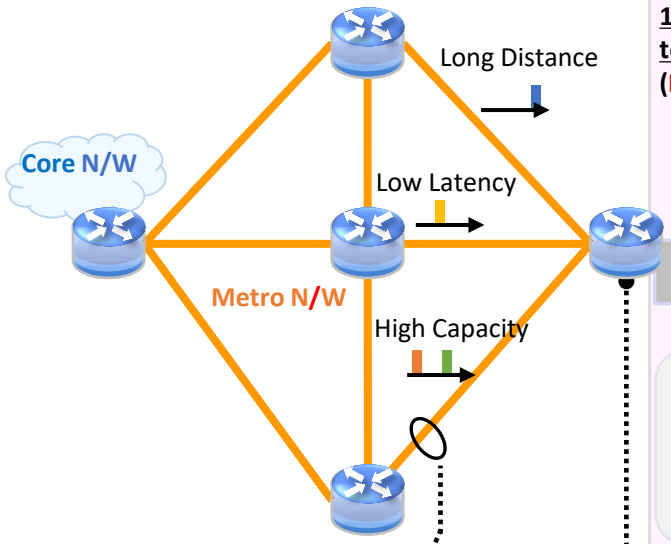
Member Institutions

MITSUBISHI ELECTRIC Changes for the Better | KDDI Research | AIST | OSAKA UNIVERSITY | Osaka Metropolitan University

⦿ Project overview

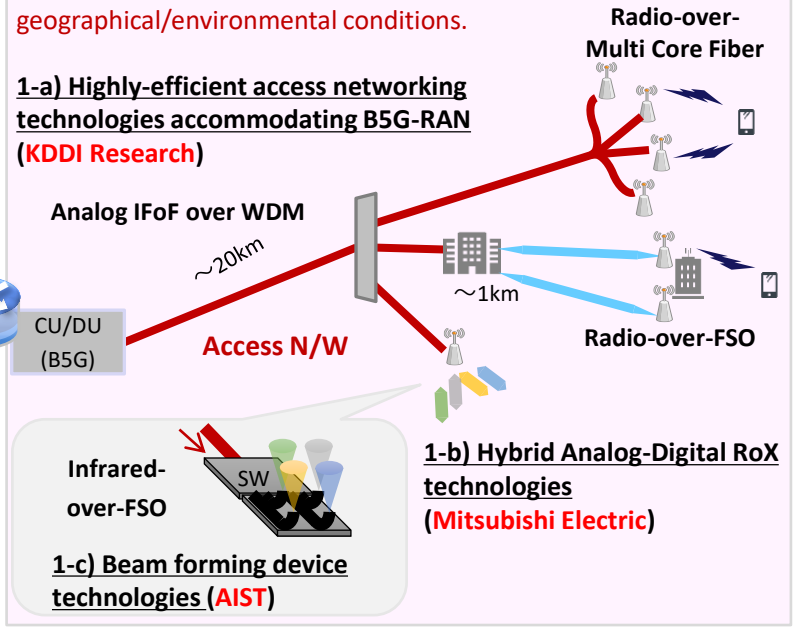
1. To establish high-capacity, bi-directional 100 Gbit/s access network based on radio-over-fiber technology which accommodates various types of RAN services under different geographical/environmental conditions.
2. To establish highly-efficient metro networking technologies which reduce the required H/W resources and spaces (10-fold) by utilizing DSP and hybrid analog-digital techniques.

Highly-efficient optical network infrastructure accommodating various B5G RAN services in metro/access N/W.



1. Highly-efficient access N/W technologies

Next gen. Radio-over-Fiber (RoF)-based MFH technologies enabling accommodation of various RAN services under different geographical/environmental conditions.



1-a) Highly-efficient access networking technologies accommodating B5G-RAN (KDDI Research)

1-b) Hybrid Analog-Digital RoX technologies (Mitsubishi Electric)

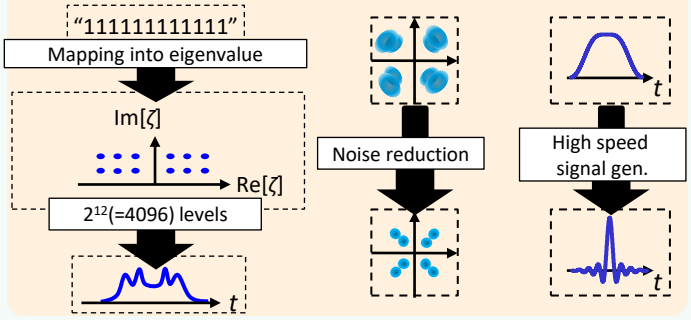
1-c) Beam forming device technologies (AIST)

2. Highly-efficient metro N/W technologies

High-capacity fiber transmission

2-c) Nonlinear transmission technologies (Osaka Univ.)

2-d) Hybrid optical-electrical signal processing technologies (Osaka Metropolitan Univ.)

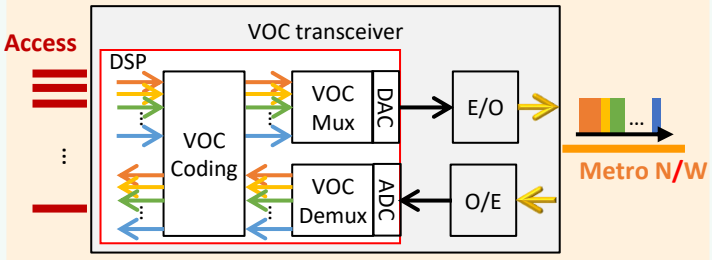


Mitigating fundamental impairments due to nonlinear effects and amplifier noise in fiber communication systems.

Highly-efficient TRx and DSP for metro N/W

2-a) Virtual optical channel technologies

2-b) FEC technologies for accommodating multiple heterogeneous services (Mitsubishi Electric)



Efficiently accommodates various RAN service while reducing H/W resources and volume. (10–fold improvement compared with conventional TRx.)

RAN: Radio Access Network
IFoF: Intermediate Frequency over Fiber
WDM: Wavelength Division Multiplexing
RoF: Radio Over Fiber
RoFSO: Radio Over Free Space Optics
RoMCF: Radio Over Multi Core Fiber