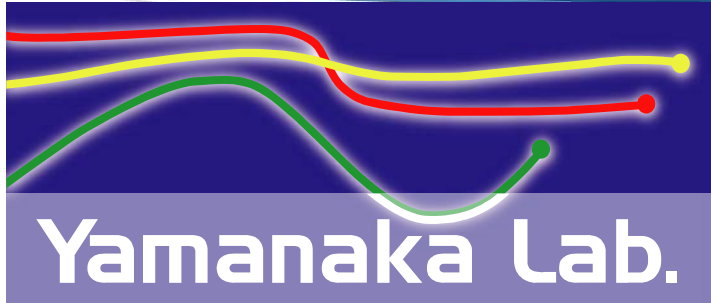


Elastic Lambda Aggregation Network

~Overview~

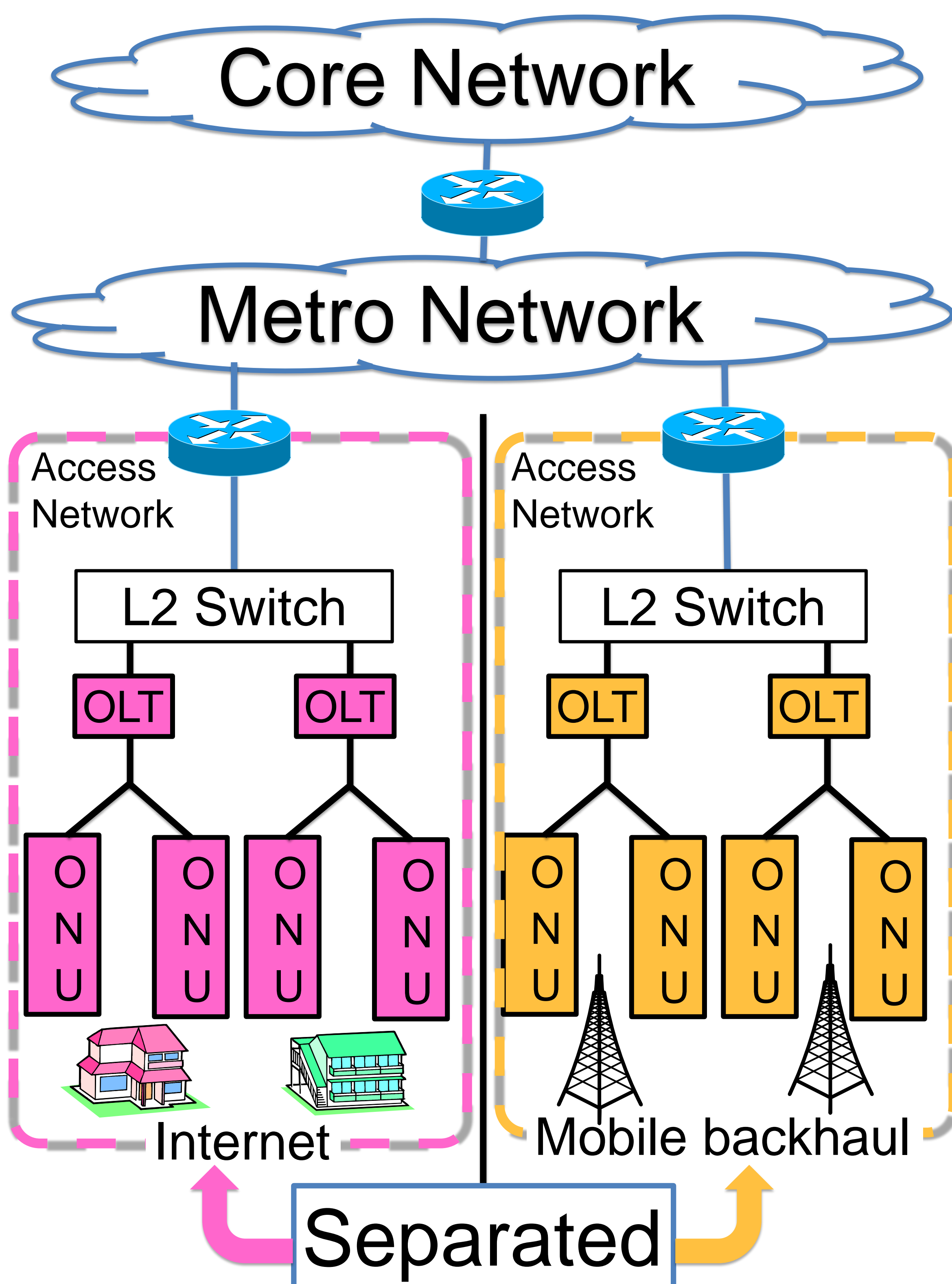


OLT: Optical Line Terminal
ONU: Optical Network Unit
L-OLT: Logical OLT
L-ONU: Logical ONU
L2: Layer-2
P-OLT: Programmable OLT
P-ONU: Programmable ONU

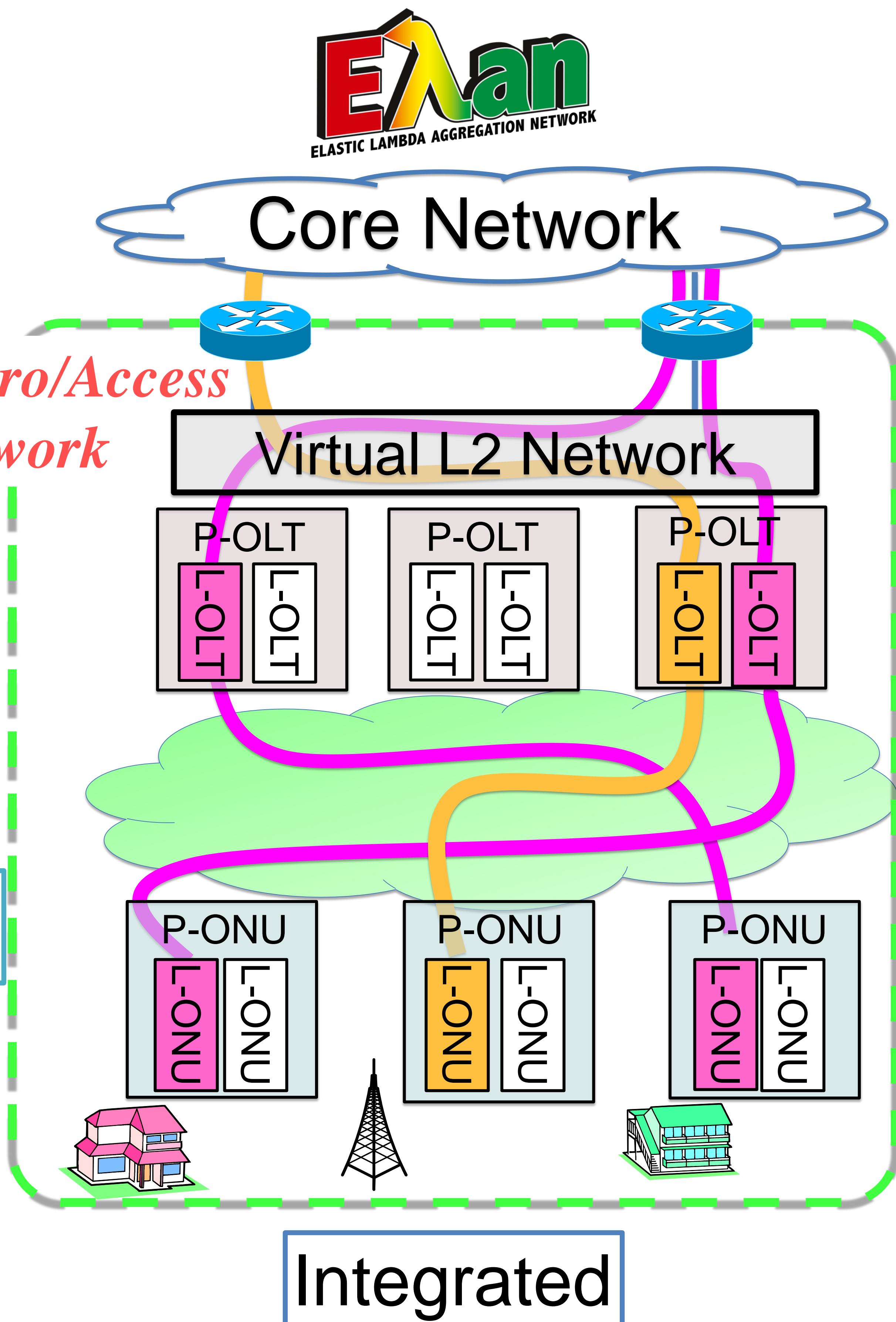
Elastic Lambda Aggregation Network(EΛAN)

- Integration of metro and access networks
- Flexible reconfigurable all-optical network and virtual L2 network
- Programmable devices provide logical OLTs/ONUs
- Integration of services presently provided by separated networks

Present Network



40km
All-Optical Network



Services

- | | | |
|---------------------------|-----------------------------|------------------------|
| ▪ Internet access | ▪ Ethernet private line/LAN | ▪ Mobile backhaul |
| ▪ Virtual Private Network | ▪ Data-center network | ▪ Radio access network |

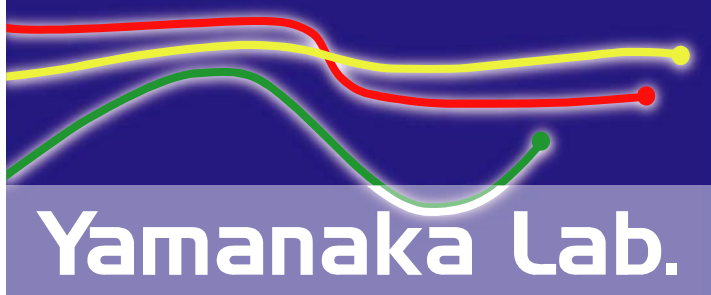
Advantages

- Fully virtualized metro/access integration
- Efficient use of network devices
- Reduction of power consumption
- Improvement of disaster tolerance

Elastic Lambda Aggregation Network

~ Advantages ~

Keio University



FTTH: Fiber To The Home
NW: Network
OLT: Optical Line Terminal
ONU: Optical Network Unit
L-OLT: Logical OLT
L-ONU: Logical ONU
TRx: Transceiver

Fully virtualized metro/access integration

- Deploy OLTs closer to the border of metro and core network

Efficient use of network devices

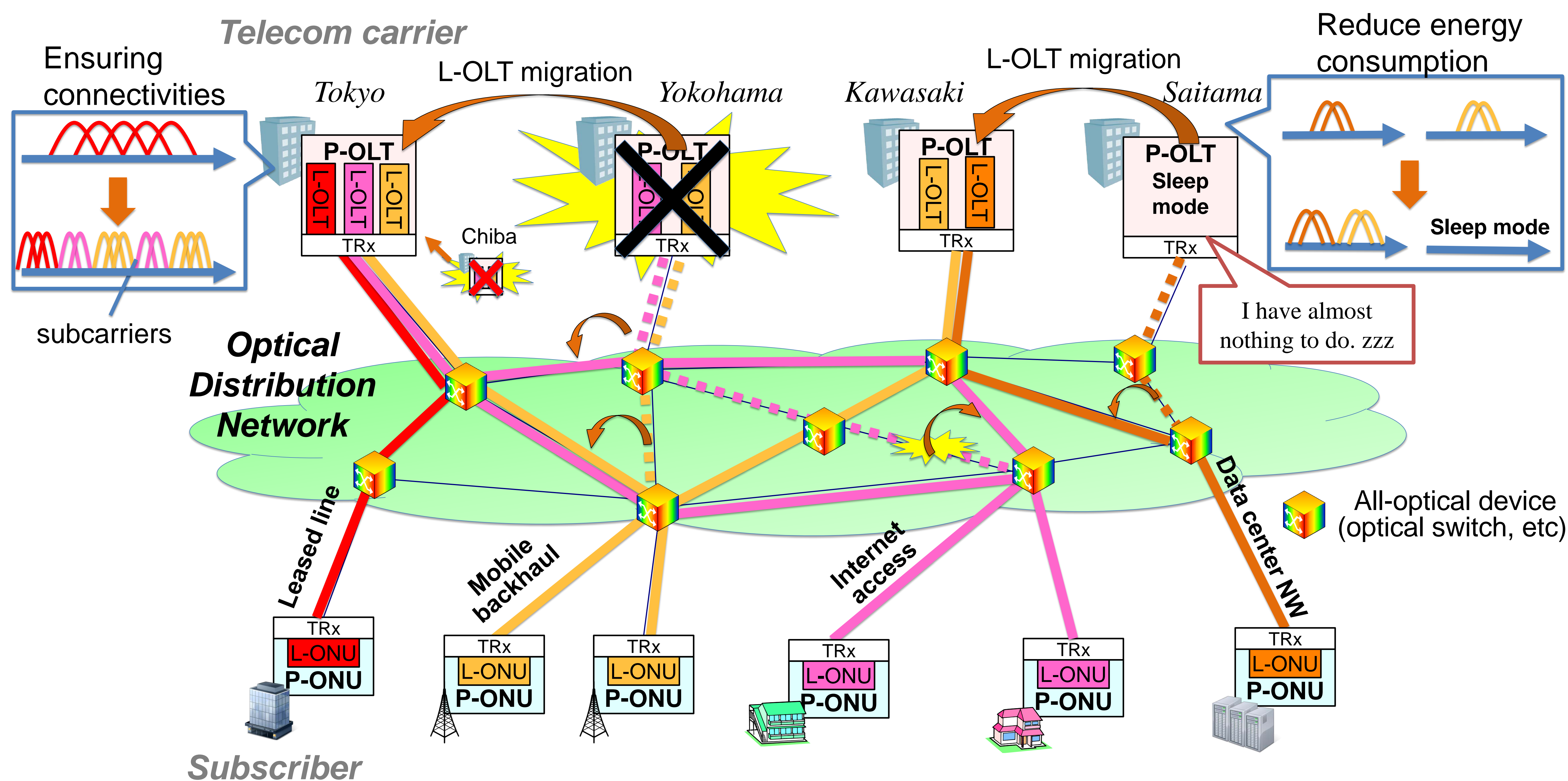
- Provides various network services in a single network system
- Flexible bandwidth allocation according to traffic fluctuation

Reduction of power consumption

- Reduction of the number of network devices by sharing network equipment
- P-OLT sleep mode in times of low traffic demand

Improvement of disaster tolerance

- Network reconfiguration by available network equipment
- Ensuring connectivities according to the service priority



Programmable OLT (P-OLT)

- Configuring logical OLTs (L-OLTs) for each NW services
- Provides various NW services according to subscriber's requirements

Optical Distribution Network (ODN)

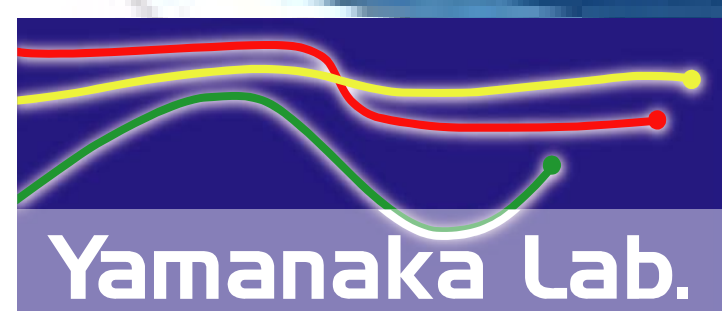
- Provides optical paths/trees that have elastic bandwidth appropriate to each service

Programmable ONU (P-ONU)

- Configures logical ONUs (L-ONUs) for each NW services
- Realize requested services by migration of software

Elastic Lambda Aggregation Network

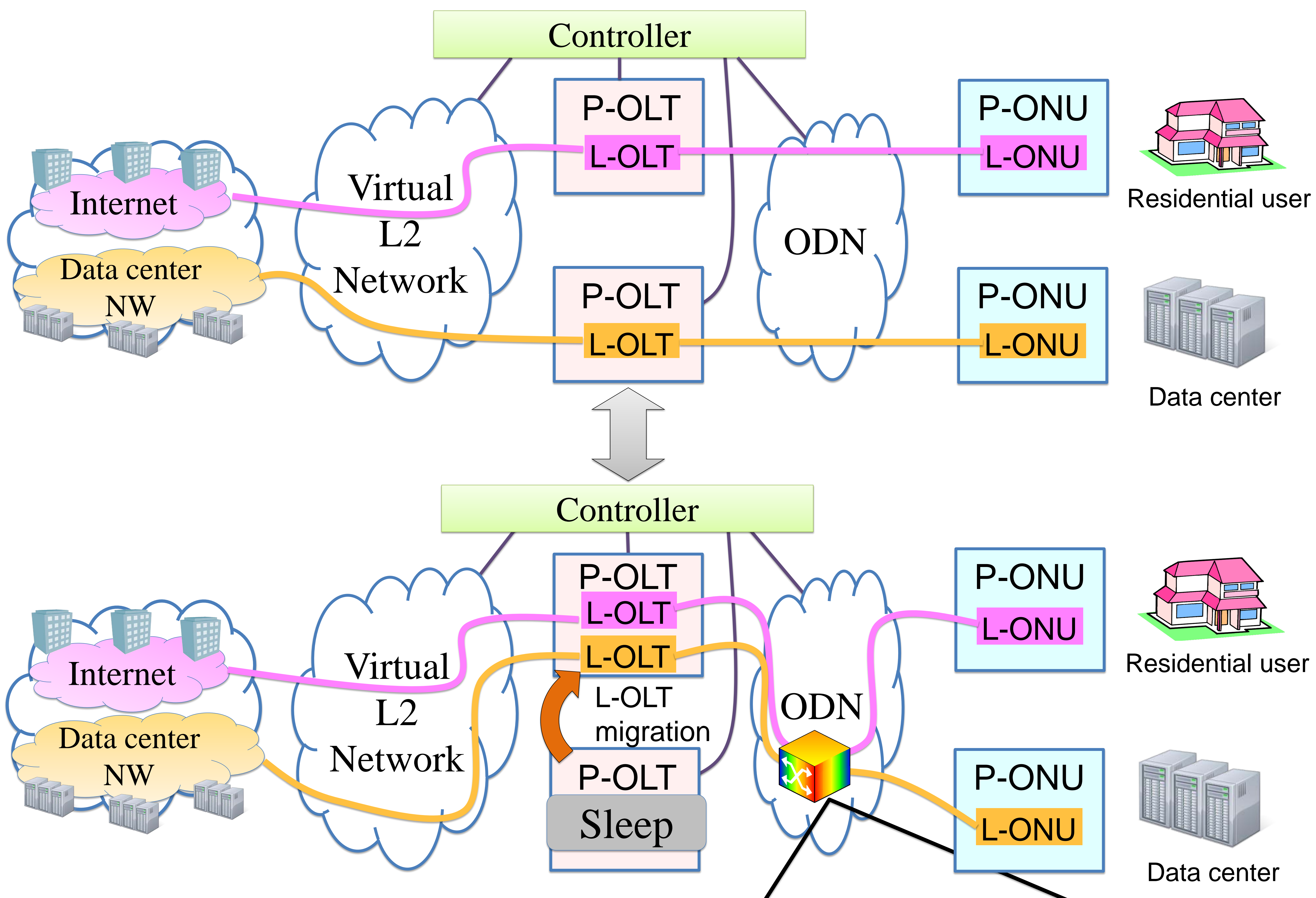
~ Demonstration ~



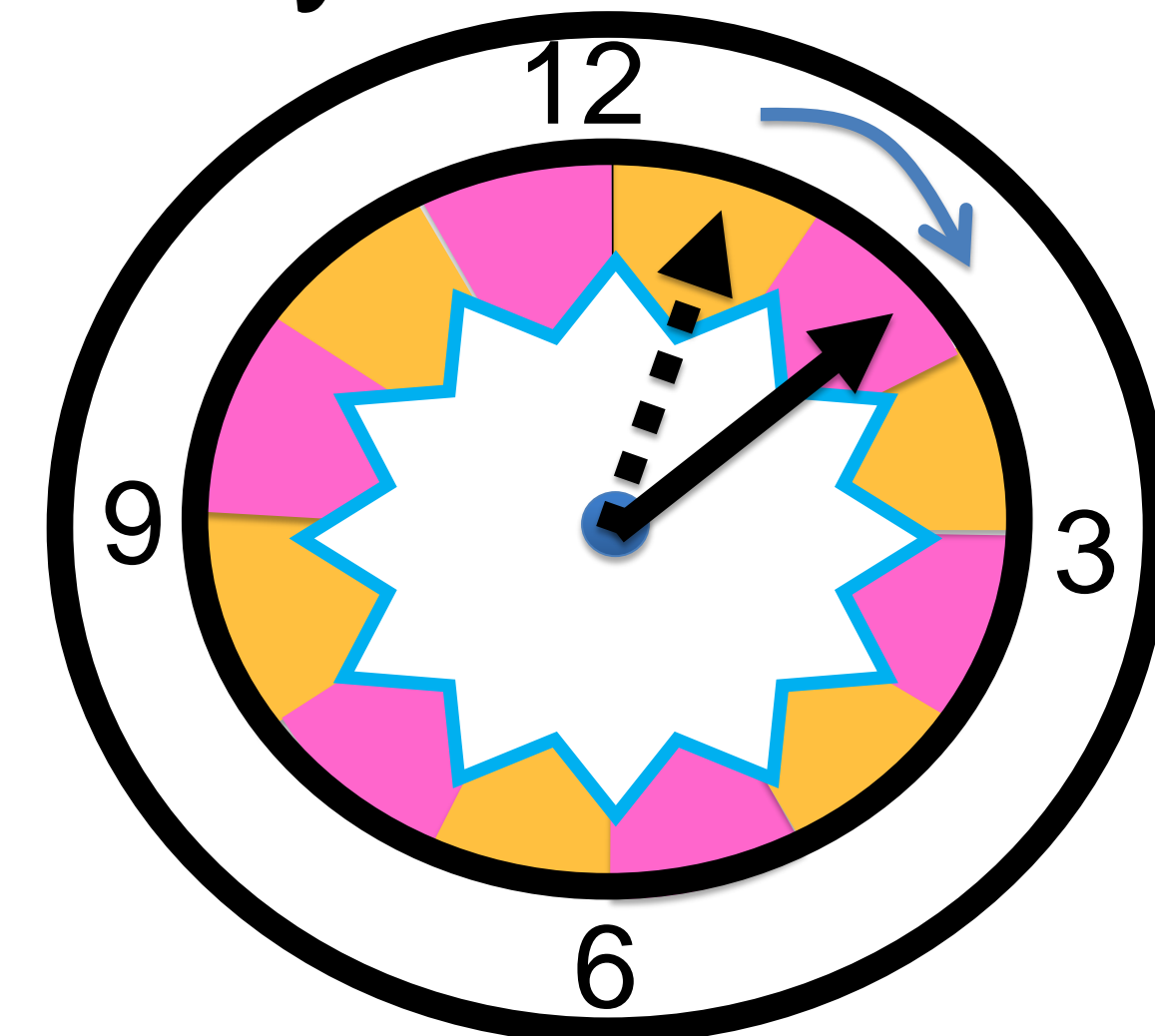
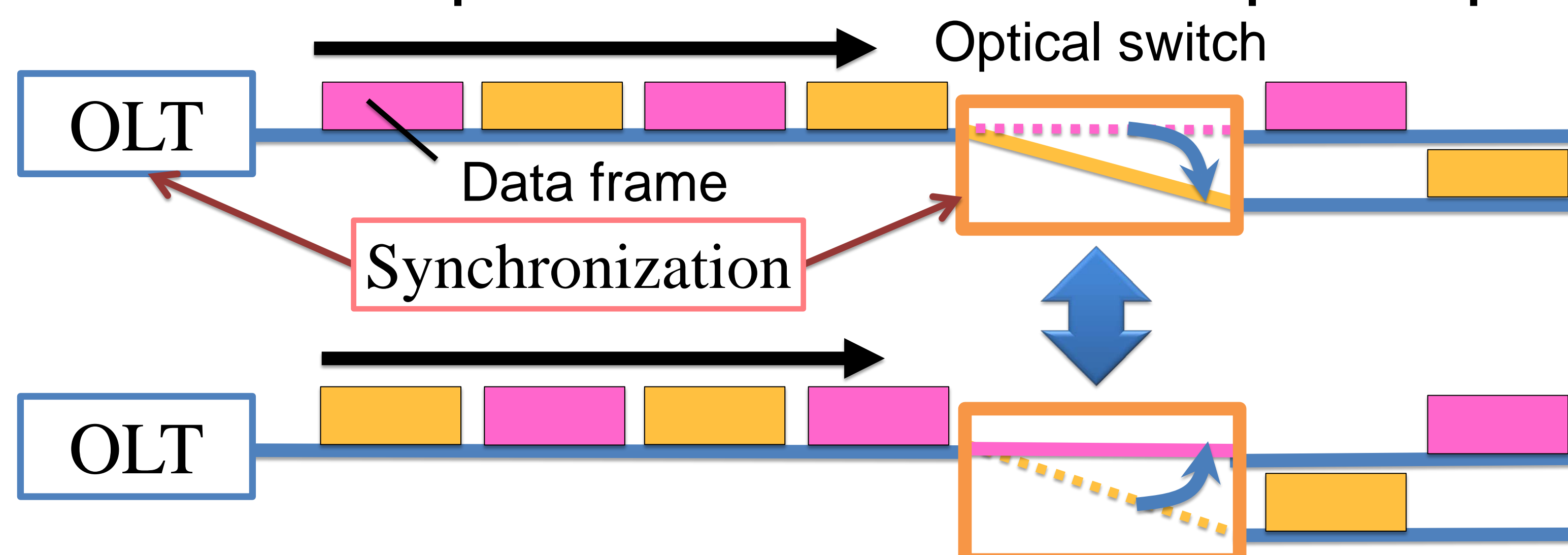
NW: Network
ODN: Optical Distribution Network
OLT: Optical Line Terminal
ONU: Optical Network Unit
L-OLT: Logical OLT
L-ONU: Logical ONU
L2: Layer-2
P-OLT: Programmable OLT
P-ONU: Programmable ONU
TDM: Time Division Multiplexing

Demonstration of service integration

- Aggregate two NW services in a single P-OLT by migrating L-OLT
- Vacant P-OLT goes to sleep mode



TDM optical switch switches paths periodically



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