Innovative R&D by NTT

Mini-PON:
Softwarized module-type PON architecture enhanced by SEBA

Keita Nishimoto, Takamitsu Tochino, Tomoya Hatano
NTT Access Network Service Systems Lab (AS-Lab), Japan

ONF Connect @ Santa Clara, USA（5th Dec, 2018）

Today's schedule

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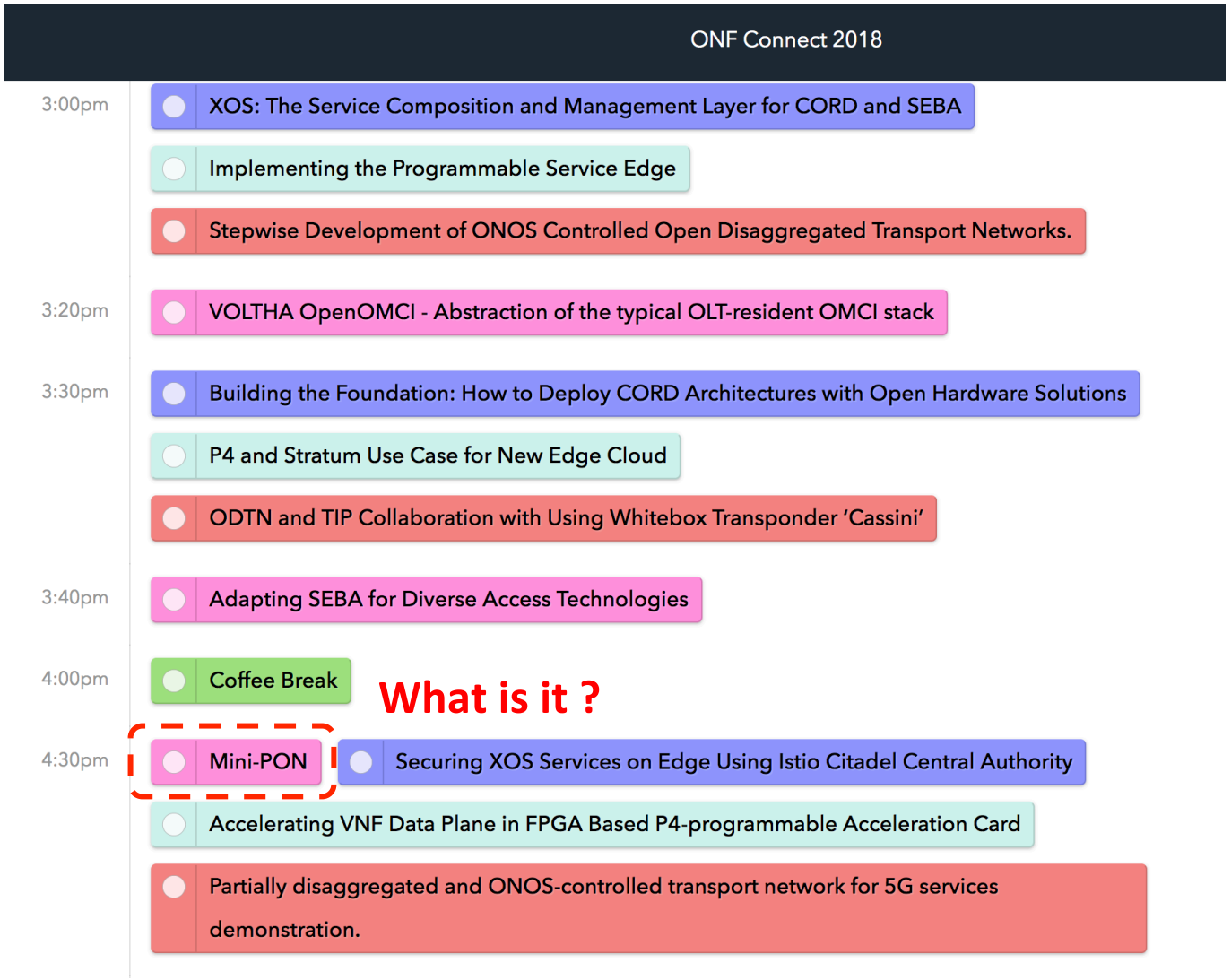

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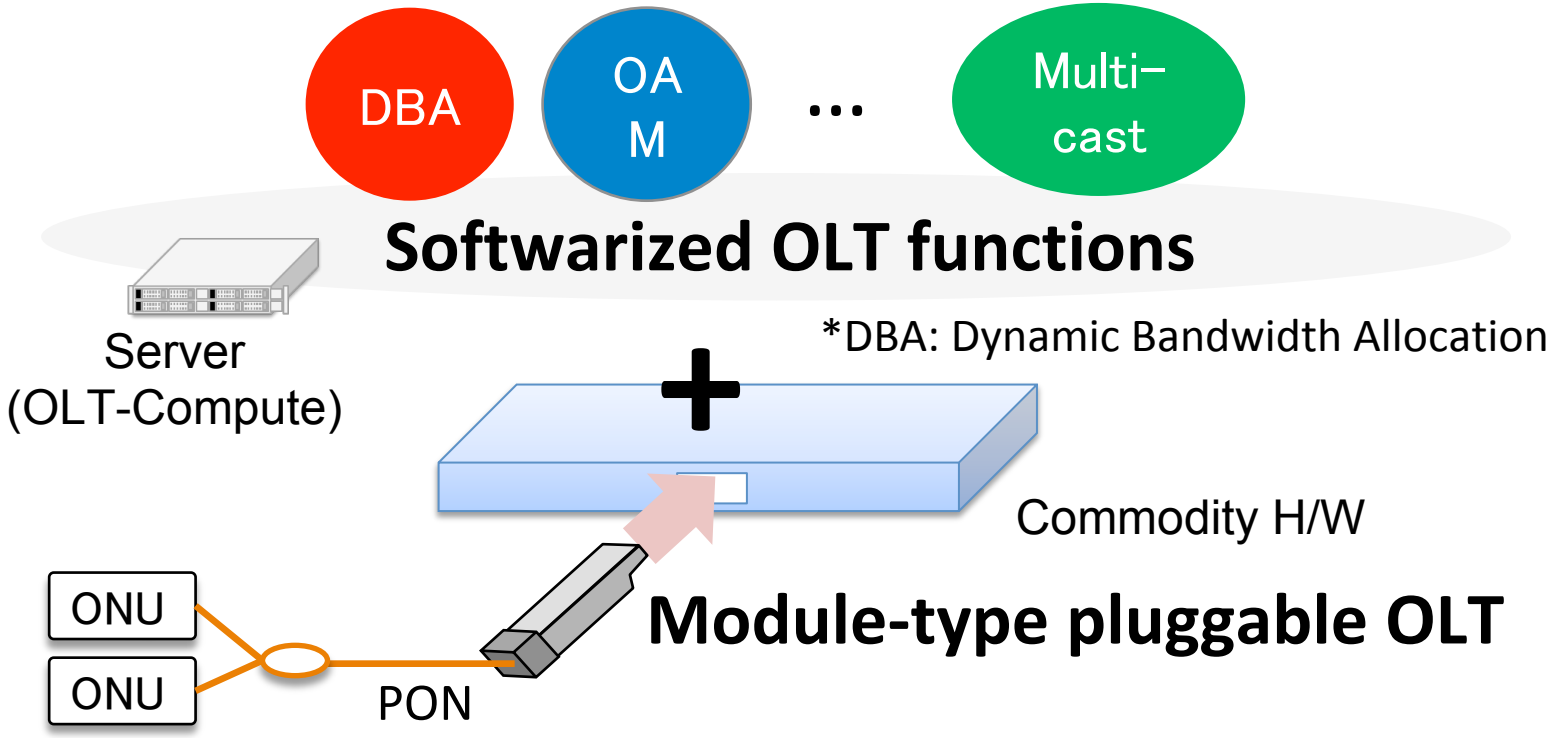
What is Mini-PON ?



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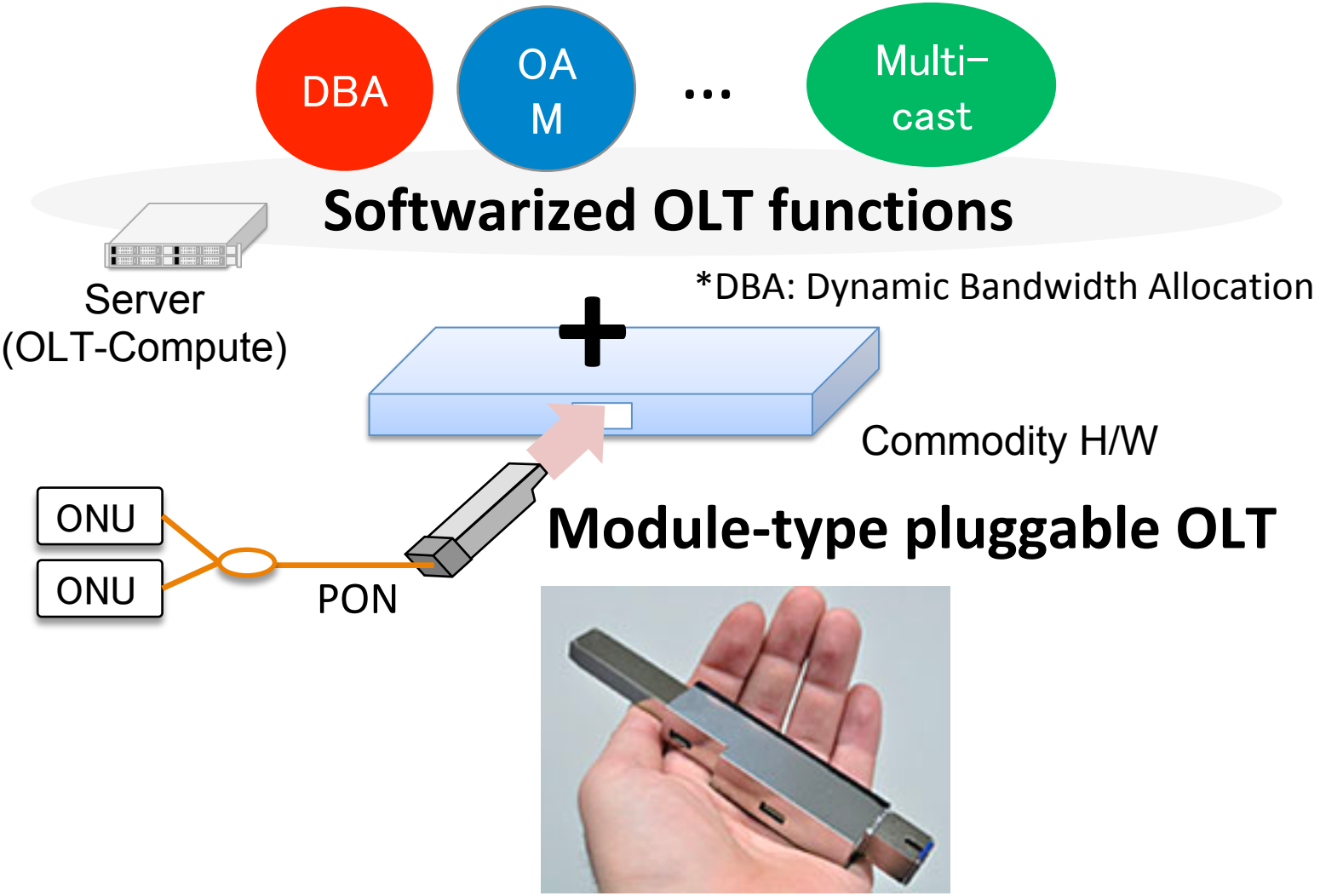

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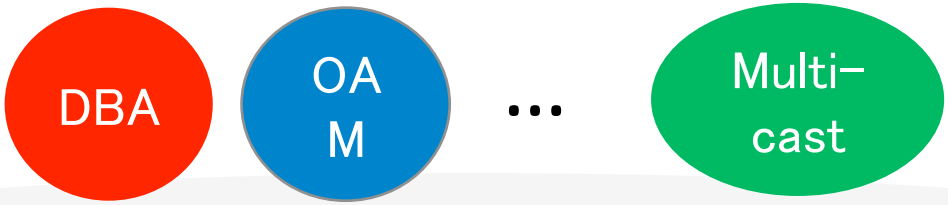
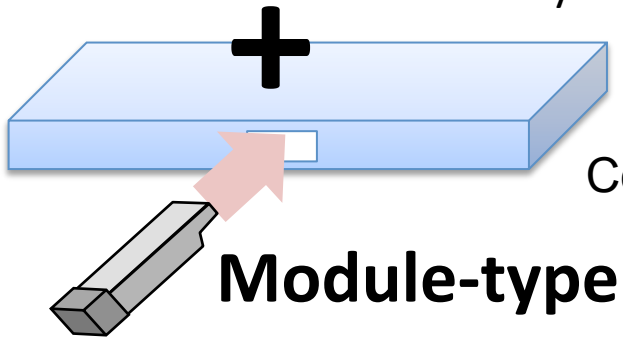


Softwarized OLT functions

*DBA: Dynamic Bandwidth Allocation

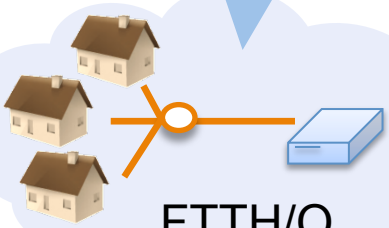
Server
(OLT-Compute)



Commodity H/W

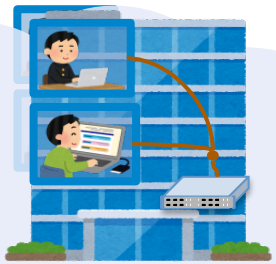
Module-type pluggable OLT

To diverse applications



FTTH/O

Factory LAN



Company LAN

What is an application of Mini-PON ?

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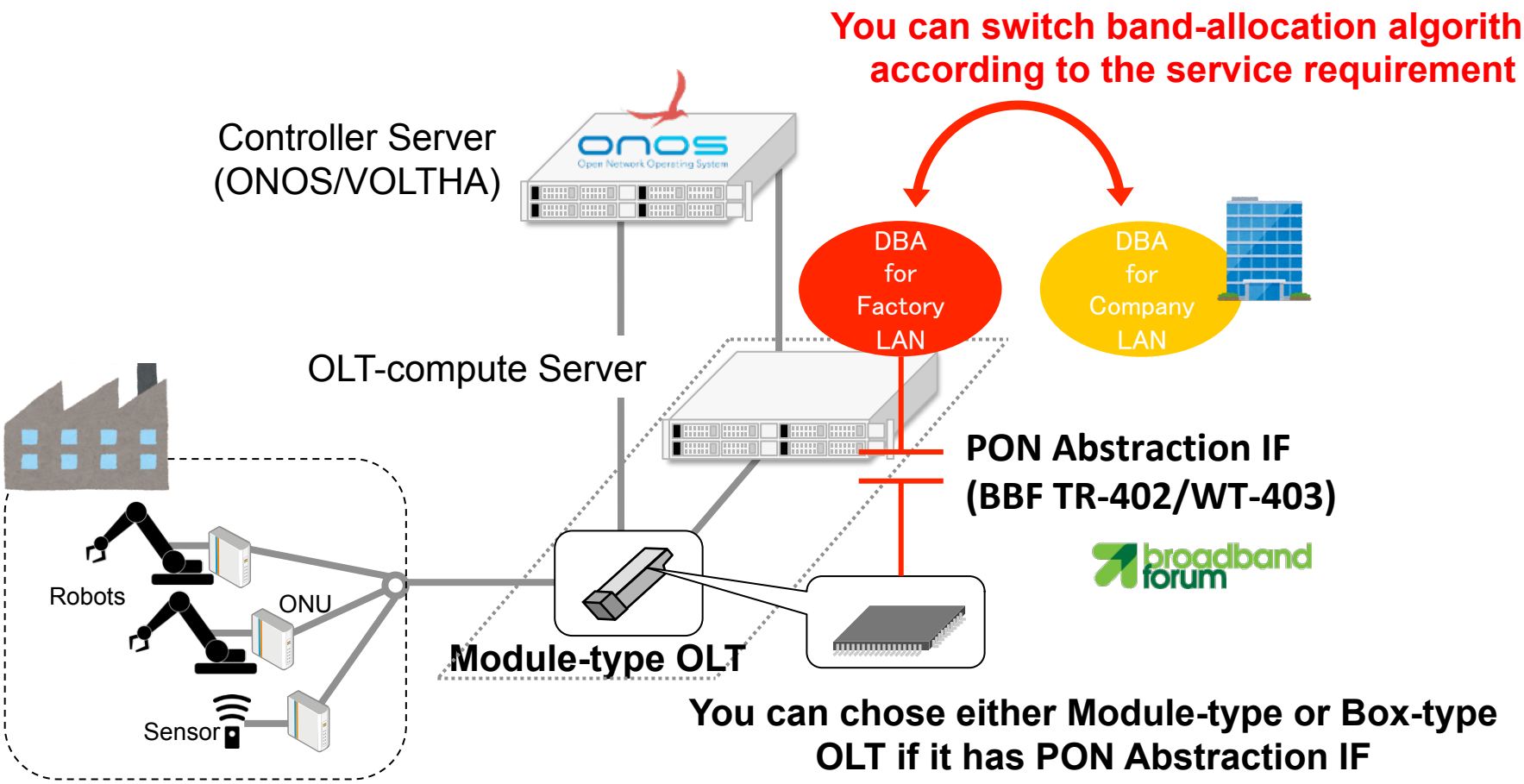
- **DBA switch for various service requirement**



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Mini-PON DEMO

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- **Purpose**

We demonstrate the feasibility of Mini-PON, and further, that SEBA can support various use-cases including ours.

We will show you …

1. SDN controller can manage a pluggable module-type OLT
2. Softwarized OLT function (DBA) is successfully decoupled from H/W, and switched for satisfying different service requirements

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Mini-PON DEMO

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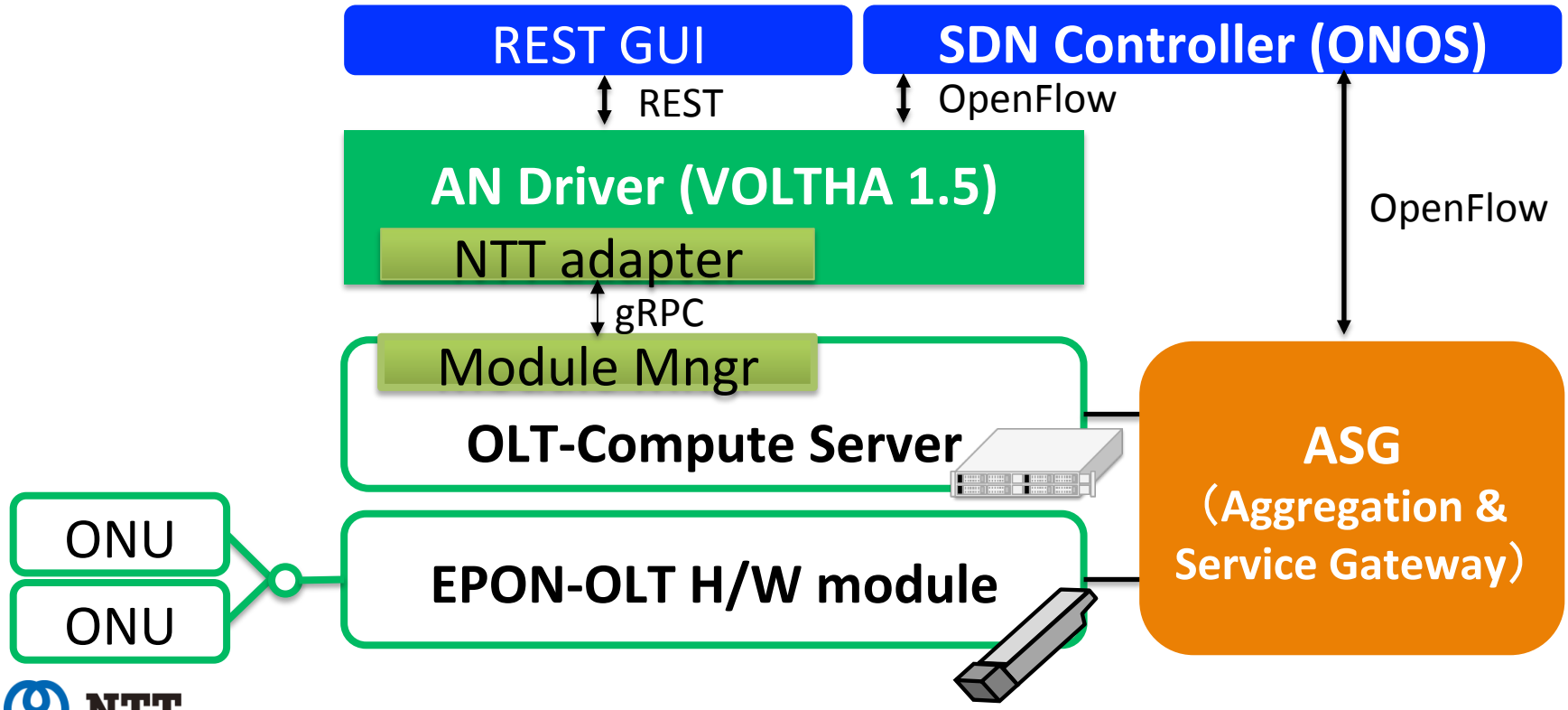
- **Overall architecture**

SEBA software component (ONOS/VOLTHA) controls both of the module-type OLT and softwarized OLT func (i.e. DBA func).



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Mini-PON DEMO

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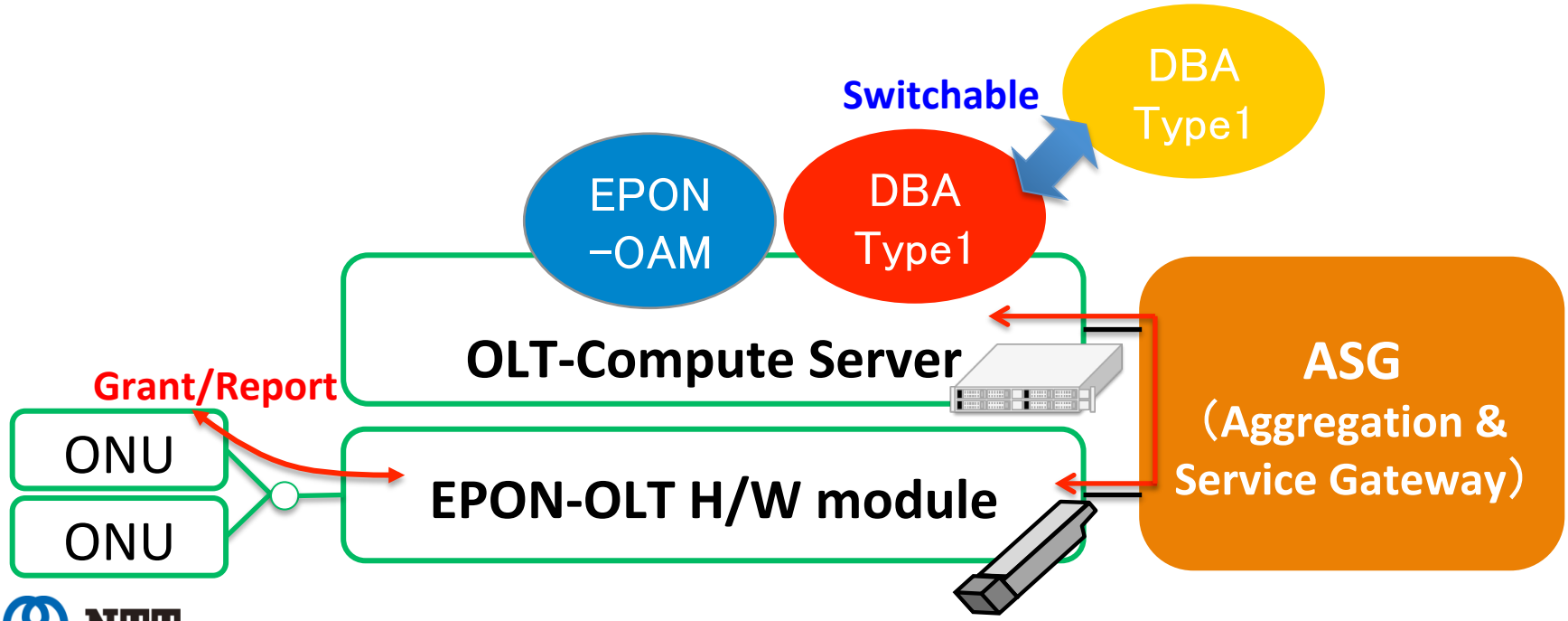
- **PON architecture**

DBA & PON-OAM func are implemented as software that run on a server and are separated from OLT hardware. We will demonstrate the switch of DBA func while it's running for showing it is successfully decoupled from hardware.



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Mini-PON DEMO

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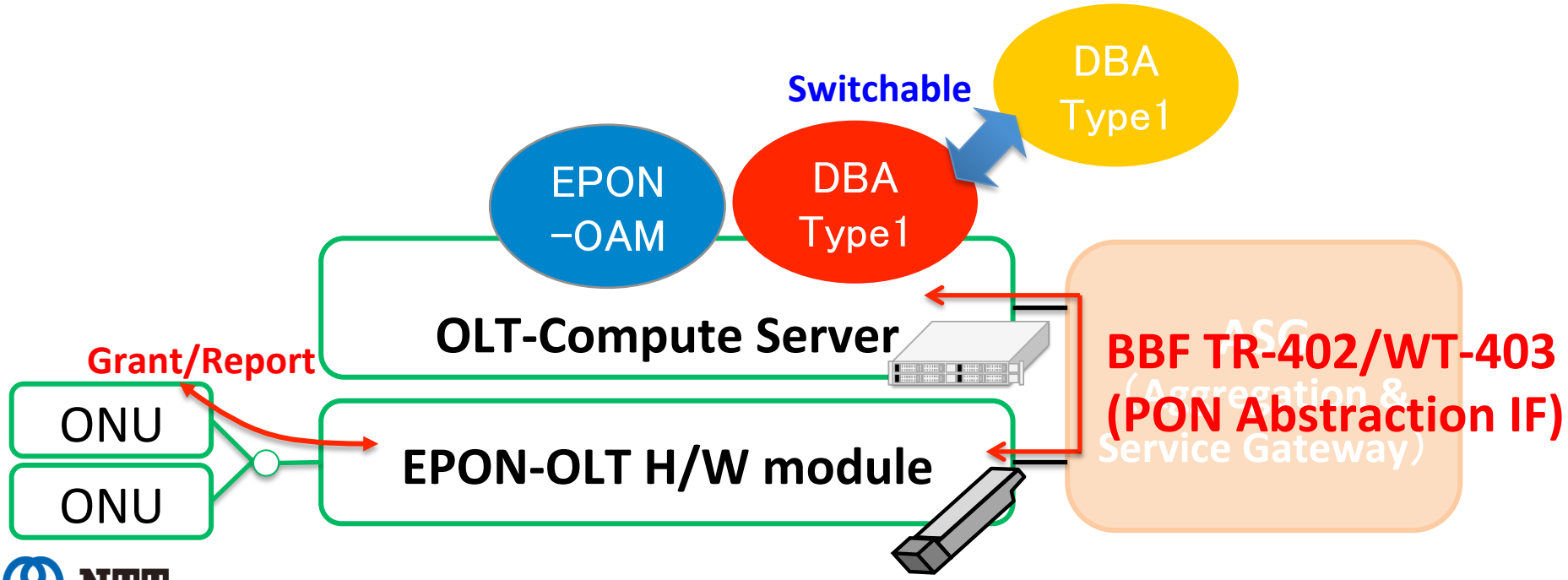

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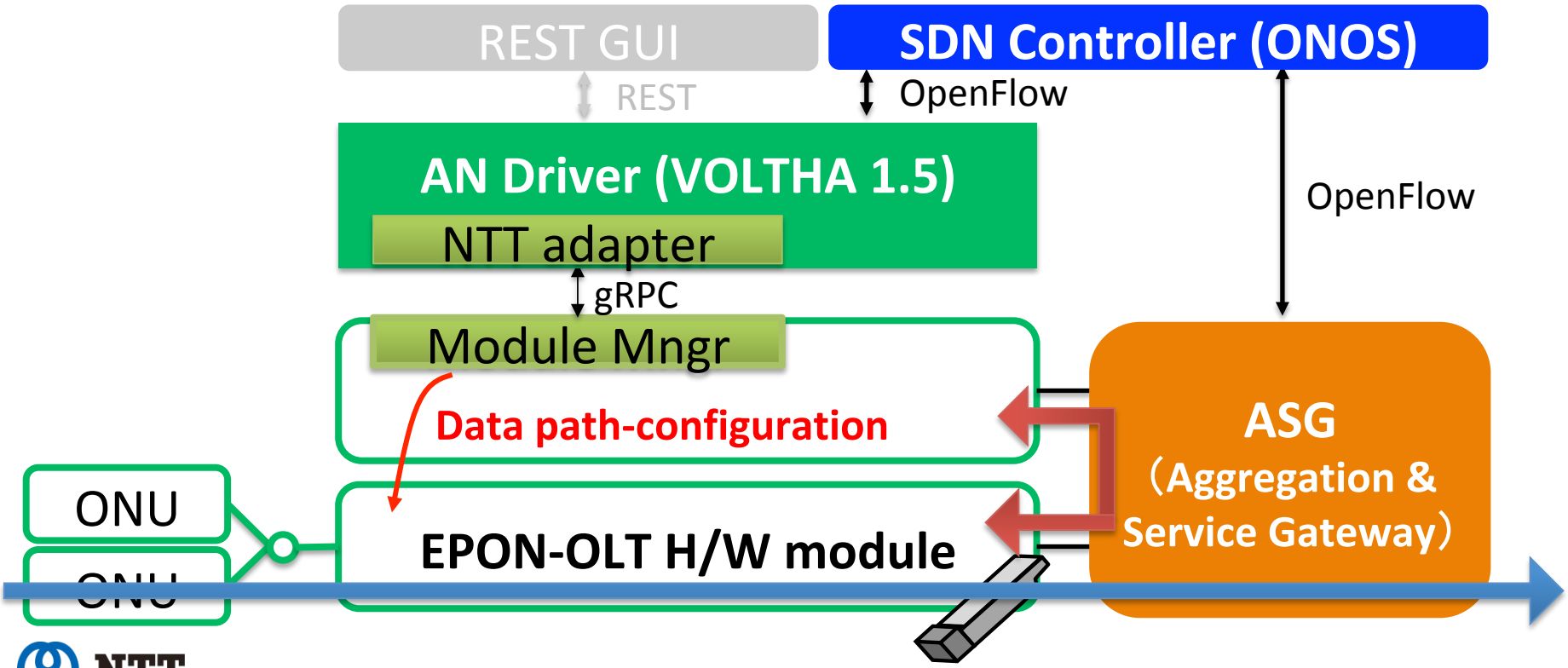
Mini-PON DEMO

- **Management architecture**

SDN Controller & AN Driver (ONOS/VOLTHA) manages the OLT module and softwarized OLT functions via Module Manager in OLT-compute server.



Mini-PON DEMO

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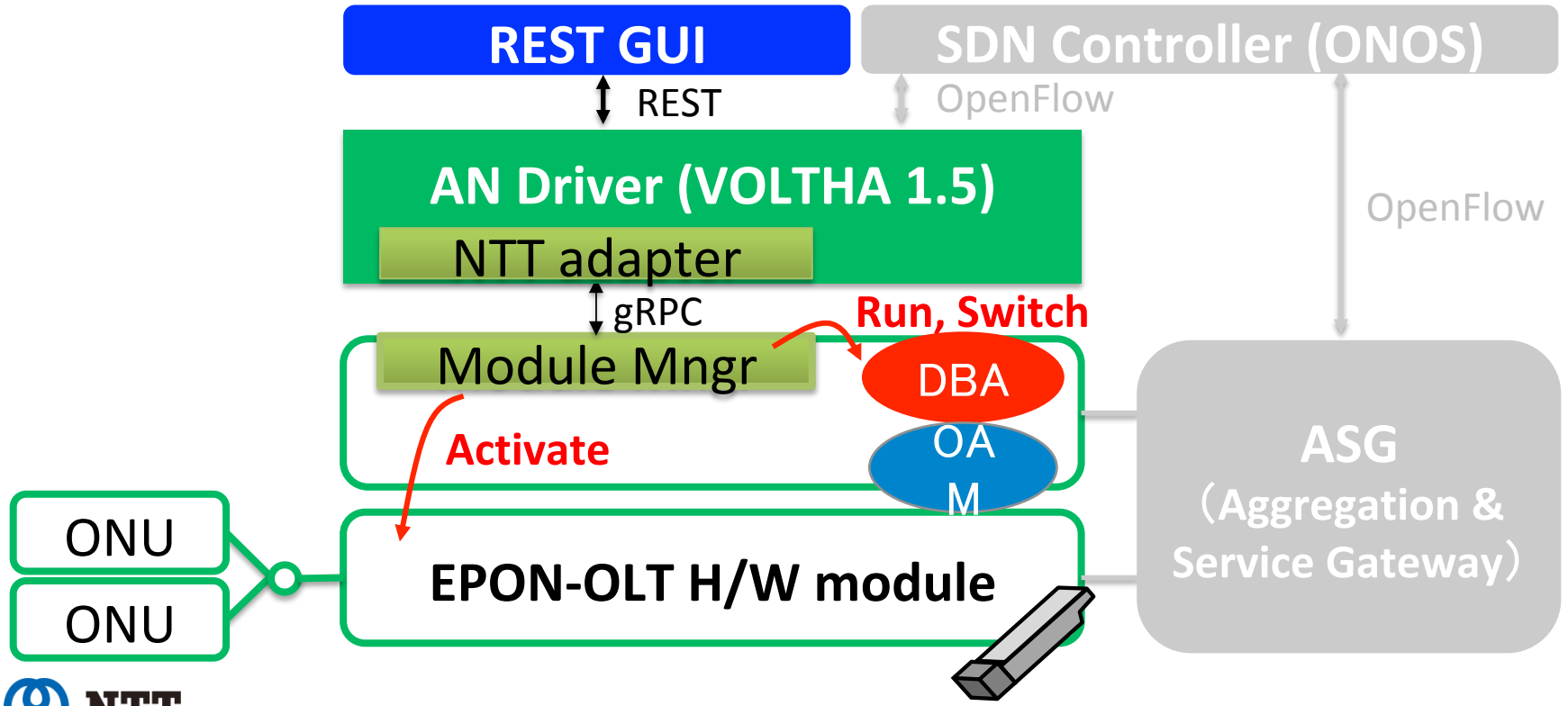

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Mini-PON DEMO

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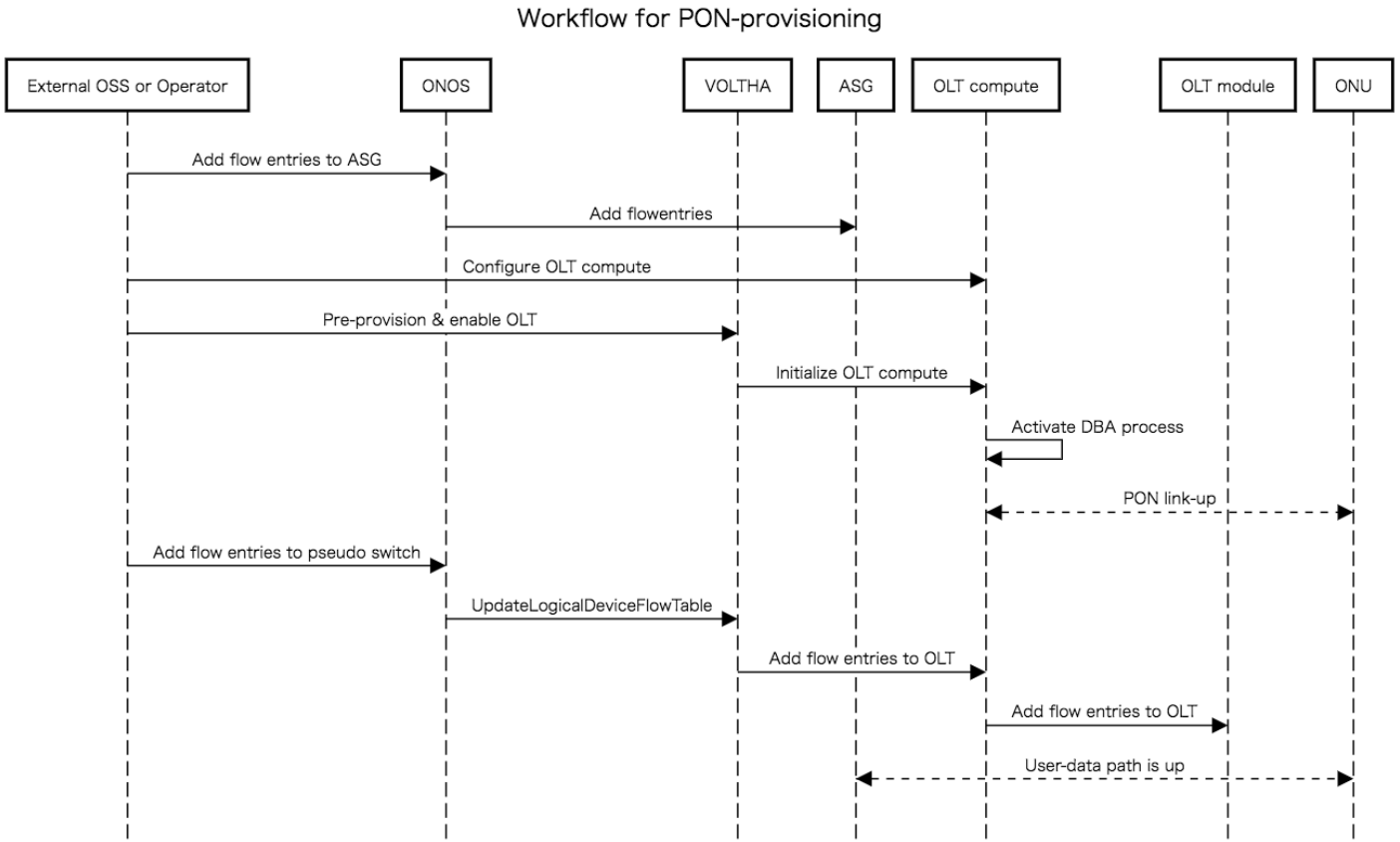
- **Mini-PON workflow**

We hope to discuss the workflow with you.
(https://wiki.opencord.org/display/CORD/SEBA+NTT+AS+Lab+Workflow)



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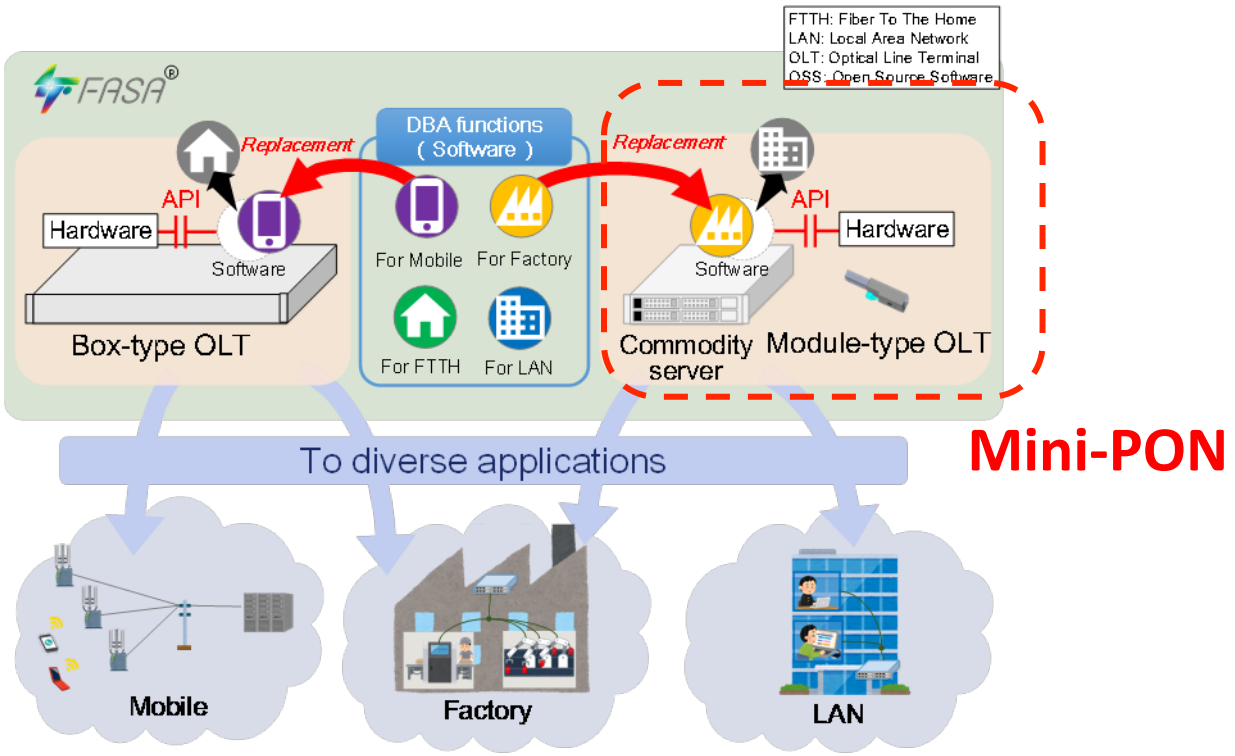
FASA Project in NTT

Innovative R&D by NTT

- **FASA** (**F**lexible **A**ccess **S**ystem **A**rchitecture)

aims to modularize the function of access network equipment (e.g. OLT) for providing various services without H/W development.

※Mini-PON is a part of FASA.

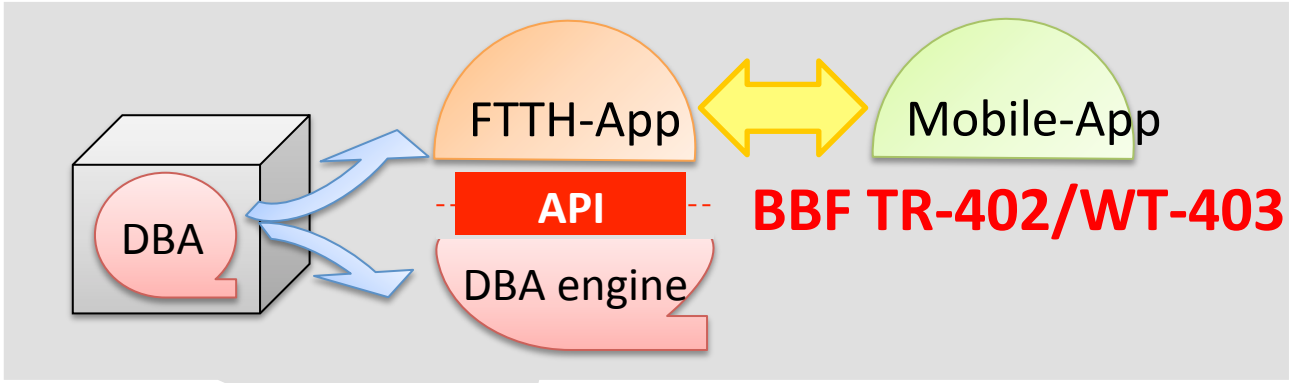


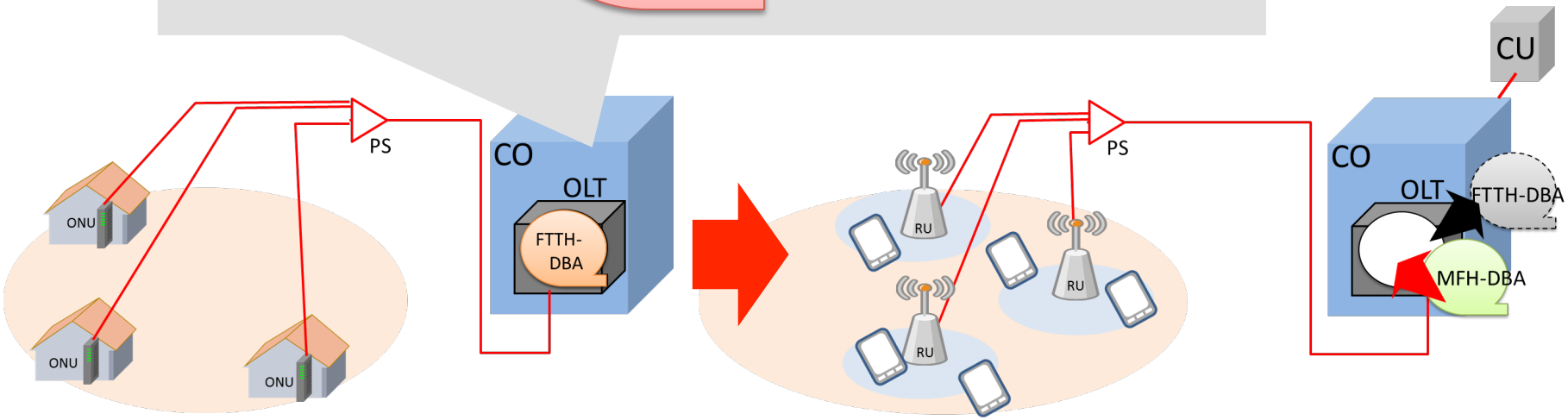
FASA Project in NTT

Innovative R&D by NTT

・PON Abstraction interface (BBF TR402/WT403)

As a part of FASA, NTT-AS Lab is promoting standardization of API for OLT Time-Critical function (e.g. DBA etc..) in BBF.





DBA switch for Mobile service

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FASA Project in NTT

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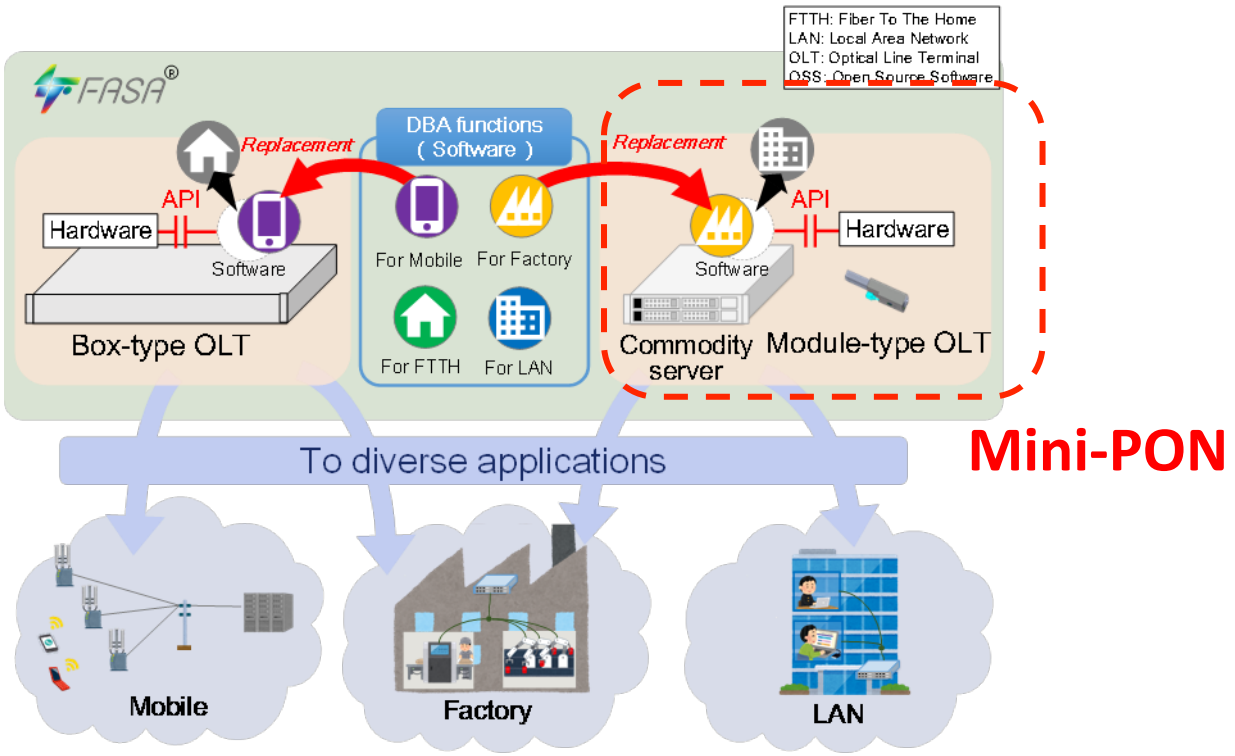
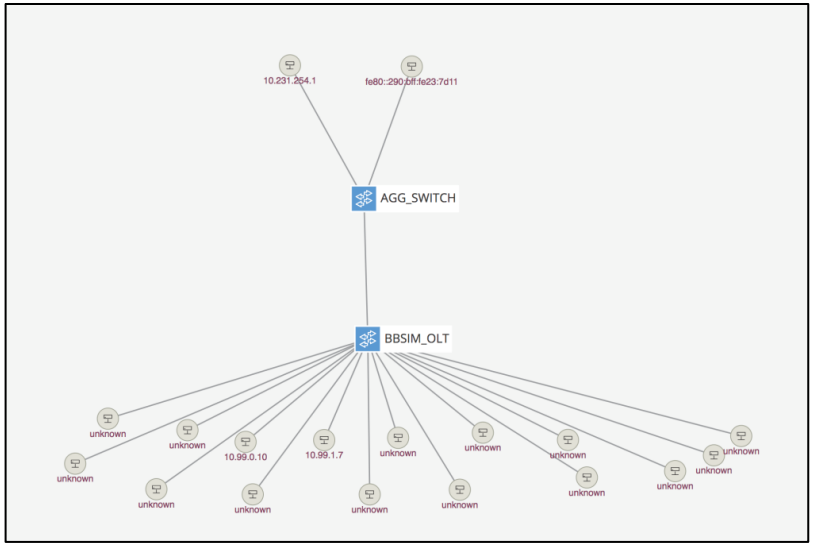


NTT AS Lab's contribution for SEBA

- **NTT AS Lab contributed SEBA RD draft by**
  - Writing 2.3.2.10 PON section, workflow
  - Reviewing
- **Further, we contributed SEBA development by**
  - developing VOLTHA 2.0 (especially for VOLTHA-BBSim)
  - PoC for SEBA @ NTT R&D Forum, ONF Connect



1OLT/16ONUs emulated by BBSim

NTT AS Lab's contribution for SEBA

Innovative R&D by NTT

・Future development plan

We plan to complete the development of OpS for Mini-PON by the next autumn, using VOLTHA/ONOS.

For this, we will contribute to SEBA project in the following ways:

- Functional expansion for Tech. Profile for various Access Tech（especially focused on EPON support)
- ONU test function (e.g. loopback test etc…)

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Summary

- NTT-AS Lab successfully implemented Mini-PON based on SEBA, and it will show you:

1. SDN controller can manage a pluggable module-type OLT,
2. Softwarized OLT functions can be decoupled from H/W, and switched in accordance with the service requirement.

- NTT-AS Lab will keep contributing to SEBA project.

- I'd be glad if you give us any proposal about the use-case for a module type OLT and softwarized OLT functions.