Adapting SEBA to Diverse Access Technologies

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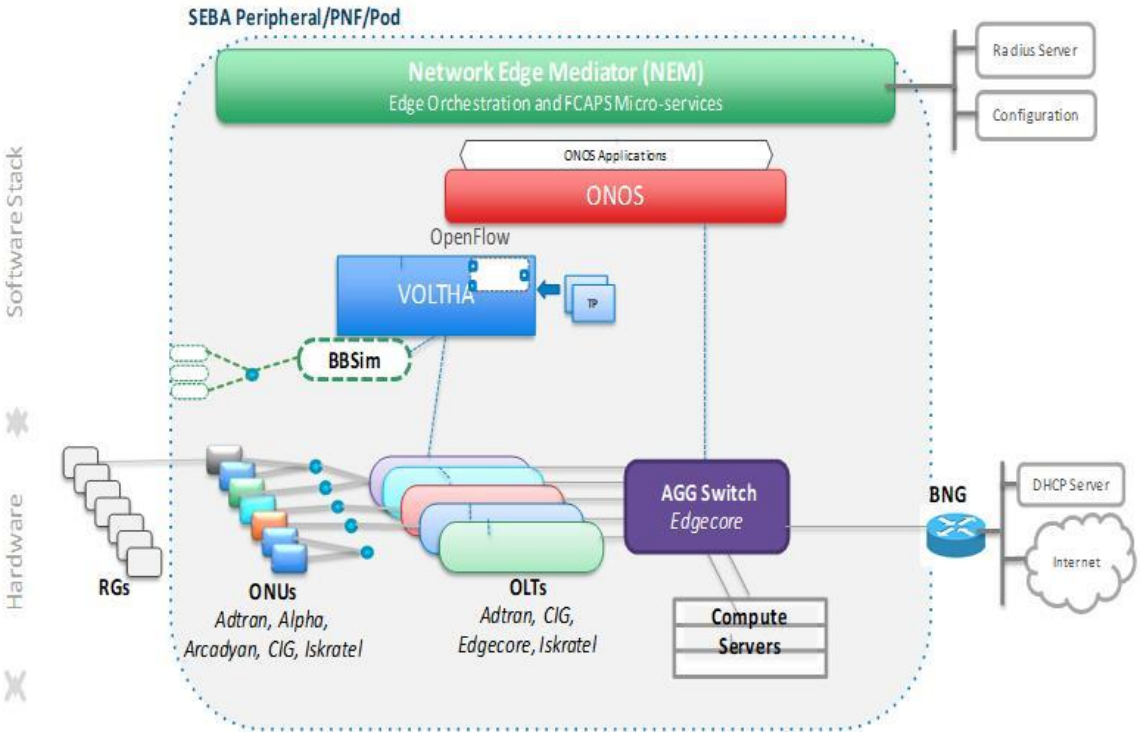
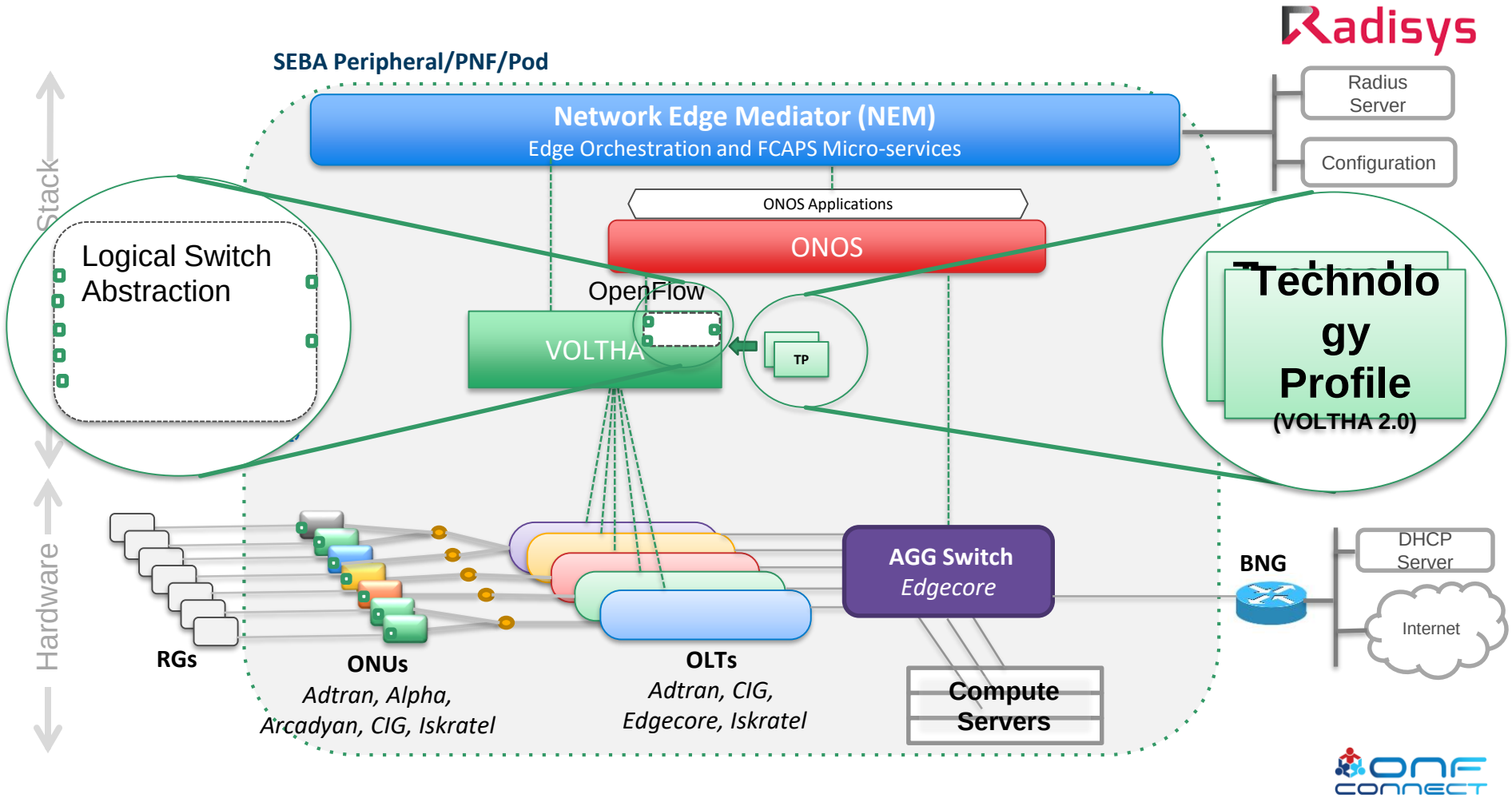
SEBA Exemplar - 2018

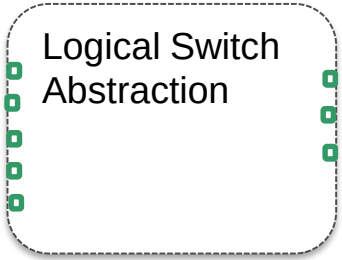
At the beginning of 2018 the ONF Community were wrestling with a couple of problems:

- How to Maintain a VOLTHA Core which was agnostic to specific Access Technologies
- How to allow for discovery of subscriber Equipment and to automate the Subscriber Authentication and Service Configuration Process.




Radisys
SEBA Peripheral/PNF/Pod
Stack
Hardware
Network Edge Mediator (NEM)
Edge Orchestration and FCAPS Micro-services
Radius Server
Configuration
ONOS Applications
ONOS
OpenFlow
VOLTHA
TP
Logical Switch Abstraction
Technology Profile
(VOLTHA 2.0)
RGs
ONUs
Adtran, Alpha, Arcadyan, CIG, Iskratel
OLTs
Adtran, CIG, Edgecore, Iskratel
AGG Switch
Edgecore
BNG
DHCP Server
Internet
Compute Servers
ONF CONNECT

Device ‘Logical Switch’ Abstraction



- Physical Devices are represented as Logical Switches within VOLTHA e.g. OLT and ONUs – the OLTs have NNI and the ONUs have UNI Ports on the Logical Switch.
- As each OLT is Discovered a Logical Switch is created and as ONUs are Discovered Logical Ports are added to represent their UNI interfaces.
- Logical Devices keep the Core part of VOLTHA from being Technology Specific – the same abstraction is used for all Types of Devices – XGS PON, GPON, EPON, DOCSIS CMTS/CM, G.fast etc.

Technology Profiles

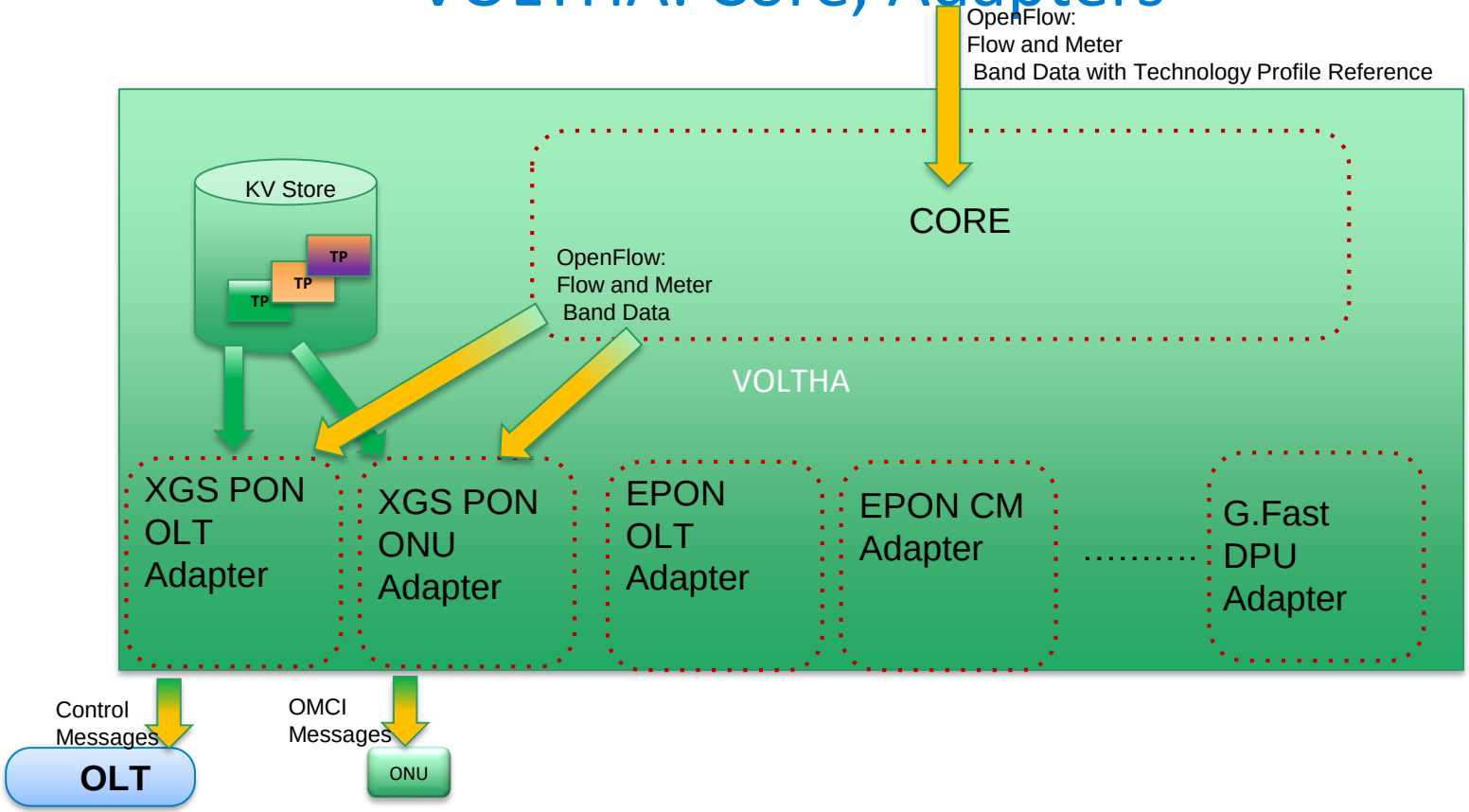
Radisys

Technology Profile
(VOLTHA 2.0)

- Technology Profiles provide Technology Specific Data for the Logical Device Adapters to be able to create Technology Specific Service Flows ***in combination with OpenFlow.***
- OpenFlow References (via a Flow Table ID) a Specific Technology Profile to use for a Service Flow.
- ***All Bandwidth Profile Data is kept separate from Technology Profile Data as this may be highly variable – Provided by OpenFlow Meters.***
- ***All Flow Tag/Action operations provided by OpenFlow***
- Technology Profiles are 'Blobs' of Opaque Data to VOLTHA Core which maintains its Technology agnostic nature.

ONF CONNECT

VOLTHA: Core, Adapters



Technology Profile Example: XGS PON

ITU: G.989.3/G.988 +

BBF: WT-385/TR-383+

Instance Control

Technology Profile Identifiers
1. Name
2. OF Table ID
3. Profile Type
4. Profile Version

Common Instance Control
1. ONU: Single/Multi
2. UNI: Single/Multi
3. # GEM Ports(Queues)

U/S Scheduler
1. Additional Bandwidth {None | NA | BE | Auto}
2. T-CONT; Priority
3. T-CONT; Weight
4. Queue Scheduling Policy

D/S Scheduler
1. Priority
2. Weight
3. Queue Scheduling Policy

U/S GEM & Sched Attributes

Per GEM Port Attributes:

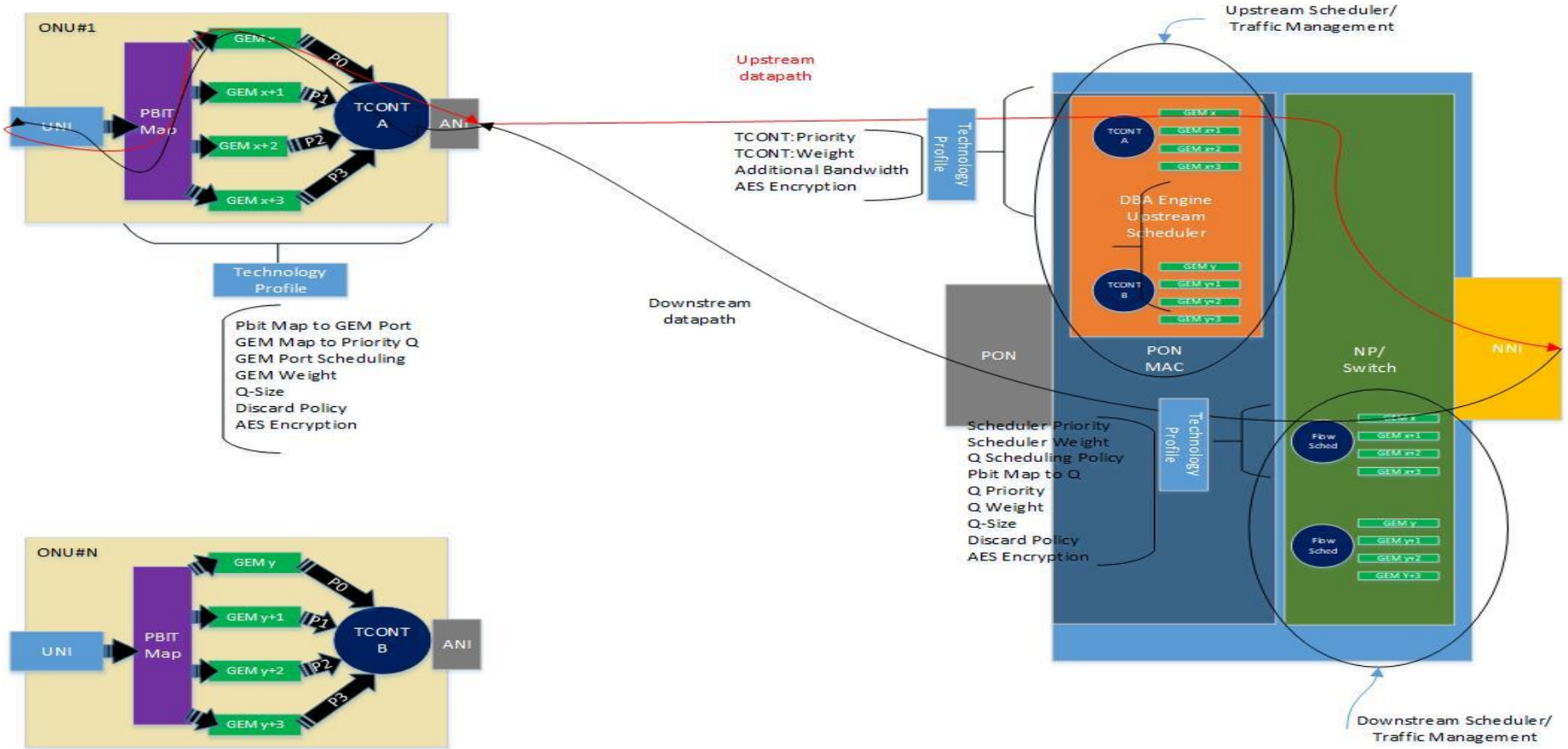
I. P-Bit Map
II. AES Encryption
III. Scheduling Polic
IV. Priority
V. Weight
VI. Q Size
VII. Discard Policy

D/S GEM & Sched Attributes

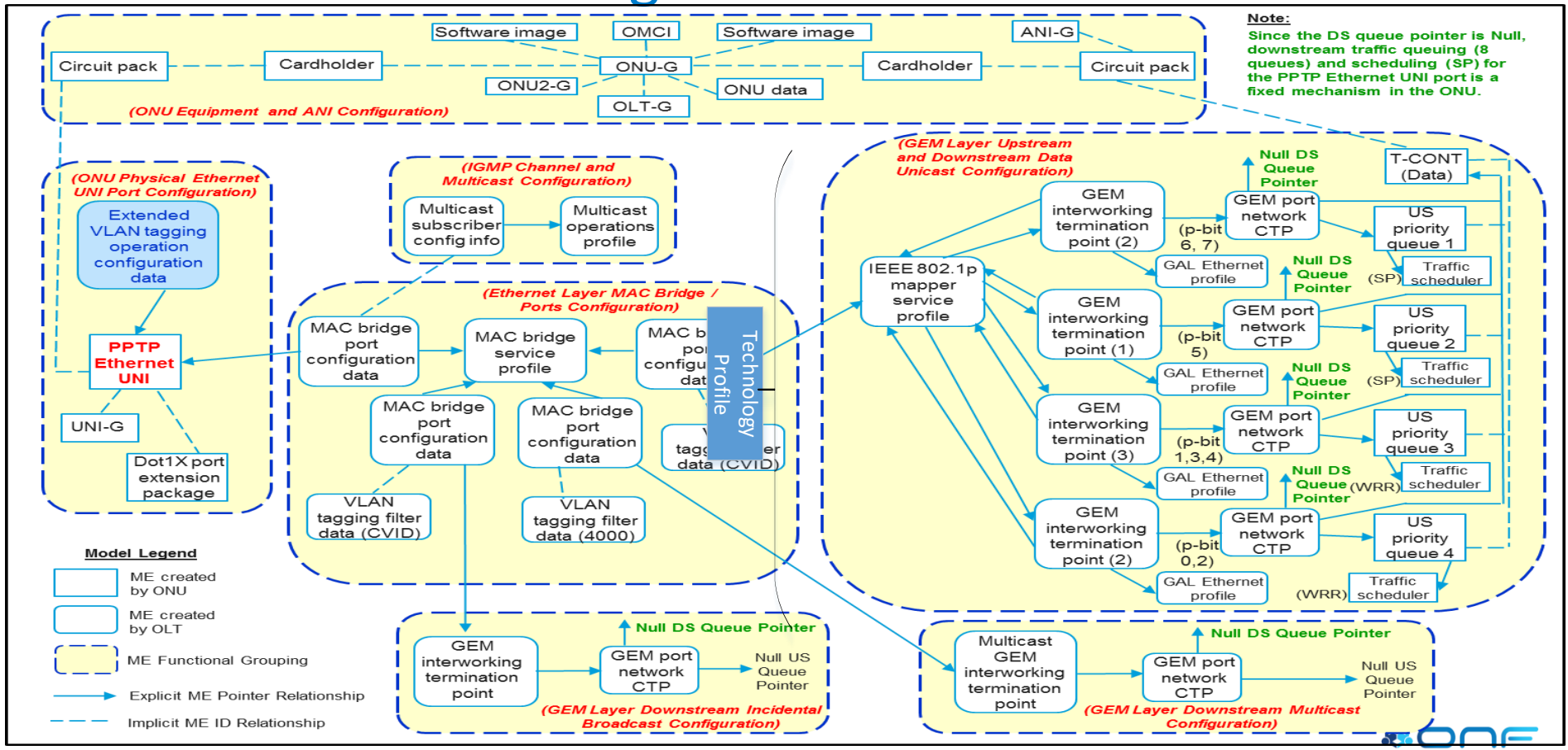
Per GEM Port Attributes:

I. P-Bit Map
II. AES Encryption
III. Scheduling Polic
IV. Priority
V. Weight
VI. Q Size
VII. Discard Policy

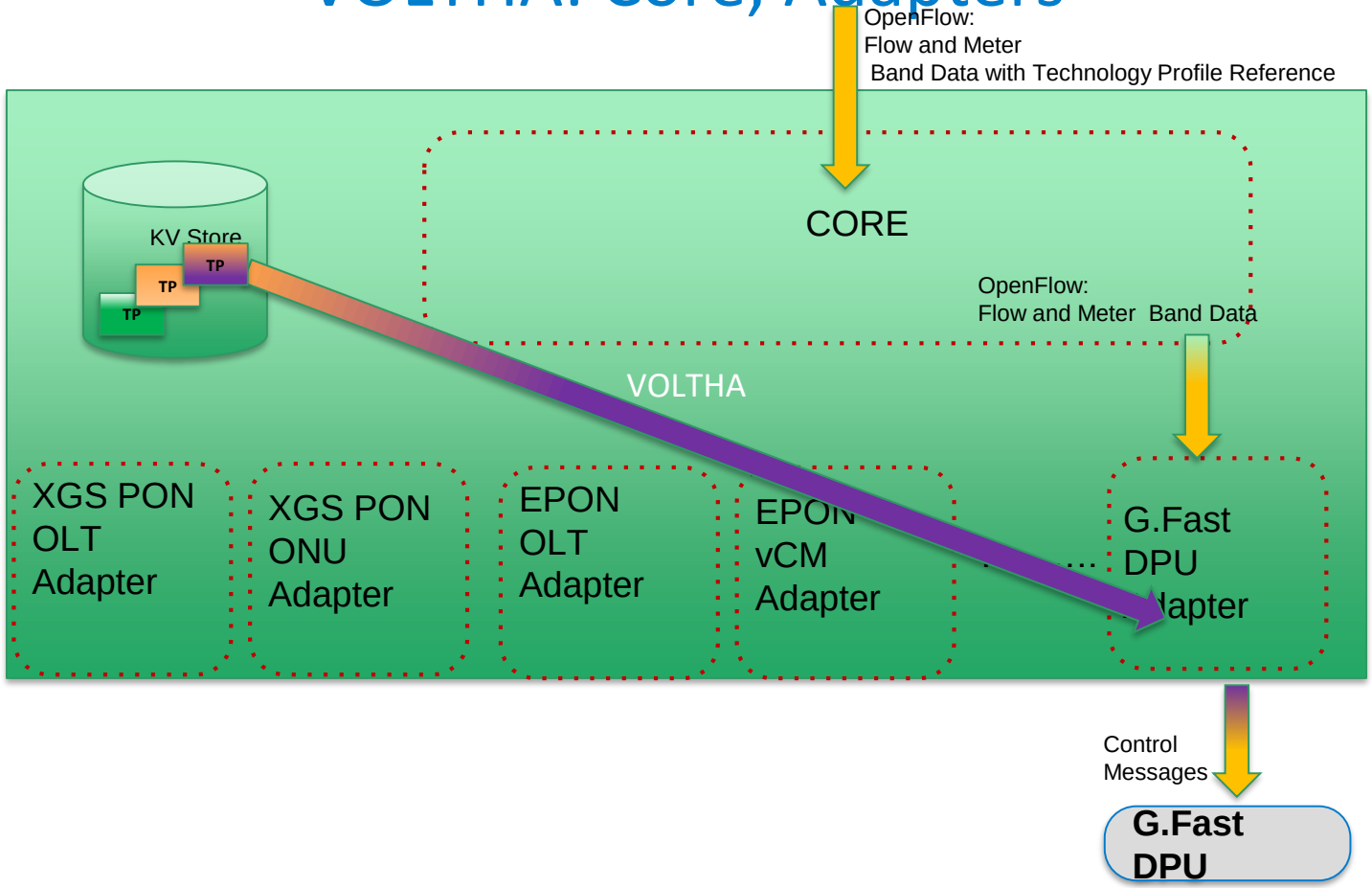
Technology Profile Application to OLT/ONU System



OMCI ME Management



VOLTHA: Core, Adapters



Technology Profile Example: G.fast

TR-165 Issue 01(Vector of Profiles)

TR-371 Issue 01

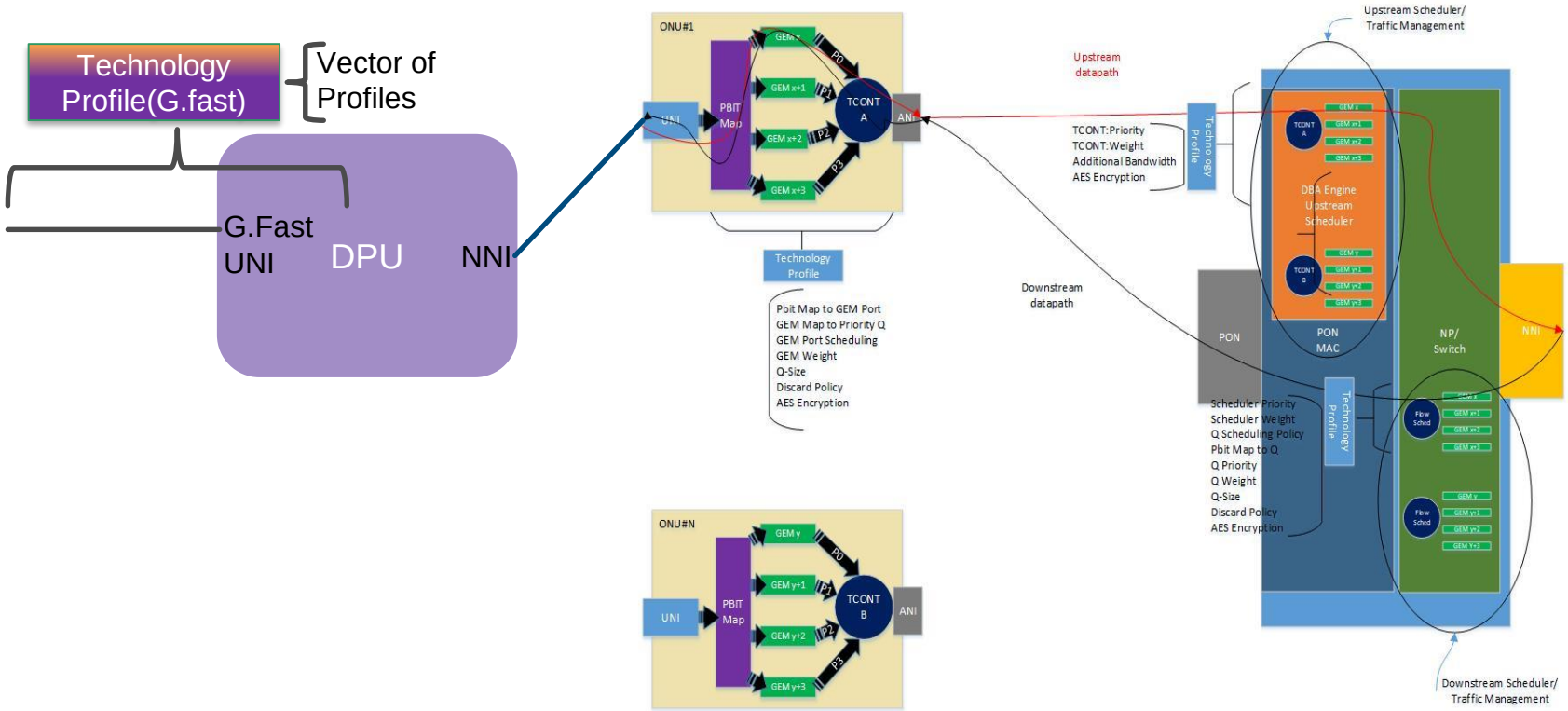
Technology Profile Identifiers

1. Name
2. OF Table ID
3. Profile Type
4. Profile Version

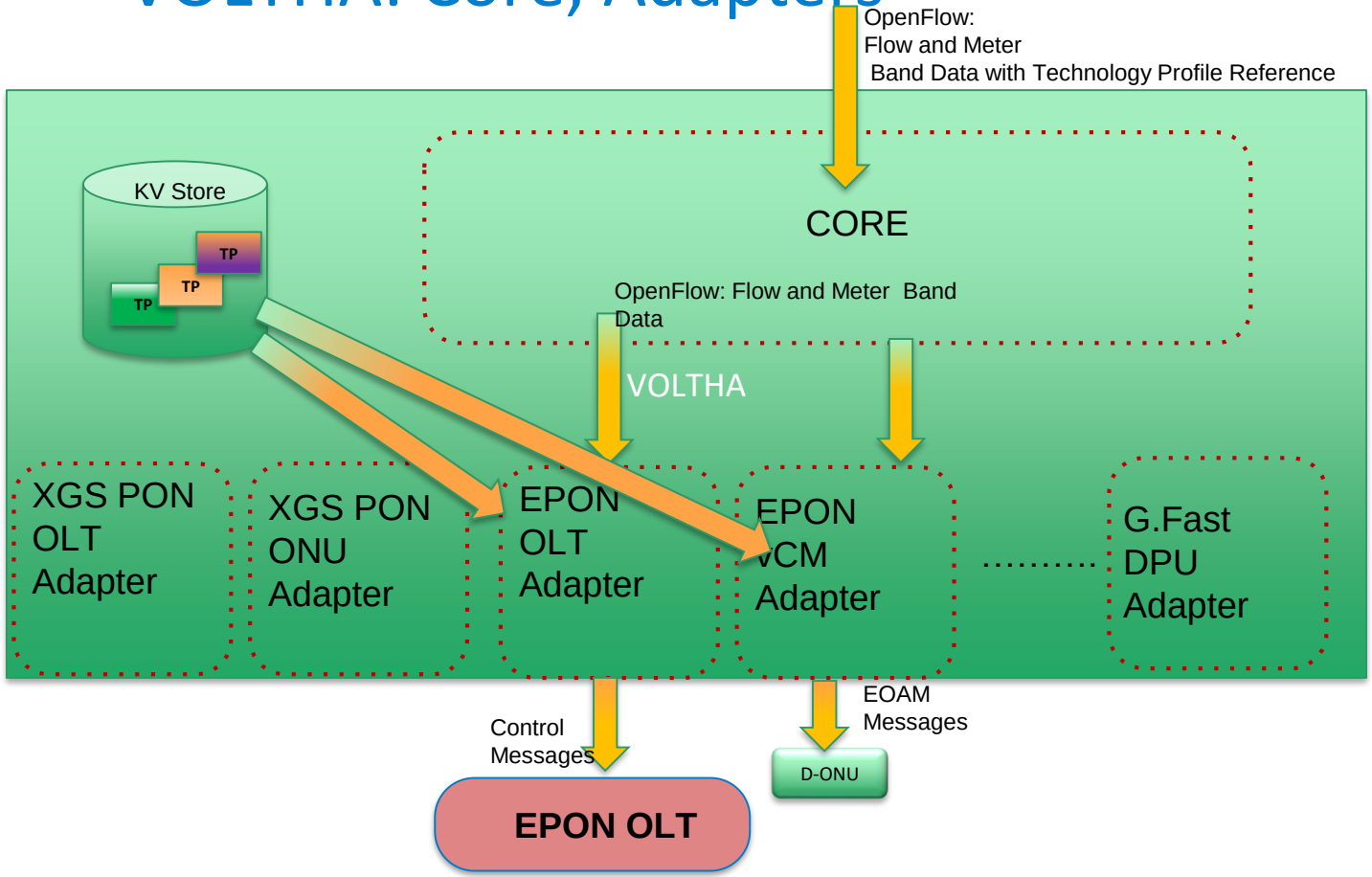
Line Configuration Vector Profile

1. TDD_Profile_Name
2. Downstream_Data_Rate_Profile_Name
3. Upstream_Data_Rate_Profile_Name
4. Low_Power_Rate_Profile_Name
5. Line_Spectrum_Profile_Name
6. UPBO_Profile_Name
7. RFI_Profile_Name
8. Noise_Margin_Profile_Name
9. FRA_Profile_Name
10. Retransmission_Profile_Name
11. Fast_Restrain_Policy_Profile_Name
12. Vectoring_Profile_Name

Technology Profile Application to DPU NE subtended from an OLT/ONU System



VOLTHA: Core, Adapters



Technology Profile Example: EPON

CableLabs DPoE Standards

Technology Profile Identifiers

1. Name
2. OF Table ID
3. Profile Type
4. Profile Version

U/S Scheduler

1. LLID Sched Type: Request
2. Flow SchedType: {BE | RTPS}
3. Priority : (0-7)
4. Weight
5. Grant Threshold
6. Polling Interval
7. TDM Interval
8. TDM Grant Threshold
9. Q Scheduling Policy
10. Metro Ethernet service Profile
11. Service Class Name

D/S Scheduler

1. Priority
2. Weight
3. Q Scheduling Policy
6. Metro Ethernet service Profile
7. Service Class Name

U/S Service Q & Sched Attributes

Per Queue Attributes:

I. Scheduling Policy
II. Priority
III. Weight
IV. Q Size
V. Discard Policy
VI. Primary Service Flow:True/False

D/S Service Q & Sched Attributes

Per Queue Attributes:

I. Scheduling Policy
II. Priority
III. Weight
IV. Q Size
V. Discard Policy
VI. Primary Service Flow:True/False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ONF
Open Networking Foundation
Thank You