



NOKIA

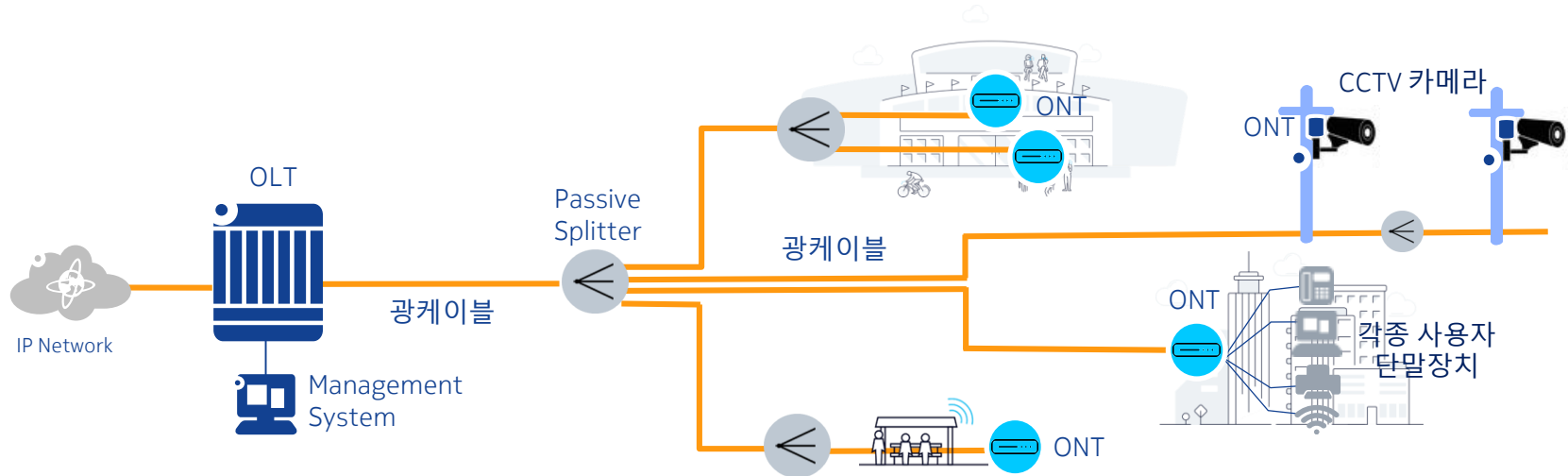
Nokia Passive Optical LAN

솔루션 소개

2020

What is POL? (Passive Optical LAN)

광 케이블 기반의 사용자 Access Network 솔루션 (GPON 기술 기반)

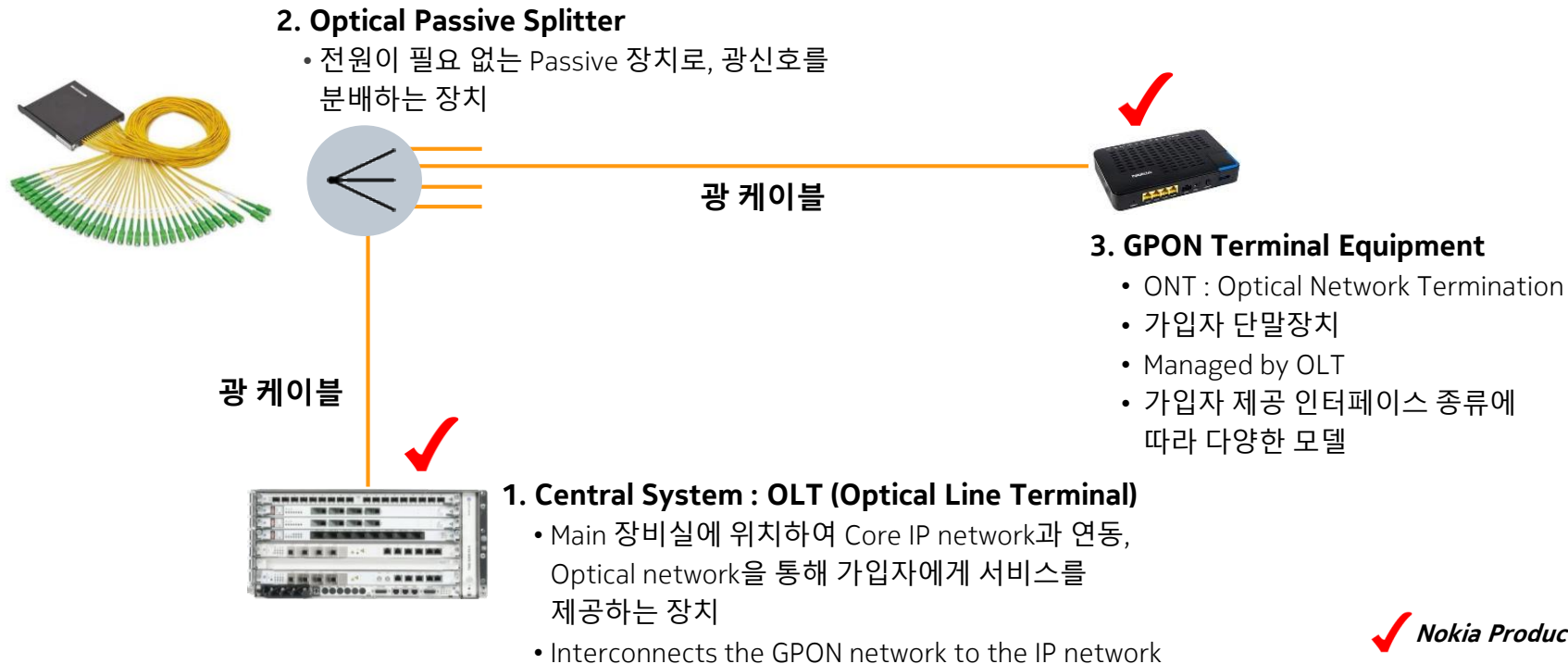


Key facts

대역폭	하향: 2.5Gb/s, 상향: 1.2Gb/s
구성 및 커버리지	최대 분기 1:128 분기, 커버리지: 20 km
수용 서비스	데이터, 음성, Video, Wi-Fi 등
확장성	XGS-PON, TWDM-PON 으로 확장 가능, SDN으로 진화 가능

What is POL? (Passive Optical LAN) – Cont.

POL 주요 구성 요소



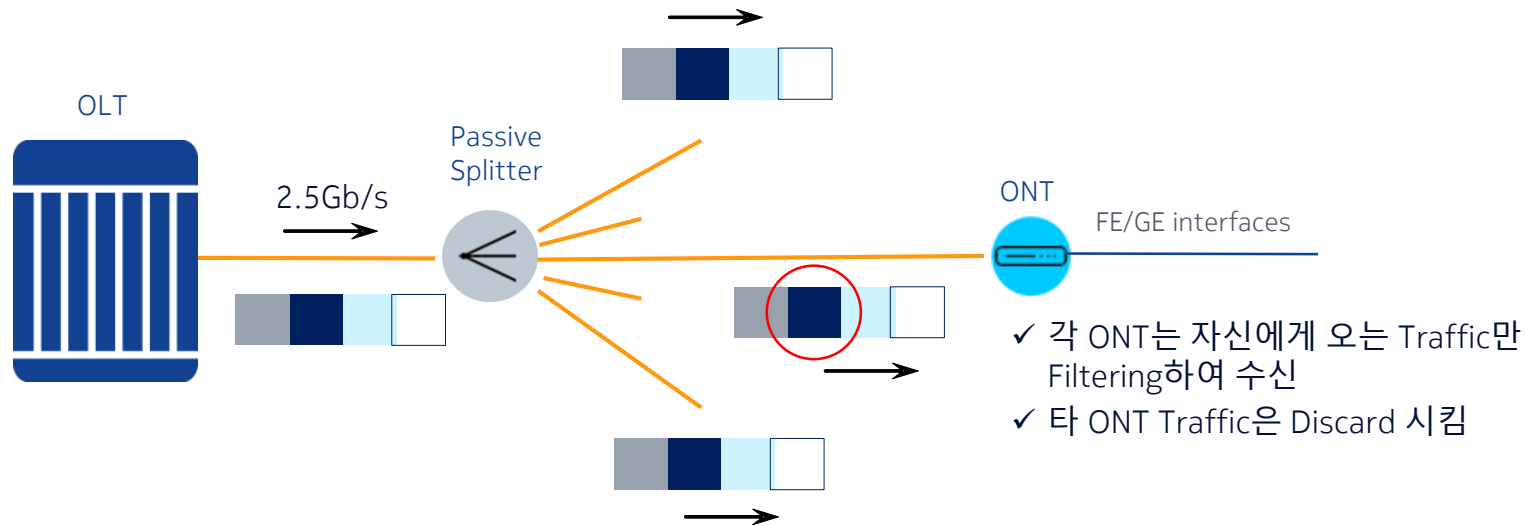
✓ **Nokia Product**

POL 기본 동작 방식

Traffic Downstream (OLT → ONT)

Downstream : Traffic Broadcast (Traffic encryption – AES Algorithm)

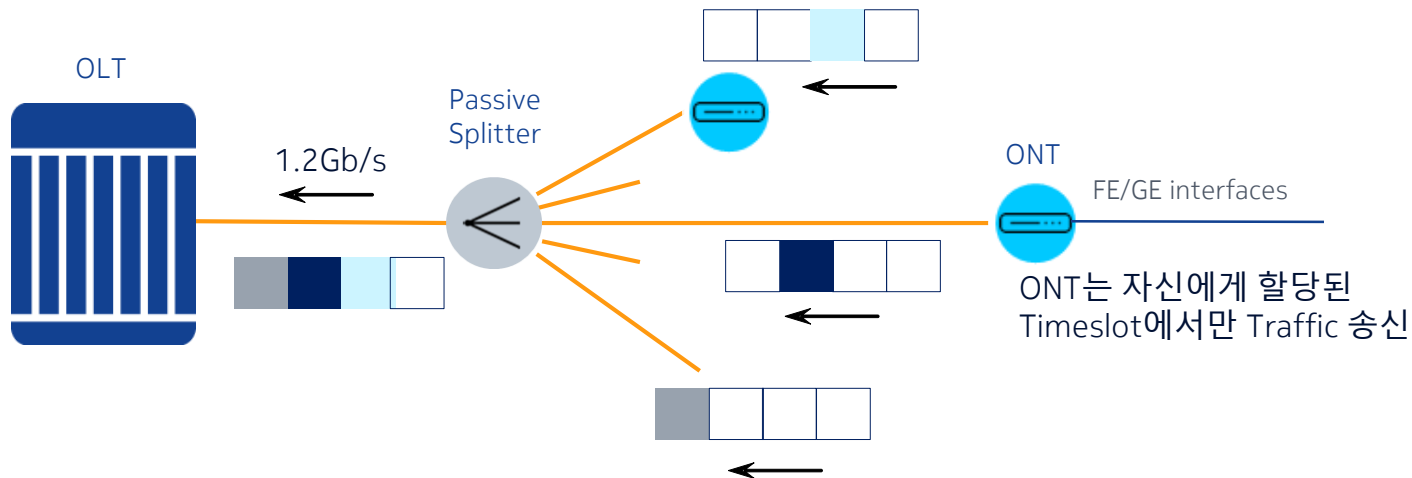
- OLT는 Traffic을 암호화하여 모든 ONT에게 Broadcasting함



POL 기본 동작 방식 – Cont.

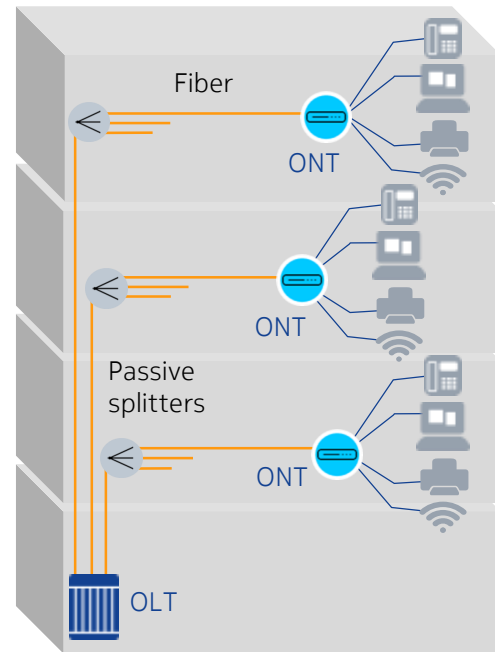
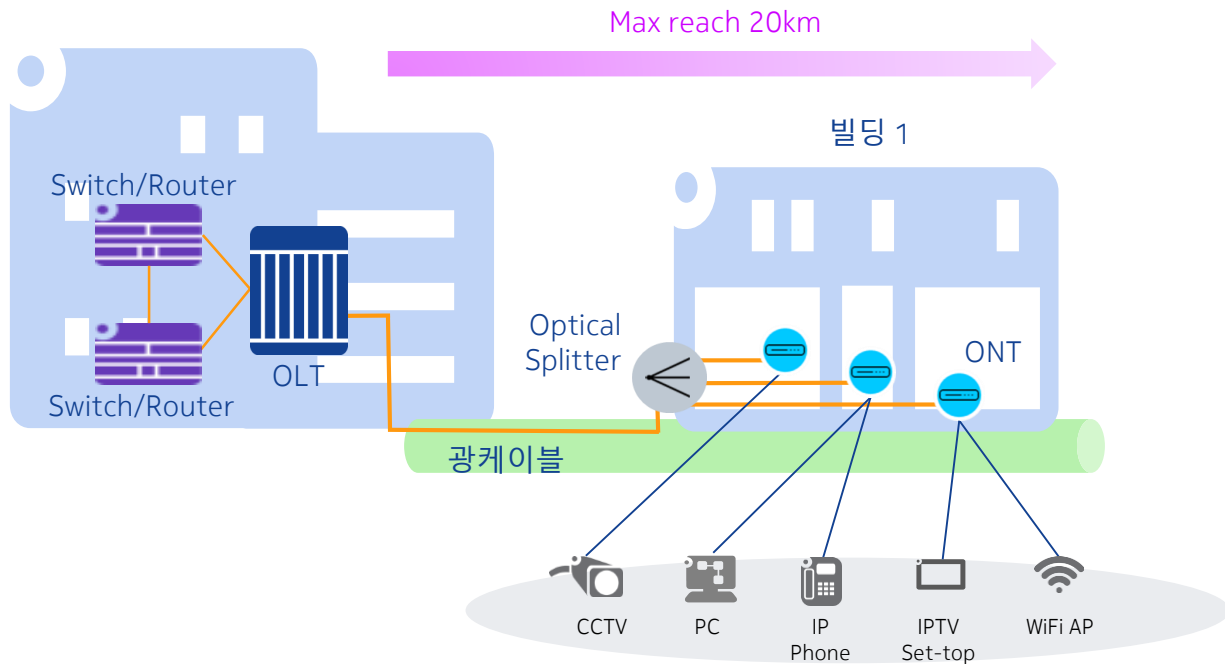
Traffic Upstream (ONT → OLT)

Upstream : Time Division Multiple Access (TDMA) 방식



POL (Passive Optical LAN) Network Architecture

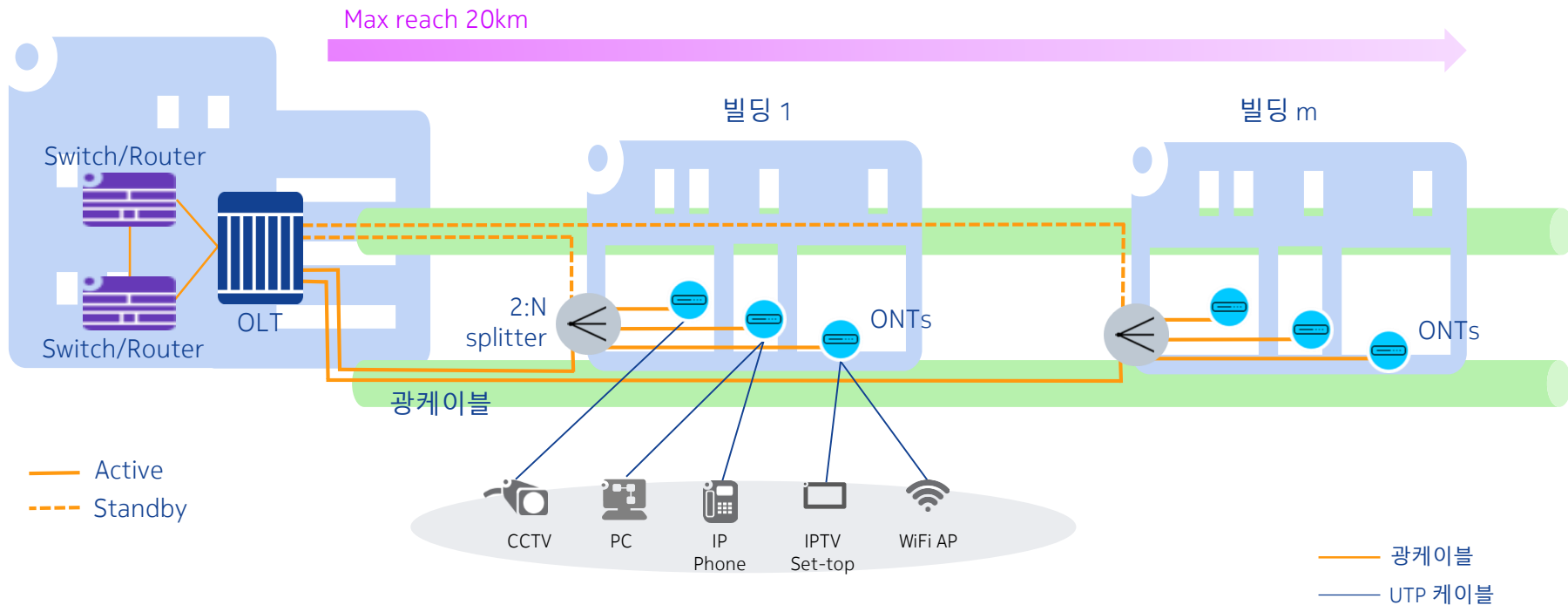
기본 구조



— 광케이블
— UTP 케이블

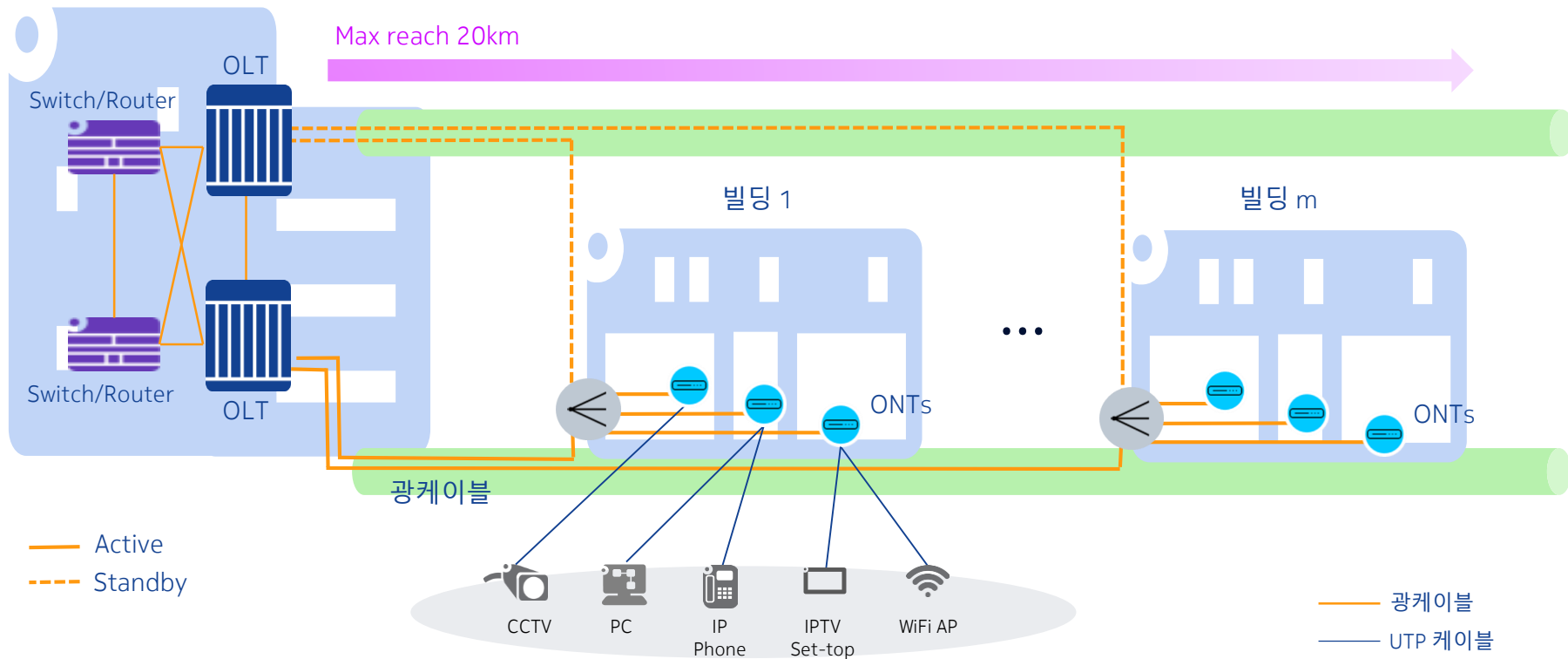
POL (Passive Optical LAN) Network Architecture

이중화 구조 (1) – GPON Uplink Redundancy



POL (Passive Optical LAN) Network Architecture

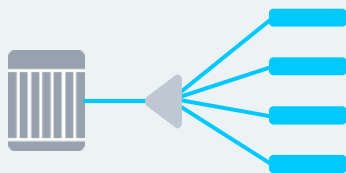
이중화 구조 (2) – OLT Chassis Redundancy



PON Technology 진화

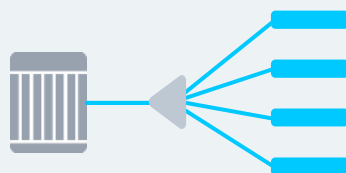
GPON

➔ 2.5 Gb/s
➔ 1.25 Gb/s



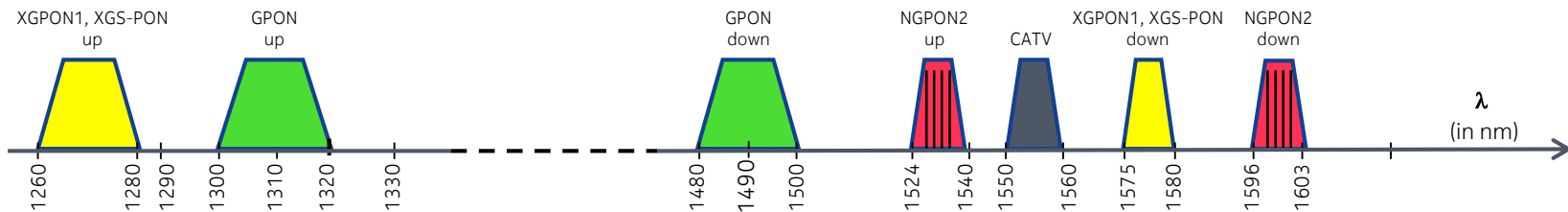
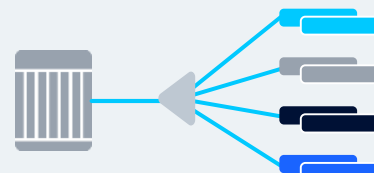
XGS-PON

➔ 10 Gb/s
➔ 10 or 2.5 Gb/s



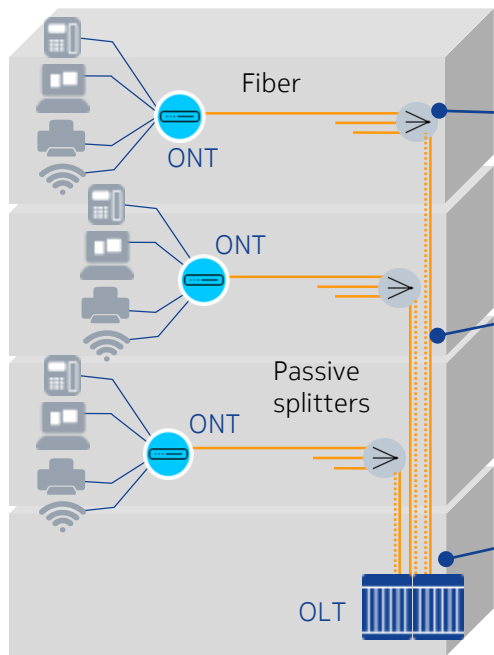
NGPON2

➔ 4x 10 Gb/s
➔ 4x 10 or 2.5 Gb/s



POL Solution 특,장점 (1)

견고한 네트워크 아키텍처 제공



A

- OLT - ONT간 별도 전원이 필요없는 Splitter 사용
→ 장애 발생 요인 최소화

B

- OLT - ONT간 광케이블 기반 구성
→ 다양한 서비스 제공이 가능한 광대역 인프라
→ UTP 케이블 대비 반영구적 사용

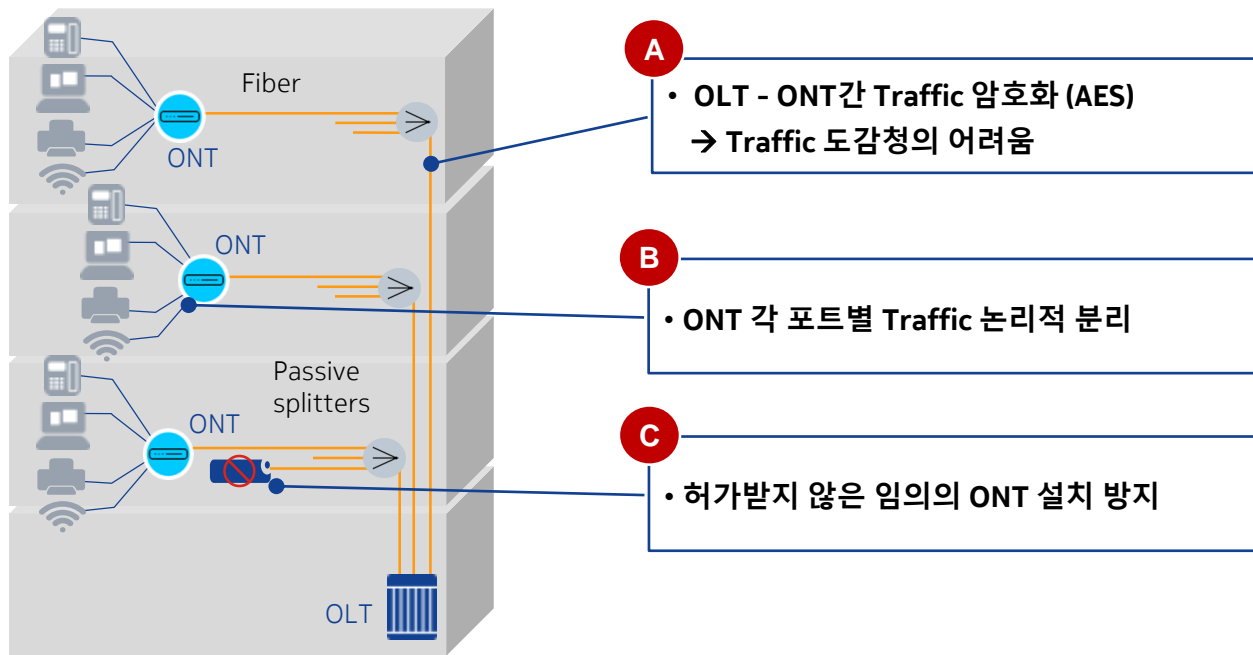
C

- 다양한 이중화 기능 제공
→ OLT 이중화, Controller 및 Line Card 이중화,
Splitter Uplink 이중화



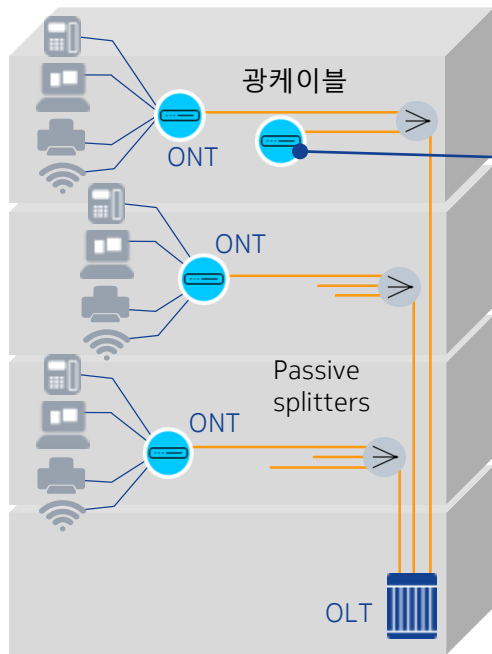
POL Solution 특,장점 (2)

강력한 네트워크 보안 제공



POL Solution 특,장점 (3)

편리하고 신속한 운영관리



- A**
- Web GUI를 이용한 간편한 ONT 장비 추가

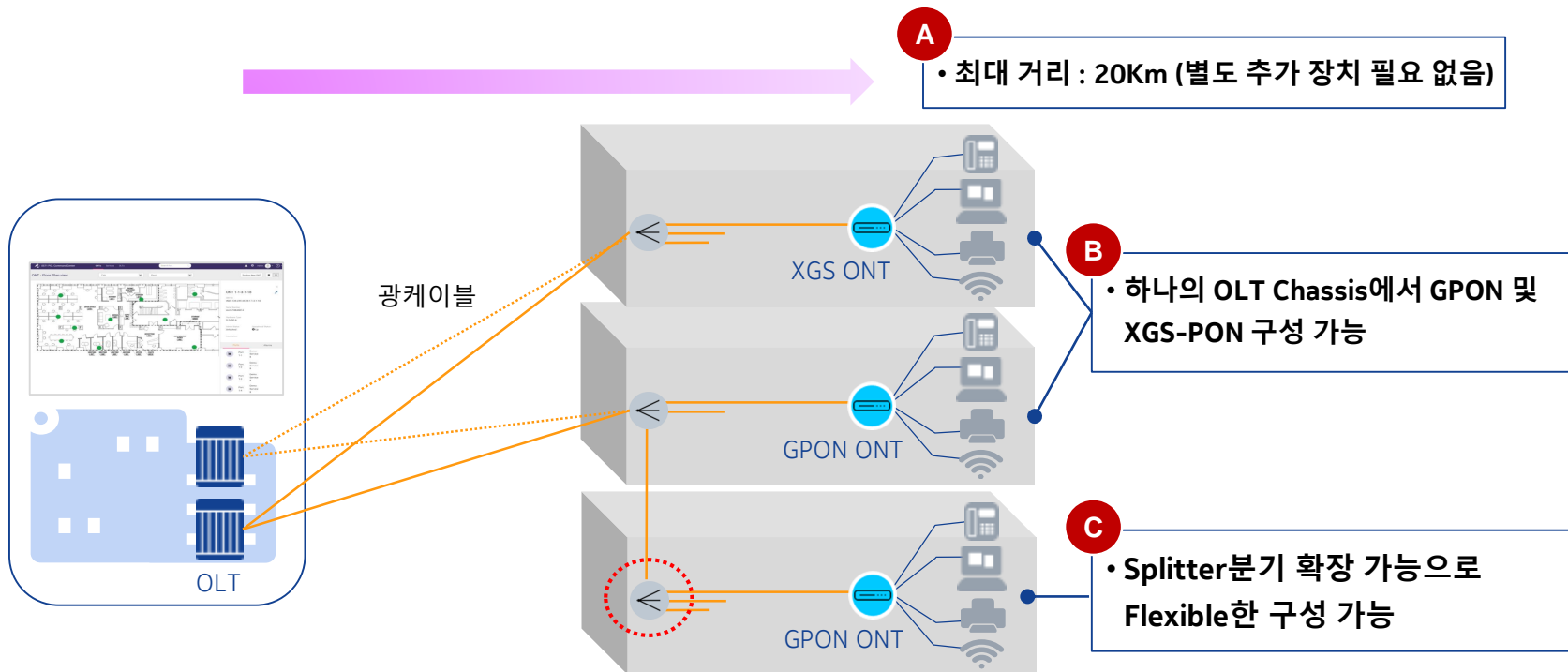


5571 PCC 관리 화면

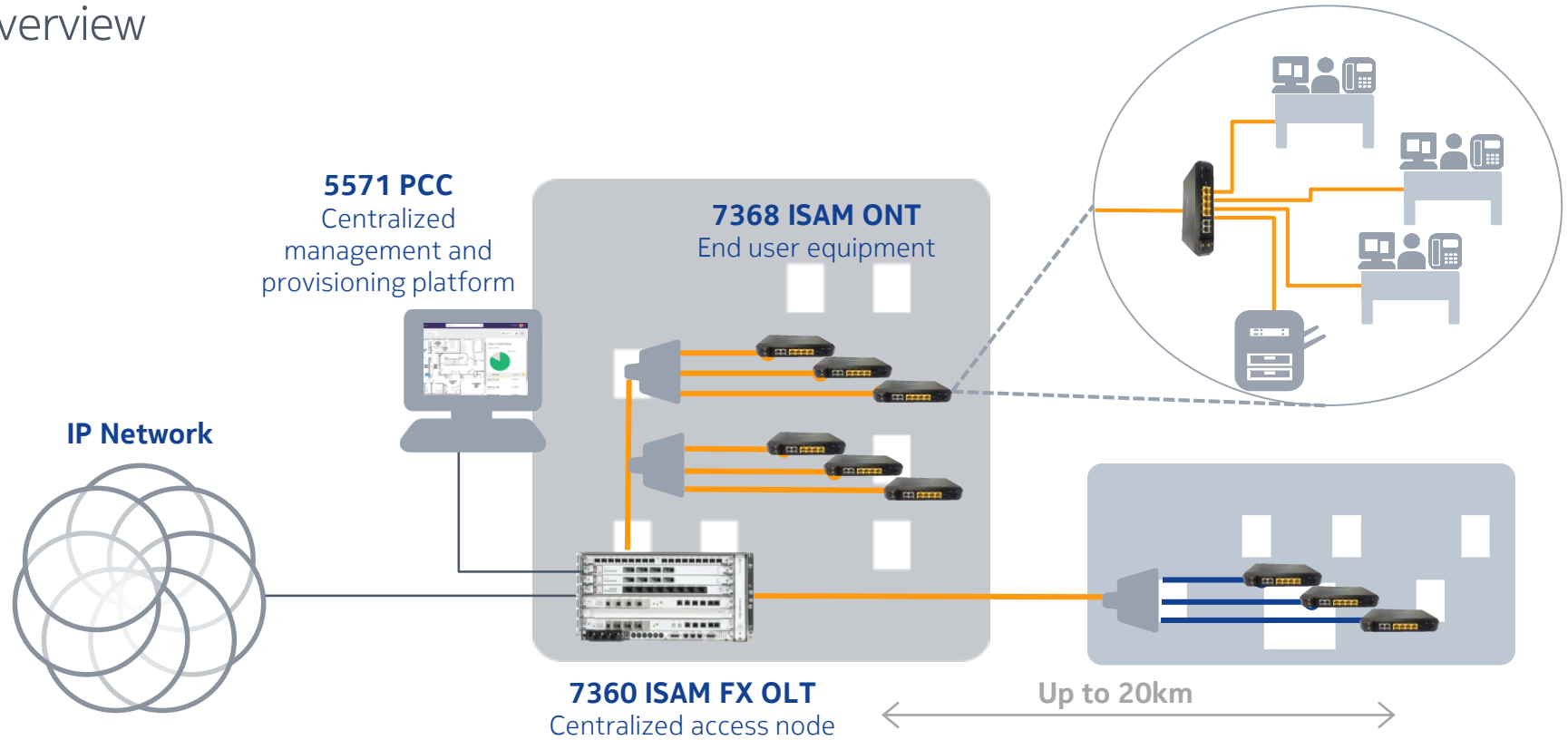
- B**
- 중앙집중 관리를 통해 POL 시스템 전체에 대한 운영 가시성 확보

POL Solution 특,장점 (4)

뛰어난 확장성

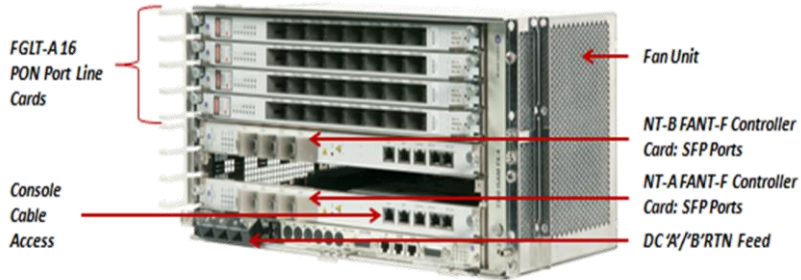


Nokia Passive Optical LAN (POL) Solution Overview



Nokia Passive Optical LAN (POL) Solution

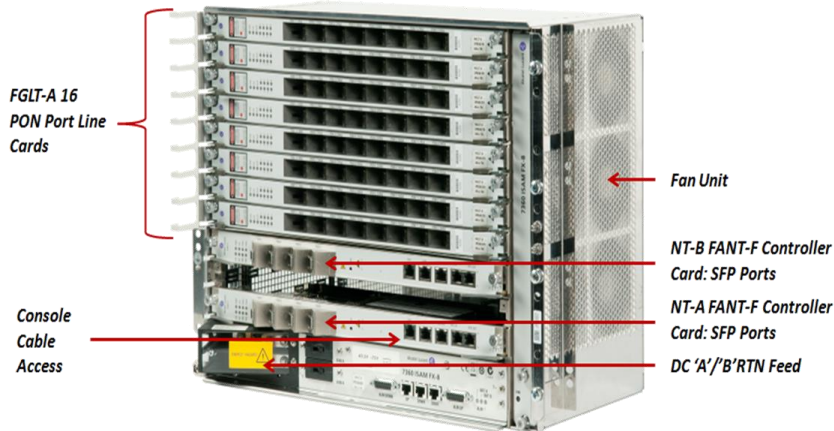
OLT



7360 ISAM FX-4

- 19" Rack 장착
- Dual -48VDC Power
- 2 x Controller Cards (NT Card)
- 4 x Line Cards (LT Card)

Field proven
Gigabit
Solution



7360 ISAM FX-8

- 19" Rack 장착
- Dual -48VDC Power
- 2 x Controller Cards (NT Card)
- 8 x Line Cards (LT Card)

All services
Converged on a
single platform

Nokia Passive Optical LAN (POL) Solution

NT Card (Network Termination Card) 종류



	Switching capacity	Uplink capacity
FANT-F	480 Gb/s	40 Gb/s



FANT-G	1.2 Tb/s	140 Gb/s
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FANT-H	3.2 Tb/s	200 Gb/s
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Nokia Passive Optical LAN (POL) Solution

LT Card (PON Line Card) 종류



	용도	Port 수
FGLT-B	GPON	16-ports
FWLT-B	XGS-PON	8-ports
FWLT-C	GPON or XGS-PON or Multi-PON or	16-ports 16-ports 16-ports

Nokia Passive Optical LAN (POL) Solution

주요 ONT Portfolio (1)



G-010P-A

- 1x10/100/1000Base-T
- POE/POE+ (MAX. 30W)
- 65 x 90 x 100 (HxWxD, mm)
- 운영온도: -40°C to 60°C



G-040P-Q

- 4x10/100/1000Base-T
- POE/POE+ (MAX. 68W)
- 40 x 130 x 209 (HxWxD, mm)
- 운영온도: -5°C to 45°C



G-240G

- 4 x 10/100/1000Base-T
- 2 x FXS ports
- 30 x 205 x 135 (HxWxD, mm)
- 운영온도: -5°C to 45°C



G-240W

- 4 x 10/100/1000Base-T
- 2 x FXS ports
- 802.11 b/g/n
- 33 x 205 x 176 (HxWxD, mm)
- 운영온도: -5°C to 45°C

Nokia Passive Optical LAN (POL) Solution

주요 ONT Portfolio (2)



U-090CP-P

- 8 x 10/100/1000Base-T (POE/POE+)
- 1 slot for pluggable interface module
 - 4 x 10/100/1000Base-T module
- 1 x 10G Ethernet Interface
- GPON or XGS PON Uplink
- POE/POE+ (MAX. 150W)



U-00160CP-P

- 16 x 10/100/1000Base-T (POE/POE+)
- 2 slots for pluggable interface module
 - 4 x 10/100/1000Base-T module
- GPON or XGS PON Uplink
- POE/POE+ (MAX. 370W)



U-050X-A

- 2 x 10/100/1000Base-T
- 2 x Combo (2xSFP or 2xRJ45)
- 1 x 10G (SFP+)
- GPON or XGS PON Uplink



XS-010X-A

- XGS PON (10G Uplink/Downlink)
- 1 x 100M/1G/2.5G/5G/10G Base-T
- 30 x 135 x 135 (HxWxD, mm)

Nokia Passive Optical LAN (POL) Solution

주요 ONT Portfolio (3)



G-010S-A
(GPON SFP ONT)

- 12.5 x 14.1 x 72 (HxWxD, mm)
- SC/APC connector
- 운영온도: -40°C to 85°C



XS-010S-A
(XGS-PON SFP ONT)

- 15.0 x 14.0 x 81.0 (HxWxD, mm)
- SC/APC connector
- 운영온도: -40°C to 85°C

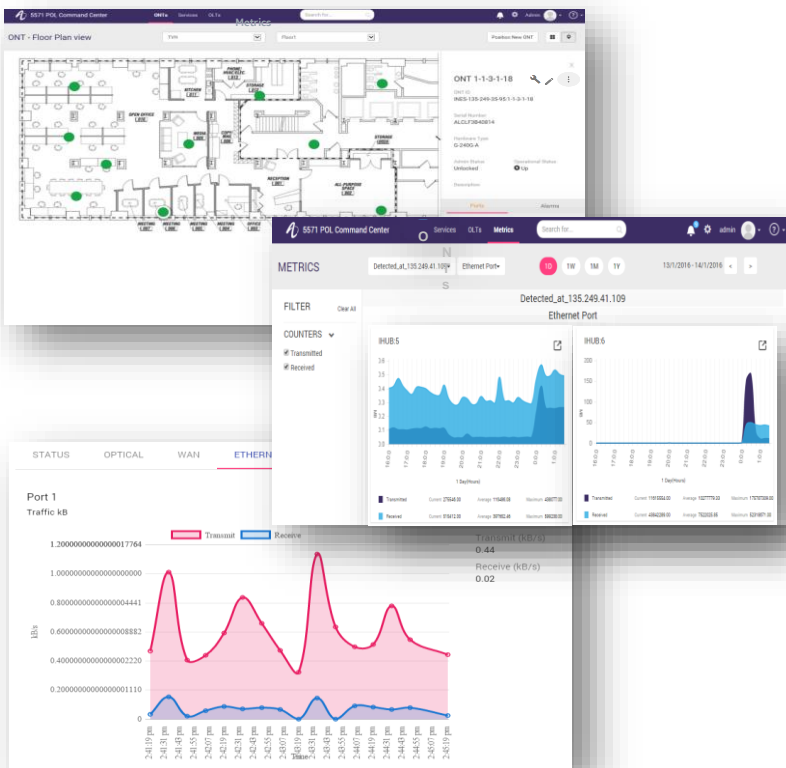


XS-250X-A

- XGS PON (10G Uplink/Downlink)
- 4 x 10/100/1000Base-T
- 2 x FXS ports
- 1 x 10G Base-T

Nokia Passive Optical LAN (POL) Solution

5571 PCC – 중앙 집중 방식의 Management & Provisioning 시스템 (EMS)



직관적인 웹 유저
인터페이스

알람 표시 및 관리

간소화된
프로비저닝

직관적인
문제해결 지원

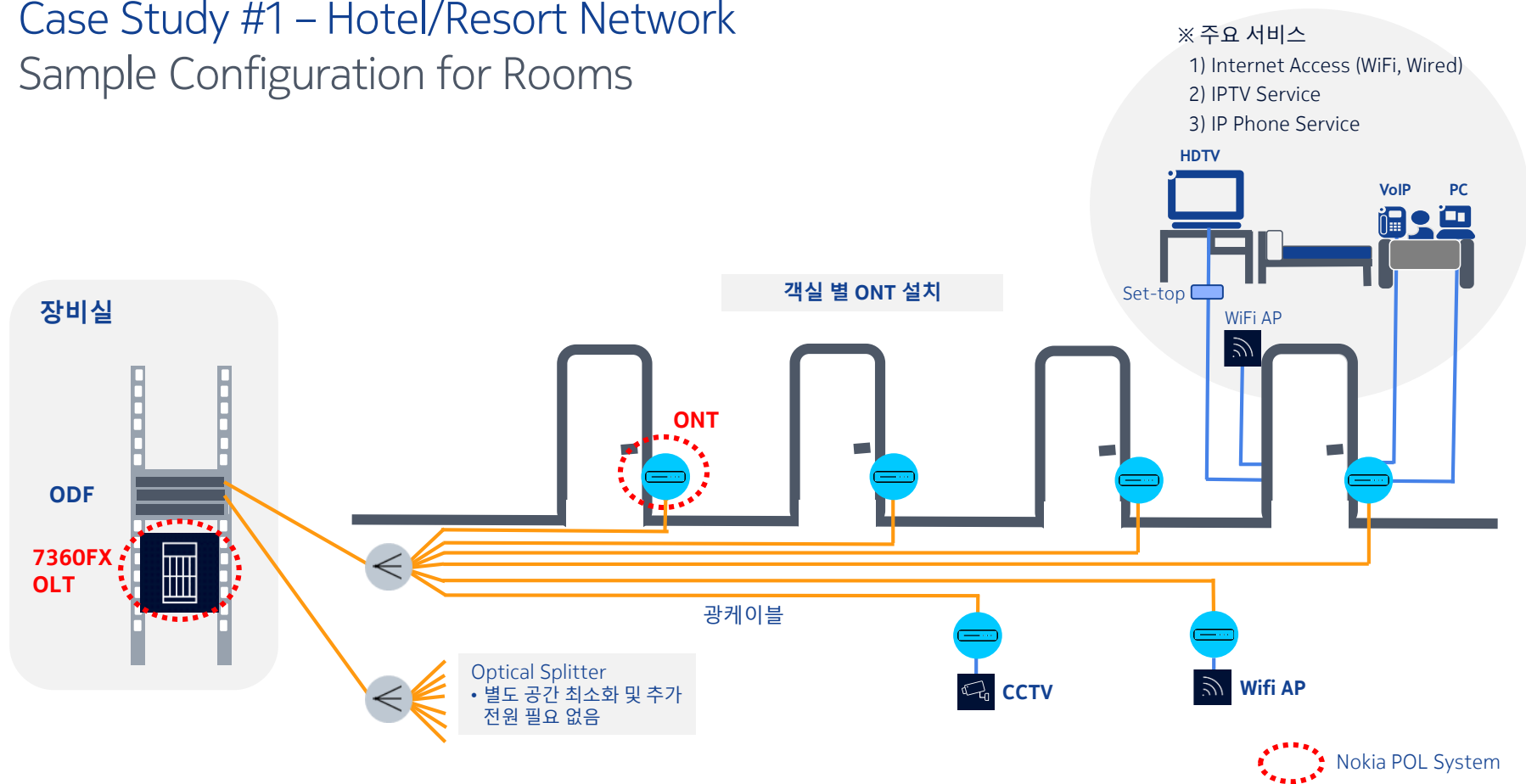
쉬운 설치

각 사용 유형에
대한 사전 서비스
정의

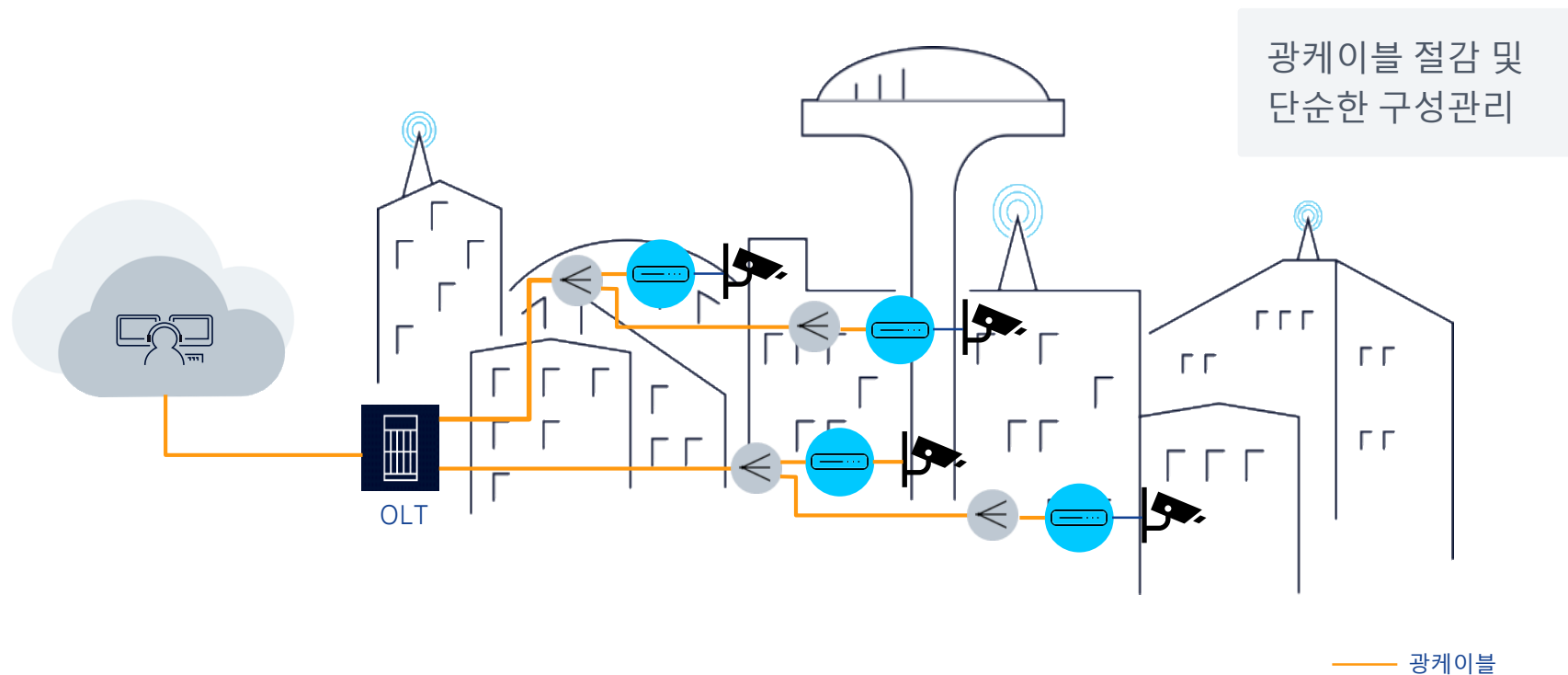
ONT 자동 활성화

Case Study #1 – Hotel/Resort Network

Sample Configuration for Rooms



Case Study #2 – CCTV Network



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