Connecting Networks: Urban to Rural with FTTH
Back to basics and beyond with PnP & Automation

Broadband India Summit 2025

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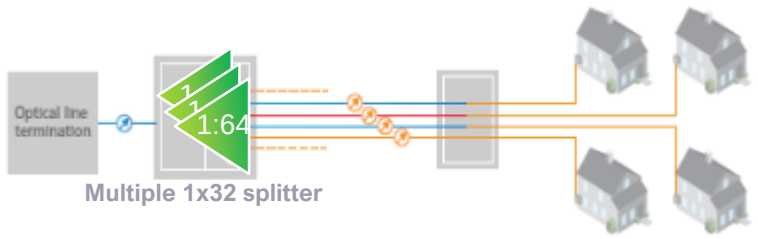
COMMSCOPE®

Network Topology Choices

All modelling analysis based on aerial installation utilizing 'Non-Hardened Connectivity'

Centralized

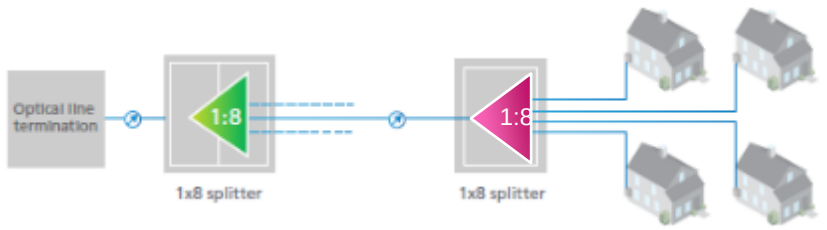


Single Level Splits, Co-located At The Same Location

Distributed

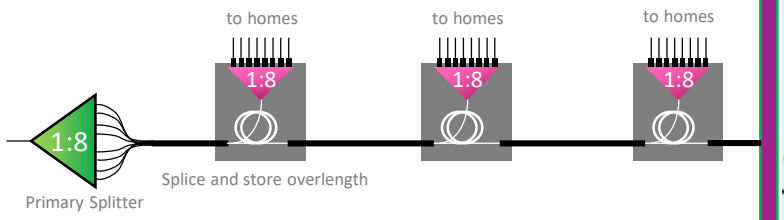
Single Level Split Distributed Throughout The Network

Cascaded - Star



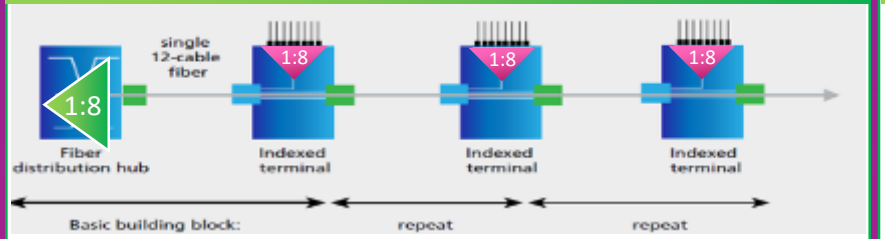
Multi-level Splitters Cascaded Within The Network

Cascaded - Daisy Chain



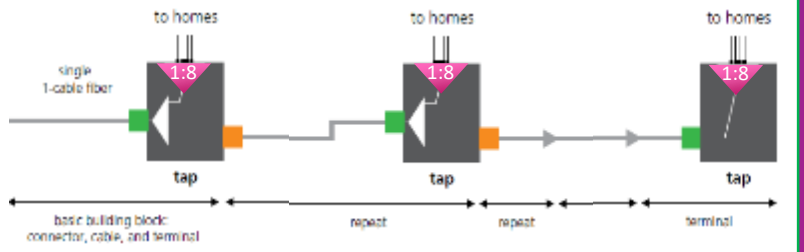
Cable Accessed At Each Terminal Location And Spliced To Splitter

Cascaded - Indexing



FLX™ ODN Solution

Cascaded - TAP



Singe Fiber Network Diverting Part Of The Signal To The Splitter

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Centralized Architecture

Single Level Splits, Co-located At The Same Location

Lots of fiber kms in distribution network, right from the S1 location

Pros	Cons
Centralized fiber configuration location	High Fiber count cables
Maximum Network flexibility	Increased splice quantity
Consolidated splice locations	Increased permissions/RoW requirements
	Increased civils requirements

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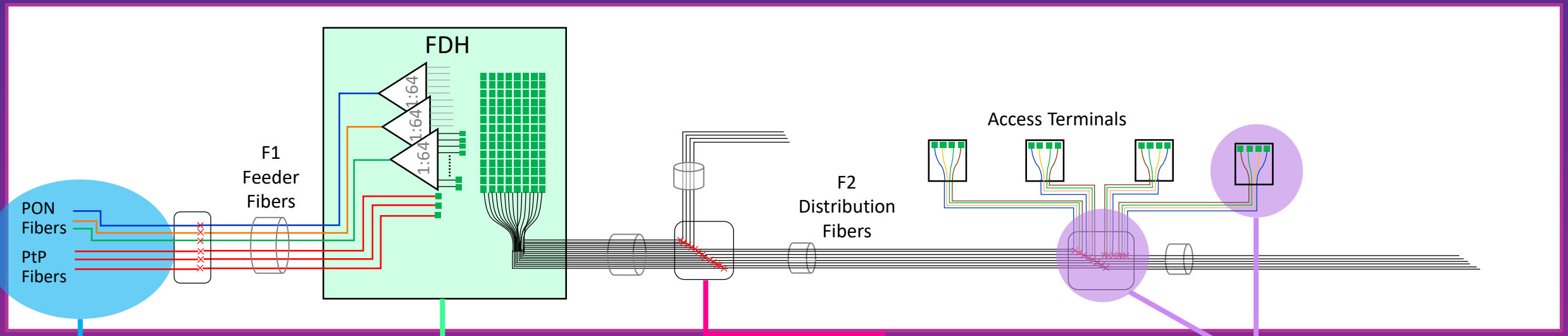
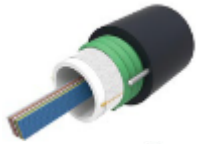
Centralized Architecture



Cable Options

SLT (Stranded Loose Tube)



Central Tube Ribbon

Rollable Ribbon

Primary Splitter

FDH Cabinet

Hub in Ped

FDH 4000

1x64 Splitter – PnP

Splice Closure

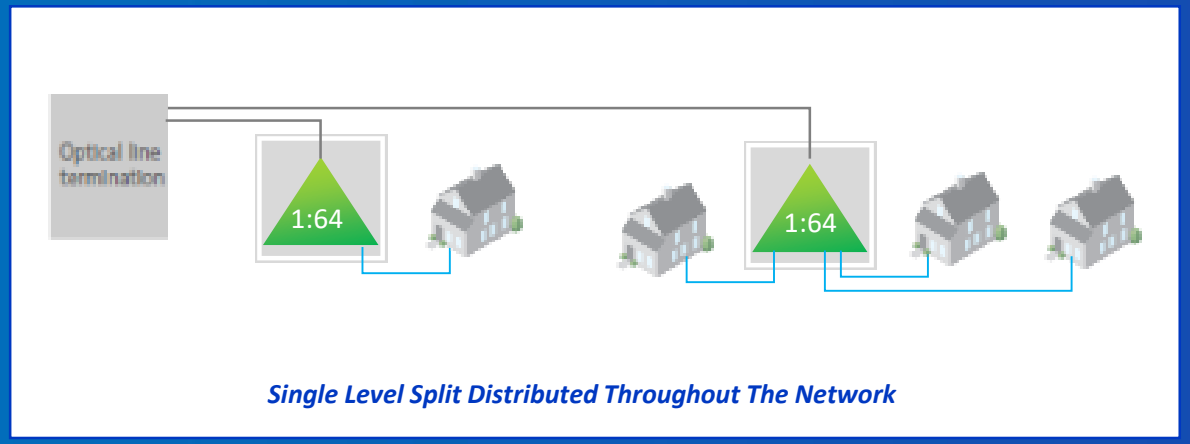
FOSC 400

Raymech

Terminal Options (Non-Hardened)

FAT / Mini-FAT / OTB / FDC

Distributed Architecture

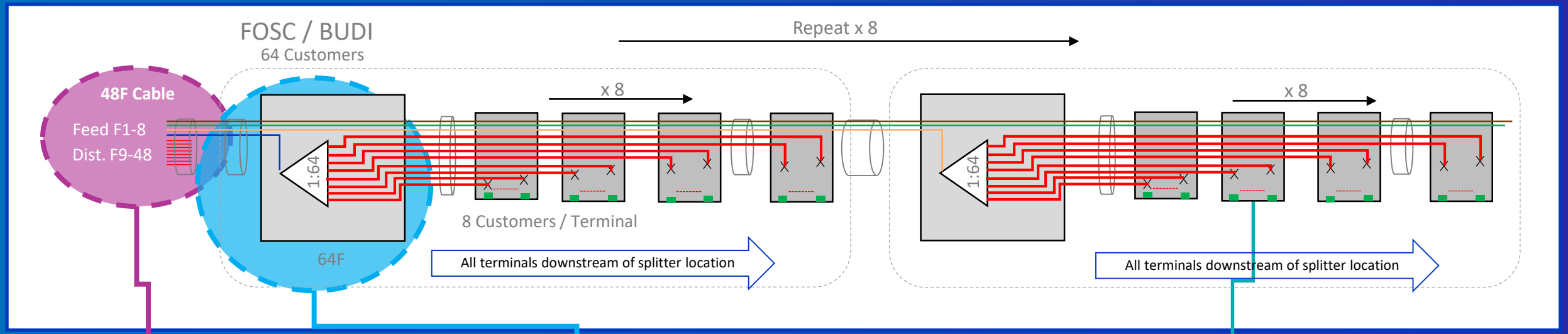


Single Level Split Distributed Throughout The Network

Saving lot of fiber kms in distribution network, by distributing the S1 location

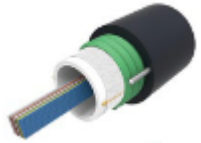
Pros	Cons
Centralized fiber configuration location	Multiple Splice locations
Good Network flexibility	Mid-sheath access at each terminal & splitter location
Reduced Fiber count solution, reuse of fibers	
Compatible with legacy OSS/BSS Systems	
Small number of SKUs repeated	

Distributed Architecture



Cable Options

SLT (Stranded Loose Tube)



Central Tube Ribbon

Rollable Ribbon

Primary Splitter

BUDI-S

FOSC-450B

1x64 Splitter – PnP

1x32 Splitter – Field Installable

Terminal Options (Non-Hardened)

FAT / FDC / Mini-FAT / OTB

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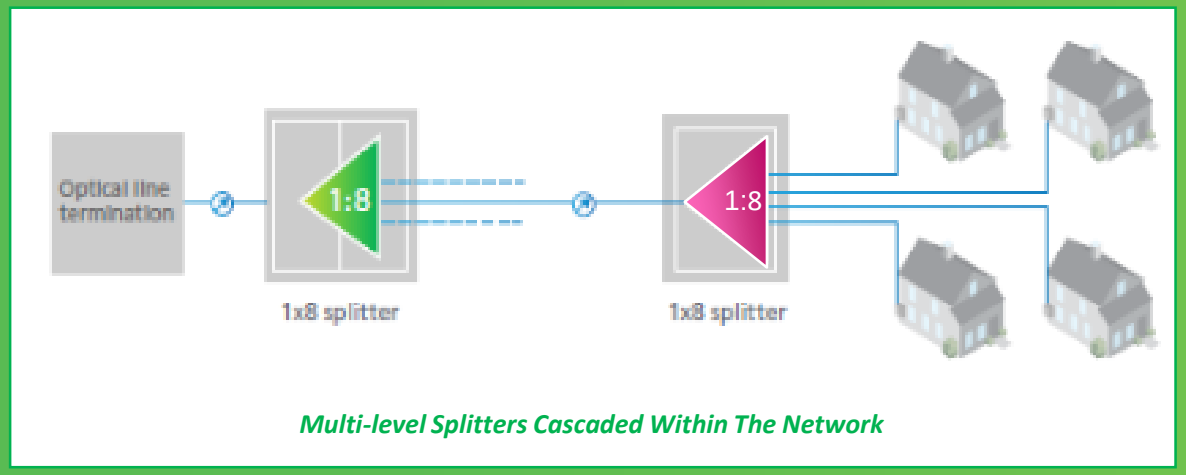
Cascaded Star Architecture



Multi-level Splitters Cascaded Within The Network

Saving fiber kms in distribution network, best of both the solutions

Pros	Cons
Reduced Fiber Counts – Reduced Splicing	Higher Splicing Locations
Smaller Cable Diameters	
Reduced Permitting Requirements (no cabinet)	

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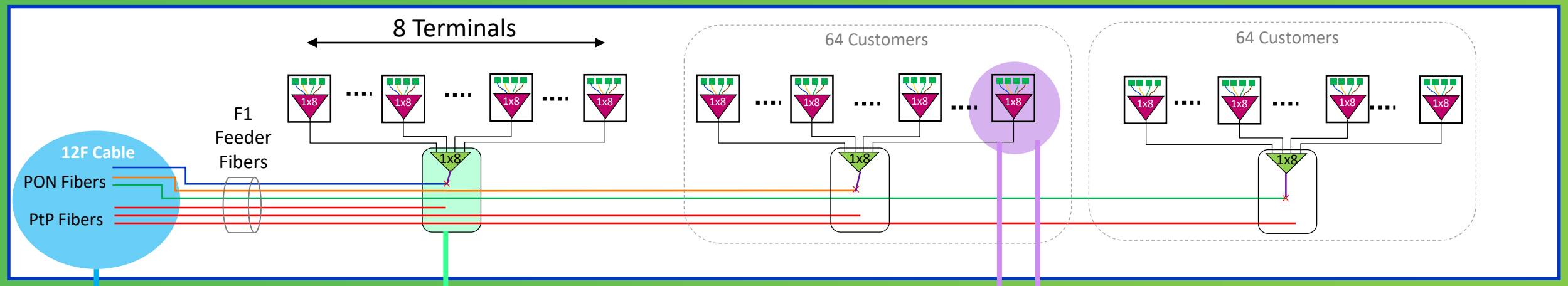
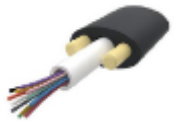
Cascaded Star Architecture



Cable Options

SLT (Stranded Loose Tube)



12F Flat Drop

HeliARC

Primary Splitter

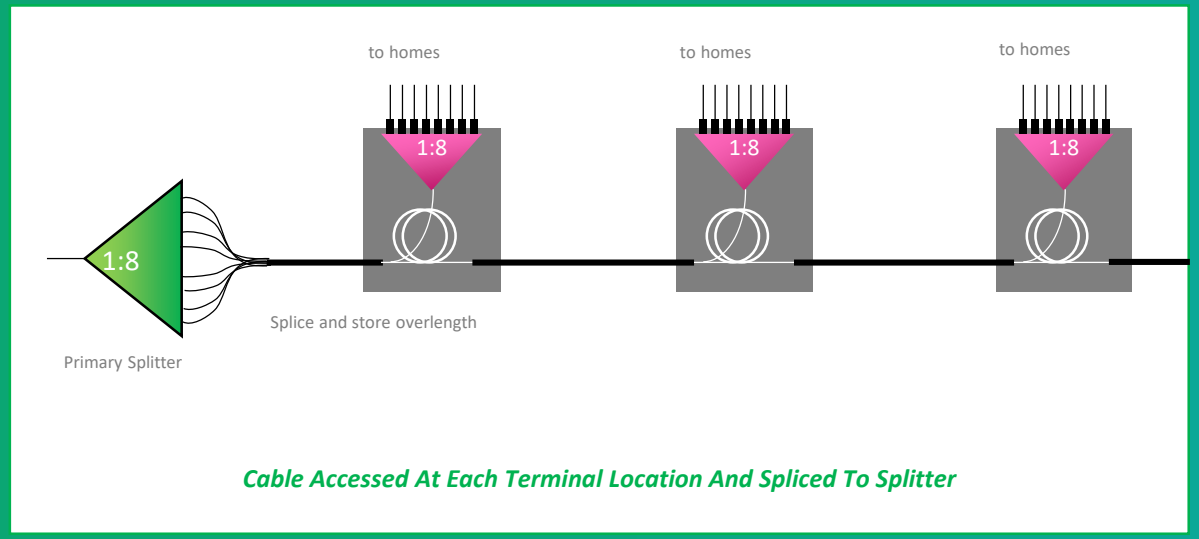
FOJC

FDC

Terminal Options (Non-Hardened)

FAT / Mini-FAT / OTB

Cascaded – Daisy Chain Architecture

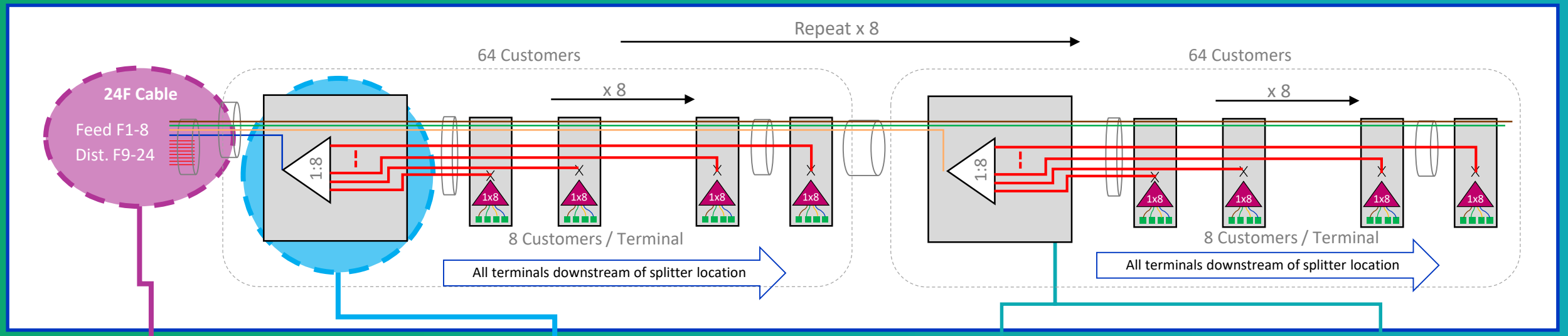


Cable Accessed At Each Terminal Location And Spliced To Splitter

Saving lot of fiber kms in distribution network, by using a single low fiber count OFC

Pros	Cons
Reduced Fiber Counts – Reduced Splicing	Increased number of splicing locations
Smaller Cable Diameters	Mid-span cable prep at terminal locations
Re-use of distribution fibers within cable	
No-overhauling of cables	
Simple Point-to-Point inclusion	
Minimal pre-engineering efforts, enables deferred terminal placement	

Cascaded – Daisy Chain Architecture



Cable Options

12F / 24F Flat Drop

HeliARC

24F SLT

Primary Splitter

FOJC

FDC

Terminal Options (Non-Hardened)

FAT / Mini-FAT / OTB

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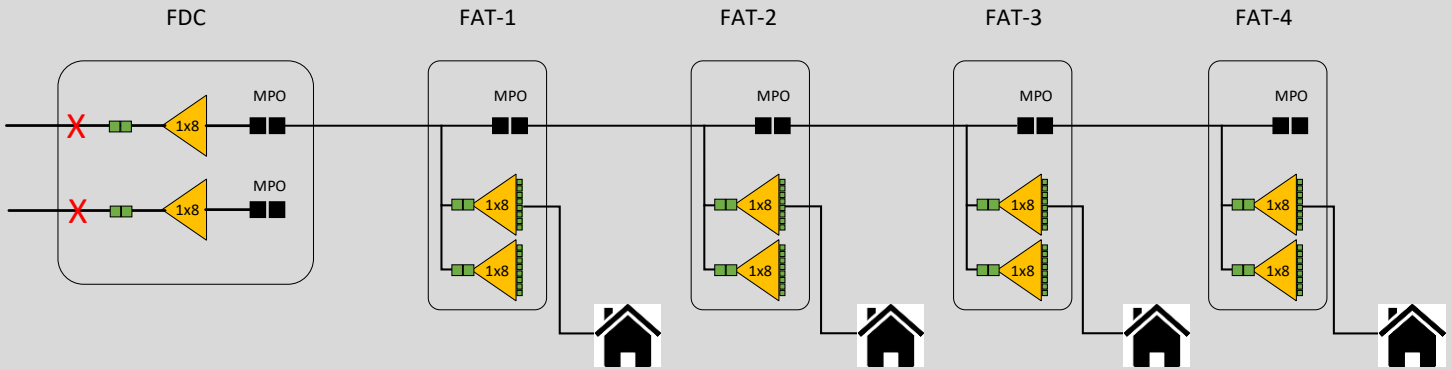
All is well – But …….

I still have challenges on my passive FTTH ODN network:

- Speed – Mean time to market, acquire customer fast and create a large customer base.
- Ease – Ease of deployment using lighet flexible cable, with minimum planning
- Time and cost of Splicing
- Skilled labour requirements
- *Right at the first time….in terms of fiber connections ……..*
- ……..

FDC



FAT

For fiber serving area of **2048** homes*

	Splice	Connectorised
Total splices:	~~608~~	32 [**95%** reduction]
No splice locations:	~~144~~	16 [**89%** reduction]

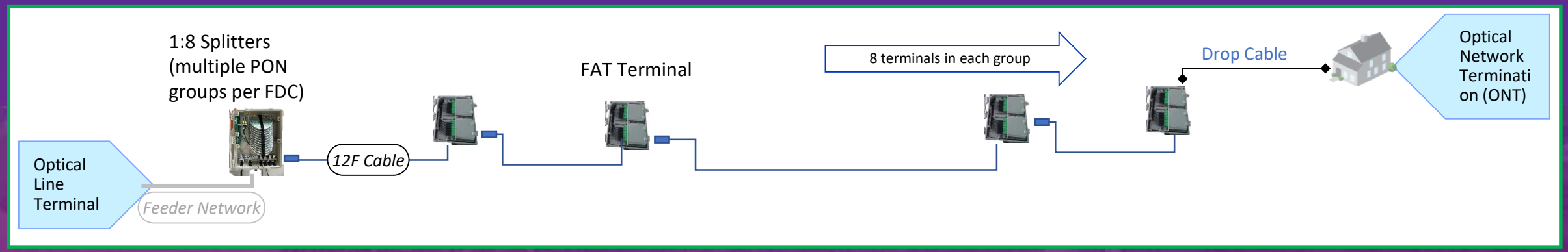
Benefits:

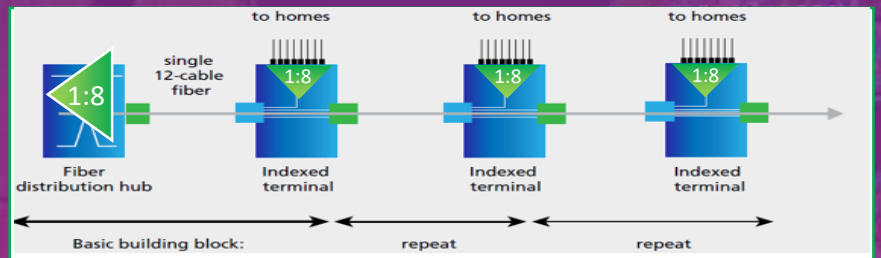
- Speed of deployment – VERY FAST with **connectorised plug and play** for fast turn up
- **Low labour skills** – splicing only on input fiber (day 1 activity only)
- **Quality & performance** – factory terminated cable assemblies

* Requires 16 FDC and 128 FAT

FLX™ ODN Plug & Play Solution - Connectorised

FLX™ ODN Cascaded Indexing





FLX™ Cascaded PON

Pros

Smaller cable diameters

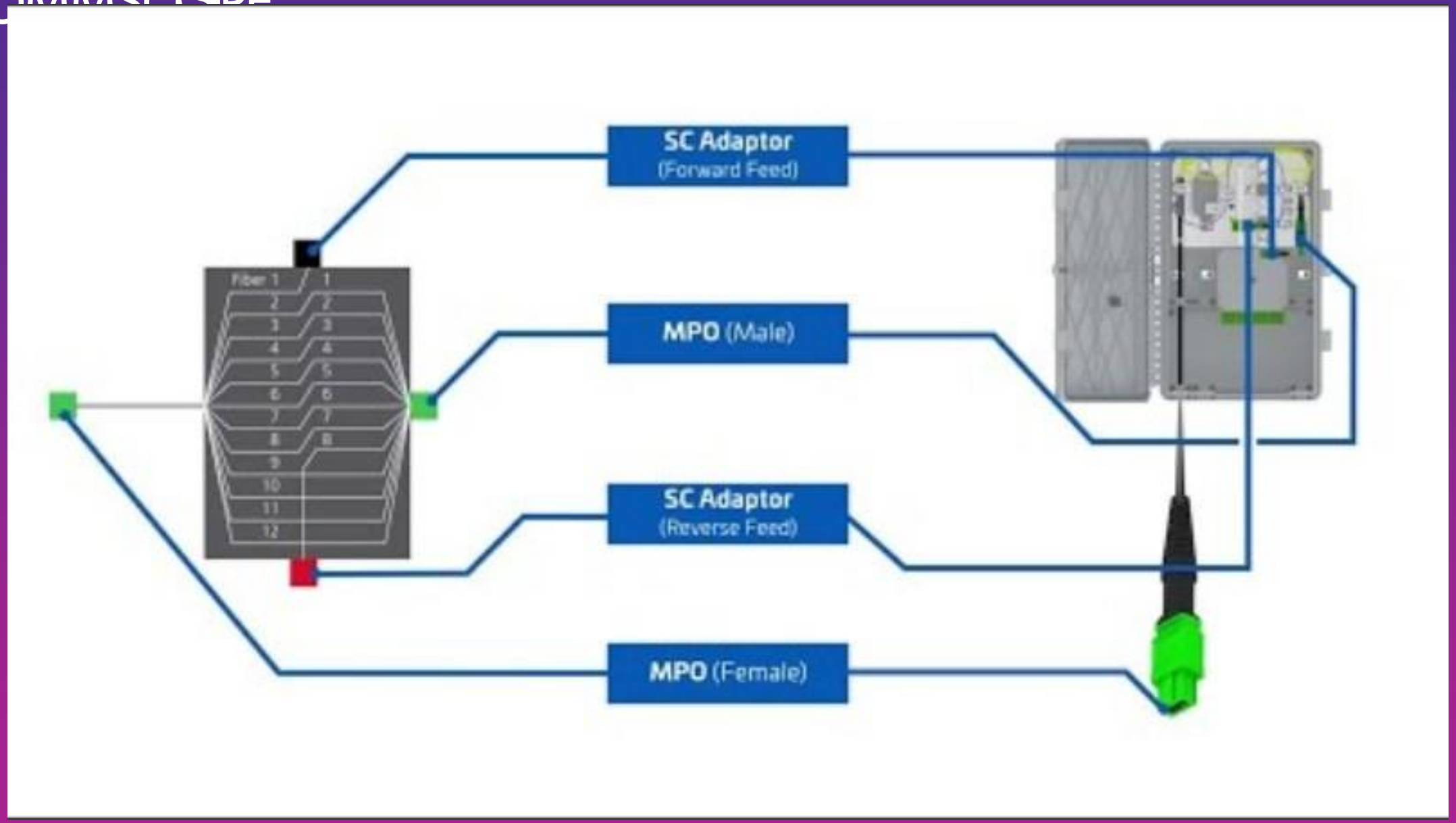
Faster speed of deployment

Low installation skills required

Signific

***Flexible ODN allows Feeder and Distribution on same cable**

Indexing Architecture Video


SC Adaptor
(Forward Feed)
MPO (Male)
SC Adaptor
(Reverse Feed)
MPO (Female)
Fiber 1
1
2
3
4
5
6
7
8
9
10
11
12

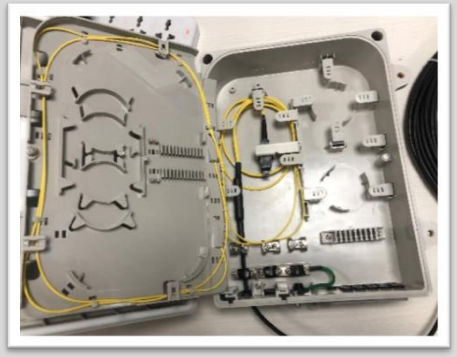
Two key products: FDT & FAT

A single FAT type – **simple, Single and double splitter**

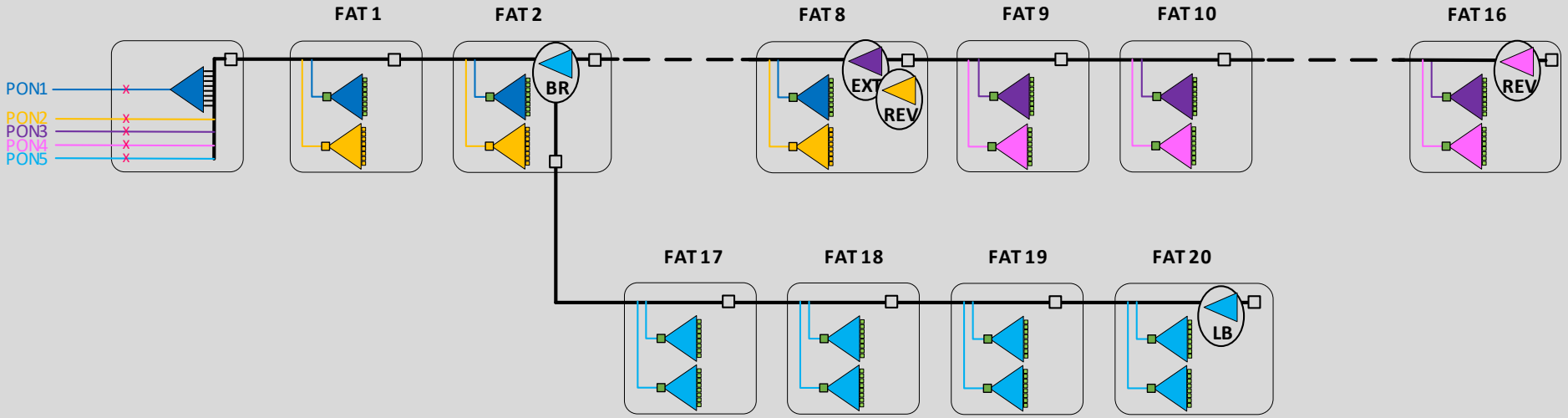
Different cable lengths – **optimised products**

A single 12F cable between FATs – **less fibre**

Indexed FDT



Indexed FAT



CommScope FLX™ ODN

Forward

Reverse

Branching

Loopback

Save Distribution cable runs, splicing time, splicing cost, fast deployment, expand in forward direction, on already laid daisy chain and branches

FLX™ ODN Going beyond Plug & Play, enabling the exapnsion

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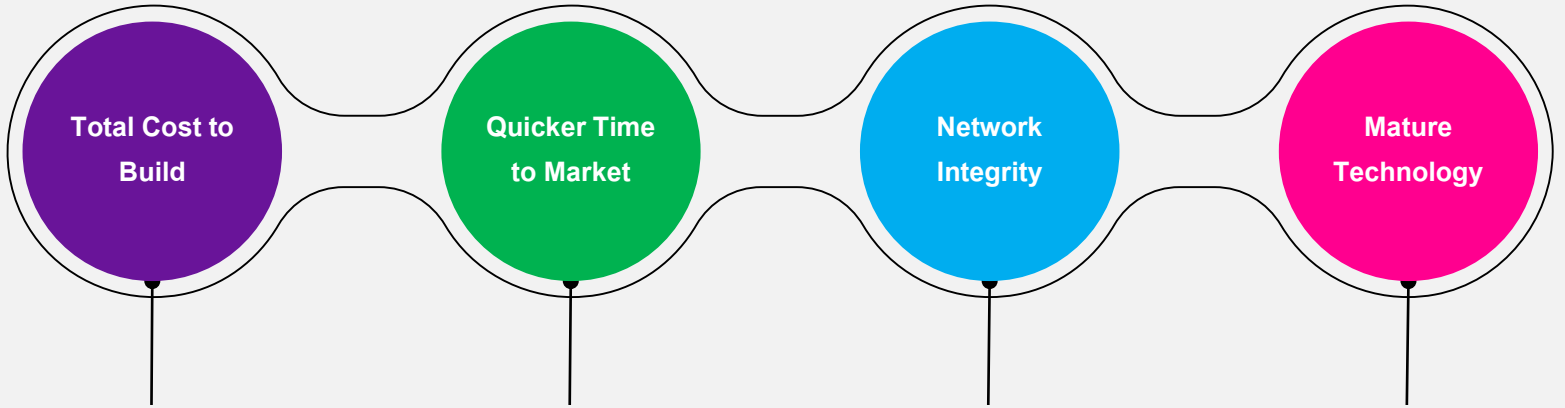
Introduction

CommScope FLX ODN

A pre-connectorised solution for building ODN FTTH networks.

Value proposition



36%

FLX ODN will help the customer reduce the total cost to build the network

57%

With FLX ODN, customer can build the network faster and quicker time to market

100%

Higher quality build means first time right deployment and high network integrity.

+8 Mil

The indexing construct behind our FLX ODN solution has over 8 million home passed worldwide

CommScope FLX™ ODN Case Study in India

Based on the analysis, CommScope FLX™ ODN Solution **can be constructed 43% quicker** as compared to the traditional splice solution. With this time savings the sites can be quicker to market and help Airtel accelerate Return on Investment (ROI)

For example, a 25M Homes passed **ODN construction program taking an average of 3 yrs to build, which can be reduced to 1.7** yrs using CommScope FLX ODN solution

Intangible Benefits

- XGS PON Ready –Ready For future
- Reverse Port giving Additional capacity
- Faster Commissioning & less field splicing issues
- Design Efficiencies
- Less Project Management Effort
- Less Skill Labour required
- **Accelerate Return on Investment (ROI)**
- **Time to Market**

30% cost Investment In Materials

Cost

3% Overall Saving on Deployment Cost

43% Saving on Construction duration

Benefits

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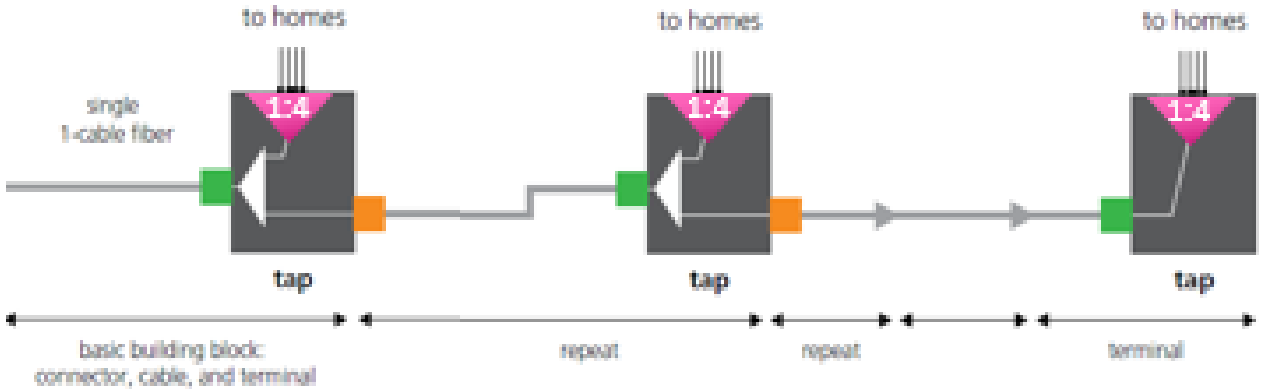
Competitive Analysis

Feature	FLX ODN Solution	Competitors TAP Solution
Pre-connectorised – no splicing	✓	✓
Matches existing architecture	Balanced ✓ Cascade Split	Unbalanced ✗ TAP
Open standard connectors / non-proprietary	✓ SCA or SCU	✗ Proprietary
Same drop cable as existing	✓	✗
Maximum number of terminals in a series chain	✓ 20	✗ 4
Typical fibre reach from OLT to ONU	✓ 5km	✗ 2km
Homes covered per chain of terminals	✓ 320	✗ 32
Integrates with existing networks	✓	✗
Application	✓ FTTP + P2P	✗ FTTP only
Any terminal in any location (all terminals the same)	✓	✗

Cascaded Optical Tap Architecture



TAP Cascaded PON

Entire solution on a single fiber

Best for distributed flat demography

Pros	Cons
Very lean fiber network topology	Inventory holding of various TAP ratios
Reduced splicing needs	
Best efficiency of OLT optical power	

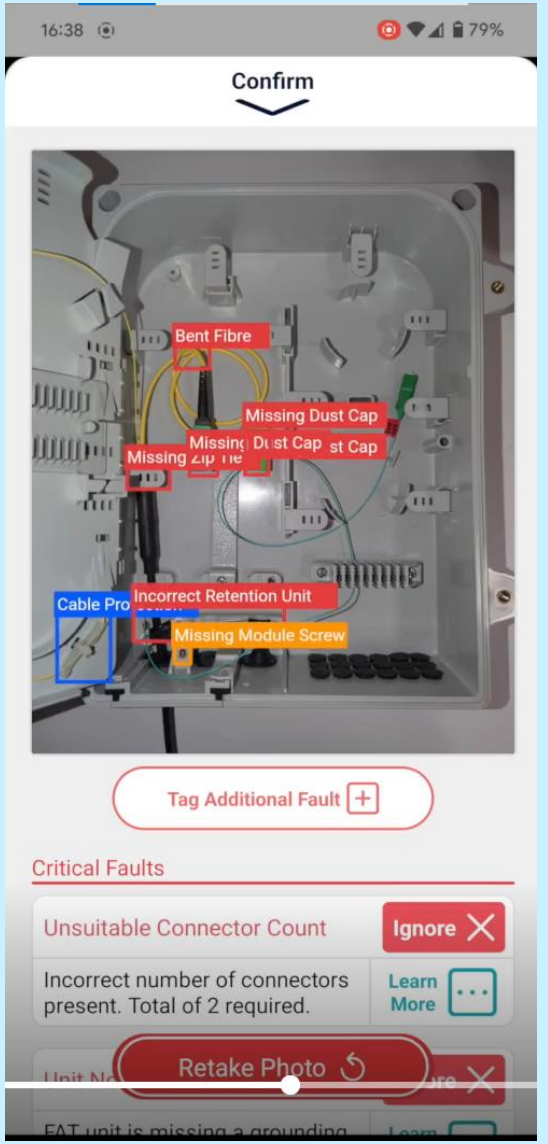
MDU Tap Terminal

Most compact Combination of TAP and Splitter in a single enclosure

What next - AI Considerations

AI opportunities related to passive network:

- Validate high quality installation of FDC and FAT
  Complementary to FLX ODN pre-con simplicity
- Audit tool
  Reduce need for separate physical audit
- Improve data accuracy
  Ensure customer connected to correct port
- Training and guide the field engineer
  Identify skill issues / training opportunities



First time right – every time

Next Steps

Let us meet and quantify the FLX ODN benefits for your specific network

1

Design a FLX ODN solution for your network

- Provide us an area you have already designed or built; **2,000 HP minimum.**
- Share your current network architecture, the area BoQ, network planning and build guidelines.

2

Assessment

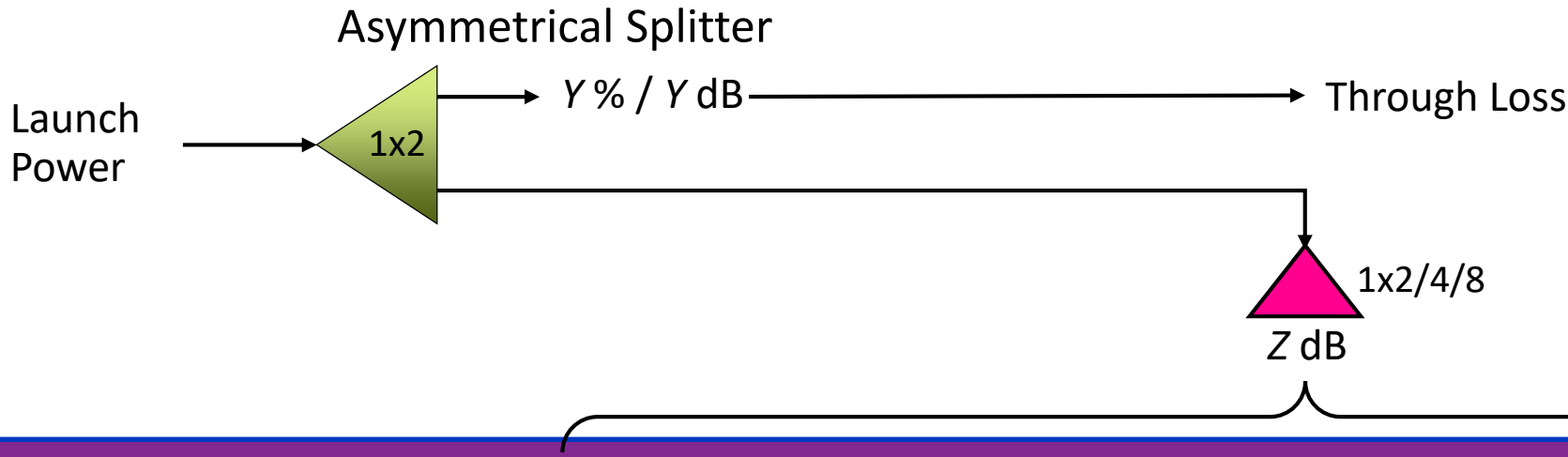
- We will design a FLX ODN solution that maximises benefits while complying with your network requirements.
- A full design and BoQ showing implementation of our FLX ODN solution in your designated area will be delivered.

3

Demonstrate

- An analysis comparing the total cost to build FLX ODN vs a traditional spliced solution will quantify the benefits specific to your network.

Cascaded Optical Tap Architecture



Tap/thru split ratio %	2 port taps		4 port taps		8 port taps	
	Thru loss max (dB) *(Y)*	Drop loss max (dB) *(Z)*	Thru loss max (dB) *(Y)*	Drop loss max (dB) *(Z)*	Thru loss max (dB) *(Y)*	Drop loss max (dB) *(Z)*
Terminating	NA	3.70	NA	7.10	NA	10.40
30/70	6.00	5.80	6.00	9.20	6.00	12.50
45/55	4.10	7.00	4.10	10.40	4.10	13.70
60/40	2.70	8.50	2.70	11.90	2.70	15.20
70/30	2.00	9.80	2.00	13.20	2.00	16.50
80/20	1.30	11.60	1.30	15.00	1.30	18.30
85/15	1.00	13.00	1.00	16.40	1.00	19.70
90/10	0.80	15.00	0.80	18.40	0.80	21.70
93/7	0.60	17.30	0.60	20.70	NA	NA
95/5	0.50	18.20	NA	NA	NA	NA
97/3	0.40	21.70	NA	NA	NA	NA

