

Digitalized and Automated FTTx: Key to successful deployment

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Today's Presenters



Sterling Perrin Principal Analyst – Optical Networking & Transport Heavy Reading



Sandeep Dhingra CTO, Network Services Business, STL



Himanshu Kumar Technical Head, Network Services Business, STL

Agenda

- Introduction
- FTTx Demand Factors
- Key KPIs for FTTx Roll Out
- Integrated & Automated FTTx Implementation Platform
- Case Study
- Summary
- Questions & Answers

Broadband Data Rates Keep Rising

- Global broadband subscription growth will slow but average broadband speeds will rise sharply:
 - Global average broadband rate to increase 540% between 2017 and 2024
 - Average broadband rate in 2024 to exceed 270 Mbit/s
- Broadband data rates in some developed regions will be much higher than global averages:
 - Hong Kong to hit 460 Mbit/s by 2024



Source: Ovum, Consumer Broadband Subscription and Revenue Forecast: 2019–24, 2020



Emerging technologies & recent **Pandemic**



Downstream increases over pre-CV19 usage

10% Video streaming16% web traffic12% file sharing300% conferencing

Upstream increases over pre-CV19 usage

20% Video streaming70% web traffic100% file sharing400% conferencing

....has pushed back the demand on Wired Infrastructure

Down-Upstream Rate		Efficiency range
ADSL, ADSL2, ADSL2+	24/3 Mbps	5 km
VDSL, VDSL2, Vectoring	100/40 Mbps	1 km
G.Fast	Gbps bandwidths possible	200 m
Optical Fiber Cable	10/10 Gbps & more	10-60 km

FTTX is a clear choice that delivers **Superior Experience** over other types of broadband technologies...

Source - Europe Commission & Cisco VNI Report

Most major economies in the world have significant FTTx investments planned





By 2022, essentially all parts of the country will have access to FTTP with speeds of at least 30Mbit/s, and >100Mbit/s

France

Public and private investments amounting to EUR20 billion



Develop a gigabit network, with a preference for FTTP

Germany

A public financing requirement of EUR10 to 12 billion



By 2020, develop an NGA network able to provide speeds up to 100Mbit/s to ~85% of households

Italy

A state-aid budget of EUR4 billion



U.K.

Deploy gigabit-capable broadband to the most remote 20% of locations by 2025

Allocated EUR6 billion



U.S.

Symmetrical Gigabit Broadband Service as the National Fixed Broadband Benchmark for the United States



\$100B

Broadband infrastructure investment by US Federal Govt.

>\$100B

Private Investment by tier-1 operation in Australia, India, Japan, Germany, Turkey, UK, US, and many more

>\$30B

EU Funding mechanism for broadband investment – 'Connecting Europe Facility'

\$100B

Public Investment to provide the African continent with reliable access

FTTx deployment must be scaled up to the Global requirement

Understanding challenges at each stage of deployment





Deployment KPIs needed for the Scaled Requirements...



Evolving Customer Requirements	Stringent KPIs	Current	Need	
Faster deployment	Scale of Deployment (km/yr)	• x	>3x	
Longer network life and minimal network faults	Fiber Faults (/100 km/Month)	• >2	<1	
Planning, Design and Deployment	Bespoke vs standardized	• Purpose built	Open Access Fiber	
Cost of ownership	TCO/Km	• x	>10% TCO reduction	
Failure response	MTTR Adherence (<=5 hours)	<50%	>90%	
Customer Self service capability	Self service capability	• Limited	100%	
Service Activation	Activation time	• >24 hrs	<6 hrs	





In your opinion which one is the biggest challenge in FTTx Deployment?



Confluence of Digitization, Automation and Process Orchestration tackles these inefficiencies



Integrated Automation Framework



Survey data can be utilized for multiple

applications

Network Asset Management

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Live visualization enables faster decision

making

Digitalized Planning and Iterative Design



Up to 60% efficient and 80% faster

Land base creation	&
mapping	

Planning and design

Field Survey

Project Monitoring

As-Built Automation

Quality Assurance

Network Asset Management



Key Benefits

- Faster network rollout
- Improve productivity of scarce and expensive network planners & designers

- Algorithmic tool
- BOQ & ROI automation
- Helps in business case modeling

Visual, Centralized and Location Enabled Database STU25 30 to 50% faster

APP Based Survey/Street view

Land base creation & mapping

Planning and design

Field Survey

Project Monitoring

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Network Asset Management





Key Benefits

nmetry Survey Device

e Mobile Tracking

Mobile Survey Application

Skibelet

Rithm

diam'



GPR Survey Tool

Real time image capturing thereby improving

the quality of survey data

- Identifying & mapping underground utilities
- Avoiding 3rd party damage claim

Advanced Project Monitoring Process Automation Scaling to Large Projects Field Force Management System Enterprise GIS solution Land base creation & mapping Field Scheduling [1] Artel Score Antal Barrer 8 **Planning and design** Samer Lawork Reports Field generation Reporting liart Point Pho Officer: Availab FFMS field Theater Application Sectors Tree **Field Survey** Authority Ty Cristanta Typ Patroller Monitoring Forat Excern Dashboard Monitoring East Point a * * * * * * * * * * End Prent Phot Obtained in the Geo-**Project Monitoring** * 12 K = V D N M 0 Fencing m a . 1001 CONTRACT. **As-Built Automation Key Benefits Quality Assurance** Capture point data with geo-tagged image Man/machine **Resource utilization tracking** Provide better visibility of field activity and Health & maintenance alert of Machines project management teams through the Machine idling alert ٠ **Network Asset Management** unified task management Improve project management efficiency through Applications run in both offline & online better collaboration across departments and teams mode

As- Built Drawing Automation

Simplified and 70-80% more efficient



As Built Mobile Application

Land base	creation	&
mapping		

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Network Asset Management

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Key Benefit

- Real time update of field elements .
- Improve efficiency by eliminating manual intervention
- Help in identifying deviation between planned and as-built layer



Automated approach App based entry of All field elements Online Validation and Update in GIS

- Fixed accountability will help to monitor field force
- Help in capturing different scenario-based information

Quality Assurance

Ensuring effective Compliance



Land base creation & mapping

Planning and design

Field Survey

Project Monitoring

As-Built Automation

Quality Assurance

Network Asset Management

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- All functions controlled by 1 Mobile App Interface Integrated with Google 2 Map platform Live photo & video 3 captured Videos & Photographs 4 are timed and Geo tagged 5 Real time tracking at site by central location Cloud storage linked 6 with Google Map **Key Benefits**
- Adherence to Quality Standard
 - Ensuring Compliance to technical parameters
- Real time monitoring of FTTx Deployment
 - Remote access using Google cloud



Remote Fiber Acceptance Test



Network Asset Management

30% MTTR Reduction ; upto 25% Opex saving



Land base creation & mapping

Planning and design

Field Survey

Project Monitoring

As-Built Automation

Quality Assurance

Network Asset Management







- Fault Management Reference trace comparison, fault location alert, & escalation protocol
- KPI Analytics Cluster Analysis, Network & Event summary & Route stability analysis
- Health Monitoring –Route assessment, proactive maintenance & route link analysis

Key Benefit

- OPEX reduction by at least 28%
- ~80% reduction in precise fault localization
- Faster restoration team mobilization
- MTTR reduction by at least 30%

Passive inventory management solution



- Real time tracking of all passive cabinets of FTTx network
- Access control with event logs







Which stage needs to be automated on the highest priority for enabling large scale FTTx deployment?



Planning of 3 Mn FTTx Home pass in a country by a leading Operator



Typical Human Resource Requirement for 3Mn Home Pass Rollout Planned in One Year

Activity	Quantitative Analysis	Skill Requirement			
Cluster Survey and Information	Survey Productivity - 100 HP / Engineer/ Day Effort Required for 3 Mn - 30000 Engineer Da	Medium - Basic Understanding about Network, Layout, YOFC Connectivity, Network Elements - Active / Passive	125 Survey Engineers	FTTx deployment is	
Digitization	Concurrent Survey Engineer Needed - 125			highly resource	
	Productivity - 125 HP / Engineer / Day	High - Deeper understanding of network design and	100	Intensive	
Network Planning	Effort Required for 3 Mn - 24000 Engineer Da	y planning, knowledge various design considerations,	Design Engineers		
and Design	Concurrent Design Engineer Requirement – 100	Tools.	Design Engineers		
Implementation	Productivity - 30 HP / per day/ per crew(2 Engineer) Concurrent requirement of FTTH engineer – 833 Splicer / OSP Engineer Productivity –	High - Fixing S1 and S2 Elements, In-building wiring, Tapping Feeder Network, extending OSP from feeder tapping to Street Cabinet/FAT / FDP. Splicing and	1083 Implementation Engineers	Thus, it is extremely essentia to leverage the power of	
	100 HP / Day	interconnecting, etc.		Digital Technologie	
	oncurrent requirement of Splicers - 125			for deriving maximum	
	Concurrent requirement of OSP Engineer – 12	5	83		
Quality Assurance	Productivity - 150 HP / Engineer / Day Concurrent requirement of QA engineers - 83	High -Quality testing of ISP / OSP, Distribution Network, CO location, In-building wiring, Network Elements, Power Level. etc.	QA Engineers	Efficiency & cost	
	Cluster Supervisor - one per 20000 Home Pass	High - Implementation supervision, Progress Reporting, Material Coordination, Escalation Management, Business	180	benefits	
Managers and Supervisors	City Manager - 1 / Major Cities and 1 for two Minor cities, Circle Manager - 1 Each Circle	Priority Assignment, RoW & Permission, Training & Safety	Managers		
	Supervisor - 150, City Manager -30				

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High expectations from passive network infrastructure designers and builders



Seven Stages of Deployment	KPIs Impact
Faster deployment	2X to 3X faster network planning
Longer network life and minimal network faults	At least 50% faster network roll-ou
Planning, Design and Deployment	20-30% % improvement in MTTR ac
Cost of Ownership	Simplified, automated, & digitized mo entire infrastructure creation cycle
Higher Availability	~ 100% Quality adherence with First T Right approach
Faster Service Activation	75% faster service activation ~10% rea O&M costs

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Time

duction in

Min 10% reduction in execution cost per **Home Pass**

At least 50% faster documentation with high accuracy

Customer Self service capability

Upcoming 2nd Part Series





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