

TELESTE CORPORATION

Technology Trends and Challenges

Attila Pester
Sales Director in CEE region



Mission

We make your everyday life
smart, safe, and smooth.

Smart - We bring broadband and TV services to your home



Smart - We bring TV services to you



Element directory - Main - CATVisor Argus Explorer

Server Edit View Element Event Windows Help

Element directory - Main

- Server, Argus Server
- Head-end, Turku
- Head-end, Mikael (RAD)
- Head-end, 1. RHE Hyvinkylä
- Head-end, 4. RHE Petasat
- Head-end, 2. RHE Pori
- Head-end, 5. RHE Rovaniemi
- Head-end, 3. RHE Seinäjoki
- Head-end, 6. RHE Kuusamo
- Head-end, 7. RHE Vaivakuu
- Head-end, 8. RHE Jyväskylä
- Head-end, 9. RHE Kouvola
- Head-end, 10. RHE Lappeenranta
- Head-end, 11. RHE Tammasaari
- Head-end, 12. SHE Hakaniemi
- Head-end, 13. RHE Porvoo
- Head-end, 14. RHE Kemi
- Head-end, 15. RHE Tampere
- Head-end, 16. RHE Oulu
- Head-end, Hämäläinen
- Head-end, 17. RHE Kälviä
- Head-end, 18. RHE Äänekoski
- Head-end, 19. RHE Jämsä
- Head-end, 20. RHE Alavus
- Head-end, 21. RHE Ilmajoki
- Head-end, 22. RHE Raase
- Head-end, 23. RHE Suonenjoki
- Head-end, 24. RHE Haapavesi
- Head-end, 25. RHE Levi
- New SNMP devices
- New HMS devices

Element list - Main

IP or host name	Type name	Name	Location	Serial	SVL version	HV/S version	MAC
Explorer/Localhost	HFC network	Littonen		ELO000038			
	Fibre	4		ELO000038			
	Subnode/1						
	HFC network	New devices					
	Head-end	22. RHE Riihe					
	HDD532	Opagitter 3					
	New HMS device						
	Head-end	8. RHE Jyväskylä					
	HFC network	Roskamäki					
	Fibre	Kuivaniemi					
	Head-end	17. RHE Kälviä					
	Head-end	14. RHE Kemi					
	Head-end	3. RHE Seinäjoki					
	Head-end	15. RHE Tampere					
	DVO124	Optical splitter					
	Fibre	2					
	HFC device	Test123					
	Head-end	16. RHE Oulu					
	GE Network	Lp-Mik					
	GE Network	Por-Mik					
	Head-end	5. RHE Rovaniemi					
	Head-end	19. RHE Jämsä					
	GE Network	Por-Tie					
	HFC device	AMP 215					
	Head-end	Turku					
	Head-end	10. RHE Lappeenranta					
	Fibre	BK1					
	Head-end	4. RHE Petasat					
	GE Network	Thur-Por					
	HFC device	AMP 215					
	Hub	F-001					
	Head-end	23. RHE Suonenjoki					
	HFC network	DOCCIS					
	Head-end	Mikael (RAD)					
	HFC device	Raklintonen					
	Rack	CMTS					
	New SNMP devices						

Measurement history [AC9000/AC9000 Node 1 @ PM demo room]

Pilot level main 3 high, Pilot level main 3 low, Pilot level main high, Pilot level main low

Display parameters:

- Interstage gain (G)
- Interstage gain 3 (G3)
- Interstage slope (S)
- Interstage slope 3 (S3)
- Modern RX Level (MRL)
- Modern TX Level (MTL)
- Optical RX1 input power (ORP)
- Optical RX2 input power (ORP2)
- Optical TX1 bias current (OTBC1)
- Optical TX3 bias current (OTBC3)
- Pilot level main 3 high (PLM3H)
- Pilot level main 3 low (PLM3L)
- Pilot level main high (PLM1H)
- Pilot level main low (PLM1L)
- Temperature (T)
- Voltage remote AC (VRA)

Event log - Non-communicating - Return path issues

Medged by	Source - Name	Source - IP	Source - Location	Started	Duration	Message
	AC1200 2nd gen123	10.9.15.171	PAT-Testauk_ohjelmointi	12.11.2015 11:04...		Ingress alarm
	AC3000-1	10.9.19.188	KuusiSan Testoin	12.11.2015 9:58:09		Minor Lat (open) Time = November 12, 2015
	AC3000 - Trunk 1_5	10.9.19.182	AC-camps wall, tel floor	12.11.2015 5:41:05		Minor Lat (open) Time = January 16, 2016
	Test	10.9.19.188	KuusiSan Testoin	11.11.2015 17:08		Minor Lat (open) Time = November 12, 2015
	RF module	10.9.15.111	KuusiSan venemeston kokeita	5.11.2015 21:55:44		Spectrum 1 out of bands
	AMP2.2	10.9.80.4	Kesäkatu 3	5.11.2015 16:35:54		+12 V voltage low
	Docsis Split Test	10.9.19.181	KuusiSan Testoin	30.10.2015 9:55:03		Service terminal connected
	Docsis Split Test	10.9.19.181	KuusiSan Testoin	30.10.2015 9:54:59		Lat (open)
	KuusiSan master-valvottu_ää kokeita	10.9.100.4	KuusiSan Testoinin alla	29.10.2015 22:48...		Ingress alarm
	Docsis	10.9.19.197	KuusiSan Testoin	28.10.2015 22:40...		Ingress 1 alarm
	Test	10.9.19.188	KuusiSan Testoin	23.10.2015 14:42		HF Remote supply voltage 258 (91.7 V) Too
	Splitter - Trunk 3_3	10.9.15.130	AC-camps wall, tel floor	23.10.2015 5:52:13		Modern trunk level calculated
	Test	10.9.19.188	KuusiSan Testoin	22.10.2015 9:56:17		HVH - +12 V supply voltage 257 (91.4 V) Too
	HOM100 T - Debug@PAT	10.2.15.102		22.10.2015 9:44:50		No HFC devices connected
	KuusiSan master-valvottu_ää kokeita	10.9.100.5	KuusiSan Testoinin alla	22.10.2015 8:43:22		ALC2 identified
	Splitter - Trunk 3_2	10.9.15.129	AC-camps wall, tel floor	22.10.2015 4:42:22		Transponder internal error

Ingress control

Element	Location	IP address	ICS1	ICS2	ICS3	ICS4	ICS5
ACV/AC3951/JAC1000/AA.3	Telentehtävu 1	172.18.32.4	ON	-	-	-	-
ACV/AC3951/JAC1000/AA.2	Europa	172.18.32.3	ON	-	-	-	-
ACV/AC3951/JAC2000/AC3200/AA.1	Telentehtävu 4	172.18.32.2	ON	ON	-	-	-
ACV/AC3951/JAC1000/AC3010/AA.5	Europa	172.18.32.7	ON	-	-	-	-
ACV/AC3951/JAC2000/AC3200/AA.4.5	Telentehtävu 1	172.18.32.6	ON	-	-	-	-
ACV/AC3951/JAC2000/AC3201/AA.4.4	Telentehtävu 1	172.18.32.5	ON	ON	-	-	-
AC9000/AC8991/AA.1	Riescherberggasse 49 / Erlingergasse 21, 1160 Wien	172.18.32.1	ON	ON	ON	ON	ON
HMS device/BC3603/KVP	Demo room Demos	172.20.18.205	OFF	OFF	ON	ON	ON
HMS device/BC3603/DMP	Demo room Europa	172.20.18.204	ON	OFF	ON	ON	ON
RIS device/AC1500/BI.4E.A3.6			ON	ON	ON	ON	ON
RIS device/AC1500/BI.4E.A3.5			ON	ON	ON	ON	ON
RIS device/AC1500/BI.4E.A3.4			ON	ON	ON	ON	ON
RIS device/AC1500/BI.4E.A3.3			ON	ON	ON	ON	ON
RIS device/AC1500/BI.4E.A3.1			ON	ON	ON	ON	ON
AC870/AC8991/N3.1	Europa	172.18.32.61	ON	ON	-	-	-
ACE3/AC8980/A2.2	Europa	ACE3.1	ON	-	-	-	-
AC3010/AC8980/A2.5	Europa	AC3010.4	ON	-	-	-	-
AC3010/AC8980/A2.5	Europa	AC3010.3	ON	-	-	-	-
AC3010/AC8980/A2.4	Europa	AC3010.2	ON	ON	-	-	-
HMS device/AC3010/A2.3	Europa	172.20.18.154	ON	-	-	-	-

Our customers - Network Products



vodafone



Stofa:



LIBERTY GLOBAL.



TeliaSonera



powered by



RCS & RDS



Safe – Our products and solutions secure you in public places and guide your use of public transport



**Smooth - We help you join
the networked society**



Our customers - Network Services



vodafone



upc



CityFibre



ciena

Infinera

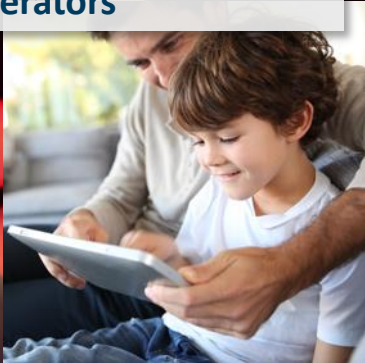


arqiva



Our solutions - for our customers' dynamic future

Common customer base
Cable operators



Broadband and video solutions for cable networks

Network services for versatile network operations

Video security and information solutions for large-scale security and information

Common technology platform systems
Video processing and transmission technology

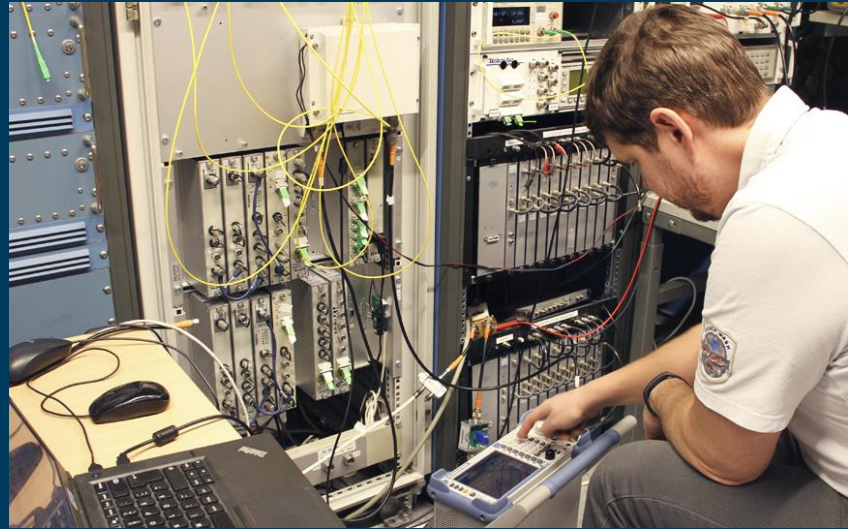
Teleste facts & figures

- HQ in Turku, FINLAND
- Net sales 2017: 240 M€
- Listed on Nasdaq Helsinki

Research and development

- Own applied R&D in **Finland** and **Poland**
- Co-operation in the development of basic technologies with partners such as the Technical Research Centre VTT, universities and polytechnics

We combine **innovation** and **experience** into the best solutions for our customers.



Operations and logistics services

- Customer-specific services and end-to-end responsibility
- Agile and lean production
- Manufacturing in Finland and China
- Logistics hub in Belgium
- World-wide reseller network

Our solutions **go beyond products and services.**
When everything flows we know we have succeeded.



The Teleste team

We employed more than 1,400 people at the year-end 2017.

You can find Telestians in:

- Germany
- Finland
- Great Britain
- Poland
- Belgium
- China
- + 15 other countries globally



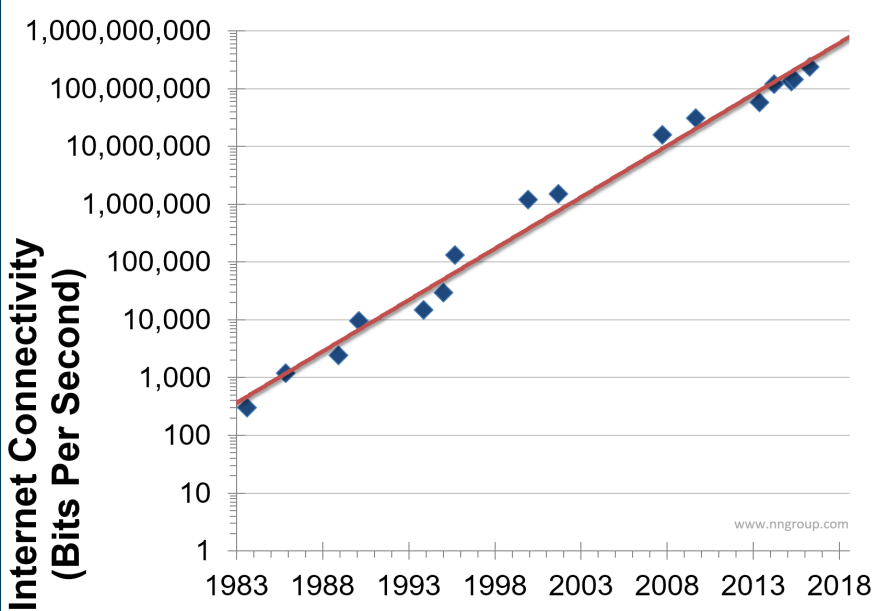
The **true driving force** behind Teleste is people – the passionate professionals building our customers' success.

“Connectivity is king”

- Mike Fries, CEO LGI



We are heading towards GigaWorld! Meaning...?



...now and in short term

- Proliferation of connected devices (IoT...)
- Premium TV services over IP
- UHD
- UHD virtual reality
- Home video surveillance

www.cablelabs.com/thenearfuture/



Main families of GigaWorld



Main families of GigaWorld



Automated living

Connected devices,
big data analytics,
M2M communication
→ patient health tele-
monitoring, robot
performing home
cleaning, etc.



Main families of GigaWorld

Augmented discovery

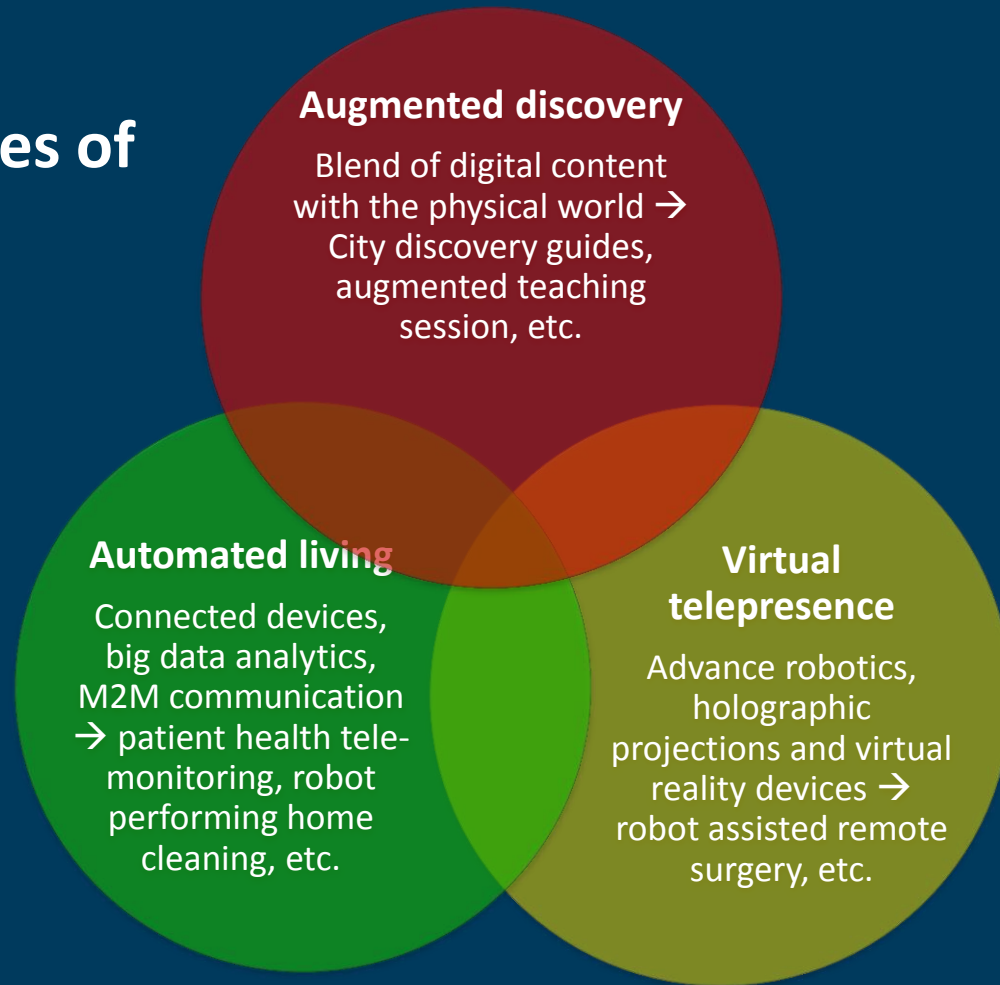
Blend of digital content
with the physical world →
City discovery guides,
augmented teaching
session, etc.

Automated living

Connected devices,
big data analytics,
M2M communication
→ patient health tele-
monitoring, robot
performing home
cleaning, etc.

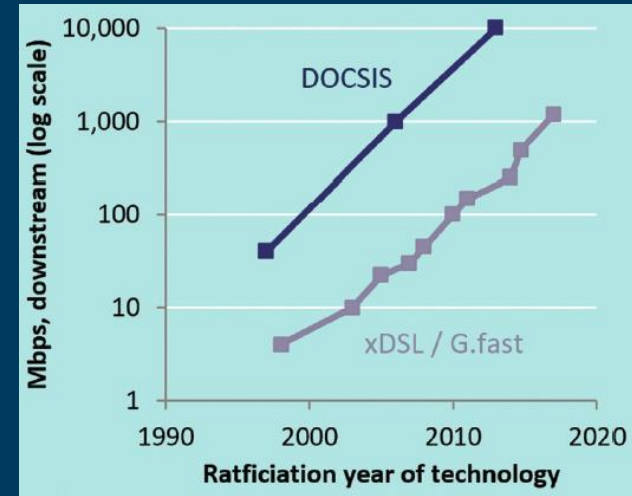


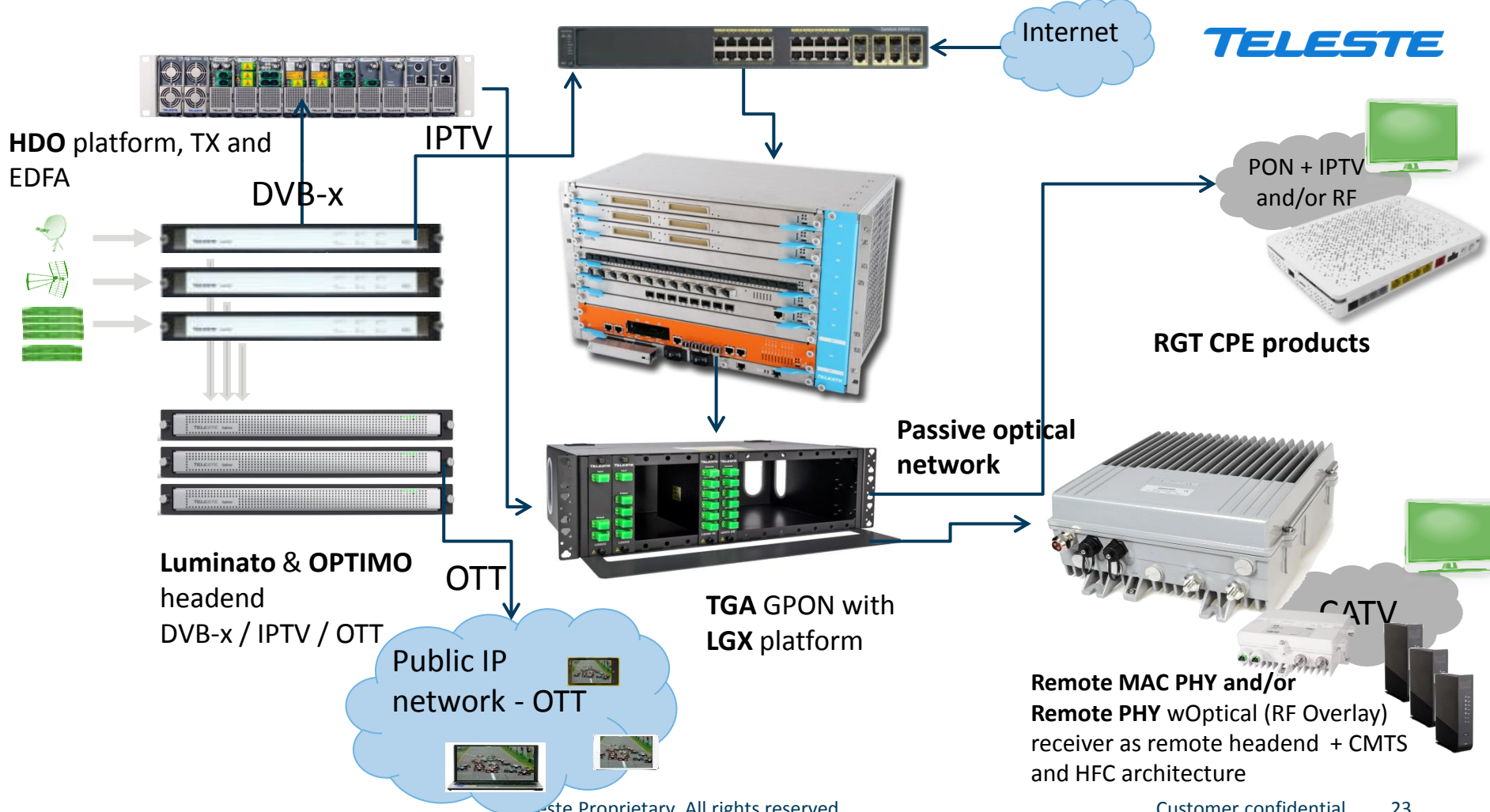
Main families of GigaWorld



Technologies to deliver GigaWorld?

- Fibre to the premise (FTTP) is the end-game
- Rapid development of G.fast, DOCSIS 3.1 and soon available fixed wireless access (5G FWA) are causing operators such as Google Fiber, Australia's nbn and Swisscom to shift from FTTP to these technologies
- These technologies are cheaper, they can be commercially deployed to more customers





HDO platform, TX and EDFA

DVB-x

IPTV

Internet

PON + IPTV and/or RF

RGT CPE products

Passive optical network

Luminato & OPTIMO headend DVB-x / IPTV / OTT

OTT

Public IP network - OTT

TGA GPON with LGX platform

CATV

Remote MAC PHY and/or Remote PHY wOptical (RF Overlay) receiver as remote headend + CMTS and HFC architecture

Vision

Best partner for
networked society

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