

Net Neutrality Video Services in Slovenia in the Scope of High Quality and Open Internet

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Presented information is not necessarly based on official position of AKOS

Mobile App is the Base of Digital Society





TV/Living Room is Changing – From Linear to OnDemand/OTT







Public Safety is tremendous

NGA opportunit





Find the best balance

Between

- Investment friendly
- Regulation
- And
- Service competition
- Regulation
- Following
 - Smart State Aid etc.
 - Sustainable Operations
 - Inclusive Principle



Video/IPTV in Slovenia

- Slovenia started with IPTV already in 2000
- First Ethernet Multicast DSLAM in 2002
- One of the highest penetrations in EU
- Catch Up/Time Shift/On Demand growth on all IPTV/Cable platforms
- IPTV on Mobile devices/Zero Rating Issues

Video Types

Definitions

- Internet video to TV: Video delivered through the Internet to a TV screen by way of an Internetenabled set-top box (for example, Roku) or equivalent device (for example, Microsoft Xbox 360), Internet-enabled TV, or PC-to-TV connection
- Video: Video includes the following underlying categories:
 - Short form: User-generated video and other video clips generally less than 7 minutes in length
 - Video calling: Video messages or calling delivered on fixed Internet initiated by smartphones, nonsmartphones, and tablets
 - · Long form: Video content generally greater than 7 minutes in length
 - Live Internet TV: Peer-to-peer TV (excluding P2P video downloads) and live television streaming over the Internet
 - Internet PVR: Recording of live TV content for later viewing

Ambient video: Nannycams, petcams, home security cams, and other persistent video streams

 Mobile video: All video that travels over a second-, third-, or fourthgeneration (2G, 3G, or 4G, respectively) network

Live (Linear)

Traditional TV 1926

> Tune-In or Miss Out

Mass Concurrent Audience

Real-Time Buzz



On-Demand

DVR / Streaming 1999

> Watch on Own Terms

Mass Disparate Audience

Anytime Buzz



Semi-Live

Snapchat Stories 2013

Tune-In Within 24 Hours or Miss Out

Mostly Personal Audience

Anytime Buzz



Real-Live

Periscope + Facebook Live 2015/2016

> Tune-In / Watch on Own Terms

Mass Audience, yet Personal

Real Time + Anytime Buzz







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Many types of video traffic

- IPTV Multicast
- IPTV Unicast
- OTT on Demand
- OTT Live Streaming
- Dedicated Videoconferencing Systems
- Web Video conferencing
- WebRTC

Traffic Growth

	2015	2016	2017	2018	2019	2020	CAGR 2015– 2020
By Network (PB per Month)							
Fixed	39,345	48,223	59,294	72,442	88,399	107,375	22%
Mobile	3,027	5,127	8,326	12,609	18,436	26,080	54%
By Subsegment (PB per Month)							
Internet video	28,768	38,116	50,512	66,263	86,708	109,907	31%
Web, email, and data	7,558	9,170	11,061	12,752	14,060	17,006	18%
File sharing	5,965	5,938	5,858	5,742	5,645	5,974	0%
Online gaming	82	126	189	294	421	568	47%

QoS - Focus on Busy Hour

Busy-hour Internet traffic is growing more rapidly than average Internet traffic. Busy-hour (or the busiest 60-minute period in a day) Internet traffic increased 51 percent in 2015, compared with 29percent growth in average traffic. Busy-hour Internet traffic will increase by a factor of 4.6 between 2015 and 2020, while average Internet traffic will increase twofold.

Smartphone traffic will exceed PC traffic by 2020. In 2015, PCs accounted for 53 percent of total IP traffic, but by 2020 PCs will account for only 29 percent of traffic. Smartphones will account for 30 percent of total IP traffic in 2020, up from 8 percent in 2015. PC-originated traffic will grow at a CAGR of 8 percent, while TVs, tablets, smartphones, and machine-to-machine (M2M) modules will have traffic growth rates of 17 percent, 39 percent, 58 percent, and 44 percent, respectively.

IPTV Service in Slovenia

- Generaly available with support for Multicast, Unicast and OTT mode with very high penetration – IPTV +
- Unicast and OTT also available from Cable operators
- Peak traffic from Unicast is growing dramaticaly in last years already surpassing other internet traffic in Peak Hour
- QoS mechanisms mandatory for reasonable User Experience
- QoS architecture open on Wholesale level but not regulated
- Unicast prioritization at least as critical as Multicast
- Unicast prioritisation is based on Set Top Box, where do we go with Smart TV

Consumer vs Business

IP Traffic, 2015–2020								
	2015	2016	2017	2018	2019	2020	CAGR 2015– 2020	
By Type (Petabytes [PB] per Month)								
Fixed Internet	49,494	60,160	73,300	89,012	108,102	130,758	21%	
Managed IP	19,342	22,378	25,303	28,155	30,750	33,052	11%	
Mobile data	3,685	6,180	9,931	14,934	21,708	30,564	53%	
By Segment (PB per Month)								
Consumer	58,539	72,320	89,306	109,371	133,521	162,209	23%	
Business	13,982	16,399	19,227	22,729	27,040	32,165	18%	

Importance of Business/Governmental Communications

- Slovenia is one of the most polycentric countries
- Small, Medium and Family Business is critical
- NGA DAE Network Development Strategy will be very important for infrastructure deployment
- Highly scalable Internet Access as well as Specialized Services must be available and affordable on all transport infrastructures and form a well balanced and open business environment
- Last Mile NGA is critical for cost and Qos optimization
- Unbundling/VULA/Bit stream/Business Fiber

WebRTC/Web Conferencing

- Key political brakthrough happened this year fast growth predicted
- All Players agreed to participate
- Video conferencing/Screen Sharing will come to many Web Services and Peer to Peer Applications
- Differentiated traffic management is Crucial for generaly acceptable QoExperience
- Uplink QoS is key requirement.

Business Traffic

Business IP traffic will grow at a CAGR of 18 percent from 2015 to 2020. Increased adoption of advanced video communications in the enterprise segment will cause business IP traffic to grow by a factor of 2 between 2015 and 2020.

Business Internet traffic will grow at a faster pace than IP WAN. IP WAN will grow at a CAGR of 6 percent, compared with a CAGR of 21 percent for fixed business Internet and 47 percent for mobile business Internet.

Business IP traffic will grow fastest in the Middle East and Africa. Business IP traffic in the Middle East and Africa will grow at a CAGR of 21 percent, a faster pace than the global average of 18 percent. In volume, Asia Pacific will have the largest amount of business IP traffic in 2020, at 11.4 EB per month. North America will be the second at 9.1 EB per month.

QoS Architecture Special Service vs IAS



Specialised vs. Internet Access definition ideas

- Internet Access is every citizen basic need and right
- Specialized S. is special Business Opurtunity and Need, highly desired for well balanced Communications Community
- IAS traffic differentiation is optimization within IAS for the customer advantage
- Specialized S. traffic differentiation is within common infrastructure and not reducing defined, published, sold and monitored High Quality multi service optimized IAS.

Net Neutrality and Market Regulation

- Retail and Wholesale network products must be mappable in technical and economic sense
- Pricing, SLA and QoS must follow Flagship Service trends and promote Digital Society and Inclusion
- Opportunity for Innovative Service Providers
- Unified access to different transport infrastructures is key.
- Proper focus on Customer/Citizen/Business needs
- <u>Smart infrastructure investment have to be profitable</u>
 <u>investment</u>

NG networks Common dependable infrastructure



99,999 Availability1 second per day6 minutes per year



Gains vs Loses

- Customer gets dependable and predictable quality of Internet Access with choice for performance level
- Customer gets non discriminatory access to services and content without Gatekeeper and market distortion
- Infrastructure Operator gets investment friendly regulation and reasonable profitability. If he is able do develop attractive and competitive content and service, he will win on this front access.
- Content Provider gets improved Quality of Experience and non discriminatory access to users of contents
- Next generation of services built around video, videoconferencing, 4G/5G, IoT, and many more will blossom based on dependable transport
- Businesses will get dependable and affordable Special Services



First traffic light in Clevelend Ohio in August 2014

Future Regulatory Challenges

- Challenges of High Quality Internet
- Guaranted/sustained speed
 Differentiated IAS Services Video...
 in light of TSM and BEREC/NRA Role
- Specialized Services
- Definition, Reporting and Monitoring
- Mobile Broadband is Real Alternative
- Role of State Aid
 - Smart Proper Technology/Private Investment
 - Sustainable Operations and Upgrades
 - Inclusive

- Citizen vs Customer
- Nobody is left behind



Cost of Broadband networks for different topologies and technologies







Rural Settlements



Coverage Obligation SLO

- 95% Houshold Coverage in 3 Years
- 300 Settlements with 75%
- Fixed Wireless Broadband Obligation
 - Speed improvement
 - 10 Mb/s Downlink
 - 2 Mb/s Downlink Guaranted 99.9%
 - 2 Mb/s Uplink
 - Triple Play capable



Detailed Analysis of Hilly Slovenia



TOPLICE_Martjanci

Location	21								าลไ
The settlement	MORAVSKE TOPLICE_M	lartjanci	+ surroundings						
Residents	539								
Variant			Residents			Househol	ds		
10MbpsUE	539	100%	15396			6109			
30MbpsCPE	539	100%	37327	+21931	242%	14931	+8822	244%	A Contract of the second of th
10MbpsCPE	539	100%	107046	+91650	695%	42818	+36709	701%	
1MbpsCPE-	520	1000/	440070		04.60/	56200	. 50200	0000	
EIRP=35dBm	539	100%	140972	+125576	916%	56389	+50280	923%	
				Neiriburg am Sassbirch		Devach Ganig		388 19 109	

10MbpsUE
 30MbpsCPE
 10MbpsCPE
 10MbpsCPE-EIRP=35dBm

Coverage Simulation





Priključne točke Telekoma Slovenije na hrbtenično omrežje





Priključitev na hrbtenično omrežje

Prikaz kombinacije najkrajših razdalj od KT do LPT DARS ali LPT agregacijska vozlišča





Ugotavljanje razpoložljivosti omrežnih priključnih točk





Cenovni model - povzetek

Strošek Backhaul do 1.566 koncentracijskih točk (izkop+optika)	54,4 mio €				
Strošek Local Access (354.601 gospodinjstev + 85.173 ostali)	Hibridni model	FTTH			
75 % penetracija	126,5 mio €	549,0 mio €			
50 % penetracija	111,3 mio €	509,8 mio €			
Zadnjih 54.892 gospodinjstev	LTE	FTTH			
75 % penetracija	36,3 mio €	198,0 mio €			
50 % penetracija	29,6 mio €	193,2 mio €			
SKUPAJ (75%)	217,2 mio €	801,4mio €			
SKUPAJ (50%)	195,3 mio €	757,4 mio €			