

Virtualization of Access-Networks

Andreas Koman, Vienna, 16th November 2015

ISPA - Internet Service Providers Austria

- Founded **1997**
- Represents over **200** members in the areas of **Access, Hosting, Content & Services**
- **Two thirds** with less than 25 employees



www.stopleveline.at

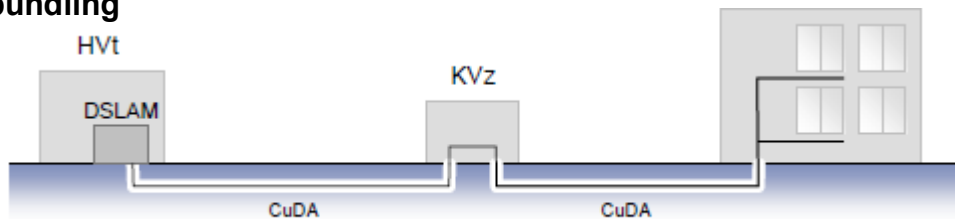
Austrian Report Centre against
child pornography and **national
socialism** on the Internet

The virtualization of fixed-line access-networks – status

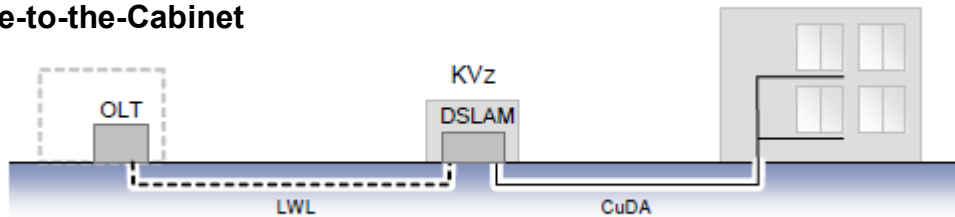
- **How can competition and diversity of services be promoted on the fixed-line broadband-market?**
- **ISPA's expectations towards a future EU regulatory framework for electronic communication**

Fixed-line access-network deployment scenarios

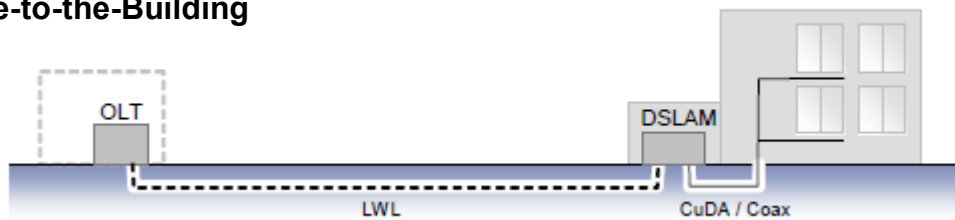
Unbundling



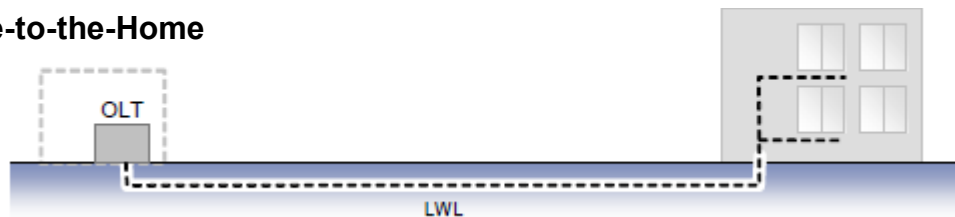
Fibre-to-the-Cabinet



Fibre-to-the-Building



Fibre-to-the-Home



- Copper only: ULL

- Copper and Fibre: VULL (L2 WAP)

- Fibre only

Source: RTR, Economical expertise in market analysis for physical access, 2012

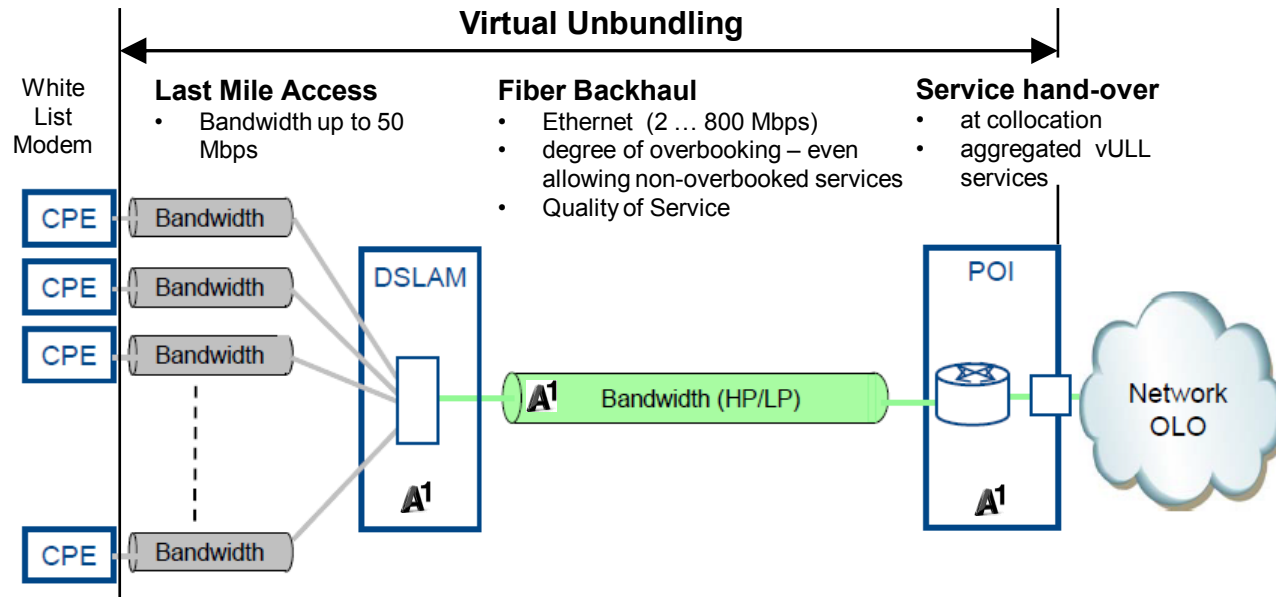
Reasons for development of virtual access

Physical unbundling is in use for legacy copper lines, but is not technically possible or economically viable for NGA deployment given the architecture chosen by the incumbent operator, due to:

- lower economies of scale at the street cabinet (than at the CO/MDF)
- the introduction of vectoring in case of FTTC/B

Source: BEREC, Common Characteristics of Layer 2 Wholesale Access Products in the European Union

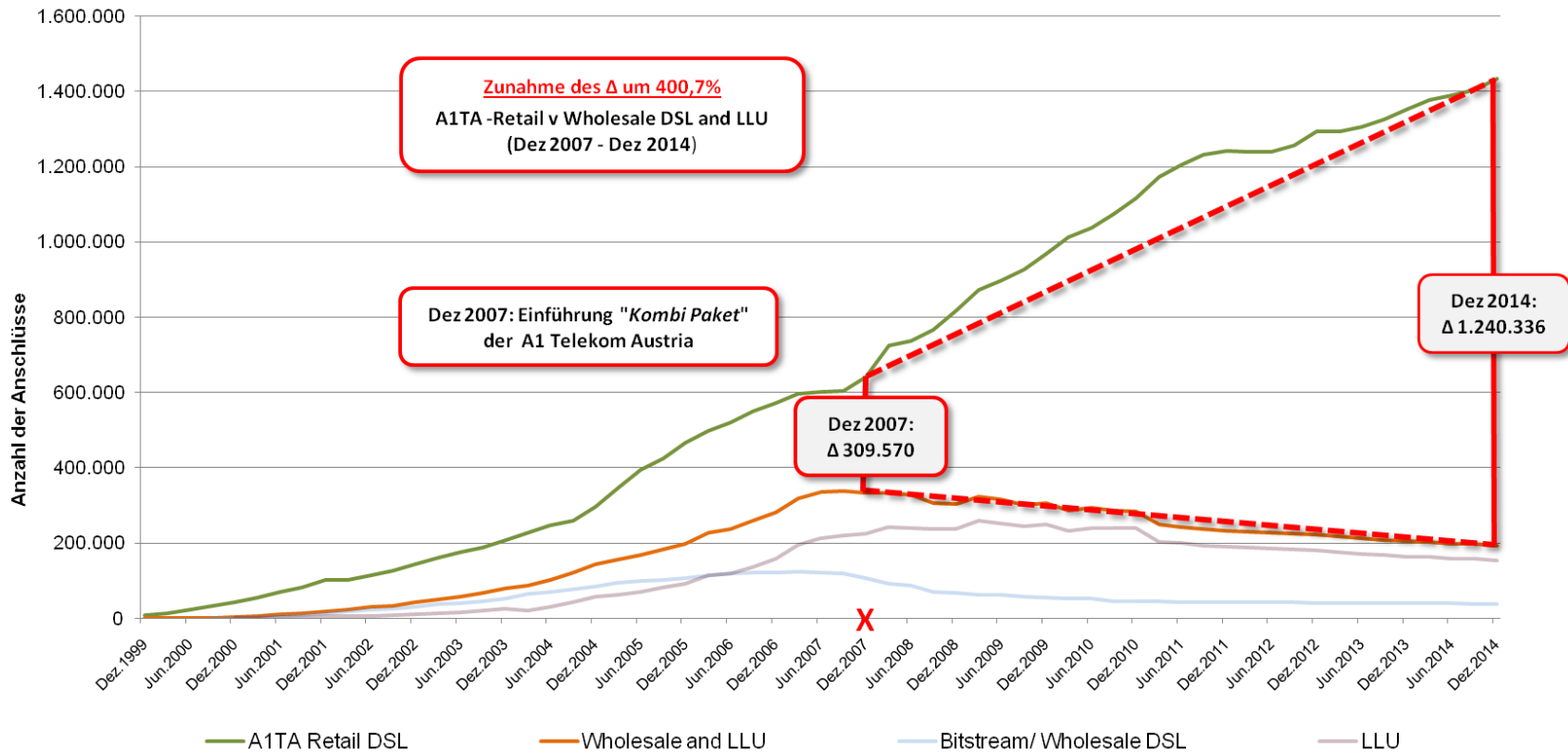
Virtual Unbundling



- Modular layer 2 bitstream product based on Ethernet technology
- Best effort replacement for unbundled copper loop (shall allow similar degree of innovation as physical unbundling, transparency of communications in higher layers, control of relevant connection parameters, degree of un/contented bandwidth etc.)

Development of the Austrian fixed-line broadband-market

Dezember 1999 – Dezember 2014



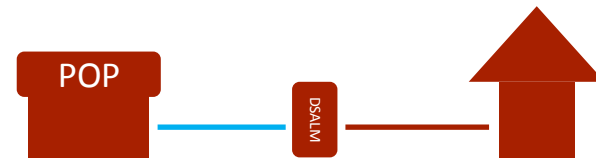
Quelle: Quartalsbericht der A1 Telekom Austria Q1/2015 sowie RTR Telekom Monitor Jahresbericht 2014.

Status of virtualization of ULL in Austria (estimation)

**ULL in Austria:
(~ 150.000 lines)**



**vULL in Austria:
(~ 4000-8000 lines)**



Topics

- **The virtualization of fixed-line access-networks – status**

How can competition and diversity of services be promoted on the fixed-line broadband-market?

- **ISPA's expectations towards a future EU regulatory framework for electronic communication**

Higher technical complexity of virtual access compared to ULL

Technical Features - Common characteristics of European Virtual Access Products (L2 WAP)

- **Technology:** The L2 WAP is based on Ethernet.
- **Availability:** The L2 WAP is (or will be) available at least in NGA rollout areas.
- **CPE/Modem:** ANOs can use and configure their own CPE/modems at least in case of FTTC/B.
- **Bandwidth:** ANOs have the possibility to control the speed of their services within the limit(s) of the bandwidth profile(s) of the subscriber access line.
- **Quality of Service:** The L2 WAP provides at least ostensibly uncontended bandwidth or a bandwidth with a defined QoS.
- **Traffic Prioritization:** The L2 WAP supports different traffic priorities.
- **Number of VLANs:** The L2 WAP provides several VLANs per end user unless additional wholesale products are available.
- **Customer Identification:** The L2 WAP enables ANOs to identify their end users.
- **Security:** The L2 WAP enables ANOs to apply security measures.

Technical constraints of VULL product for virtualisation of applied access technologies

Based on Austrian currently used technologies and VULL standard offer:

Access Technology	Category
ADSL2+	A
VDSL2	A
SHDSL/PTM 1-4-pair (ISAM)	A
SHDSL/PTM 1-4 pair	B
SHDSL/PTM 5-8 pair	C
SHDSL/ATM	C
POTS	C
ISDN	C
PDH HDSL/SDSL (legacy)	C
vULL	VULL

Category

A: access technology within scope of VULL Standard Offer - FULL compliant to VULL specification

B: access technology within scope of VULL Standard Offer - MAYBE compliant to VULL specification (NOT yet tested) OR adaptations required

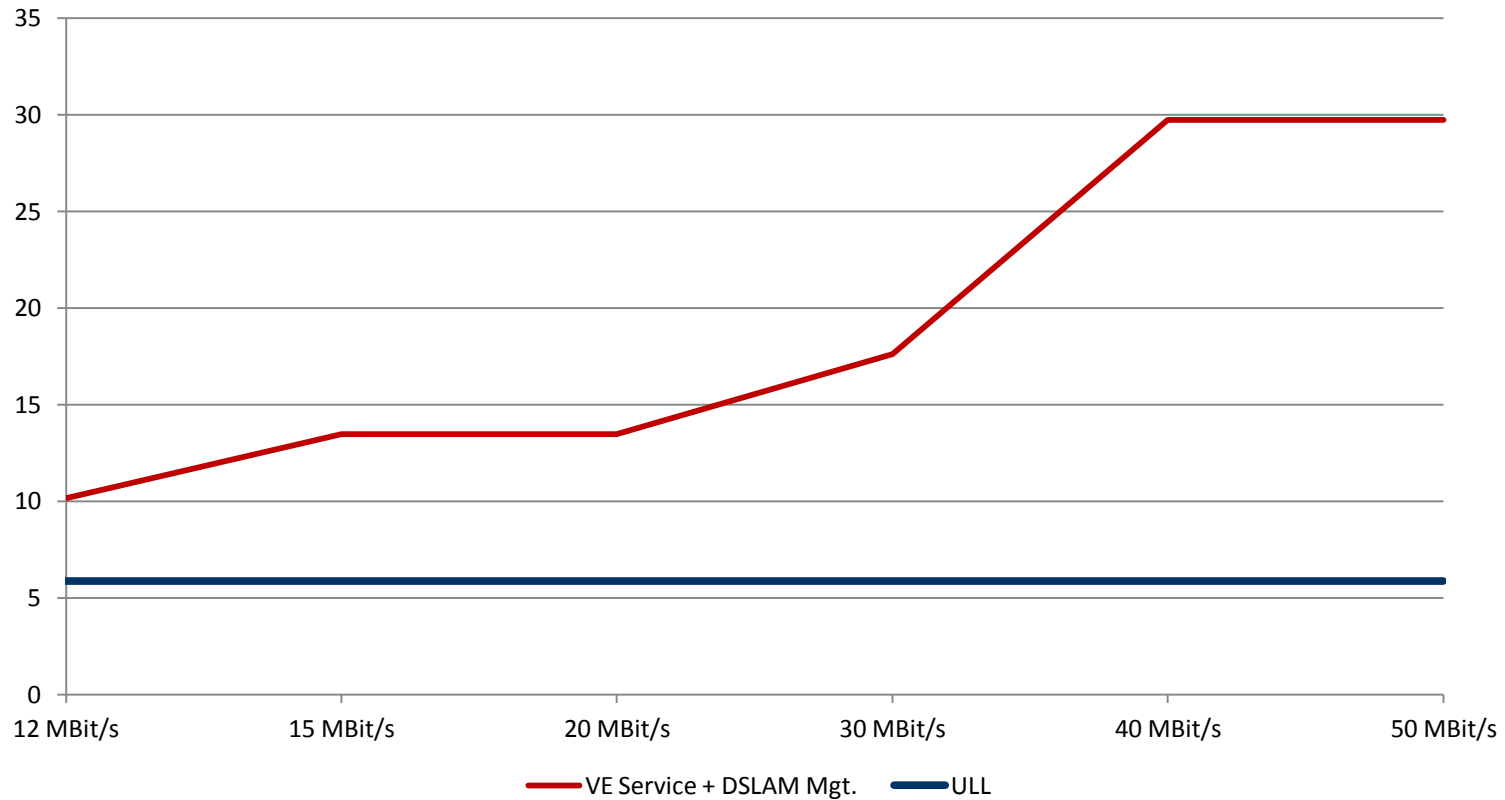
C: access technology NOT within scope of VULL Standard Offer - no direct migration path to VULL available

VULL: virtual unbundling (forced and regulatory)

Technical Challenge

- Ensure a certain degree of technical flexibility and differentiation - as it is currently possible using ULL - in order to avoid turning ANOs into pure resellers
- Enable configuration access or multi-client capability of the systems

ULL vs. VULL wholesale prices in Austria



Pricing Challenge

- Introduce a wholesale price structure and tariff levels comparable to ULL prices, whereas a minor variability depending on bandwidth might be justified

Topics

- **The virtualization of fixed-line access-networks – status**
- **How can competition and diversity of services be promoted on the fixed-line broadband-market?**

ISPA's expectations towards a future EU regulatory framework for electronic communication

Expectations (1)

- The priority of the EU-regulatory framework should be the safeguarding of competition in the transition to “all-IP” - rather than incentivising the migration to “all IP” networks by withdrawing access regulation
- The development of the virtualisation should follow the natural deployment of NGA, because in many countries physical unbundling is still possible and viable despite NGA roll out
- Technological impossibility of physical unbundling should be the only reason to impose migration to a Layer 2 WAP on ANO

Expectations (2)

- The specifics of the national markets and the different business strategies of ANO should be considered (“one-size-fits-all”, a pan-European L2 WAP are not a solution)
- Access regulation and the inclusion of virtual access is vital for the provision of competitive end-user products by ANOs
- Promotion of competition has been a win-win-win from a consumer, industry and investor perspective in the past, thus the EU-regulatory framework should keep its pro-competitive approach

Thank you for your attention!

Dr. Andreas Koman

ISPA - Internet Service Providers Austria
Währinger Straße 3/18 - 1090 Wien
Tel +43 1 409 55 76

Web www.ispa.at
EU Transparency register no. 56028372438-43
LIVR Register No. LIVR-00226