New partner for Deutsche Telekom

TV distribution for the housing industry

With its entry into cable TV marketing and the establishment of partnerships with real estate companies and NE 4- network operators a number of years ago, Deutsche Telekom expanded its infrastructure for TV and data services. After initially assigning planning and operating tasks to external partners in turn-key projects, Deutsche Telekom Technik GmbH in Darmstadt has now assumed responsibility for the nationwide operation of a network for supplying TV services to connected properties, covering all tasks such as planning, installation and procurement. In this way, the group manages its TV network using the same system as it has for DSL, FTTH and WDM networks. One exception, for example, is the partnership with the Cableway complex service provider, which Telekom is using for final-customer connections to expand its network for the housing industry.

With the advancing efforts to widen the cable TV network, IP headends sourced from Astro are also being fitted to the regional units. They are being used for IP-based TV feeds. Looking forward, this means that further solutions for video-on-demand, connected TV and OTT (over the top) web-TV services will also be possible.

The cable TV network provides participating real estate and NE4 partners the program signal up to the transfer point using a multilevel network structure. Deutsche Telekom's master headend processes and multiplexes the TV signals sourced from satellites or content providers and converts them into IP signals. From here, the TV packages are transferred to the regional headends via Deutsche Telekom's own nationwide IP backbone; the signal is then removed from the backbone stream via IP routers and processed. IP-Backbone At the regional headends, the Astro IP modules convert the IP signals into HF signals. Around 40 PAL channels, FM broadcasters and the DVB-C bouquets are prepared and then fed into Deutsche Telekom's cable TV network with this fiber deep architecture.

In an interview with Cable!Vision Europe, Dr. Ralph Leppla, Deutsche Telekom Technik GmbH Fixed Mobile Engineering Germany, explains how the network operations work.

Cable!Vision Europe: Who is involved in planning the network and what criteria were applied in the selection of the system/technology?

Ralph Leppla: Deutsche Telekom Technik is responsible for planning the Level 3 network. This is integrated in Deutsche Telekom's planning and documentation systems. To this end, we have joined forces with Telekom subsidiary Detecon to develop a planning tool for optimum positioning of the network elements for optical transmission. The topology is based on the general Telekom system.

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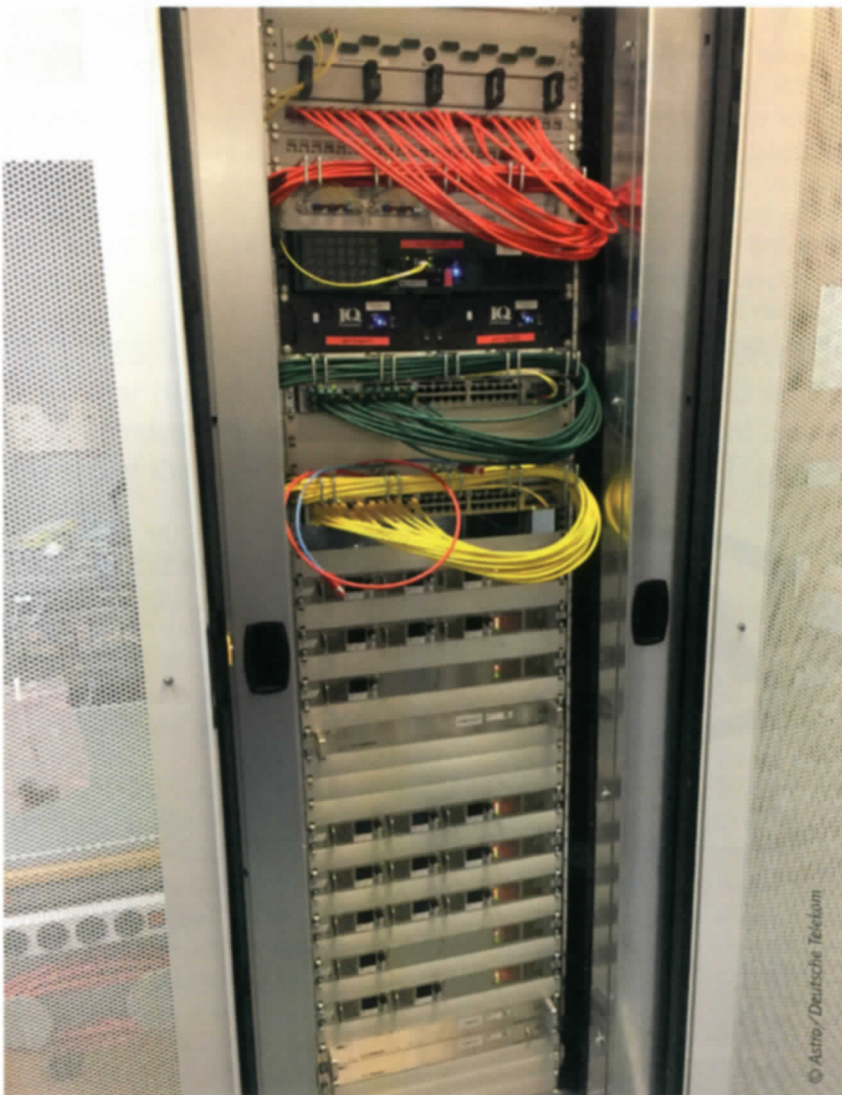
Headinstallation by Astro

ASTRO components used

Deutsche Telekom Technik GmbH also uses U 100- series components for its regional IP headends. These components convert the content transmitted across the IP backbone into CATV signals.

IP / PAL conversion is performed by the U 116 4-way IP/PAL converter. The U 116 receives up to four IP multicast groups and converts the MPEG transportation streams encapsulated in them into a maximum of four PAL output channels. In addition to excellent signal parameters, the U 116 – like all other U 100 series IP/PAL converters - offers many interesting features for network operators. Thus, for example, it is possible to display a freely programmable banner at predefined times to supply the customer with information. As well as this, different programs can be transmitted on single outgoing channel on a time-sharing basis.

The QAM channels are generated with the U 158 8-way IP/QAM converter. The U 158 can receive up to eight IP multicast groups and convert the content which they hold into QAM output channels. Support for advanced DVB stream processing with the corresponding features such as local NIT creation and LCN (logic channel number) is also integrated.

The subrack used is the U 100-48, which can hold up to three U-series modules and supply them with -48 VDC. The management system is used to configure and monitor the entire headend. The management functions include a rack view of the entire system, time-based updates and automatic replacement switching, e.g. in the event of the incoming signal being lost.

Redundancy mechanisms for highest operational reliability

Deutsche Telekom Technik GmbH uses all the software and hardware-based redundancy mechanisms fitted to the U 100 series. They can intercept any loss in the generation of the incoming signal by means of IGMPv3 and "Source Select" as well as failures in the transmission of the signal via the backbone by means of redundant data interfaces fitted to each ASTRO signal converter. Needless to say, spare hardware is available so that a replacement can be activated without the subscriber noticing anything in the event of any failure in a module or planned maintenance work.

Easy operation and maintenance

The user interface of the ASTRO U 100 signal converter is very simple. All modules feature the same user interface for the IP and IP receiver settings as well as the management functions. The only differences are in the modulator settings, thus ensuring that after initial training the modules can be used without any problems. With respect to maintenance, key attention has also been paid to simple and swift replacement of the modules. Thus, all modules including the power units are "hot-swappable", meaning that they can be replaced during live operations. The module configuration is stored on an SD card, which can be readily accessed after the module is dismantled, meaning that it is merely necessary to insert the old SD card in the new module. The new module can then be put into operation with the correct configuration.

IP-converter U 116 by Astro

CVE: Why was Astro selected as the provider of the IP headends and how does it fit into the overall DTAG system?

Ralph Leppla: We are using ASTRO's U series as IP headends alongside products sourced from other partners. It satisfies Telekom's stringent requirements with respect to security as well as integration in the Data Communication Network DCN, a separate management network for transferring all management data to the relevant network management center NMC. In addition to this, the U series is very ergonomic with respect to operations in different aspects such as updates, configuration, upgrades, hardware replacements and disaster recovery.

CVE: Who supplies the terminal devices such as the CPE?

Ralph Leppla: He customer himself generally decides which devices he wants to use. However, in the case of cable modems in particular, we are able to provide standard equipment.

CVE: The quality of the network in cable households is growing in importance as different kinds of devices are increasingly being connected. What recommendations / measures are there, also with a view to a later conversion to FTTH networks?

Ralph Leppla: Deutsche Telekom is an integrated service provider/network operator and also offers FTTH and DSL-based products. As a general principle we make use of the synergistic effects arising from the expansion of the FTTH and cable television networks by means of an integrated planning process. This produces synergies in the Level 3 network on the basis of fiber cable. When Telekom fits out a building with FTTH, it is possible to use all Telekom products including IP-TV.

CVE: What monitoring solutions do you use?

Ralph Leppla: All network elements are connected to the network management system. This is done via a separate management network which is linked with a central network management center (NMC). The NMC correlates all

U-serie by Astro

alarms and fills the ticket system on this basis. Special measuring probes are applied in the transmission routes to the regional headends (RHE) to monitor the IP video signal and to ensure the image quality. In addition to this, QAM problems are used at the RHE output. All video and DOCSIS-based signals are consolidated and monitored in the NMC.

CVE: What service and technology standards do DTAG or real estate customers stipulate?
Ralph Leppla: The housing industry expects their cable operators to comply with all relevant regulations and of course attaches particular importance to high-quality and fail-sale technological components. And this is precisely what housing companies and other corporate can expect from us.
In addition to this, Telekom attaches importance to the observance of environmental requirements, e.g. in the form of efficient electricity supplies, a factor which is playing an increasingly important role for housing companies as well. What our customers can expect from us and our suppliers is particularly high standards in process and quality management as well as business continuity and disaster recovery solutions.

CVE: What are the differences between network operators with HFC and FTTx networks?
Ralph Leppla: Deutsche Telekom operates both types of networks in Germany. In contrast to most cable network operators, we use HFC networks with a fiber-deep architecture with typically only 50 residential units per glass fiber. Both networks are monitored by the same NMC with comparable SLAs.

CVE: What services in addition to TV, audio and Internet do you offer local authorities, housing companies or other operators (NE 4)?
Ralph Leppla: In this respect we differ from straight cable network operators in that we do not only offer typical cable TV solutions to housing companies but also other services such as telephone equipment, mobile communications, security solutions, elevator monitoring solutions and smart home services. In addition to these products, we address the full range of network operations and extensions, from the modernization of existing networks to the expansion of FTTH systems, tailoring these to the specific needs of housing companies.

CVE: Services such as smart metering, home and house automation are linked with broadband connections. What solutions does DTAG offer in this respect?
Ralph Leppla: We offer numerous of these solutions, which are particularly characterized by specific and individual solutions for the housing company or NE 4 partner. These solutions can be billed flexibly either directly or via the housing company in question.