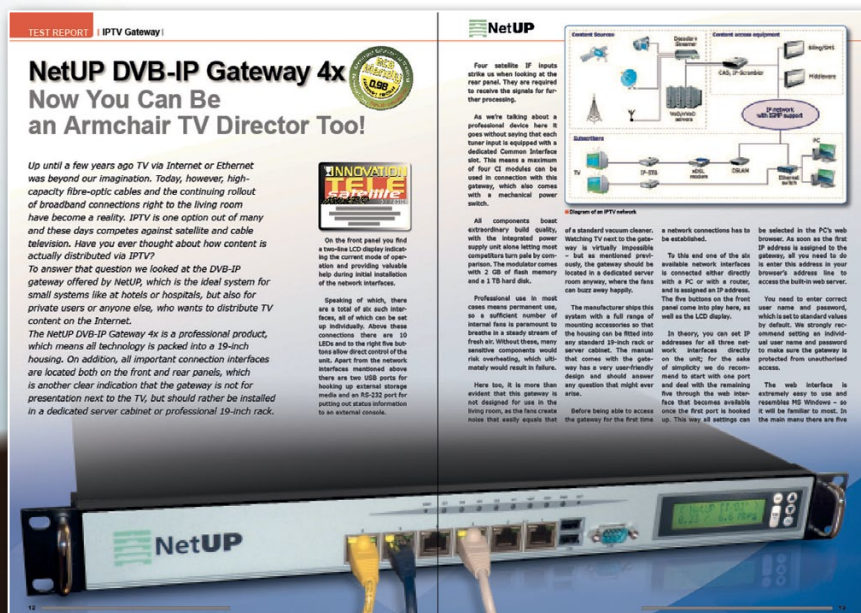


NetUP IPTV Combine 4x & Amino AmiNET130M Professional software for IPTV operators

Thomas Haring

• After having discussed the streaming function of the NetUP IPTV Combine 4x in TELE-satellite issue 10-11/2010 it is now time to have a closer look at all the features required to create a user-friendly OSD (on-screen display) for customers and to help them use all IPTV

functions on the one hand, as well as to assist operators in maintaining full control over what type of content is available to end users, and what price they have to pay.



NetUP DVB-IP Gateway 4x
Now You Can Be an Armchair TV Director Too!

Until a few years ago TV via Internet or Ethernet was beyond our imagination. Today, however, high-capacity fibre-optic cables and the continuing rollout of broadband connections right to the living room have become a reality. IPTV is one option out of many and these days competes against satellite and cable television. Have you ever thought about how content is actually distributed via IPTV?

To answer that question we looked at the DVB-IP gateway offered by NetUP, which is the ideal system for small systems like at hotels or hospitals, but also for private users or anyone else, who wants to distribute TV content on the Internet.

The NetUP DVB-IP Gateway 4x is a professional product, which means all technology is packed into a 19-inch housing. On addition, all important connection interfaces are located both on the front and rear panels, which is another clear indication that the gateway is not for presentation next to the TV, but should rather be installed in a dedicated server cabinet or professional 19-inch rack.

On the front panel you find a two-line LCD display indicating the correct mode of operation and providing valuable help during initial installation of the network interface.

Speaking of which, there are a total of six such interfaces, all of which can be set up individually. Above these connections there are 10 LEDs and to the right five buttons allow direct control of the unit. Apart from the network interface mentioned above there are two USB ports for booting up external storage media and an RS-232 port for putting out status information to an external console.

Four satellite IP inputs arrive in when looking at the rear panel. They are required to receive the signals for further processing.

As we're talking about a professional device here it goes without saying that each tuner input is equipped with a dedicated Constant Interface unit. This means a maximum of four CI modules can be used in connection with this gateway, which also comes with a mechanical power switch.

All components boast extraordinary build quality, with the integrated power supply unit alone setting most competitors back by a comparison. The modular construction with 2 GB of flash memory and a 1 TB hard disk.

Professional use in most cases means permanent use, so a sufficient number of internal fans is paramount to breathe a steady stream of fresh air. Without these, most sensitive components would risk overheating, which ultimately would result in failure.

Here too, it is more than evident that this gateway is not designed for use in the living room, as the fans create noise that easily equals that of a standard vacuum cleaner.

The manufacturer ships this system with a full range of connecting accessories so that the housing can be fitted into any standard 19-inch rack or server cabinet. The manual that comes with the gateway has a very user-friendly design and should answer any question that might ever arise.

Before being able to access the gateway for the first time a network connection has to be established.

To this end one of the six available network interfaces is connected either directly with a PC or with a router, and is assigned an IP address.

The five buttons on the front panel come into play here, as well as the LCD display.

In theory, you can set IP addresses for all three network interfaces directly on the unit; for the sake of simplicity we do recommend to start with one part and deal with the remaining two through the web interface that becomes available once the first part is hooked up. This way all settings can be selected in the PC's web browser. As soon as the first IP address is assigned to the gateway, all you need to do is enter this address in your browser's address line to access the built-in web server.

You need to enter correct user name and password, which is set to standard values by default. We strongly recommend setting an individual user name and password to make sure the gateway is protected from unauthorized access.

The web interface is extremely easy to use and resembles MS Windows – so it will be familiar to most. In the main menu there are five

■ The IPTV Combine 4x was the focus of an in-depth test report in TELE-satellite issue 10-11/2010.

■ IPTV Combine 4x from NetUP – the core of the IPTV network presented in this report.



NetUP

Files > Control center

United Control Center SE (Requires Sun Java Runtime Environment)

Set Top Boxes > Firmware update

STB	Status	Actions
Amino AminET 110	Disabled	Configure Enable Disable
Amino AminET 125	Enabled	Configure Enable Disable
Amino AminET 130	Enabled	Configure Enable Disable
D-Link DIB-120	Disabled	Configure Enable Disable
Telergy TS02	Disabled	Configure Enable Disable

Set Top Boxes > Styles

Name	Description	Actions
Default style (HD)	Default style (HD)	Remove
Default style (SD)	Default style (SD)	Remove
Default style (simple)	Default style (simple)	Remove

Set Top Boxes > Translations

Name	Description	Actions
English language	English language	Remove
Русский язык	Русский язык	Remove

System configuration > Services

Service	Status	Actions
NetUP IPTV Middleware	Running	Start Stop
NetUP IPTV Billing	Running	Start Stop
NetUP IPTV VoD/DRM Balancer	Running	Start Stop
NetUP IPTV Encryption VoD Server	Running	Start Stop
MySQL Server	Running	Start Stop
DNS Server	Running	Start Stop
Time Server	Running	Start Stop

System status > Storage

Device	Mount point	Size	Free	Usage
/dev/hdc1	/mnt/flash	1.9G	666M	64%
/dev/sda1	/mnt/hdd	917G	864G	1%

Middleware – interface between end user and IPTV network

Middleware is a software solution which takes care of presenting IPTV content in a visually pleasing way to customers of IPTV operators. It makes sure the right

channels find their way into the channel list, it creates a user-friendly EPG (electronic program guide) and – last but by no means least – it packages all information into a neat OSD system on the IPTV receiver.

Generally, there are two types of middleware that can

Basic configuration of the IPTV Combine 4x

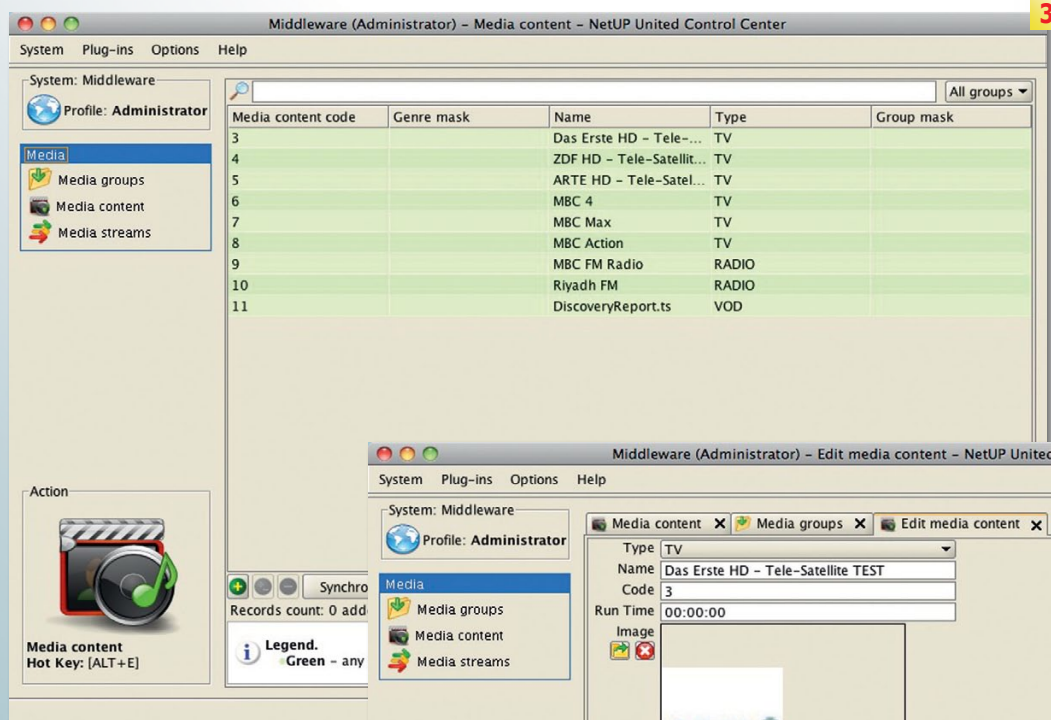
1. The United Control Center is an integrated feature of the IPTV Combine 4x server and can be directly downloaded from there
2. All IPTV receivers in the network can be provided with software updates from the central firmware update server
3. Various OSD themes (skins) can be created, edited and saved on the IPTV server
4. IPTV operators can decide to have OSD texts translated into any required language
5. A web interface is available to launch, quit and adjust all IPTV Combine 4x services
6. The IPTV Combine 4x boasts 1TB of internal hard disk capacity to store VOD and nVOD content

be used: The more simple version consists of the web server which creates and provides HTML pages and JavaScript applications, which in turn are made available to IPTV receivers which then display all corresponding information on the end users' screens. In such a system the middleware takes over the role of

control as well as marketing.

Every time an IPTV network is set up to make money you need extended middleware, such as the IPTV Combine 4x from Russian company NetUP. The receiver component of the NetUP middleware is written in C++, runs directly on the IPTV receiver and therefore allows lag-free use of all features, even in

there is the server end (IPTV Combine 4x Server) which provides all required information. And then there is the client end (IPTV receiver) which receives this information, processes all data and creates a graphic user-interface. As these two components need to work very closely with each other all of the time, middleware and



web server, while the IPTV box at the client end acts as web browser. While this is a system that can be set up and implemented easily, it does not serve any commercial purpose, as IPTV operators have no billing option and no way of controlling access to content.

The second middleware category is more complex, but at the same time more versatile and much more for useful as a business application. It is based on IPTV boxes that are not only capable of displaying received information, but can also communicate with the middleware so that they cannot only create a nice OSD for end users, but also assist in billing, content and cost con-

nection with a high-definition on-screen display, which is an important aspect these days and – in particular – in future.

Middleware

Strictly speaking, the NetUP Combine 4x middleware consists of two distinct components: For one,

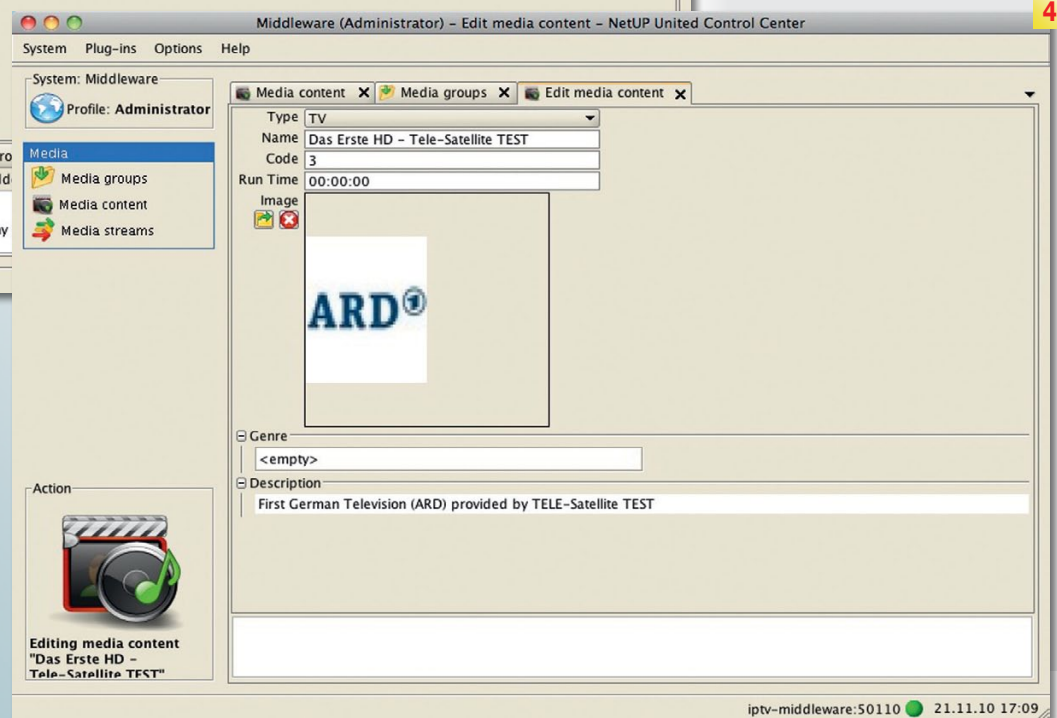
IPTV box must be compatible with each other. If the NetUP IPTV Combine 4x is the middleware of choice operators can choose from a number of compatible IPTV boxes. For the purpose of this test report we have selected the AmiNET130M from Amino.

All features and configurations of the NetUP IPTV

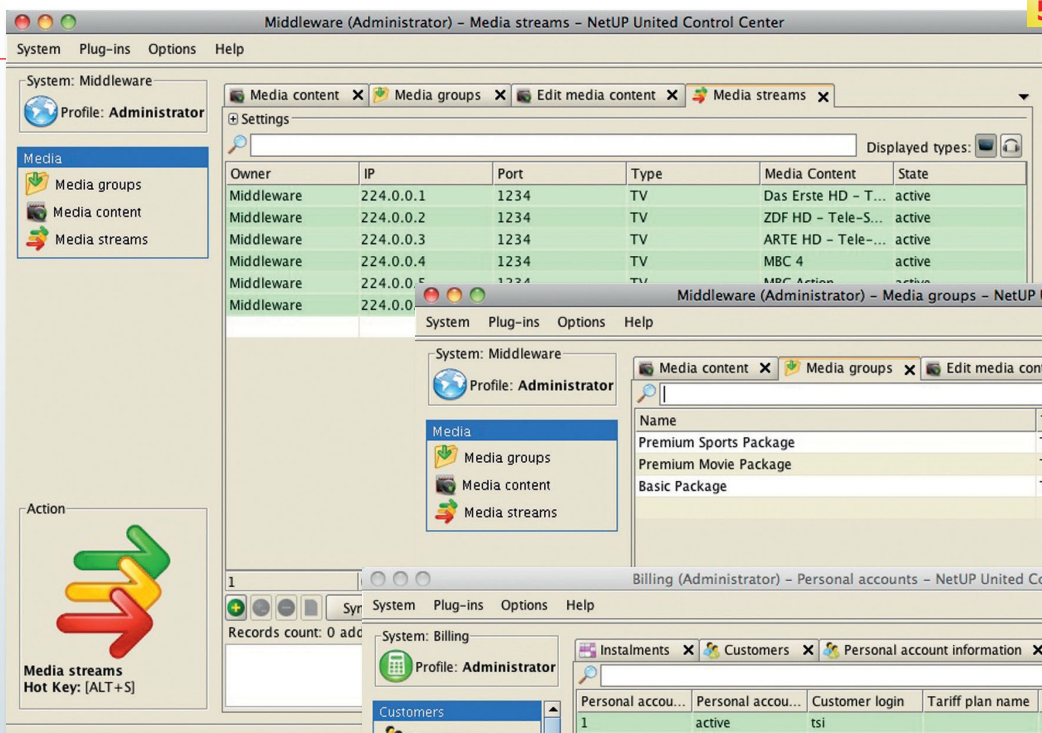


Main menu of the NetUP middleware

1. United Control Center main menu
2. Thanks to a DNS server all services within an IPTV network can be addressed by name. While IP addresses can be used as well, they are no prerequisite.
3. List of existing TV and radio channels in the middleware
4. Adding a new TV channel complete with logo and station details



Combine 4x are partly controlled via a web interface which is used to launch, activate, deactivate and set up individual services such as streaming, middleware, VOD, etc. More detailed settings of the middleware, the billing system and the video-on-demand system are accessed through the so-called United Control Center.

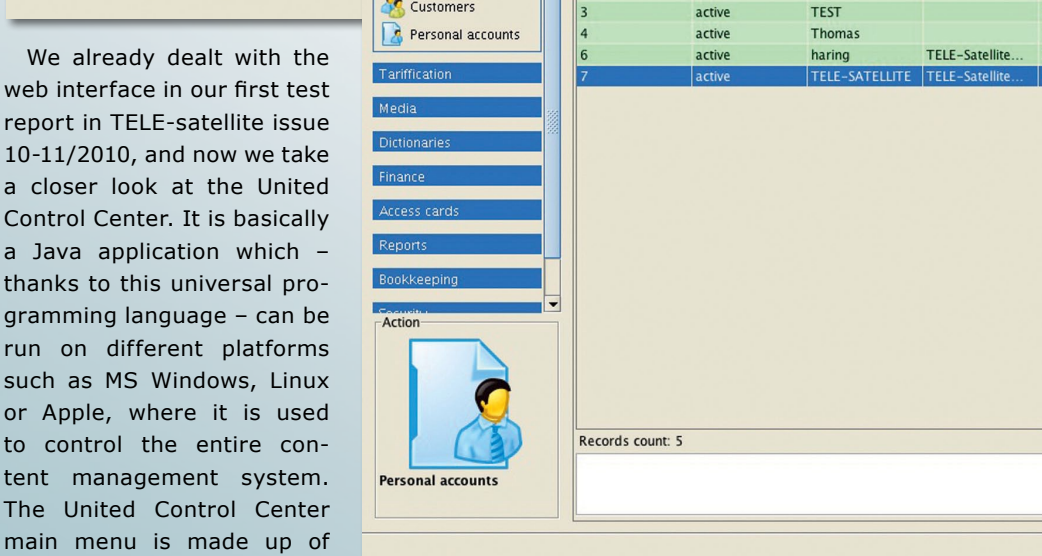


Owner	IP	Port	Type	Media Content	State
Middleware	224.0.0.1	1234	TV	Das Erste HD - T...	active
Middleware	224.0.0.2	1234	TV	ZDF HD - Tele-S...	active
Middleware	224.0.0.3	1234	TV	ARTE HD - Tele-...	active
Middleware	224.0.0.4	1234	TV	MBC 4	active
Middleware	224.0.0.5	1234	TV	MBC Action	active
Middleware	224.0.0.6	1234	TV	MBC Action	active

5. Individual channels and their IP data within the IPTV network

6. Various packages with differing content

7. User account administration



Personal account	Personal account	Customer login	Tariff plan name	Current balance	Payments	Charges
1	active	tsi		1000,0000 RUB	1000,0000 RUB	
3	active	TEST		10000,0000 R...	10000,0000 R...	
4	active	Thomas		101000,0000...	1000,0000 RUB	
6	active	haring	TELE-Satellite...	20,0000 RUB	20,0000 RUB	
7	active	TELE-SATELLITE	TELE-Satellite...			

7

We already dealt with the web interface in our first test report in TELE-satellite issue 10-11/2010, and now we take a closer look at the United Control Center. It is basically a Java application which – thanks to this universal programming language – can be run on different platforms such as MS Windows, Linux or Apple, where it is used to control the entire content management system. The United Control Center main menu is made up of four elements: billing, middleware, nVOD (near video-on-demand)/VOD and DRM (digital rights management). The last two elements, TVOD (TV-on-demand) and DRM are proprietary solutions of NetUP, which were not part of our test system and which therefore cannot be evaluated in this report.

With a simple click on the middleware icon the NetUP United Control Center (UCC) opens up access to media groups, media content and media streams. All three items are intended to add, remove or combine media content. With media groups it is possible to group together different media content (such as TV channels, radio channels or

video-on-demand content) into packages. This allows creating a starter package, for example, which includes only limited content, or an extended package with full-range content.

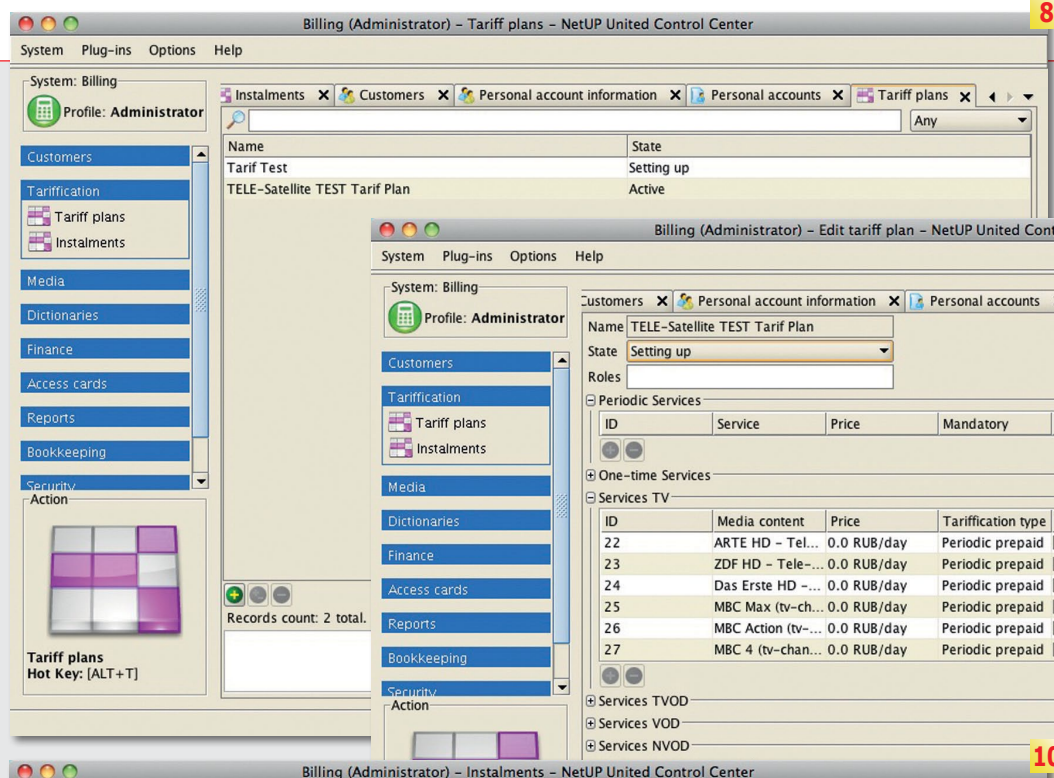
In order to grasp the underlying logics of the NetUP IPTV system we have to put ourselves in the role of an IPTV operator. This begins with starting to think and act like a commercial operation. As most of us come from terrestrial or satellite reception we are used to the fact that all content is always available to all users. Even if we're talking about subscription TV we simply obtain a smartcard and all of a sudden encrypted content is available on screen

as well. IPTV is different in a fundamental way: Thanks to direct communication between end user and IPTV operator, complete with return channel, it would be a total waste of resources to send all content to all customers all of the time in the first place, only to then grant or restrict access (as is the case with terrestrial and satellite TV). Instead, IPTV operators create individual packages for a single customer or a certain group of customers. Let's take a hotel as an example: The hotel owner makes a certain range of basic TV and radio channels available to all guests, the price of which is included in the room rate. Therefore, we use the middleware to group together all required

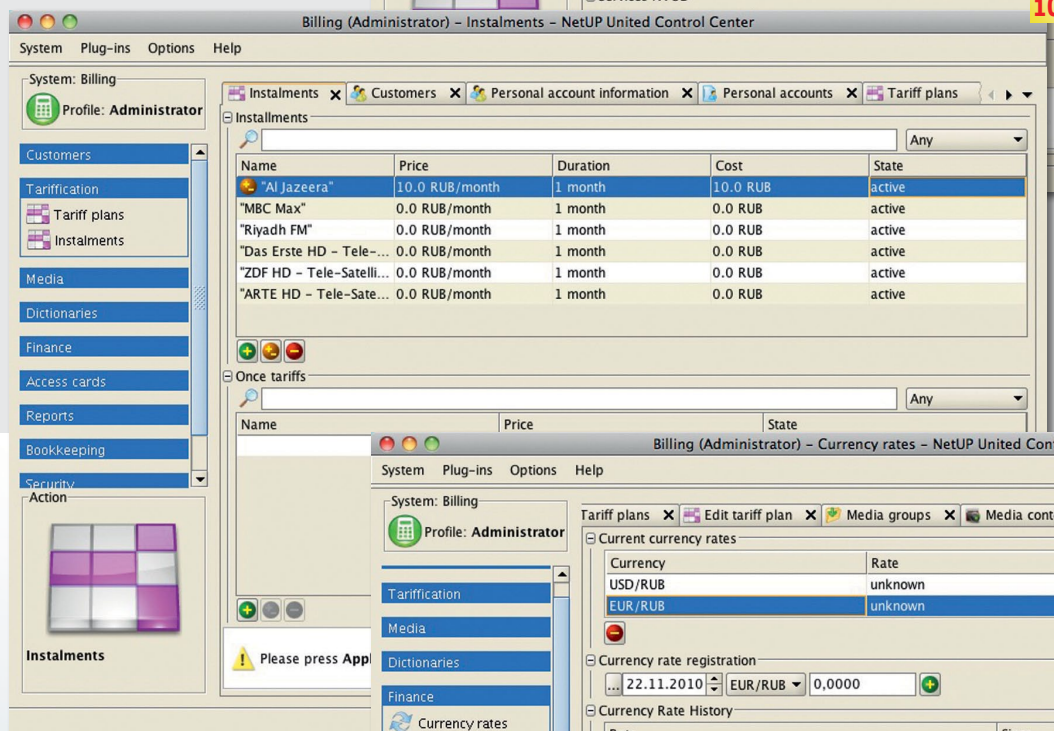
TV and radio channels by letting the system know the corresponding IP addresses and ports – after we have configured them via the web interface of the streaming component of the IPTV Combine 4x.

In order to simulate a real-world scenario we design a package with three HD channels, three SD channels as well as two radio channels from two different satellites. The IPTV Combine 4x is equipped with a total of four DVB/S2 tuners (see test report in TELE-satellite 10-11/2010) and so we are at liberty to select content from up to four different transponders or satellite positions.

We then bundle these



8. Different rate plans can be activated and deactivated for each single customer



9. Setting up and editing rate plans

10. Customers are able to get access to individual channels at a set price

11. A currency converter can be used to display amounts in different currencies with the IPTV set-top box

eight channels into a package labelled 'Basic'. Next, it is time to think about making money. To that end, we decide to create two additional packages, one with current movies, and the second with live sports coverage. The procedure is the same as for the 'Basic' package, with configuring the individual TV channels using the web interface of the streaming server, before determining their IP addresses and ports using the UCC.

All these steps can be car-

ried out intuitively thanks to the excellent user interface of the United Control Center and the web interface. All options and functions are

more or less self-explanatory, so that it's almost impossible to go wrong when setting up the system. It's even possible to add a chan-

nel's logo and short station description apart from the channel name, which offers added value to end customers who are able to find

their preferred channel more quickly.

It goes without saying that the same is true for radio channels as well, and for video-on-demand content which can be stored on the IPTV Combine 4x's internal hard disk. Several hundred hours of video fit easily on the built-in 1TB hard disk. Stored content can be added to any package in the same way as a TV channel through the middleware. During special events (for example Olympic Games and the like) individual channels can be added for all to enjoy for a pre-set period of time, after which they will automatically disappear from the channel list again. This allows planning ahead so that hotel staff (in our example) does not have to deal with technical changes and system maintenance under pressure.

In our test scenario we are looking at a professional IPTV system in a commercial framework, so that each IPTV channel also has to feature program information. After all, if hotel guests turn on their TV they want to know right away which event they are currently watching and whether or not there is anything on they would be interested in later that day. In order to implement this feature the NetUP IPTV Combine 4x offer two options. First, it is possible to take over program information for streamed channels right from the original provider via satellite, cable or DVB-T. This will also be the most reasonable and practical way to go in most situations.

In addition, no additional costs occur. If, however, a TV or radio channel that is streamed over the IPTV network does not supply program information, the IPTV

Combine 4x middleware also allows adding EPG data manually for each channel. When we tried out both features in our test every nook and cranny seemed to work as intended and as smoothly as possible.

Now that we have set up all basic functions of our virtual IPTV network we continue with looking at an appropriate billing system for our offering. Simply click on the 'Billing' icon in the United Control Center main menu and you're right where you need to be.

Billing

For the sake of simplicity, let's stick to our idea of a major sports event that should be made available at a hotel through IPTV. Obviously, all IPTV receivers need to be hooked up to the IPTV server for such a distribution network to work. This means that in theory each receiver has access to all of content, unless access is restricted by making use of the return channel capability. The IPTV Combine 4x billing feature is based on the assumption that each customer is entered in the system with his or her full name and has an individual customer account which can be used to activate and deactivate access to certain content on an individual level. In our hotel setting, for example, the 'Basic' package would be available to all guests without extra charge. If hotel guests then decide to watch additional channels or content, they are able to top up their personal account at reception with an amount of their choosing, let's say USD 50. Reception staff uses the NetUP IPTV Combine 4x billing system to add that amount to the corresponding guest account so that additional channels as well

More on This Manufacturer

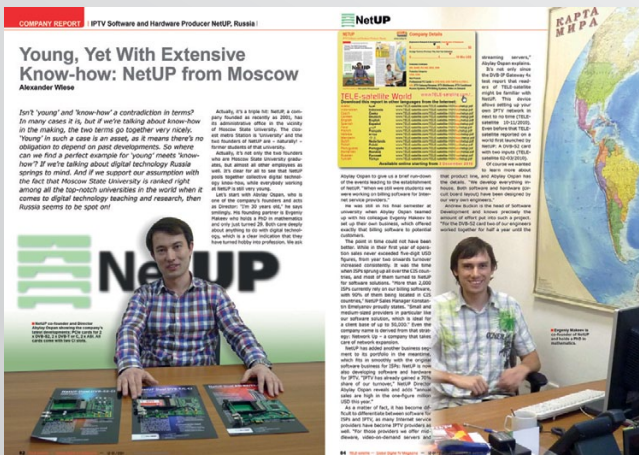
Read TELE-satellite's Company Report:

NETUP

IPTV Software and Hardware Producer, Russia



www.netup.tv



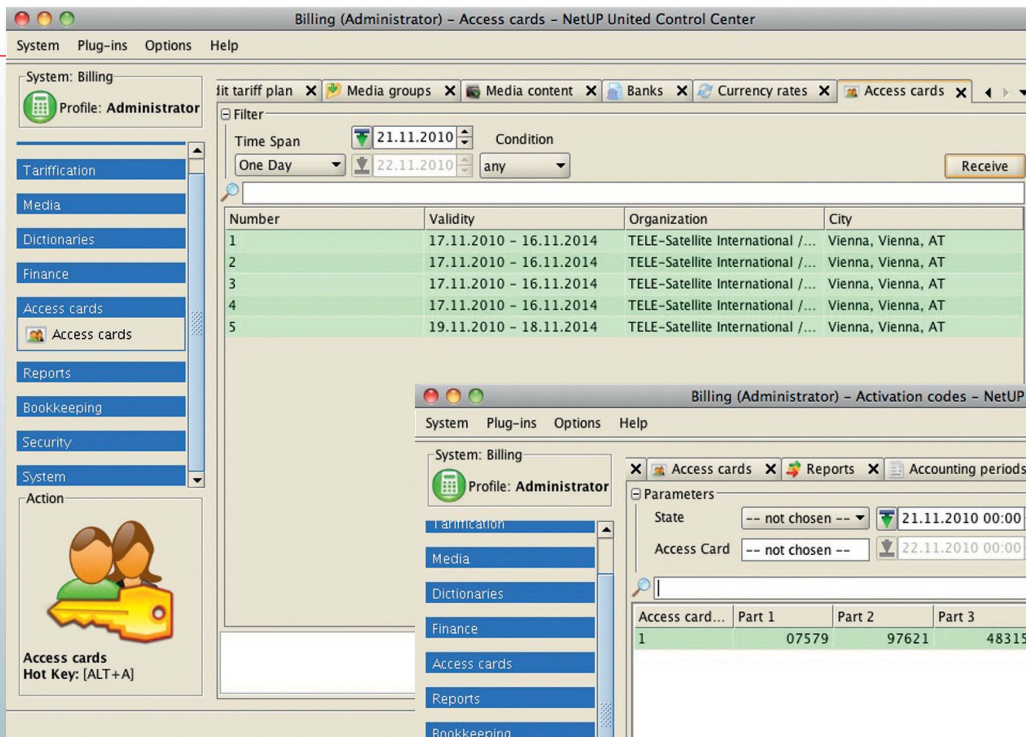
www.TELE-satellite.com/TELE-satellite-1101/eng/netup.pdf

as on-demand content are available to this guest until all credit has been used up. The IPTV Combine 4x even does currency conversions so that guests can be shown the current account credit in their own currency, if the hotel decides to implement this feature.

The final step is customising the IPTV receiver in the guest's room, so that it actually offers and displays all content the guest has paid for and/or is authorised to watch. The obvious way would be using the individual box's MAC address or serial number, but once again NetUP has gone the extra mile and offers a brilliant feature for generating an activation key for each client on the IPTV Combine 4x server. This activation key has to be entered in the IPTV receiver to obtain access to the IPTV network in the first place. At the same time, with this key the IPTV becomes an individually addressable and controllable IPTV reception point, no matter where in the hotel it is located. This way the IPTV receiver is sent information about the current guest, the length of his or her stay at the hotel, and any available credit the guest has available. It is

even possible to unlock all channels for 24 hours after the guest's arrival and then lock extended channels again – hoping guests will want to keep watching the full range and pay for the service accordingly. If guests now choose to watch content that is not available with the free 'Basic' service they may simply use their remote control to select and activate additional content using the in-room IPTV receiver, provided they have bought enough credit at reception beforehand. Any credit used up for such extended content is automatically deducted from their account, with reception being able to monitor all transactions or even assist guests who might prefer to order content via phone rather than working with the IPTV receiver.

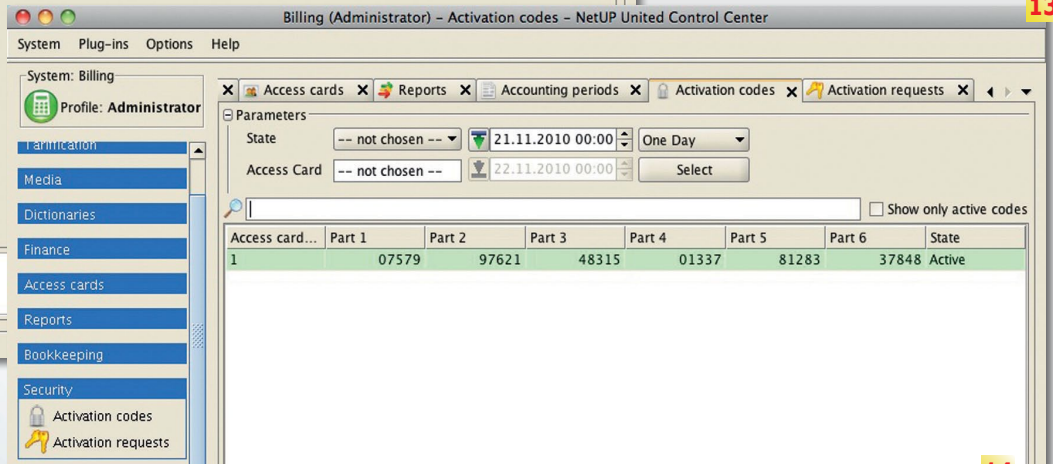
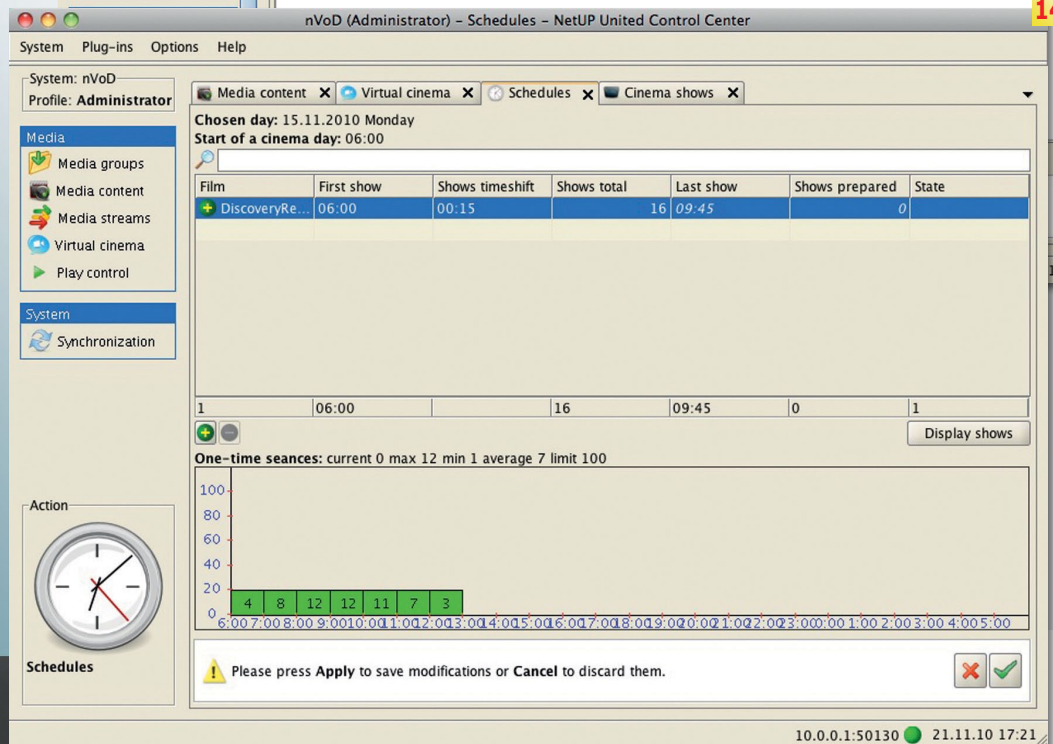
As far as the NetUP billing system is concerned, we were just as impressed with all its features and ease of use as with the middleware options. Obviously, it takes a little time until you are able to use all tools to the fullest, but after only a short while everything seems as to be easy as ABC and in everyday use you'll most probably be in awe at how smoothly the system works.


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12. Every single IPTV receiver across the entire network can be individually addressed and customised as required

13. An activation code is required so that an IPTV box can become a fully authorised member of the IPTV network

14. nVOD content can be easily organised and made available via the UCC OSD of the IPTV receiver

13

14


VOD – Video On Demand and nVOD – near Video on Demand

In our first NetUP IPTV Combine 4x test report we mentioned that the server is equipped with a 1TB internal hard disk with enough capacity to store several hundred hours of video content. The files need to be in transport stream format (MPEG-2 or H.264) in SD or HD resolutions and can be added to packages much like TV channels. If required, different on-demand content can even be offered at different prices. The middleware menu of the UCC is used



to administer on-demand content. While video-on-demand is a fully customised service that makes available content individually for every single guest at a time of the guest's own choosing, nVOD (near video-on-demand) is a service that repeats certain content at pre-defined times in a loop, so that guests can watch a movie, for example, every full hour. This means that with nVOD guests are not in a position to determine the start time of an event – as opposed to true VOD. With nVOD, on the other hand, several guests use the same stream, using up less server and network capacity than true VOD. It makes perfect sense for operators to push nVOD over VOD by offering lower prices for nVOD, for example. The NetUP IPTV Combine 4x supports both nVOD and VOD and the UCC has a dedicated menu item for setting the start and end times of nVOD events.

Here, too, we were impressed at how versatile and user-friendly the NetUP system behaves. It didn't take us much longer than a couple of minutes to set up our in-house nVOD system and store a number of current movies on the IPTV Combine 4x's built-in hard disk. The system can process up to 50 simultaneous video-on-demand streams, which means that in large set-ups using nVOD instead of VOD may be a wise move in order not to push IPTV network capacities to the limit. Incidentally, video-on-demand content can be transferred to the IPTV Combine 4x from any PC using an FTP client.

Customising the IPTV receiver to individual requirements

All user information at the

client end is displayed on screen using an OSD system. NetUP provides three OSD skins (themes): HD, SD and simplified SD. IPTV operators can freely choose the skin that best fits their purpose and are able to adjust each of the three skins, if need be. This allows offering several OSD languages, for example, or changing colours and display modes. The creative potential of IPTV operators can be exploited to the max and we, too, simply loved to try out various visual solutions. It has to be said, though, that these settings cannot be made with the help of a graphic user interface but need to be programmed directly in the files of the selected skin. Luckily, the user manual explains all relevant steps in detail, so that it first looks trickier than it actually is.

One of the benefits of an IPTV system is that the server is in direct touch with all connected IPTV boxes at all times. This way, updates, changes to OSD skins or any other configuration adjustments that will have to be made from time to time can be sent to all IPTV receivers fully automatically. The NetUP IPTV Combine 4x does not only come with a DHCP server for automatically assigning an IP address to each box, but also boasts a DNS server which takes care of correctly addressing content, a time server for maintaining the right date and time on all IPTV boxes, and an update server for providing new software and updated settings to IPTV receiver.

There is actually a reason why we have come up with a hotel scenario for our test: NetUP offers a dedicated version of its IPTV Combine 4x for hotels, with optimised

software optimised for use in such businesses. Of course it, too, comes with all standard features that are useful for most applications (hospitals, large yachts, cruise ships, education institutions, etc.), but also features additional options focusing on hotels. The hotel version is available as an option and connects the IPTV system to frequently used hotel software suites such as MICROS-Fidelio, for example. The following additional features are then available:

- Individual welcome message in room via TV and IPTV receiver
- Hotel information screen via TV and IPTV receiver
- Displaying all hotel charges via TV and IPTV
- Displaying messages from reception via TV and IPTV receiver
- Express checkout
- Ordering room cleaning service via IPTV receiver

This way hotel guests are not only provided with TV, radio and VOD content via IPTV right in their room, but the in-room TV and IPTV receiver also take over the role of multimedia control panel for most hotel agencies.

Conclusion

With its IPTV Combine 4x NetUP has in store a fully-fledged IPTV solution for small and medium-sized IPTV networks consisting of up to 500 reception boxes.

Our test revealed that only are the range of features, the absolute ease of use and the logical concept of the IPTV Combine 4x truly impressive, but it is actually real fun to work with a system that offers everything you need in everyday use and is genuinely user-oriented. Even though we looked long and hard there was hardly any aspect worth criticising. If there is one point we would like to raise it's the user manual, which we would have preferred to be slightly more detailed at some stages. If this is the first time you deal with IPTV it will be very difficult to set up the IPTV Combine 4x server, even with the help of the manual. Then again, we can safely assume that anyone investing a lot of money in the NetUP system will also be able to afford a technician to take care of the initial setup. Once that is completed it is virtually child's play to control, service and adjust the system.

TECHNICAL

DATA

Manufacturer	NetUP Olof Palme Street 1, Floor 7 resp. Postbox 87, 119311 Moscow Russia
Fax	+7 499 143 5521
E-Mail	info@netup.tv
Model	IPTV Combine 4x
Function	IPTV Gateway for DVB Signals, Middleware, Billing, VoD, nVoD, DHCP-, Time- & DNS-Server
Tuners	4
Max. simultaneous Transponders	4
Max. bandwidth	240 MB/s
DiSEqC	1.0
Ethernet ports	6 x Gigabit Ethernet 10/100/1000 MB/s
CI Slots	4
USB Connector	yes (2)
RS232	yes
Dimensions	430x44x411mm
Power	90 ~ 264 Volt, 47 ~ 63 Hz
Weight	11.5kg
Consumption	~ 100W