Solution Overview

The Automated Broadband Solution

PacketFront®

The Future of Broadband. Today

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1 Broadband network opportunities and challenges

The majority of broadband network operators and network owners share the same challenges and opportunities associated with broadband deployment, regardless of access technology used. Among DSL, CATV, FTTH and wireless network owners, the challenges and the opportunities are primarily business-related, rather than technical. Typical and important areas of consideration are:

How to increase revenue:

- Increase service-take-rate and average revenue per user (ARPU) on existing customer base
- Attract new customers through more and enhanced services
- Minimize churn

How to control costs:

- Minimize operational expenditures (OPEX)
- Minimize capital expenditures (CAPEX)

Other business-related challenges:

- Choice of business model: retail, wholesale or a combination of these
  - Open or closed access network
  - Different models for the funding and ownership of network infrastructures, passive and active.

Building a viable business case for broadband deployment is largely a question of automation and of service differentiation. Automation as a means of controlling the costs, including network operation and provisioning of services, is crucial for profitability. This is an area where PacketFront has unique expertise. The automated broadband solution from PacketFront has been with one clear objective – to allow advanced IP technology to facilitate a profitable broadband deployment.

Automation is one cornerstone of PacketFront's broadband solution, and service differentiation and business model flexibility are others. Business model flexibility is vital to support separated ownership of network infrastructure from service provisioning. In other words, flexibility in the choice of business model, and hence the separated ownership, is an enabler of an open-access environment. In such networks (open-access networks) services are offered from third-party service providers and distributed over a shared broadband infrastructure. This is becoming more and more common as organizations like utilities, municipalities and property owners start to deploy broadband networks, but it is also attracting CATV operators and telecom operators.

In this paper we will explain how PacketFront's automated broadband solution addresses the key business challenges and opportunities mentioned above. How can operating a broadband network with hundreds of thousands of end users that are free to choose any service from any service provider of their choice, be made cost efficient? And how do you secure individual management of each service from every service provider (IPTV, Internet, IP telephony, e-learning, e-health, etc)? And finally, how can individual treatment per service help you as service provider or network owner to increase the service-take-rate and eventually ARPU?

2 The automated broadband solution – High-level overview

PacketFront's fully automated broadband solution consists of two core product families:

Network automation, control and provisioning software:

- BECS™, Control and Provisioning System
- SMT, Subscriber Management Tool
- HMT, Helpdesk Management Tool
- SSP, Service Selection Portal

FTTH access and broadband aggregation:

- ASR 4000 series of Advanced Services Router for FTTH access. ASR 4000 comes in hardened version for installation in non-controlled environments. ASR 4000 features the iBOS software.
- ASR 5000 series of Advanced Services Router for high-capacity FTTH access, and cost-efficient aggregation of low- bandwidth access technologies such as WiFi, WiMAX, etc. ASR 5000 is intended for central office installations. ASR 5000 features the iBOS software.
- ASR 10000 series of Advanced Services Router for aggregation of access technologies such as IP DSLAMs, PON, Ethernet over coax, and wireless devices. ASR 10000 is intended for central office installations. ASR 10000 features the iBOS software.

2.1 Network automation, control and provisioning system

Automation in controlling the network and in the provisioning of services is the key to profitability. PacketFront has developed a series of software products, all of which perform different tasks based on the importance of automation. Furthermore, all software platforms come pre-integrated and fully supported, minimizing the need for manual work.

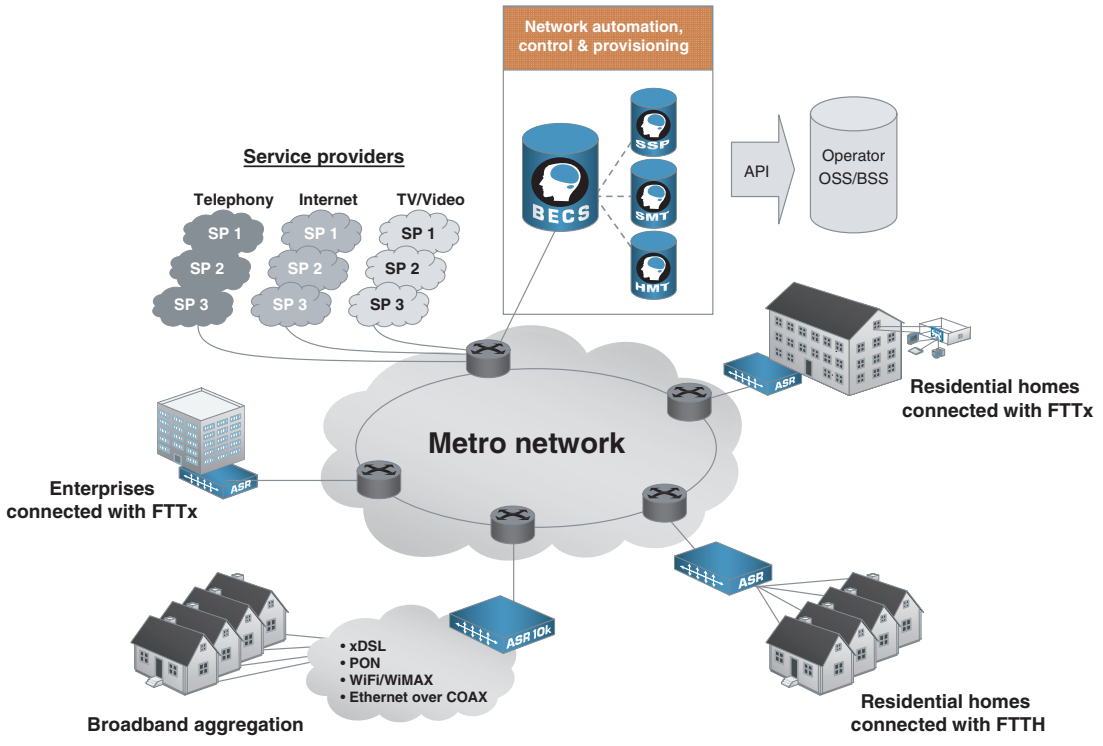

Illustration: Network overview of PacketFront's automated broadband solution.

BECS – The automation, control and provisioning system

BECS is a unique and centralized control and provisioning system for automation of resource-demanding tasks in the network. Its key functions are:

- Authentication and authorization of users, clients and services
- Policy decision for service access and control
- Service policy provisioning, on demand or scheduled
- Element management, including automated software control and upgrades
- Network awareness for end-to-end service quality control
- IP address management and advanced DHCP server functions
- Providing network statistics (e.g. for Service Level Agreements (SLA), troubleshooting, billing, or other strategically important purposes)
- Providing a Mediation Point for integration with external third-party OSS/BSS systems as well as towards PacketFront systems (SMT, HMT, SSP)

SMT, Subscriber Management Tool – Controlling the subscribers

SMT is a subscriber management tool that further automates the network tasks. Its key functions are:

- Maintaining a database of all households, users, clients and services
- Managing end user's "periods of notice" when changing or deactivating services
- Logging service usage, activation and de-activation
- Providing hacker and abuse traceability from the logging records
- Providing functionality for suspension and resumption of end users

SMT can be distributed to an external service provider, who carries its own customer database in the system. SMT is integrated with BECS through the BECS Mediation Point.

HMT, Helpdesk Management Tool – Fast troubleshooting

HMT is designed to reduce the resolution time at the service provider's customer support helpdesk, and to equip the helpdesk with advanced troubleshooting tools. Its key functions are:

- Providing helpdesk applications for service providers
- Ensuring visibility of key network information, including the service's status at the end user's premises
- Providing case/end user log with interaction towards BECS and SMT

SSP, Service Selection Portal – Services on demand

SSP is an end-user portal that allows self-provisioning of services in real time. Through the easy-to-use interface, service consumption tends to increase, while lowering the cost of service provisioning. Its key functions include:

- Attractive and user-friendly interface designed for both PC and TV
- The option to select, activate, change or de-activate services in real time from PC or TV
- Selection of services from multiple service providers
- On-demand, automated provisioning of the services

2.2 Advanced Services Router

The Advanced Services Routers (ASR) are the policy enforcement points in the network. Depending on the network topology required and the nature of end-user needs, the location of the ASR is flexible. The network builder decides whether to place it close to, or far from, the end users. The ASRs are controlled by BECS, and all software updates and configuration profiles are automatically provisioned and supervised through this connection.

All ASRs run the iBOS software, which is designed to control services, rather than access lines. This makes it possible to separate the services from the access line and treat each service individually (in terms of bandwidth, QoS, security and priority). Such granular service treatment allows sophisticated service differentiation and stimulates the innovation of new services, both having positive effects on the ARPU.

This is especially important in an open-access (wholesale) environment, where each service from all of the multiple service providers can be defined with different parameters.

iBOS

iBOS is the software of all ASRs. Key features include:

- Provides bandwidth management per service
- Provides Quality of Service per service
- Provides user and content integrity
- Advanced multicast capabilities, including restricted access to TV channels
- Open-access (wholesale) capabilities per service
- Advanced security filters (Access Control Lists, ACL)
- Support for both direct access and aggregation (indirect access)
- Time and volume awareness

ASR 4000 family

The ASR 4000 family is purpose-built for point-to-point FTTH access. Key features include:

- Up to 24 fast Ethernet end-user ports and 2 Gigabit Ethernet uplinks
- Support for multiple fiber types: multi mode (MM), single mode (SM), single mode Bi-directional and 10/100 TX
- Hardened version for non-controlled environments
- Policy enforcement point for BECS decisions
- Fully automated by BECS
- BECS-controlled software upgrades and configuration changes
- Powered by iBOS software
- Redundant and field-replaceable external power supplies (AC)

ASR 5000 family

The ASR 5000 family is the next generation NPU–based broadband router, purpose-built for high-capacity point-to-point FTTH access and for fast Ethernet broadband aggregation. Key features include:

- Unmatched performance through an NPU-based architecture offering unlimited capabilities of delivering advanced and bandwidth-heavy services today and in the future
- Flexible and future proof system architecture through Software Defined Forwarding, allowing support for future requirements and demands of functions, features, standards, protocols or killer applications.
- 24 fast Ethernet end-user ports and 2 Gigabit Ethernet uplinks
- Support for multiple fiber types: single mode (SM), single mode Bi-directional and 10/100 TX
- Policy enforcement point for BECS decisions
- Fully automated by BECS
- BECS-controlled software upgrades and configuration changes
- Powered by iBOS software
- AC and DC power options
- Redundant DC power
- Easy on-site handling and maintenance

ASR 10000 family

The ASR 10000 family is purpose-built for broadband aggregation. It is positioned to aggregate xDSL, FTTx /PON, Ethernet over coax, and wireless devices. Key features include:

- 24 10/100/1000 TX ports
- 8 Gigabit Ethernet uplink (requires SFPs)
- Policy enforcement point for BECS decisions
- Fully automated by BECS
- BECS-controlled software upgrades and configuration changes
- Powered by iBOS software
- Redundant DC power

2.3 Central automation and distributed intelligence

The combination of a central software platform and distributed ASRs is the base for PacketFront's automated broadband solution. In combination with product excellence, this architecture addresses both key technical and key business issues.

3 Challenge – How to increase revenue?

One of the top priorities for all broadband operators today is to increase the total service revenue. The focus is on how to increase the customer base and how to increase the average revenue per user (ARPU).

Selling *more* to the *existing* customer base. Selling to *new* customers. Avoiding customers buying from the competitors *(reducing churn)*. These are all ways of increasing revenue. Extending the variety of services offered broadens the service portfolio, and tends to make each broadband consumer spend more on broadband services. In other words the service-take-rate is increased. With more services to choose from, end users' total consumption of services from the broadband connection tends to rise. And, with more services to choose from, the chances of attracting new customer groups increase too, as the greater variety of services satisfies the needs of a broader section of the population, both demographically and geographically.

PacketFront's broadband solution addresses this in the open-access network offer. The architecture of the solution separates network infrastructure from service development. This allows network owners to invite third-party service providers to distribute services over the shared network infrastructure, e.g. a fiber access network. A shared risk/revenue agreement regulates how risks and revenues are divided between the two parties. Network owners focus on the infrastructure whereas service providers focus on their core business – developing attractive services to offer. Customer satisfaction is improved and churn rate is lowered through the enhancement of existing services, either by improving QoS, shortening resolution time of service disruptions, or increasing the reliability of service delivery, etc.

So how does the PacketFront solution lead to service innovation, service differentiation and enhanced quality of existing services? PacketFront's solution is designed to manage services – not connections or ports on a broadband router. PacketFront's solution is designed to treat each single service offered by each service provider separately.

Ease of use is another key feature if end users are to increase their broadband consumption. Through the Service Selection Portal (SSP), end users can self-provision any service from any service provider of their choice – in real time. No waiting at the customer support desks. And the self-provisioning is done either from a PC or from the TV.

In a fast-changing industry, operators looking for long-term profitability must be extremely flexible in how they package, price, market and sell services, both today and in the future. Not only is the industry changing rapidly, each market and each operator is different. This has stimulated PacketFront into developing a solution that gives operators the flexibility to create their own service offerings. PacketFront's view is that technology should not create limitations that prevent the operator from producing and/or provisioning any type of service.

A network owner and/or a service provider must address the following areas, in order to maximize revenue:

- Service differentiation
- Pricing and packaging strategies
- Ease of use
- Services on demand
- Security

3.1 Differentiated data and Internet services

PacketFront's automated broadband solution offers a number of features that are crucial for service creation and deployment, and management of data and Internet services in broadband networks.

3.1.1 Bandwidth management and other means of managing data and Internet services

Each service offered on the access line requires individual treatment in order to:

a) reach the end user with high quality
b) reach the end user securely
c) reach the end user within an acceptable timeframe, and
d) secure that it is prioritized correctly; for example that a phone conversation or movie download is not interrupted.

By being able to set parameters like a) QoS, b) security, c) bandwidth, and d) priority on a per service basis, the flexibility of managing each service is unlimited and the total bandwidth to the home premises can be utilized more efficient. Services are easily defined in BECS, and the capability mentioned above makes service differentiation an easy task, as well as the introduction of new services.

In BECS, QoS, security, bandwidth and priority are managed by the service definitions. For instance, the service definition can be set so that data is provided at speeds ranging from slightly above that of a dial-up modem to a full duplex 100 Mbit/s fast Ethernet, depending on the access technology. The parameters can also be limited for each service type. For example, this makes it possible to assign different bandwidths to each end-user client. A PC with Internet access can be allowed 2 Mbit/s, while an IP-based digital TV service can run at 8 Mbit/s on the same access line.

Finally, since one end user is able to subscribe to many different services, he/she can have different bandwidths for the same end-user PC depending on the destination (also known as "destination-based services"). In the example below, the PC can be assigned to an ASP service with a fileserver for data storage. This service allows the PC to use 10 Mbit/s – with the 2 Mbit/s Internet access limit still in place.

Internet access does not have to be one single service. The Internet can be divided into zones, and the same PC can have different services with different bandwidth limits to separate zones within the Internet. Traffic to a domestic site may, for instance, be cheaper than traffic to a foreign destination in another part of the world. Furthermore, the differentiation of services may allow end users access to local services even though they do not subscribe to Internet access.

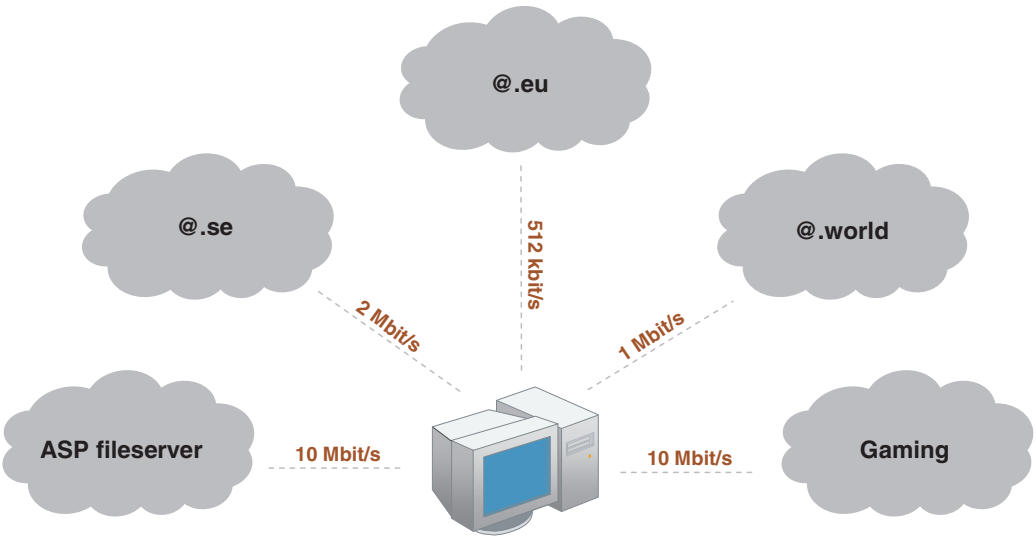

Illustration: PacketFront's solution allows an end user to receive different bandwidths (and different pricing) for different Internet services, depending on the destination.

3.2 Differentiated IPTV and video services

As in above chapter discussing differentiated data and Internet services, PacketFront's broadband solution offers immense flexibility in giving individual treatment to services such as IPTV and Video-On-Demand.

3.2.1 TV channels on demand and a-la-carte packaging

In PacketFront's solution, the network manages access to content, presenting the option of allowing end users to order, cancel or change their channel subscription themselves. Through the Service Selection Portal (SSP), the end users can select the TV channels of their choice. The TV channel will then be provisioned and activated automatically via the ASR. Costs are minimal, even when customers select individual channels or pay-per-view. This opens up the opportunity to offer channels "à-la-carte" instead of bundling channels or mixing the two models.

3.2.2 End-user based content control

Through the management per service capability, commercials can be tailor-made to match different kinds of end-user demography. The network is able to send different sets of commercials to different end users. Different blocking strategies can also be applied so that, for example, violent or other adult-oriented content is inaccessible during certain hours of the day, or cannot be accessed without a password.

3.3 Service pricing strategies – usage, time or flat rate?

The flexibility of PacketFront's solution allows many types of pricing strategies. Information is collected from the ASRs about how much data has been transmitted, who transmitted it, to where, and the period during which it was transmitted. BECS then provides this information, and it can easily be transmitted to external billing systems serving as charging data records. Services can be charged on volume usage, time usage, flat rate or combinations thereof.

3.4 Easy-to-use services-on-demand

In general, the use of technologies and services increase when end users can manage the technology without any difficulty. Through the Service Selection Portal (SSP) the end users can easily subscribe to and provision the services in real time.

3.4.1 Easy-to-use bandwidth-on-demand

End users occasionally need more bandwidth than they normally use, for a limited time period. PacketFront's solution provides two flexible ways of meeting this need. The first way is the "bandwidth-on-demand" option, where end users are able to temporarily upgrade their bandwidth for a certain period. The second option allows end users to subscribe to a service that guarantees a certain bandwidth while still allowing the use of more bandwidth if it is available. Naturally, the second option is less reliable for the end user than the first, but the service can be sold at a much lower price.

Common for both of the above options is that the end users themselves can manage the bandwidth on demand, and no manual intervention is required. Ease of use will stimulate the usage of services, increase customer satisfaction and limit the churn.

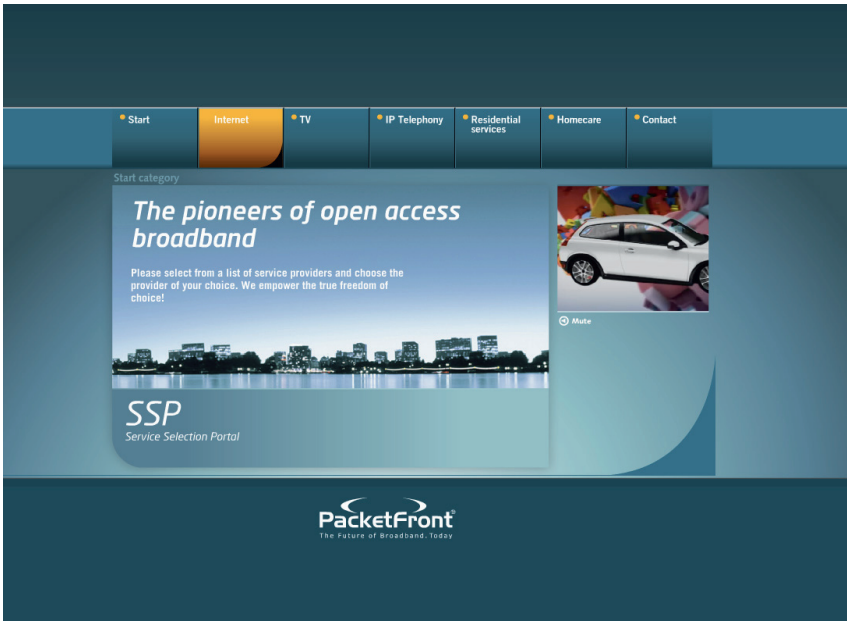

Illustration: A screenshot from the Service Selection Portal (SSP). From SSP end users can easily register to and activate services themselves in real time, for instance activate a bandwidth-on-demand service.

3.4.2 Enhanced channel zapping

All digital networks have issues with the time taken to "zap" from one channel to another. This time is minimal in PacketFront's automated broadband solution, which offers an almost identical feel to that of an analogue TV network.

3.5 Security options

There are a number of options available to maximize security in the network. For example, most users lack the necessary knowledge to manage all security issues in their computers, and so they must depend on the network to take care of most of the threats. However, some users want to manage these issues themselves and would actually consider this a limitation. The PacketFront solution enables different security options for different users.

3.5.1 Restricted multicast access

In PacketFront's solution, the network controls access to the content. This ensures that end users will never be able to view a TV channel that they have not paid for. The solution complements, or even eliminates, the need for smartcard readers in set-top boxes. Furthermore, all traffic is traceable and can be monitored. As a result, extraordinary usage patterns are easily detected and managed.

4 Challenge – How to control costs?

The typical high-risk costs in a broadband business case occur in two areas: predicting the operational costs (OPEX), and managing the system costs (CAPEX).

The following operational costs are hard to predict:

- The amount of man-hours spent on network upgrades – how many system engineers are required?
- The number of times end users will contact the customer support centre, and the time spent on troubleshooting different faults.
- The estimated time needed for provisioning a service upgrade from 1 Mbps to 10 Mbps, or for adding another TV channel, for one end user.
- The number of man-hours spent on changing the configuration setting for a service with 100,000 end users.

The list above can be extended with over a hundred detailed operational questions that all have an impact on the business case of running a complex triple-play network.

The traditional response is to develop central in-house systems to manage some of the operational tasks. This is a difficult and costly approach.

Based on its own experience, PacketFront has designed the automated broadband solution to address both OPEX and CAPEX issues.

4.1 Low operating costs – BECS as the engine for automation

Operating costs are hard to predict, and are unfortunately often underestimated, reducing profitability for network owners. When designing the automated broadband solution, PacketFront has focused on automating tasks that, by nature, are repetitive and consume large amounts of man-hours. Automating these tasks will dramatically lower operating costs.

Automated key functions:

- Dynamic configuration changes
- Software verification and upgrades
- Provisioning of new services
- Provisioning of service changes
- Mass deployment
- End user self-registration
- End user service selection

PacketFront's broadband solution provides automated configuration of network elements. BECS stores all configurations and manages all configuration changes in the network. Managing multiple services, combined with many thousands of end users, usually requires a lot of manual input. Thanks to BECS, PacketFront's solution manages multiple services in an automated manner, and the manual work required is reduced to an absolute minimum.

Mass deployment of network elements is facilitated through automation. Installation of the ASRs does not require high-cost network engineers; you simply connect the fiber, and the ASR will automatically receive the correct software version and configuration files upon connecting to the network. The same procedure applies in the case of replacing a unit.

Services are registered in BECS and a service configuration profile is automatically distributed through the ASR to the end user's client, with no manual intervention involved.

Self-registration and self-provisioning are also supported by means of automation. End users can subscribe to a service, and obtain immediate access to it without any manual interaction, avoiding a wait at the customer support help desk.

Finally, a FTTH broadband network has a long life cycle. Providing a 100Mbit/s broadband connection to the end user, as in PacketFront's solution, is sufficient in terms of carrying almost any broadband service of the future.

With regard to future proof network deployments, providing a Gigabit connection to the home offers the desired bandwidth to those users requesting and paying for it, e.g. business users, power users, etc. and meet end-user demands for quite some time to come.

4.2 Low capital investment - out-of-the-box solution

One of the most underestimated challenges in a CAPEX budget for broadband operations is the system side. It is not only complex but also very costly. It is common for provisioning/OSS/BSS projects to run heavily over budget due to an endless need for upgrades and changes.

One key problem is that many software tools are extremely specialized. A large array of these tools is required in a broadband network in order to achieve a sustainable platform for automation, control and provisioning. This often results in a conglomerate of different software systems, often from different vendors. Dependences between the systems are usually created with continuous upgrades and integration work as a result. The network owner becomes the integrator/developer of a solution that needs continuous maintenance, development and support.

A key objective for PacketFront is to develop a more complete and pre-integrated solution that works "out-of-the-box". This reduces the cost dramatically, and reduces the time to become operational from several quarters, or even years, to less than one week.

Existing third-party systems, e.g. billing or Customer Relation Management (CRM) systems, are easily integrated through the BECS Mediation Point.

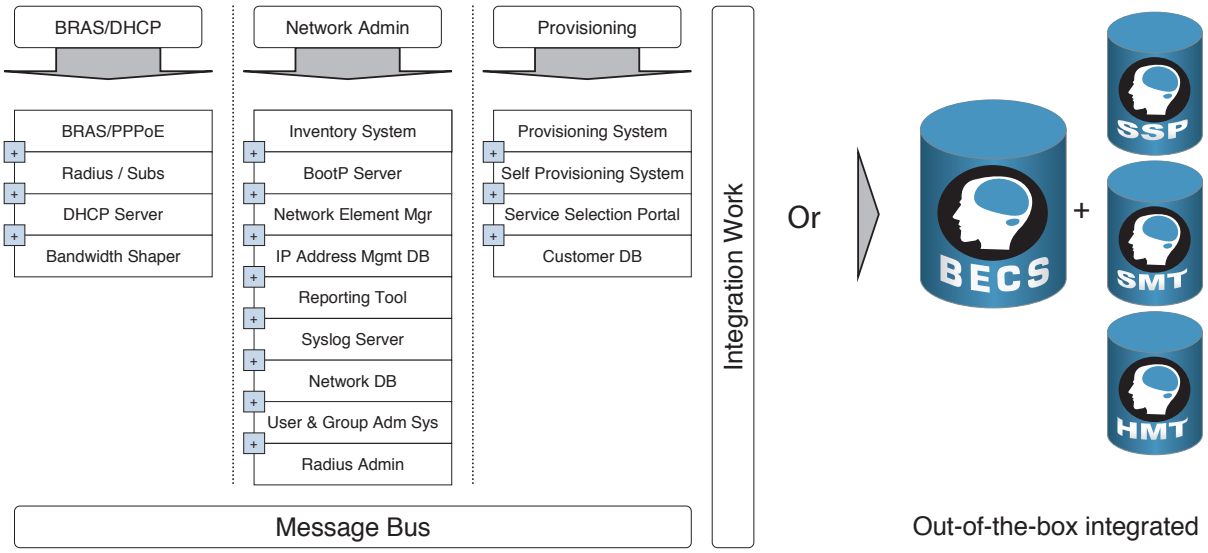

Illustration: Common systems for network automation, control and provisioning.

5 Challenge – Which business model to choose?

5.1 New business models – open access per service

Broadband deployments often require major investments in passive and/or active equipment, as well as in central systems. Furthermore, the broadband network is worth nothing without the services; these too require investments, both in terms of financial resources and human expertise, in order to develop and be maintained. This resembles the situation in the world of UMTS/3G, and we are seeing a trend emerge in which operators share infrastructure, and where ownership of the infrastructure is separated from service development. A business model that helps third-party service providers to distribute services over a shared infrastructure is the open-access business model. The risks and revenues are shared and multiple-service providers are offering their services over the network owner's infrastructure.

Different flavors of the model can be applied; for instance, a network owner may want to offer its own Internet and/or IP telephony services, while deciding to invite a third-party provider for TV or Video on Demand services. In a scenario like the open-access scenario, it is imperative that the network supports multiple service providers while keeping administration to a minimum.

By dividing the different roles and responsibilities between different players in the value chain, it becomes possible to solve a familiar "Catch 22" issue, i.e. profitability. The network owners have not been able to make the business case profitable, partly because they have lacked the resources or skills required to develop all services themselves. On the other hand, the service providers have not had the resources or expertise required to build a network infrastructure capable of carrying their services to the end users.

As a result, a clear trend in the industry is towards open and independent network architectures. This places major demands on the network infrastructure. PacketFront's automated broadband solution is designed to support this type of business model.

In many markets, fiber-based broadband networks (FTTH, FTTP, etc.) are state-subsidized, often with a requirement that the network must be open for multiple, and also competing, service providers. Regulatory authorities favor open infrastructures, and it is very likely that they will also regulate the last-mile fiber. Preparing for possible regulatory requirements is therefore recommended when considering broadband investments.

Regardless of the current situation, the conditions for network owners, operators and service providers will change over time, due to changes in regulations and policies, financial and technical limitations, and end-user demands. The flexibility that PacketFront's open-access solution provides is vital in order to enable strategic decisions in the future, and to avoid being locked in by legacy infrastructure.

The flexibility in the business model includes the ability to retail or wholesale the access line, or combine the two models. PacketFront's solution supports open access per service, an advanced version of the open-access model, and a key factor for a successful open-access network. As mentioned in earlier sections in this paper (see section 3.1.1), BECS and the ASR series include the capability to manage each single service from each service provider individually.

Key opportunities with PacketFront's automated broadband solution:

- *Multiple service providers* offering their services to the end users. This gives end users the freedom to choose any service provider of their choice and avoids the lock-in effects seen in closed networks.
- *Different service providers per client (set-top box, PC or IP phone)*. This makes it possible to have one service provider for Internet services, another for telephony services, a third for IPTV services, etc. It also makes it possible to have different Internet providers for different PCs within the household.
- *One client can have different access speeds for two or more services*. The service provider for Internet services and ASP services can be different, even if the same PC is used.

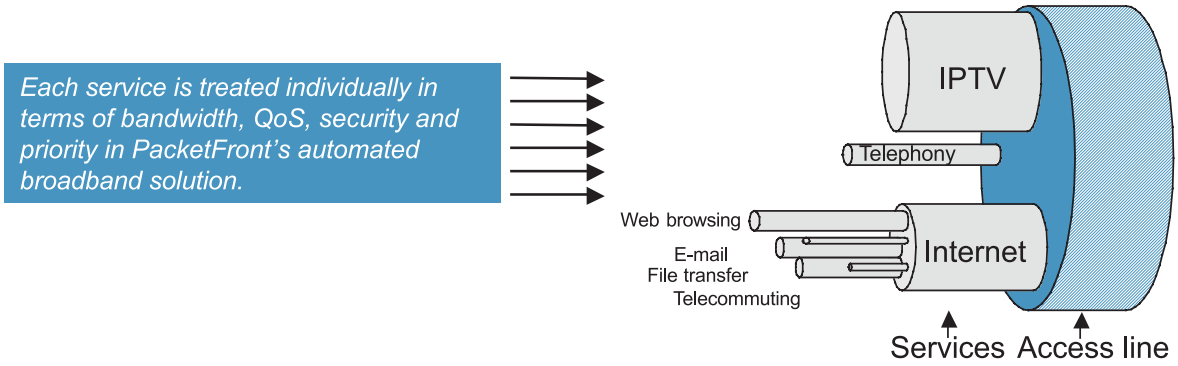

Illustration: Treatment per service is key enabler for a successful open-access network.

5.2 New business roles

Modern players in the market must aim to allow the technology to enable all possible business models, and to ensure that an open model can be offered. New business models are evolving alongside the opportunities afforded by new technology. In these new business models, the parties involved are divided up in terms of roles, responsibilities, and investment commitments.

In an open-access network, the typical business model has four main parties: the property owner, the passive infrastructure owner, the active infrastructure owner, and the service provider.

The owner of the property – i.e. housing co-operatives, residential tenants, or owners of private homes – often makes the in-property investment or shares this investment with the passive network owner. However, the property owner commonly conducts both the last-mile and the in-property investments.

The passive infrastructure owner – often a city, municipality, or utility company – has invested in a municipal fiber network and is willing to invest in the last mile. It has a 20-year horizon on the investment and has access to low-risk financing. Instead of a fixed rental fee, the fiber is offered using a revenue-sharing model in which the passive network owner receives a percentage of the service fees, or a fixed price per end user and service.

The active infrastructure owner is generally an independent company that does not offer any services of its own. This company is also referred to as the communication operator – it builds the independent IP network and ensures that multiple service providers offer their services over their network. This party also works with a revenue-sharing model, but has no end-user relationship. It simply takes on the investments associated with developing and operating the IP network. The key advantage for the infrastructure owner is the opportunity to offer wholesale of the different services independently, instead of wholesale only per access line. In this way, the infrastructure owner earns more for each service to which the end users subscribe.

Finally, *service providers* are responsible for offering, pricing, and marketing services to the end users. They have an end-user relationship, including the responsibility for billing. Service providers cover the investment costs for developing and operating all services.

This is the model of choice for most parties, but deviations are common. Sometimes, one player aims to play more than one role (or all roles) in the above model. However, all parties must accept a revenue-sharing model, regardless of the model selected. In this way, sharing risks and rewards is balanced and no party is overexposed.

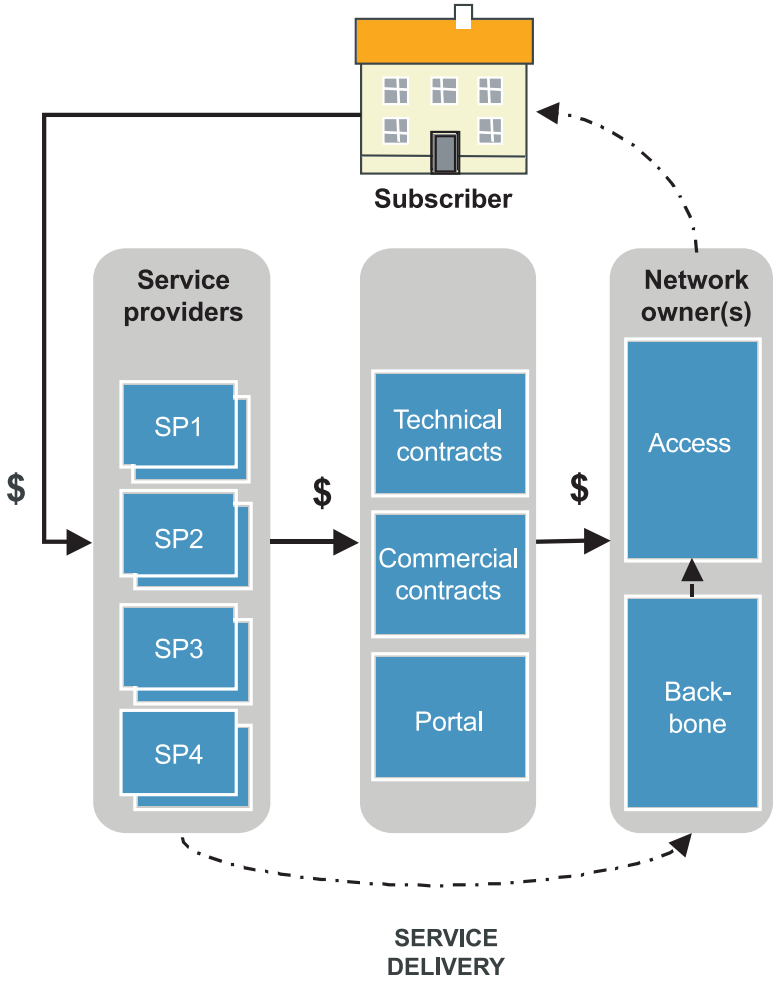

Illustration: The players involved in an open-access environment and how they interact with each other.

6 Some final words

PacketFront's automated broadband solution is designed for the cost-efficient delivery of triple-play services in an open-access environment. Control of the services is the key to high revenue. This control may be the difference between success and failure in a business case. PacketFront's automated broadband solution provides:

- Treatment-per-service for maximum flexibility in service differentiation, eventually resulting in increased revenue.
- A high level of automation and a unique set of technical features, keeping the operational and capital investments low.
- An open-access infrastructure that offers flexibility in the choice of business models and avoids lock-in effects for the end users.

The challenges associated with OPEX, CAPEX, and the complexity in deploying a triple-play network, are all addressed in PacketFront's solution. The solution is based on experiences in broadband deployments, and is deployed in some of the world's most advanced broadband networks.

PacketFront Systems AB - June 2007

For more information go to:
www.packetfront.com

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