



*The successful  
broadband operator*

**Automation and control in a single architecture  
– independent of access technology**



## **New:** *ADSL powered by BECS™ – Triple-Play over ADSL is now a reality*

- All-IP DSLAM
- Non-blocking/future-proof architecture
- True Triple-Play
- 26 mbps ADSL2+
- Automated control and provisioning

The technology advances that have taken place within ADSL, including the introduction of ADSL2 and ADSL2+, have led to largely increased bandwidth capacity. As a result, PacketFront has developed a unique solution for delivering Triple-Play services over copper phone lines. This is the first ADSL solution using all-IP and no BRAS, without compromising service control.

PacketFront's ADSL solution is built with the same architecture as its FTTH solution. The new solution adds high-performing, non-blocking IP DSLAMs to PacketFront's portfolio, and gives the operators an already proven architecture for Triple-Play services over ADSL.

### *Next-generation network architecture for cutting-edge broadband operators*

The all-IP DSL solution addresses the following type of customers:

- CLECs with the objective to build better services more cost-efficiently than their main competitors – the ILECs/PTTs.
- Aggressive ILECs/PTTs sharing the vision of an all-IP, high-capacity network, wishing to upgrade existing, obsolete equipment.
- Utility companies wishing to mix fibre/VDSL/ADSL
- Municipalities/Regional networks with (or without) open access ambitions, wishing to build a True Broadband Network as an increased service to the citizens and companies in the area.

The customers that choose to partner with PacketFront have a great deal in common. They are aggressive, innovative and open-minded operators who aim to build a qualitative network for the services of today, while also being prepared for the services of tomorrow.

*"CMON is building a regional Open Access network in British Columbia, Canada, with the objective to cover up to 75,000 households and businesses in over 75 rural communities. Being a not-for-profit organisation with limited staff, it was extremely important for us to get a complete solution - not simply a boxful of equipment, but a roomful of real-world expertise to help us deploy it successfully as well. The way in which PacketFront enables open access is very important to us as it allows us to drive competition into our small rural markets, utilize a wide variety of last-mile technologies, and develop innovative business models to ensure the sustainability of our initiative. Our "last-mile" networks will include fibre, VDSL, ADSL/ADSL2+, and possibly wireless depending on density, cost and speed of deployment. Partnering with PacketFront gives us the possibility to have complete flexibility while using one common architecture."*

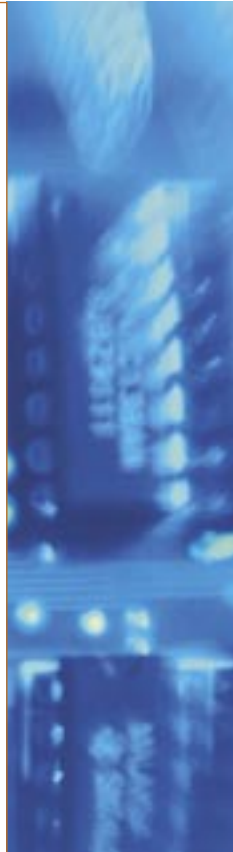
*Matt Wenger, President CMON/Canada*

*"We have been running the PacketFront FTTH solution for over one year, and have experienced the value of the BECS™/ASR architecture. We are very satisfied with the automation their architecture provides, and the abilities to run true triple-play services over the network. As we decided to add ADSL services, we turned to PacketFront. We wanted a cost-efficient IP DSLAM, with triple-play abilities and a future-proof architecture behind it."*

*Eric Åkerlund, IT manager, VEAB, Power utility/  
Sweden*

*"In general, the DSLAM is only as valuable as the gear backing it up"*

*Lightreading Technology Research report,  
September 2003.*



Historically, there have been a number of challenges in providing TV, Telephony and Internet services over an ADSL connection. PacketFront is now offering a robust

technology, thereby addressing these issues for ADSL operators as well. This table outlines some of these challenges and the advantages with the PacketFront solution.

Challenge	Typical solution	PacketFront solution	Benefits
Open Access/Wholesale capabilities.	BRAS features, often with support for wholesale of access port only.	Separation between access and services. Wholesale possible for all service categories.	Increased revenue capabilities for network owner. Increased freedom of choice for customers. Meets future requirements of regulatory authorities.
Provisioning of services.	Engineering department with manual interaction. Time consuming and long lead time.	On demand. Automatically managed by the BECS™ system. Self provisioning by the user.	Reduces the operational costs. Empowers the customer to try new services, which in turn drives penetration and ARPU.
Authentication of users.	PPPoA/PPPoE BRAS solution adds complexity, investment and operational cost. Another bottleneck in the network.	Authentication without tunneling servers. Every IP packet is marked for bullet-proof authentication and traceability.	No bottlenecks; one component less to integrate in the network. Lower investment and operational costs.
Multi-layer architecture adds complexity and increased investment.	ATM based solution over SDH/Sonet with IP on top of it.	All-IP based.	Lower investment, lower complexity, lower operational costs.
Multi-cast features that enable commercial TV services.	Complex in mapping ATM VC to IP Multicast groups; limited support for additional features.	Addresses key requirements on IP multicast, security of content, access control of TV channels, integrity of content, etc.	Possible to offer commercial TV services with control over content and user behaviour.
Quality of service to ensure quality of Telephony and TV services.	Complex environment with different PVCs per connection.	Each service is treated individually on the IP layer with individual QoS, bandwidth and filter parameters, etc. Controlled dynamically by BECS™.	QoS is dynamically deployed and configured automatically through the network without engineering involvement. Dramatically reduced operational cost and decreased risk of manual mistakes.
Many customers share the uplink capacity, which in turn creates bottlenecks.	Up to 500 users on a 622 mbps or 1 GE uplink gives high overbooking ratio and growth issues.	Non-blocking architecture with more uplink capacity than the aggregated user traffic.	Gives capacity needed for commercial TV and Video services over ADSL. Future proof.
Capacity on access links due to limitations in technology.	0.5–8 mbps downstream based on ADSL standard, ambition of operator and distance.	Support for ADSL, ADSL2, ADSL2+ with up to 26 mbps downstream. Softmodem configurable per port.	More bandwidth to provide TV/video services. Separation between access speed and services speed in IP architecture.
Density of lines/rack space required.	ATM DSLAM chassis, BRAS equipment, ATM equipment all take up large amount of rack space.	All-IP based solutions typically consist of fewer types of equipment and hence less rack space.	Lower cost of renting rack space from ILECs/PTTs.