



# *COAX Multi-Service Networks*

*How to protect and expand market share  
by capitalizing on existing infrastructure*



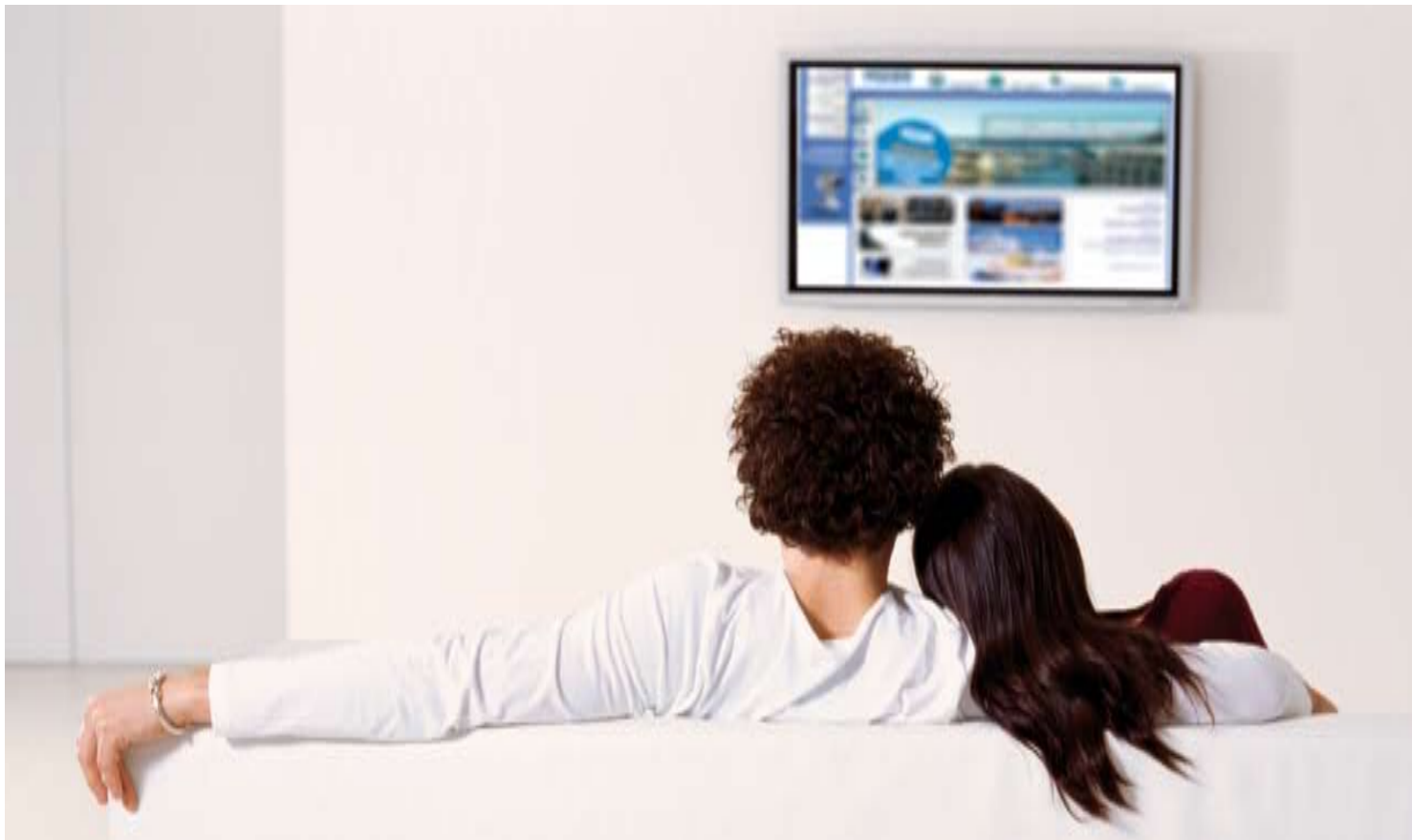
## *Changing landscape of competition*

CATV providers are in various stages of transformation. Some still only deliver analog TV content over a COAX network and others have upgraded their product offering to include internet and telephony. But still they are facing new competition.

Incumbents are upgrading their existing copper networks to deliver new high-speed broadband services using technologies such as VDSL and many incumbents are in the position to launch triple-play services. That means that delivering TV content is no longer the monopoly of COAX networks and therefore these networks will face increased competition on their existing customer base. As a result, most CATV

operators are forced to deliver new and enhanced services, based on IP-enabled platforms often over Docsis.

There is a strong consensus in the market that full fiber networks (FTTH) will replace the existing copper and COAX infrastructure in the future. When new networks are deployed, by both incumbents and cable companies, fiber is the preferred choice. However, it is unlikely that this will happen overnight on a large scale due to the fact that transition to a full-fiber network requires a significant investment. The challenge for CATV operators is to extend the value of the existing network and to protect their customer base during this transformation period in a cost-effective way.



**Today's CATV operators need to master these three challenges:**

- 1 Extend the value of existing infrastructure**
- 2 Cost-effective operation of multiple services**
- 3 Coexistence of multiple access platforms**

**Challenge 1  
Extend the value of exiting infrastructure**

Most CATV operators already have a sizeable HFC network in operation. Fiber is mostly deployed to street cabinets or local exchanges (POPs). These networks often run Docsis, standards that are not very applicable in either multi-service or multi-access environments, due to:

- Being too costly to add and operate new services
- Not having a workable solutions for alternative access platforms

A key challenge for CATV operators will be to migrate from Docsis in a way that facilitates maximum leverage on the current passive network (fiber and COAX).

**Challenge 2  
Cost-effective operation of multiple services**

To keep existing and gain new customers CATV operators will be forced by the incumbents to provide services beyond triple-play. The introduction of new services is not merely a question of capacity but also how to provide multiple-services in a cost-efficient way.

- High OPEX has been a business case killer for many FTTH pioneers and is currently the #1 challenge for many ILECS
- Cost components such as subscriber management, service management and element management have to be under control

Multiple services typically result in an exponential growth in required functionality, complexity (integration) and transaction volume and there is a real risk that the corresponding growth in CAPEX and OPEX will be exponential as well.

**Challenge 3  
Coexistence of multiple access platforms**

The resistance of CATV operators to deploy fiber networks is the challenge of multiple access technologies. The PacketFront solution enables the coexistence of fiber connections adjacent to your COAX network.

The PacketFront solution:

- Decreases BSS/OSS costs
- Decreases support costs
- Enables service provisioning independently of access technologies

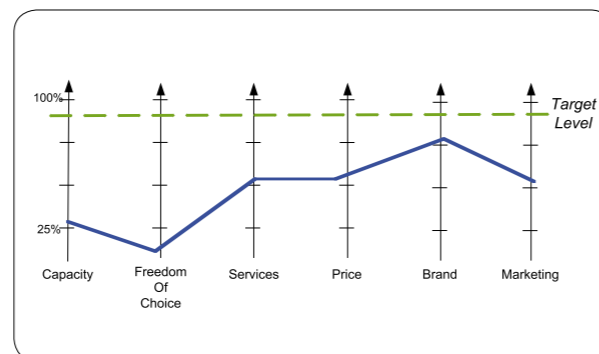
Unless properly addressed, per unit OPEX will continue to grow with each additional access platform and potentially this will serve to neutralize any CAPEX advantage.

# Challenges for transformation

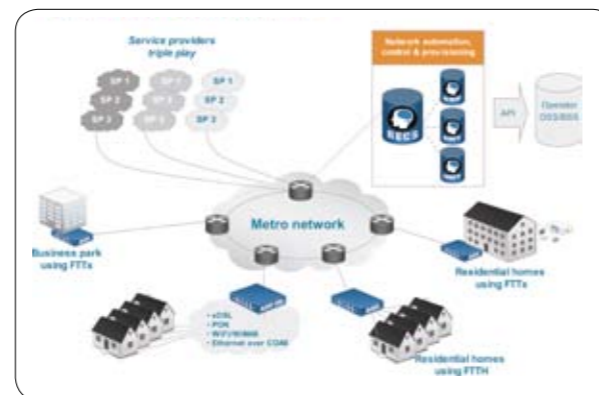
The need to compete with new ADSL2+/VDSL-based offerings is not merely a question of providing more bandwidth. The transformation of HFC networks is also about solving the challenge of delivering new and enhanced services at low operational cost. This creates a requirement for an advanced IP solution which can act as an enabler for new and innovative IP services as the network should never be an inhibitor for service innovation and development.

PacketFront does not believe that Docsis can handle today's and tomorrow's requirements. We think that Ethernet over COAX is a viable and more beneficial option for CATV providers. The PacketFront solution takes advantage of open access networks, i.e. having multiple service providers to increase your value proposition towards your customers. It also gives you an automated process for service delivery for maintaining low operational expenditures.

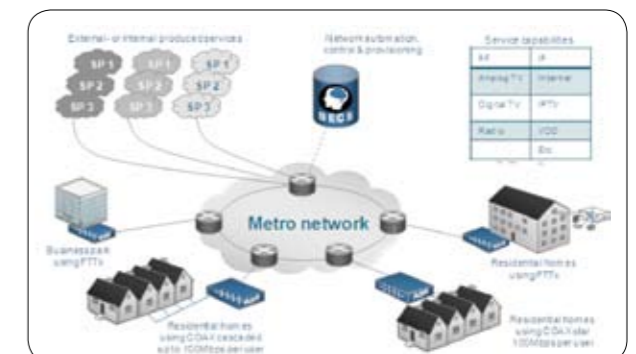
In new residential areas, the preferred access technology will be fiber. The resistance of CATV operators to deploy fiber networks is the challenge of supporting multiple access technologies. The PacketFront solution enables the coexistence of newly-built fiber connections adjacent to your COAX network. Different access technologies are easily managed by the PacketFront solution.



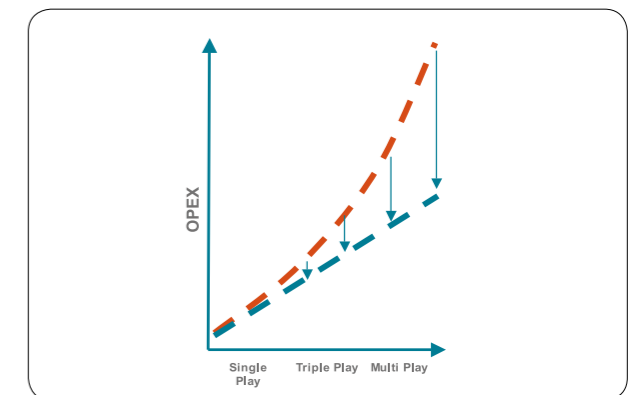
Maximum customer attraction



FTTH and COAX networks



FTTH and COAX networks – multiple access technologies



Cost-effective operations

## The solution: 100 MBits per user in an existing network

Today, PacketFront is a world leader in developing, designing, and operating open-access fiber networks. Our customers include the largest and most successful municipal and utility fiber networks in the world, as well as property developers, carriers and cable companies. Several of these customers have won prestigious industry awards such as “Municipal Area Network of the Year”, “Most Advanced Fiber to the Premise Network”, “Best Use of Fiber to Bridge the Digital Divide”, and “FTTH and FTTB with Most Advanced IP Services”.

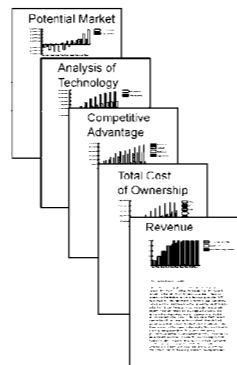
PacketFront can now also offer our solution to those CATV companies looking to upgrade their networks to more advanced IP-based services. Our Ethernet over COAX solution allows you to offer bandwidth increments up to 100 Mbits symmetrical traffic to your customers.

We have proven experience in how infrastructure providers can design and deploy an economically sound broadband network. The financial analysis is unique for each COAX operator. PacketFront has accumulated knowledge and fully fledged analytical tools in order to help you with your deployment and we recommend a five-step process to fully understand the financial undertaking and the Ethernet over COAX opportunity. Deploying the PacketFront solution, COAX operators use a single management platform to deliver, provision and manage multiple services over multiple access technologies. And allows your company to make a smooth transition towards delivering next generation services.

### The five step model:

- 1 **Estimating local potential for Ethernet over COAX**
- 2 **Economic analysis of infrastructure technology**
- 3 **Calculation of competitive advantage and levels of investment**
- 4 **Estimation of total cost of ownership including organization and operation**
- 5 **Revenue from services**

These steps lead to the total ROI and serve as a basis for a decision to invest.



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