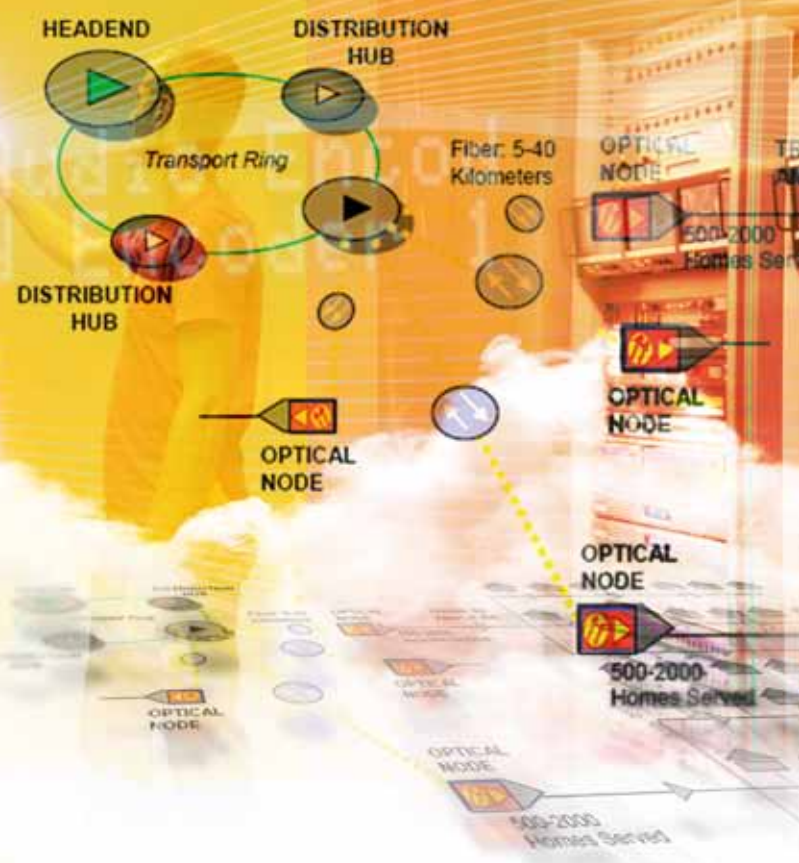


ProStream 1000  
ProStream - 2



## SOLUTIONS

*Implementing innovative video technology.*

## CHANGE

The demand for higher bandwidth efficiency to support higher quality or simply more content results in frequent releases of new products and features. Not only in the operator network, but also in the end-users home where the set-top box or other CPE devices play a leading role in the acceptance of digital television.

To secure innovation and improvement, IMPEQ Solutions acts as a technology mentor towards the Operator. The main goal is enabling short term network readiness for new services, and a longer term network evolution.

## WHAT DO WE DO NOW?

IMPEQ Solutions provides multi-vendor products and solutions for the HFC broadband, satellite, IPTV and broadcast industry including:

- Digital head-ends with HD, 3D, and multi-screen capabilities,
- Content contribution and video repurposing, on-demand, and content protection.
- Cable edge and access solutions including DOCSIS 3.0, switched digital video, IP over Cable/Direct to Edge, and HFC network upgrades.
- Network management and service analysis and remote monitoring.

*Rob Timmermans: C.E.O*



# IMPLEMENTING INNOVATIVE VIDEO TECHNOLOGY

IMPEQ Solutions has always been about technology adoption and integration in content delivery and network infrastructures. Moreover, IMPEQ has through the years gained a keen sense that helps determine which technology innovations are truly beneficial. We set out to leverage our experience and vendor relationships to assess and mitigate risk for individual Operators allowing them to maintain a competitive advantage.

## WHY IMPEQ SOLUTIONS?

Taken as a whole, IMPEQ is a multi-vendor partner focused on maximizing the inherent value of combining excellent people with the best technology, two key elements we believe are inseparable. IMPEQ Solutions experts are part of a company culture that has a leading track record of planning, and building and

running some of the most reliable and innovative video delivery networks in the world.

IMPEQ Consulting and IMPEQ Services provide the foundation and demand for high quality solutions and system integration. While IMPEQ Staffing provides up-to-date visibility in how Operators and Service Providers are changing operations and processes and what special challenges they face. Thanks to these inter-operable lines of business we provide our customers with current, tangible and executable solutions that is of great importance when innovating your operations.

Together with your own operational capability, we realize market leading solutions.

*trusted multi vendor relationships*



# KEY VALUE PROPOSITIONS

## EXPERIENCE & EXPERTISE

Our specialist solution designers offer invaluable experience and expertise, which is continually augmented by our field engineers and consultants. Trusted customer relationships, many of which have now entered their 15th year, and strong manufacturer partnerships help provide the foundation required for more innovative deployments such as multi-screen streaming, advanced security combining CAS and DRM, switched digital video/direct-to-edge and scalable IP based integrated monitoring and control. Naturally, our know-how spans all traditional delivery segments (satellite, cable, and terrestrial) and their convergence with emerging broadband networks.

- *Experience & Expertise*
- *Innovation*
- *Realize asset values*
- *Operational continuity*
- *Trust*
- *Core business focus*
- *High quality*
  - Leading end user experience
  - High availability

## INNOVATION

IMPEQ Solutions has always been about technology adoption and integration in content delivery and network infrastructures. Moreover, IMPEQ has through the years gained a keen sense that helps determine which technology innovations are truly beneficial. We deliver solutions that enable business goals to be met and deliver competitive advantage.

## REALIZE ASSET VALUES

Most businesses are either faced with wasteful ongoing capital expenditures for technology, implement solutions which aren't future proof and quickly require upgrading or don't get enough life out their equipment because of improper monitoring and servicing. IMPEQ Solutions integrates equipment to ensure maximum value is delivered from both your content assets and infrastructure.

## INCREASED REVENUE

Upgrading to advanced solutions and diversifying into new technology spaces enable new integrated video services and a heightened customer experience. Fundamentally providing progressive revenue streams and retaining hard-won existing customers.

## CONTINUITY

When you work with IMPEQ Solutions, you engage with dynamic talented individuals and contract with IMPEQ, a stable company, instead of individual vendors. Our customers are assured of receiving the highest quality solutions, but also the assurances of a long-term partner. If a project suddenly changes scope or new requirements demand structural changes to the equipment

our specialist solution designers remain in place to provide continuity decoupled from the supply chain. With IMPEQ Solutions it is possible to maintain knowledge and continuity while still benefiting from an optimal multi-vendor supply strategy.

## **MULTI-DIMENSIONAL COMPETENCIES**

In order to be an expert in this industry, an organization has to build experience in technology, operations and servicing aspects of video delivery and network infrastructure. IMPEQ Solutions leverages our multi-dimensional knowledge and relationships to offer the very best array of products and solutions.

## **TRUST**

The IMPEQ name is synonymous with high quality and dedication. Over many years we have developed partner relationships with operators and manufacturers alike based on trust. This understanding is the enabler of our unique multi-vendor solutions proposition. IMPEQ Solutions means continuous innovation and the highest dedication to a quality end user experience.

## **CORE BUSINESS FOCUS**

By taking on some of your most consuming infrastructure projects, and acting as a technology mentor, we can help stimulate an environment which allows you to focus on your primary activities. Your management teams are skilled in developing and monetizing the customer relationship. IMPEQ Solutions ensures that your managers are able to focus on their core business without distraction.

## **HIGH QUALITY**

As a network Operator you realize, that the quality of your system is only as good as the people who stand behind it. Our solutions and services are top-tier because of our top quality people and their result focused work methodologies. Above all, we provide solutions that have a sharp focus on delivering a high quality end user experience.

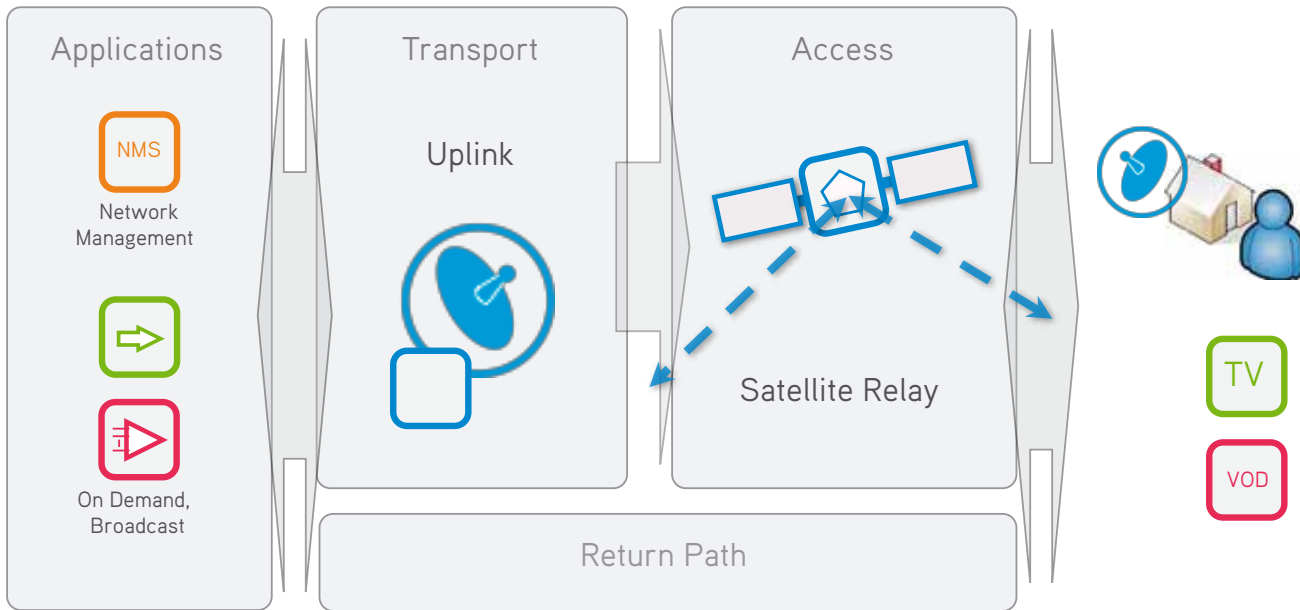
*Contribution Encoding, Head-end Solutions, EPG and Metadata, CAS Scheduling, Routing & Modular Infrastructure, Network Monitoring, Content Protection, Active Storage, Multi-screen, Rights Management, On-Demand, Transcoding and splicing, Video Servers, Content preparation, Ad-Insertion, Cable Edge - Direct-to-Edge, EdgeQAM, DOCSIS 3.0, Switched Digital Video, Cable Access - HFC, Network Planning & Design*



**SOLUTIONS**

*Implementing innovative video technology.*

# SATELLITE BROADCAST



## DIGITAL HEAD-ENDS

As encoding and multiplexing technology continues to evolve our close relationship with leading manufacturers means that we are among the first to access these developments. These advances can therefore be quickly deployed in our customers networks with the added assurance that our experts provide.

Conditional access (CA) is evident on nearly all digital systems. CA is naturally cloaked in secrecy and restrictions on information. IMPEQ has gained the trust of the CA vendors over many years and is uniquely able to implement the most complex of DVB simulcrypt and next generation card-less CA requirements.

No system of complexity is readily available from any single vendor without limitation or compromise in the functionality. IMPEQ and its partners recognise this and co-operate to provide the best-in-class components. The experience and expertise within IMPEQ provides the ability to advance the solution rapidly to meet new and every changing requirements.

## SATELLITE BROADCAST QUALITY

IMPEQ's staff have implemented and maintained some of the most complex Satellite uplinks since the inception of the DVB standards. We understand the subtleties in the encoder's settings to optimise quality and accurately transfer additional data.

The Satellite uplink is not complete without numerous ancillary components (text, data, downloads etc.). These components are woven together with advanced PSI and SI. These need to be understood and expertly implemented.

## CONDITIONAL ACCESS & DVB SIMULCRYPT

To date IMPEQ has implemented no fewer than 14 simultaneous CA types on a single operational multiplexer. Customers with any scale of DVB simulcrypt requirement repeatedly turn to IMPEQ for an assured implementation.

## THE NEW APPLICATIONS

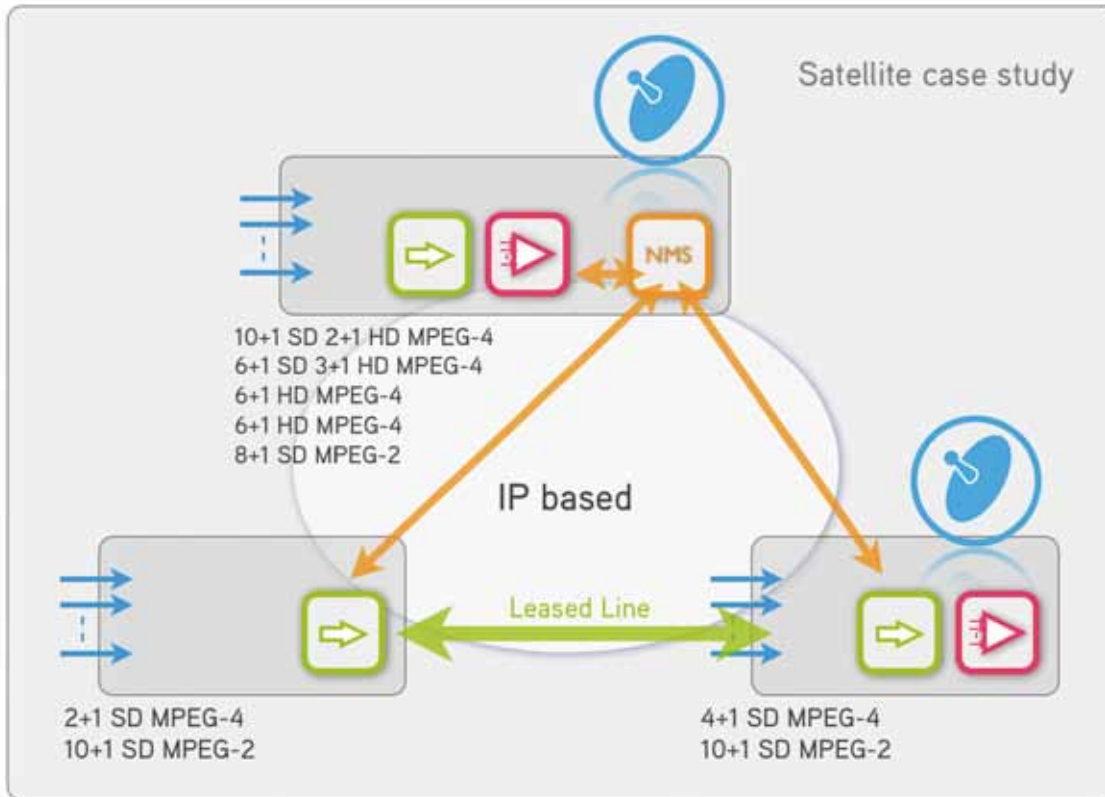
Some existing technologies are being utilised to optimise the transmission chain and further enhance the commercial offering to consumers. Multiplexer and CA scheduling can be used to sell-on or repurpose bandwidth at different times of the day. IMPEQ strives to allow our clients to maximise their uplink utilisation and revenue.

## RELIABILITY

A single satellite uplink can service more than 100 million homes. This demands exceptional skill and experience when working on the live system. At IMPEQ this is a primary consideration during the design, commissioning and maintenance phases of any project.

Equally the deployment of Set-top boxes in the platform or retail model is a major hurdle. Maintenance of an installed base of boxes is both complex and expensive. Our verification and validation services aim to minimize the risk in deploying set-top boxes.

## DISTRIBUTED STATMUX



## IP BASED HEAD-ENDS

As IP networks become more video friendly the opportunities for innovation in the digital head-end expand.

Regionalisation of content benefits considerably from distributed VBR encoding and reliable content switching. The expertise demanded of the operator and service provider shift from being broadcast centric to a hybrid of broadcast and IP networking.

IMPEQ has been working closely with its partners to ensure that the technology and services we deliver enable the operator to see IP network advances as a valuable opportunity. IMPEQ deployed the world's first statistical multiplexing encoding system distributed across international boundaries.

Some of the requirements we receive from our customer area not only complex but also geographically challenging. In the case described here we have implemented the system in three countries, all connected via a IP based network.

## REAL-LIFE REQUIREMENTS

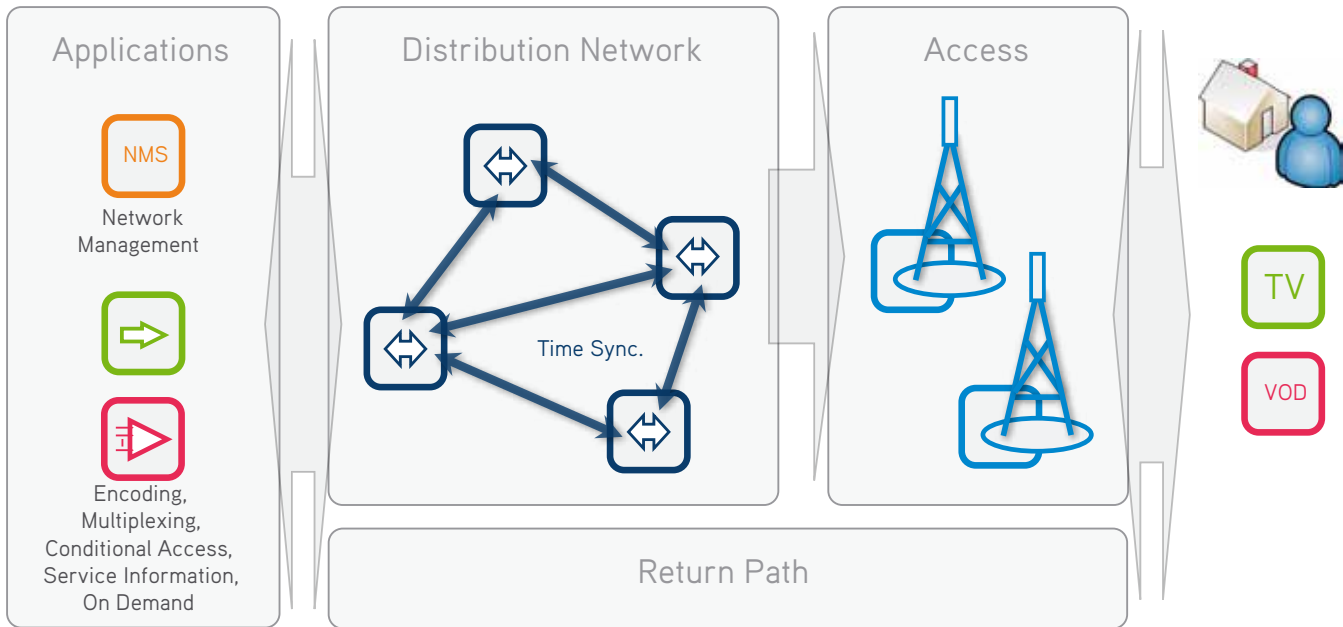
- *Combination of SD and HD services.*
- *High service availability, redundancy is required.*
- *Site locations in three countries.*
- *Central management.*
- *Flexibility to add and change services.*
- *Future proof solution.*
- *No quality compromises.*
- *24 x 7 service and support.*
- *Creative solutions design (multi-vendor).*



**SOLUTIONS**

Implementing innovative video technology.

# DIGITAL TERRESTRIAL TELEVISION



## EXPERIENCE FROM THE FIELD

Through experience from the field, our specialists and project teams have gained valuable knowledge in the practical engineering, installation, integration and operation of DTT SFN networks including DVB-T2 and ISDB-T.

## TERRESTRIAL NETWORK COMPONENTS

From your control room to set-top box, IMPEQ has partnerships with the leading suppliers in the industry to secure end-to-end solutions for terrestrial broadcast.

The solutions and services we offer consist of interchangeable elements and building blocks to enable a tailor-made approach towards your current and future needs. Our approach is pragmatic and focused on solutions. Together we enable your network for high quality terrestrial broadcast.



**SOLUTIONS**

*Implementing innovative video technology.*

## MULTI SCREEN

Many parts of the service delivery chain are rapidly converted into IP based solutions. Doing so enables an interesting mix of broadcast and personalised services.

### IP DELIVERY

IP delivery to the subscriber has always been the case for typical Telco driven IPTV deployments, but developments such as Docsis 3.0, Docsis bypass and hybrid set top boxes also bring full IP delivery to the various screens in the cable environment.

### HYBRID SOLUTIONS

Even for satellite or terrestrial applications, a hybrid IP/broadcast enables interactive and on-demand services where the service providers are faced with fierce competition from the IPTV or Cable MSOs.

### STREAMING CONTENT

Alongside this, the content owner may bypass the network operator as packaging entity by providing the content as streaming or progressive download service directly over the internet. This is now commonly known as over the top TV.

### NEW EXPECTATIONS

With multi-screen TV end-users are introduced to a new paradigm - Search, Find, Watch and Share.

Search - Should you have missed your favorite movie or soap episode, you can search the database archive to find that particular show. You'll never miss your favourite show again with the extensive offerings of broadcast and internet content.

Find - By means of the program guide, it is easy to find what you are looking for.

Watch - Simply start watching anywhere without delay. Even if you want to watch your favourite movies, integrated VOD offers the possibility to enjoy a blockbuster instantly.

Share - When you have found a program you like, it can easily be recommended to and shared with friends. Whether you use Facebook, Bebo, MySpace or another community, with multi-screen TV you are in contact with your community and friends. All an integrated part of the new viewing experience.

## MULTI SCREEN ENABLING TECHNOLOGY

A file-based transcoder that supports the largest array of acquisition, editing, broadcast, web and mobile formats. A real-time video processing and encoding system with enhanced video codec technology. A commercial-grade adaptive stream preparation system for scalable, secure, high-value Internet video services.

A HTTP streaming video server ideal for originating a broad range of multiscreen services in a scalable, manageable, enterprise-class platform.

## NEW TECHNOLOGY

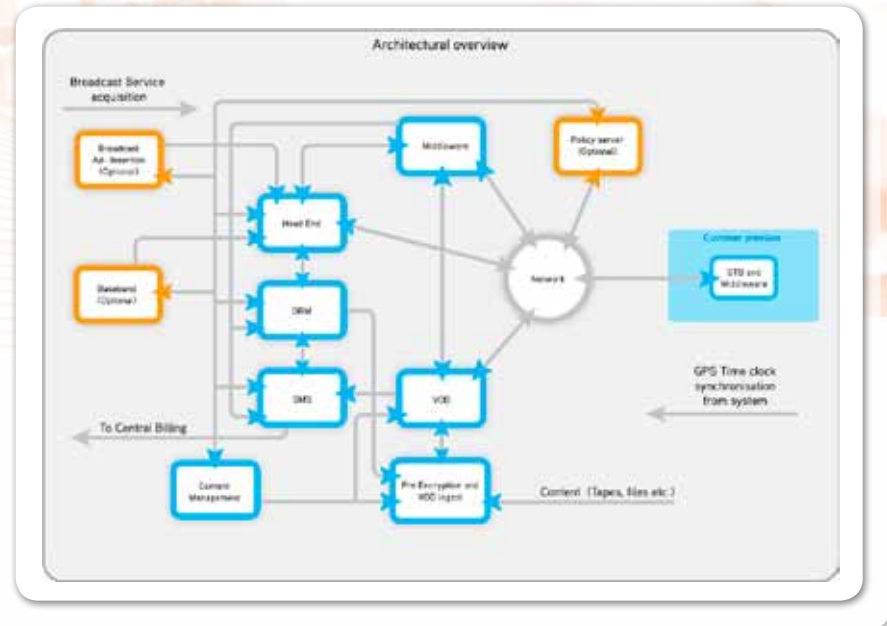
On demand services such as video-on demand, time shift TV and network PVR change the workflow and technologies encountered by the Operator considerably, and throughout the end-to-end chain.

IMPEQ has teamed up with the best of breed suppliers in order to be able to exploit on-demand as efficiently as possible, from content formatting and ingest, encryption and billing models up to distribution and play-out on the target devices.



IMPEQ Solutions offers a unique and fully integrated suite of software products that can be deployed individually or as an end-to-end video processing solution. Our solution offers the flexibility, performance and quality required for today's multi-format video services. The content workflow is integrated with leading digital rights management systems, asset management systems and content distribution networks.

As a true systems integrator, IMPEQ Solutions takes upon itself the responsibility of making all building blocks interact properly with each-other, and will fit your current and future needs by keeping the solutions flexible and scalable.

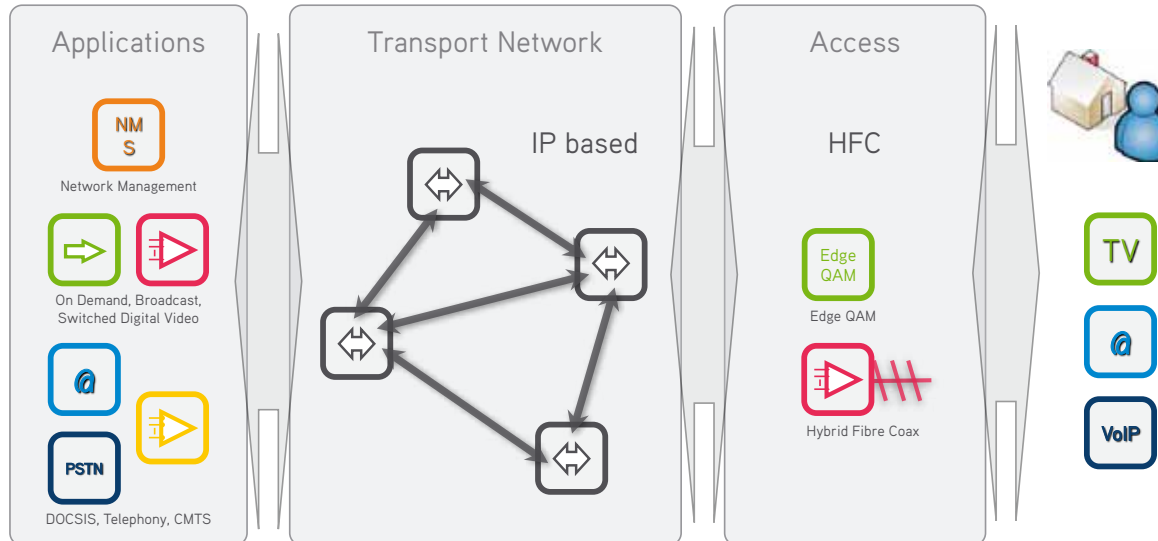


## CABLE EDGE

IMPEQ Solutions assists cable operators to deliver more bandwidth to the home with a number of solutions for the Operators network. These includes HFC network deployment, network segmentation, fiber-deep architectures and more.

IMPEQ has selected products and solutions to enable a flexible approach, where we strive to implement the most cost efficient solution. With the solution defined and the products selected IMPEQ will create an implementation programme covering product delivery, implementation, network measurement in the field (sweeping), commissioning and operation. This all guided by skilled programme manager who will be the central focal point for all parties.

## MULTI SERVICE DELIVERY ON CABLE



## EDGE MODULATION

Cable operators have the network potential to provide a significant on-demand user experience. In order to deploy these customer winning services the network must be able to transport a challenging mix of digital information. IMPEQ has addressed this challenge with cable operators across Europe replacing or upgrading inefficient and costly transports with IP delivery from the head-end, and advanced Edge QAM technology together with narrowcast enabled digital DWDM optical transport.

Today's leading Edge QAM products are complex feature rich and high density devices exceeding 648 QAMs per 2RU. They provide leading RF performance and serve as a highly integrated digital video gateway, capable of performing multiplexing, program/PID filtering and routing, scrambling, QAM modulation and RF up conversion for on-demand content streamed over an IP network. A single product provides broadcast, on-demand, switched digital video and modular CMTS solutions. It is also DOCSIS 3.0 ready and designed to support DOCSIS bypass applications.

## SWITCHED DIGITAL VIDEO

Switched digital video (SDV) is a fast and cost-effective way to provide more linear broadcast services at less cost in terms of frequency spectrum. SDV sends specific programs only to those subscribers who request them. SDV session and edge resource managers located in the backbone control edge QAM devices.

## DIRECT TO EDGE

Thanks to the proliferation of IP-enabled devices, consumers expect to view video anywhere in their home. The challenge is to monetize and capitalize on this growing demand quickly and cost-effectively. Direct to edge lets you extend managed video services to subscriber owned devices in the home network. The solution is built upon the existing cable architecture, leveraging your investment in Universal Edge QAMs and Switched digital video (SDV), to provide a cost-effective, video service using a standard DOCSIS® 3.0 cable modem or gateway.

IMPEQ works with the market leaders to deliver SDV and direct to edge solutions, while enabling use and re-use of the same edge-device technology for on-demand or data-services. Beyond the cooperation with those key vendors, we can rely on our expertise derived from a vast installed and supported base of edge-QAM's for on-demand, broadcast and data services.



# CABLE ACCESS

## HYBRID FIBRE COAXIAL

Hybrid Fibre Coaxial networks remain a cost effective and highly efficient solution for data and asymmetric video content delivery.

Furthermore existing HFC networks can be readily upgraded with dense wavelength division multiplexing (DWDM) permitting the reduction of homes passed per segment by the multiplexing of different segments on a single fibre using different wavelengths.

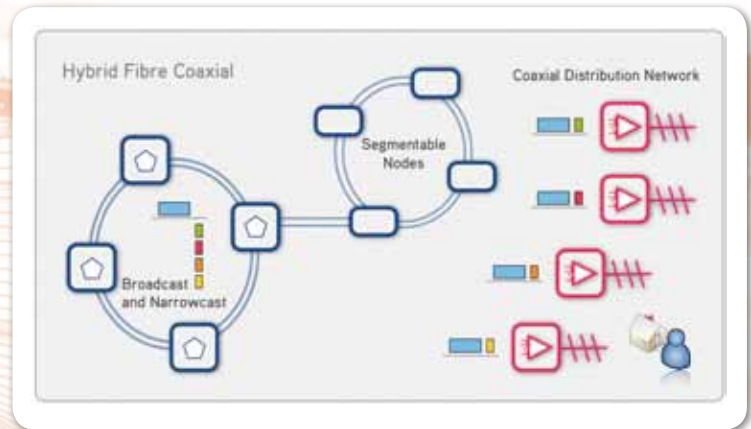
This allows scarce and existing fibre to be used efficiently for narrowcast applications like telephony, data networking and VOD. IMPEQ's dedicated team of HFC specialists need to carefully consider the special properties of not only the operator but their regional networks.

factors included are:

- Correct scaling of the solution according to the hub size.
- DWDM does not need receivers at the hub sites, but DWDM demultiplexers to split or multiplex the signal for the set-top boxes, cable modems etc. The transmit and receive equipment can be placed into the super hub or head-end and still have the possibility to segment the HFC network.
- Network equipment must be tuned precisely to match link budgets and distance. Maximum distances are also affected by fibre dispersion limitations.

## CORE AND ACCESS

Using DWDM based solutions, a wide variety of digital and analogue signals can be integrated over the same transport infrastructure and targeted by wavelength. The network gains the capability to deliver today's advanced on-demand services while supporting legacy and future technology.





## OPTICAL NODES

Optical node products provided by IMPEQ address the need for a compact, cost-effective node with forward and return path flexibility. Redundancy and segmentation options, offered in both forward and return paths, enable the Node to economically deliver today's broadcast services as well as to support additional narrowcast services such as VOD, data or telephony.

All components are based on standard building blocks to enable flexible configurations. IMPEQ has selected manufacturers that provide this flexibility for both indoor and outdoor equipment.

These easy-to-configure nodes include:

- Compact, rugged die-cast aluminium housing
- Multiple high-level outputs enables cost-effective network design.
- Separate RF slope and level control provide maximum flexibility in network design.
- Segmentable forward path allows deeper network segmentation to support expanding interactive services.
- Segmentable return path allows for increasing the return bandwidth in the future.
- Return mute switch offers troubleshooting return ingress, either manual or remotely controllable via EMS.
- Optional status transponder allows remote monitoring to ensure network reliability (up to 4 by 4 segments).

# SERVICE ANALYSIS AND MONITORING

Network operators around the world are scaling up to deliver an expanding portfolio of channels and service offerings. Network Operations Managers require their teams to maintain an oversight of all deployed equipment to quickly identify, diagnose, and rectify faults, both in the platforms and services delivered. The expansion and growing complexity of operations is rendering traditional device-centric management systems ineffective.

IMPEQ Solutions has recognized and understood these challenges and includes multi-vendor network management solutions for the HFC broadband, satellite, IPTV and broadcast industry. When combined with IMPEQ's SAM Service Analysis & Monitoring solution, IMPEQ Solutions can create customer-centric software environments which offer complete visibility and control for next generation Master Control Rooms and Network Operations Centers.

## DEMAND THESE FEATURES IN YOUR MONITORING SOLUTION

*Integration with over 2000 devices - total integration assurance - Open, XML based drivers - Unlimited web access - Distributed and scaleable architecture - e-mail and SMS notification - multi-user alarm management - long-term trending - comprehensive reporting - advanced automation - intelligent correlation and root cause analysis - service awareness - real-time SLA monitoring - KPI dashboards - mobile access - powerful CPE management.*

### DID YOU KNOW...

NMS systems includes service intelligence, which allows operators to manage their technical infrastructure from an intuitive service-based perspective, rather than the more common, but less transparent device-centric approach. This feature allows operators to assess the impact of device events much faster and to strive for optimal availability of services.

In a typical digital broadcast centre and distribution environment there are a multitude of devices aligned in the process of receiving content, re-purposing and the forward transmission. IMPEQ SAM takes care of watching the incoming and out-going content for standards adherence, semantic faults and physical stream errors. The intermediate devices are monitored and managed by discrete vendor specific solutions. By overlaying an NMS, we provide the Operators with a simple and focused one screen presentation of the environment, clear status information and critically an intelligent correlation of any faults to identify root cause. System availability is improved and best of all IMPEQ Solutions will provide you with the proof.

- **THE SAM** solution sees many application areas that provide their own specific needs. It is this variety that makes the solution fit for many requirements.
- **THE SAM** probe is a very powerful tool that may be used standalone for investigation and troubleshooting on site by engineers.
- **THE FULL SAM** solution may also be used by broadcasters to monitor availability, service integrity and content protection.

Also network operators use SAM to verify availability, transmission integrity, decoder compliance, content protection, application data (like EPG) and multi view for their network operations centre.

Typical usage:

- **ENGINEERS**
- **BROADCASTERS**
- **NETWORK OPERATORS**

### THE BENEFITS

Fault assessment on PID/service/transport stream level is done on template basis (templates can be created using snapshots) together with ETR290 measurements and black frame/audio silence detection.

All DVB delivery networks (DVB-T/S/C and IPTV) can be served in a scalable architecture using network probes and centralised data accumulation servers and clients.

## SAM FEATURES

### NETWORKS

- DVB-T/S/C/IPTV

### MONITORING

- Aggregate service issues anywhere in the distribution network to one console view
- Template based analysis with on-line template control
- Full parallel transport stream/service/component checks including :
  - Video black/freeze (optional de-scrambling)
  - Audio silence and level checks
  - ETR290 parameters with user definable alarm thresholds
  - Bandwidth behaviour, check VBR/CBR/Service or Statmux pool B/W boundaries
  - User definable tables and descriptors

### ANALYSIS

- In depth MPEG-2/MPEG-4 SD/HD support including header analysis and GOP structure
- Table analysis, including version number check
- Table export to XML
- EIT schedule to time correlation including definable EIT gap rules
- Simultaneous display of EIT and service thumbnail

### SYSTEM

- Scalable monitoring architecture using probes, accumulator and clients
- SNMP alarm interface to umbrella management systems
- Configurable alarm logging and display
- ASI/IP/File/RF/SDI input options
- Continuous or triggered recording of services or transport streams using recorder option
- flexible service display arrangements



# GLOBAL SOLUTIONS AND SERVICES FOR VIDEO DELIVERY

## ABOUT IMPEQ

### EIGHT YEARS RUNNING

Since its inception in 2003, IMPEQ Technologies has become a leading provider of video solutions and services for digital television providers and network operators across the globe.

IMPEQ is a multi-vendor partner focused on maximising the inherent value of combining excellent people with the best technology, two key elements we believe are inseparable. IMPEQ's experts are part of a company culture that has a leading track record of planning, and building and running some of the most reliable and innovative video delivery networks in the world.

Customers spanning all delivery segments (satellite, cable, terrestrial and telecom) rely on IMPEQ for advice, products, solutions, integration, knowledge, validation and dedicated services, flexible talent, and operational support.

IMPEQ offers peace of mind to content providers and network operators alike throughout the operational lifecycle. Our customers enjoy new technology sooner and for longer, reduced costs and deployment risk with maximum utilisation of resources, and importantly higher end-customer satisfaction through our verification and monitoring.

Together with your own expertise, we realize market leading solutions and services.

IMPEQ is headquartered in The Netherlands with offices in the UK, India, The Philippines and Singapore. The company's customers, including many of the world's largest communications providers, deliver services in virtually every country.







## OUR PROPOSITIONS

IMPEQ Consulting uniquely offers expertise in technology through the total life-cycle. Operators recognise IMPEQ Consulting as a valuable partner in order to meet the challenge of continuous change in our industry and derive from it opportunity and growth.

IMPEQ Services provides a comprehensive range of services including: SLA support services, operational and fully managed services together with an extensive in-house test & measurement capability. We provide an extra capability to innovate service processes and optimize operational costs.

IMPEQ Solutions provides multi-vendor products and solutions for the HFC broadband, satellite, IPTV and terrestrial broadcast industry including: digital head-ends, on-demand, content protection, cable edge and access solutions, network management, and service analysis and remote monitoring.

IMPEQ Staffing's global delivery and sourcing capabilities provide our customers with the right people, skills and industry expertise to deliver technology, business process and outsourcing services with greater assurance, quality and productivity.

Thanks to these inter-operable lines of business we provide our customers with current, tangible and executable solutions and services that is of great importance when defining your future.



**CONSULTING | SOLUTIONS | SERVICES | STAFFING**  
*Global solutions and services for video delivery*

## CONSULTING



*Expert resources enabling content delivery.*

## SERVICES



*Operational assurance in network infrastructures.*

## SOLUTIONS



*Implementing innovative video technology.*

## STAFFING



*Sourcing & flexibility with transmission people.*



**SOLUTIONS**  
*Implementing innovative video technology.*



## **SOLUTIONS**

*Implementing innovative video technology.*

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For contact details see our website at: [www.impeq.com](http://www.impeq.com)