Ericsson 4K Ultra High Definition Television (4K UHDTV) Video Contribution Solution

The television industry is currently undergoing a ground-breaking transition to a digital world, where HD quality is no longer a desirable feature but a consumer expectation. This represents a fundamental shift from simply viewing video content to experiencing it. Although the process towards mass deployment may be gradual, 4K UHDTV is the natural next step in the evolution of TV services.

‘True’ 4K UHDTV imposes a unique set of requirements on the content acquisition, exchange and distribution ecosystems that are already in use by HDTV. That’s why Ericsson has introduced the world’s first working, full quality 4Kp60, 4:2:2, 10-bit resolution UHDTV system, based on an enhancement to its AVP 2000 Contribution Encoder and RX8200 Advanced Modular Receiver. The raison d’être of these units is to deliver SD and HD video of the highest possible quality within the bandwidth restrictions that the operator places on the equipment.

With interest in 4K UHDTV increasing rapidly, it is of paramount importance that operators seek out compelling content. Movies and live events are likely to become the major sources of content – and importantly likely to be content that viewers will perceive to carry a value that is worth paying for. 2014 is also set to be a huge year for sport, with crowd-pulling live events such as the FIFA World Cup in Brazil and the Commonwealth Games in Scotland, helping to advance the technology even further. Ericsson’s 4K Ultra High Definition Contribution solution provides a clear route for broadcasters to overcome the first and most important hurdle – acquisition of high quality and truly immersive live content.

Delivering the best possible video quality from remote, live events at full 4K resolution, the capability is available as a software upgrade on the company’s existing encoder and decoder platform as part of its Content Acquisition and Content Exchange Solutions – allowing broadcasters to respond quickly to this rapidly changing and dynamic market.

In order to bring this content to the end viewer the broadcaster must first bring the content from the live and often remote event into their production flow – in a cost and bandwidth efficient manner. The Ericsson 4K Ultra High Definition Contribution solution forms the keystone of the production process.

Ericsson is the only vendor in today’s marketplace offering satellite service providers a complete solution to enable the acquisition, exchange and distribution of True UHDTV. Intelsat and MEASAT are on the cusp of offering commercial services, while Korea Telecom Skylife is also in the process of trialing Ericsson’s 4K Ultra High Definition Contribution solution. Not to mention high profile partners such as Sky Sports and Sky Italia who helped Ericsson to run earlier trials last year. These services/trials are well past the experimental stage and operators are beginning to lay the groundwork towards launching commercial services in the near future.

Live demonstrations such as these examples prove that TV service providers can build the necessary 4K ecosystems and a library of UHDTV content now, using today’s delivery infrastructure. This is a testament to the technological developments within the industry, proving that high quality fast moving images can be captured perfectly to offer a truly immersive television experience.

Ericsson’s live trial at NAB demonstrated how 4K UHDTV video compressed signals require 4:2:2 chroma sampling and 10-bit depth. This is necessary to maintain the color fidelity through the multiple encode/decode/re-encode stages and through multiple editing stages, while delivering truly astonishing results to large consumers’ sets.

4K UHDTV is not about the spatial resolution of a single frame; it’s about enabling the consumer to take advantage of the most realistic experience from their video content. Through Ericsson’s high quality compression algorithms, developed from over 20 years of research and development, operators can ensure premium video quality within an affordable bandwidth utilization. Combined with the ability to respond quickly to deployment needs by utilizing existing equipment, Ericsson’s new solution allows operators to fulfill the key application area on which all other 4K platforms ultimately rely – content acquisition and exchange.
Video is already the largest and fastest growing internet traffic segment, and Ericsson forecasts in its latest Mobility Report, continued growth to the tune of 55 percent annually through 2019. This seismic shift places a huge strain on operators and impacts the profitability of their networks, as they strive to meet the rising appetite of subscriber consumption as well as increasing quality expectations.

Already today, this rapid growth can warrant greater network expenses for operators than revenue. The continued convergence of the internet and video creates a pressing need for more dynamic ways to deliver content — a need which traditional Content Delivery Network (CDN) solutions were simply not built to meet.

A game-changing approach
Developed in direct response to today’s increasingly disruptive trends in internet video traffic, Ericsson’s Media Delivery Network (MDN) is a game-changing solution for operators. The MDN solution revolutionizes content delivery by breaking down the traditional silos of content delivery. It is the first and only solution to unite all pillars of content delivery (caching, optimization, and acceleration) within a single platform for the delivery of all types of content (managed and unmanaged) over all types of networks (fixed and mobile).

This converged solution boasts radical network simplification which creates not only significant opex and capex savings, but also, an ultra-intelligent framework that is service, access, content, device, and user-aware. This smart agility enables greater and more dynamic use of network capacity, maximizing velocity of new services and ability to monetize, providing an ideal quality of experience for more subscribers than ever before, and ultimately transforming the operator role within the media value chain.

Ground-breaking business innovation
MDN is not only a unique technological proposition, but also, a revolutionary business solution. Ericsson is enabling several new business models though this solution, most recently by addressing the need to integrate operators with the entire content value chain.

On February 20, 2014 at Mobile World Congress, Barcelona, Ericsson launched a partnership program for global CDNs, essentially establishing a plug-in media ecosystem for the operator MDN solution. This plug-in CDN ecosystem is the first of its kind, enabling operators to improve the efficiency of high quality content delivery by creating a multi service system that extends the global CDN deep into the operator’s network. Content providers will benefit from a seamless delivery mechanism for reaching audiences on both a local and global level, opening up new revenue streams.

Limelight Networks, CDNetworks and ChinaCache are the first to announce they will integrate their systems with the Ericsson content delivery solution.

More Firsts for Media Delivery Network
Deployment: World’s Largest Operator CDN
Announced September 12, 2013, Ericsson deployed the world’s largest operator CDN for customer Rostelecom. Ericsson’s Media Delivery Network solution is the heart of Rostelecom’s new system, enabling optimized content delivery across the whole of Russia. This deployment is not only significant for its sheer geographic span (29 sites) and capacity (1 Tbps), but also because it makes Rostelecom among the first operators to successfully monetize the delivery of over-the-top traffic delivered over their network.

Deployment: An all-new Business Model
On January 6, 2014, AT&T became the first operator to offer a toll free data service, with the launch of their “Sponsored Data” service. Through the service, AT&T partners with content providers to create offerings of rich content that subscribers can enjoy at no impact to their mobile bill. The content in these offers is sponsored by the content provider instead. This new toll free data service is powered by Ericsson’s MDN solution.
Ericsson Virtualized Encoding

In Ericsson’s vision of the Networked Society there will be 50 billion connected devices by 2020, 15 billion of which will be video enabled. The proliferation of these devices, combined with consumer willingness to pay for high quality, premium content, is resulting in a new age of TV Anywhere. Today’s TV service providers must deal with an ever-growing level of infrastructure complexity to deliver high quality video anywhere, anytime and to any device, faster than their existing and new competitors.

A variety of compression platforms are being used to balance investment, architecture and performance but today’s TV service providers are being forced to choose between them, especially when addressing linear/live TV services and the rapid growth of on-demand services.

The desire for video and mobility represents a key obstacle in terms of service provision and monetization. Consumers want access to premium video services, on more devices, regardless of the network. At the same time, however, technology has evolved to offer more choice to address these different needs. Today’s TV landscape deals with highly complex linear workflows, including:

- More inputs (baseband signals, compressed video off-air or from new mezzanine formats)
- More outputs (traditional linear delivery on their infrastructure, delivery on other networks and ABR delivery on unmanaged networks)
- More codecs (digital video compression has moved from MPEG-2 to MPEG-4 AVC and now HEVC, also adopting JPEG 2000 in certain applications). New standards have not meant the demise of the old ones that continue to support and serve existing legacy receiving populations.

In response to this, Ericsson has launched Ericsson Virtualized Encoding, the industry’s first unified software solution designed to remove the complexity of TV Anywhere video processing, guaranteeing best-in class performance on all chosen infrastructures, regardless of the platform running the algorithms. This enables service providers to deliver and manage a multitude of content across more formats and screens than ever before.

The new solution is completely task and service-oriented, and acts as an abstraction layer between some of the operational aspects of video processing and the platform utilized to run the algorithms. Crucially, this enables TV service providers to choose the precise combination of platforms most suitable for their infrastructure or business needs, always guaranteeing the best video processing performance for that given platform.

Ericsson Virtualized Encoding intelligently allocates resources and simplifies the process of selecting the right encoding method and platform based on the operator’s priorities for deployment speed, video quality and output. It eliminates complexity, enables more efficient resource utilization and bandwidth management and bridges the gap between broadcast and IT infrastructures, allowing deployment of enhanced TV services much more quickly.

At the 2014 NAB Show, Ericsson demonstrated Ericsson Virtualized Encoding as part of its Video Processing range. It supports all input-types (compressed off-air or mezzanine and uncompressed), all output-types (traditional linear broadcast on cable, IPTV, DTH satellite and DTT, Multiscreen ABR delivery over IP) and all codecs (MPEG-2, MPEG-4 AVC and HEVC). It can be implemented on processing platforms containing a combination of dedicated programmable hardware such as Ericsson’s video processing chip, in customer premises and software or GPU-based servers on premise, or potentially deployed in the cloud.

Unlike other vendors, Ericsson is the first and only one to provide a video processing engine decoupled from a specific platform. The infrastructure can be easily expanded, which ensures the highest and best utilization of all equipment investment at all times. With one single interface for all the component blocks, service providers can ensure operational efficiency and maximize their resource.

Ericsson’s new virtualized encoding solution provides an answer for customers who increasingly need to prepare content in more formats for more screens than ever before. It will allow them to choose their encoding infrastructure based on factors important to them such as performance, density, and time to market.

The combination of video processing performance, speed of deployment, infrastructure spend, platform choice, level of support for quality of service (QoS) and future-proofing are six key areas which are currently having a direct impact on revenue and competitiveness. However, at the heart of all these choices is compression performance.

Ericsson is harnessing its deep engineering resources to bring a new approach to a complex question. The new solution builds on Ericsson’s video compression leadership which spans more than two decades, and Ericsson Virtualized Encoding is a further step in giving its customers the tools they need to deliver successful TV Anywhere services for now and the foreseeable future.

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Ericsson Next Generation Playout Solution

There is fierce competition in the linear playout market. In the face of growing demand, broadcasters are faced with making significant technology investments to refresh legacy systems, coupled with declining traditional ad-funded revenues. This conflicting position has prompted Ericsson Broadcast Services to develop an innovative linear channel playout system that reduces cost while maintaining and improving inherent quality and reliability.

Separating operators and the technology, Ericsson’s new Next Generation Playout solution marks a major change in the way that playout is managed by broadcasters, providing reduced OPEX by consolidating operations to create more effective workflow and processes. The Ericsson Next Generation Playout platform enables faster time to market while opening up a whole new set of distribution possibilities around OTT and VOD, offering managed playout services delivered from major data centers across the world with signal distribution through hundreds of co-located carriers, distributors and connectivity providers.

Ericsson is geographically decoupling the architecture of broadcast operators and technology. This would allow for the economies of scale and specialization of skills to be concentrated where it offers the most benefits.

Playout operations will be located separately yet remotely monitored and controlled either by our customers from their own premises or by utilizing Ericsson’s service teams based at its Global Service Centers (GSC). The architecture ensures a high quality of service, focusing on reliability and resilience for each channel.

Ericsson will offer Next Generation Playout services in two unique ways:

For the Managed Linear Playout option, the operators will be working remotely from one of Ericsson’s existing Global Service Centers. In Europe playout operations are separated geographically from the playout infrastructure. The infrastructure is placed in a data center in London. This makes use of the high connectivity options London has to offer to allow content to be distributed as required both nationally and internationally via 10Ge geo redundant fiber.

Ericsson Broadcast Services is moving its playout technology into one of the most connected locations in the world, to a data center in London’s Docklands. A broadcaster will now be able to pick and choose from over 200 network providers to carry the distribution of the channel either nationally or internationally from a single location.

Ericsson’s design provides reduced OPEX by consolidating operations to create more effective workflow and processes. This design also positions playout close to the distribution hand-off points. Additionally Ericsson provides its customers with greater flexibility in their connectivity options to distributors and carriers enabling them to work with the carrier/distributor that best meets their operational requirements.

The technology used to deliver channels is architecture. This means that all video signals on the network are available as a routable source and destination. This innovation creates a potentially global software video router with no limits and latency as low as 3 frames.

Another complex part of the project is to reduce the size of space needed in the GSC to lower the CAPEX. Ericsson has managed to compress the required rack space in the GSC from 80U to 5U and integrate the 5 rack units into a special broadcast desk for monitoring and control. The rack room is no longer necessary which lowers the CAPEX investment in base infrastructure significantly and enables Ericsson to pass these benefits to its customers.

From a disaster recovery perspective, and to ensure that operations are resilient, Ericsson is locating broadcast desks in two different buildings in different countries, allowing channels to be either partially or fully controlled from anywhere in the world.

The Hosted Linear Playout service is offered as follows: the technology playout center in a data center will be accessed and controlled by the broadcaster using Ericsson broadcast-desks and web interfaces. To enable this service, Ericsson will deliver the broadcast-desks and train the operators to operate the new technology in line with their playout requirements.

The broadcaster’s operators and workflows will stay the same although they now remotely access and control the playout technology in the data center in London. Our teams will make sure broadcasters will always work with state of the art technology that is fully monitored and supported by Ericsson’s resources.

Ericsson’s Next Generation Playout offering, either as the Managed or Hosted option, is embedded in a data center with extensive connectivity options that increases the choice of distribution methods and enables other opportunities such as OTT and VOD services as part of an increasingly Networked Society.

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