

In the heart of digital convergence:
TV content accessible on multiple terminals



Digital Television

Access TV contents anywhere and anytime: a fundamental revolution of the digital ecosystem.

The new digital television markets

In Europe, before 2012, analogue terrestrial television should have definitively given way to digital television. The transition between these technologies is profoundly changing both operators' offers and consumers' expectations. It is creating a strong growth potential, especially in Europe where the penetration of digital is still relatively low. In the Americas and in Asia (especially China), this conversion is going rapidly ahead.

Converging media

Digital technology enables operators to expand their services and increase features. Now universal, it supports the distribution of content on different types of fixed and mobile devices: television sets, computers, mobile telephones and portable media players.

This evolution leads operators to work on multiple distribution platforms, combining technologies. In addition to television operators, new players are entering the world of digital TV, such as telcos, whose infrastructure is particularly suited to the distribution of television content.

The open architecture of the Kudelski solutions allows interoperability of technologies and therefore a perfect symbiosis between players within the ecosystem

The Kudelski Group ready to meet new expectations

The Kudelski Group has a complete suite of solutions that enable it to play a driving role in the evolution of this increasingly complex convergent universe. Conditional access, middleware, content management and protection, interactivity, user interfaces and removable security modules are the main elements of the Group's offer covering the whole ecosystem and contributing to extending its limits.

These open architecture solutions enable interoperability between the technologies from different players. The Kudelski Group is therefore able to deliver end-to-end turnkey platforms, based on which operators can offer their subscribers greater variety in the ways content can be viewed and interacted with.

Managing security

Conditional access – new generation of solutions

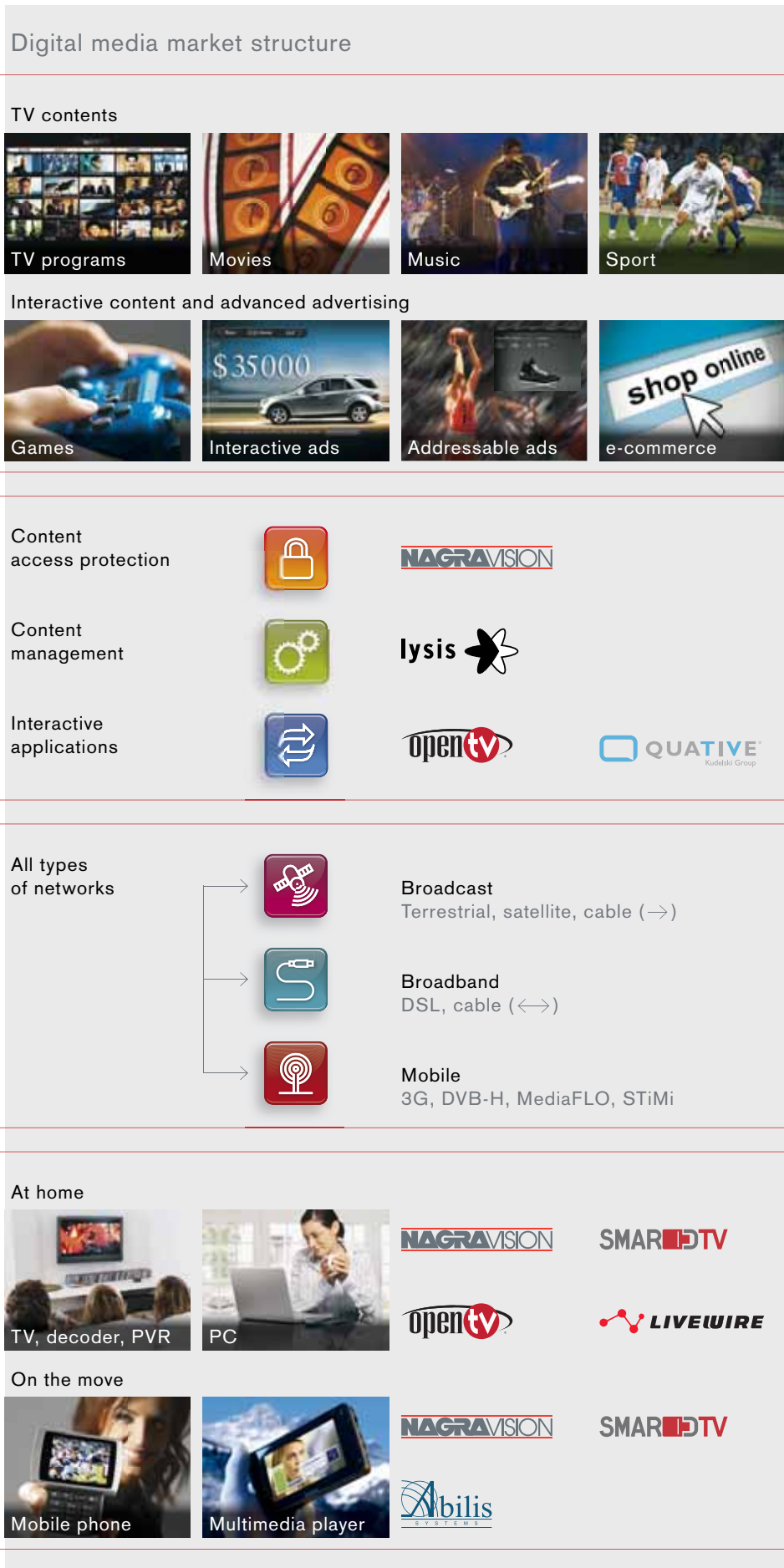
Conditional access systems are at the centre of the Kudelski Group activities. The company continues to invest substantially in this sector, both in end-to-end system solutions and dedicated security components, in particular smart cards.

Three new advanced security solution suites have been designed accordingly, in order to offer strengthened and diversified security levels to the operators while introducing a series of new, innovative functionalities. The new solutions benefit from major progress in protection against smart card attacks and enable various anti-piracy mechanisms both at the smart card and at the decoder level. In 2007, the first series of cards based on two of the new families were deployed successfully in several key markets.

The Group also strengthened its dynamic counter-measures and anti-piracy activities, providing permanent support to operators and helping them optimize the total cost of ownership of their technology environment.

NagraID – production under high security

In highly secure premises and with EMV (EuroPay Mastercard VisaCard) certification for the production of bank cards, NagraID manufactures and personalizes the cards for the Kudelski Group's Digital TV and Public Access applications.



Customer expectations

Protect the content life cycle throughout the value chain, from creation to consumption



React rapidly to market evolution



Maximize return on investment:
– increase ARPU (Average Revenue Per User)
– reduce churn



Kudelski Group added value

Highly secure end-to-end content protection and access rights management solutions. Role of integrator for the delivery of turnkey solutions

Pre-integrated solutions allowing fast deployments

Solutions and services enabling operators to protect their revenue sources and to create new ones. Flexibility and privileged relations with operators to achieve developments addressing their specific needs

Manage the operational complexity: content acquisition, aggregation and distribution



Offer ever more advanced functionalities to interact with content



Benefit from new forms of advertising



Comprehensive turnkey content management solutions

Integrated interactivity concept including VOD, PVR, EPG applications and many more

Advanced advertising solutions such as targeted, addressable and interactive advertising

Deploy services on all types of platforms



Agnostic (open architecture) technologies that can integrate with all types of networks as well as with hybrid networks

Offer a new attractive media experience based on the latest technological innovations



Content accessible on all types of devices, anytime and anywhere



Solutions pushing the limits of the digital TV ecosystem

Technologies contributing to the digital media convergence. For consumers, ever more consistent user experience, whatever the media

Content propagation: securing the whole distribution chain

With digital convergence, operators combine more and more frequently different types of networks to deliver content. As regards users, they consume content on ever more diverse fixed and mobile devices that potentially communicate with each other. This situation requires a new approach to security. The Persistent Rights Management (PRM) concept is the answer developed by the Kudelski Group.

While conventional access control denies or authorizes access to content from the outside (with a smart card), the PRM concept consists in placing the access rights in the content itself. The secured rights thus accompany the content throughout its consumption cycle, regardless of the network used and the device on which it is consumed.

By using a unique and coherent security system for all types of platforms, operators gain access to a new freedom in the development and expansion of their service offers and their business models.

This coherence in the end benefits the consumer, who can enjoy a more consistent and transparent multimedia experience.

Advanced functionalities (PVR, Push VOD, interactive program guide, etc.), allowing the consumer to access a world ever more full of possibilities, are the subject of constant developments. Requested by television viewers, they now represent an important aspect of the service offers of operators who draw from them new revenue sources.

The Kudelski Group has offered solutions enabling advanced functionalities for several years. The new generation of products has been further enhanced in terms of graphical quality and ease of use. Modular and scalable, the solutions adapt to the operators' platforms and can be rapidly deployed.

PVR and Push VOD solutions

The PVR (Personal Video Recorder) is a digital multifunction decoder-recorder with a mass memory (hard disk or flash) of tens, or even hundreds of gigabytes. It includes many features such as multiple simultaneous recordings of programs, pausing of a live program for later viewing, archiving of recordings, access to Push Video On Demand (VOD) services (content downloaded to the set-top box) and electronic program guides.

100 million digital set-top boxes and television sets in the world are using OpenTV technologies

The Kudelski Group's Nagravision solutions enable the implementation of PVR and Push VOD features thanks to which operators can offer high value-added content in an increasingly intuitive and user-friendly way.

OpenTV also offers complementary solutions. OpenTV Core2™ and OpenTV PVR2™ provide the underlying setop box software and file system required for a network operator or consumer electronics manufacturer to create a PVR solution in a very flexible manner.

Electronic Program Guides

Electronic Program Guides (EPG) facilitate navigation, guiding subscribers as they adjust to the explosive growth in digital TV programs.

OpenTV

In 2007, OpenTV presented its vision of a revolutionary intuitive user interface which enables subscribers to navigate instinctively through thousands of channels and live, pre-recorded or on demand content, based on personalized criteria. One of the innovations of this system is the concept of recommendation: after each selection, a number of additional programs based on the same criteria are suggested to the viewer. The first version of this visually rich, high definition interface is planned for availability at the end of 2008.

Nagravision

Developed by Nagravision, NagraGuide is a powerful suite of interactive applications supporting both high-definition and standard-definition. It was specifically designed to make the most of today's PVR set-top boxes integrated with Nagravision's conditional access and Push VOD technologies. NagraGuide is based on OpenTV's middleware.



OpenTV's Electronic Program Guide: a visually rich user interface enabling subscribers to navigate intuitively through thousands of channels and pre-recorded content.

Content management – Lysis iDTV

The multiplicity of content, platforms and devices makes the use of an efficient content management tool all the more important for operators. Completing the suite of Nagravision solutions, iDTV Lysis Content Management is an end-to-end flexible system allowing for the secure and optimized workflow management from acquisition of content to analysis, aggregation and post transmission. This powerful tool provides operators with a content management platform for creating, managing and delivering transactional digital television services such as video on demand.

Advanced forms of advertising and interactive applications

Often required by operators in parallel with access control, interactive capabilities have become a must. The Kudelski Group has increased its expertise in the field of interactivity via the OpenTV company.

Interactive features are enabled by a middleware system integrated into decoders and digital television receivers. OpenTV is the leading middleware supplier in the world with more than 56% market share. In addition to PVR applications, the OpenTV product range includes innovative interactive and addressable advertising solutions as well as participative applications for digital television. For example, OpenTV Participate™ allows viewers to take part in competitions, quizzes, votes and games during a program via any device including phone, mobile, PC and TV.

End-to-end turnkey solutions – the choice of customers

CanalDigitaal and TV-Vlaanderen, the only providers of digital satellite TV in the Netherlands and the north of Belgium, have selected a suite of Kudelski Group products to enhance and secure their new high definition television subscription video on demand service scheduled to launch in 2008.

The Kudelski Group products selected include the NagraGuide user interface system, OpenTV Core2™ and OpenTV PVR2™ software. High-definition personal video recorders with OpenTV software solutions, in combination with Nagravision content security and NagraGuide will provide CanalDigitaal and TV-Vlaanderen with outstanding protection for premium content, while offering subscribers more service options. The overall Kudelski based solution is expected to increase subscriber satisfaction, raise the average revenue per user (ARPU) and reduce churn.

With major commercial rollouts since 2004, IPTV (Internet Protocol TV) is an established market alongside satellite, cable and terrestrial transmissions.

Today, with bandwidths up to several megabits per second, broadband networks (DSL and broadband cable) have become modes of transmission for digital television in their own right, allowing the implementation of high value-added services, such as the distribution of multi-media content and interactive applications.

Pre-integrated solutions

The Kudelski Group occupies a key position in the IPTV market with solutions already used by major operators in Europe and the United States. These pre-integrated solutions include NagraVision's content protection system NagraIP, Quative's Service Delivery Platform and the Lysis iDTV Content Management system.

The Kudelski Group addresses the needs of the new hybrid platforms with pre-integrated solutions covering all aspects of the offering

Bringing together experts in IPTV, Quative Limited, based in the United Kingdom, provides a platform enabling operators and service providers to deliver IPTV services to subscribers' decoders keeping control of every aspect of their offering, from graphic design and navigation to applications. Quative also provides a comprehensive set of base IPTV interactive applications including an electronic program guide with PVR and TV on demand, video on demand, parental control, messaging and e-mail.

Hybrid broadband/broadcast platforms

The convergence of the broadcast and broadband ecosystems has given rise to the emergence of new hybrid platforms: cable/IP, satellite/IP and DTT/IP. The Kudelski Group addresses the needs of these markets with pre-integrated solutions combining access control, interactivity and service management.

The Group enjoys a strong position in the digital cable TV sector in most regions of the world. It is actively investing in the technologies that will enable cable operators to stand out from competitors, in particular from telecommunications companies with an IPTV offering.

Hybrid broadband/broadcast deployments

<p>Numéricâble The leading broadband cable operator in France, Belgium and Luxemburg, selected the Kudelski Group's suite of pre-integrated solutions for the rollout of new video on demand and interactive TV services. They include the NagraVision content protection solution, the Lysis content management system to drive the entire content distribution chain and workflow for on demand content, the NagraGuide advanced interactive program guide, OpenTV middleware and the Quative Service Delivery Platform. The Kudelski Group is also taking care of the overall integration with Numéricâble's existing back-end systems.</p>
<p>T-Com Innovation GmbH T-Com Innovation – a wholly-owned subsidiary of Deutsche Telekom – has chosen a Quative IP/terrestrial hybrid solution for an interactive TV pilot project including on demand applications over IP as well as free-to-air channels broadcast in digital terrestrial DVB.</p>
<p>British Telecom The operator has launched a new digital television platform in the United Kingdom. It has deployed a hybrid terrestrial/broadband PVR set-top box which integrates NagraVision's conditional access system, enabling British Telecom's subscribers to view and record premium content services.</p>
<p>CJ Cablenet The major MSO (Multi-System Operator) of Korea has chosen the Lysis iDTV content management solution from NagraVision and the Quative Service Delivery Platform to enrich its digital cable TV platform with enhanced VOD services.</p>
<p>DISH Network EchoStar Communications Corporation's satellite television network (US) announced in October 2007 a video download or Pull VOD service allowing subscribers to download quality content from the Internet for viewing on DISH Network's latest generation digital video recorders. This service is enabled by a NagraVision hybrid satellite/broadband VOD and PVR solution.</p>

Mobile television

Less than ten years ago, the idea of watching television on a mobile telephone was utopian. Three or four years ago, the first television services appeared on 2G and 3G mobile networks, but they rapidly proved ill-adapted to television broadcasting. New standards have since been introduced: DVB-H (especially in Europe), MediaFLO (firstly in the United States) and STiMi (China).

Successful pioneers

In 2006, Italy was the first country in the world to deploy Mobile TV services over DVB-H broadcast networks secured by the Nagra Mobile solution, with H3G, TIM and Vodafone Italy.

Launched in 2006 for the Football World Cup, the H3G mobile TV service attracted more than 1.1 million users (out of the operator's 7 million mobile telephony subscribers) within only 18 months of operations.

In 2008, several European countries are preparing to launch similar services according to the European Commission's frequency allocation plan.

Market potential

In contrast to what has occurred in the broadcasting world, the first content to be marketed on mobile phones was on demand content: ring tones, logos, MP3, etc. The trend is now towards premium contents, broadcast live or on demand. Security is in this context an increasingly strategic factor.

In many countries of the world, the growth of this market is, however, slowed down by the current shortage of available mobile frequencies.

The first mobile television services were proposed by mobile telephone operators. Today, television operators are also launching mobile TV offerings. Thus new opportunities are being created for the Kudelski Group by its traditional customers. In 2007, the Group consolidated its position as the mobile TV market leader by winning several new deals, both in Europe (Alcatel-Lucent in France), in the United States (Hiwire/RRD/SES Americom) and in Asia (PMSI in the Philippines).

Development axes

The Kudelski Group has continued to develop its Mobile TV solutions to address the needs of operators by providing security solutions that can be deployed rapidly and cost-effectively. The Nagra Mobile solutions support all standards currently used worldwide: DVB-H, DVB-SH, MediaFLO, STiMi. In 2007, NagraVision was the world's first conditional access company to support the MediaFLO standard.

Furthermore, the Kudelski Group announced in 2007 with Giesecke & Devrient (G&D), a leading provider of smart card-based solutions and technologies, the joint development of a secure MicroSD/SD card fully integrated with the Nagra Mobile conditional access solution. This card offers consumers a bridge between their mobile phones and their unconnected devices such as personal navigation devices and portable media players, providing full portability for both live access and recorded content.

1.1 million users within 18 months for H3G's mobile TV service secured by Nagra Mobile

Abilis

Abilis Systems strengthens the Group's expertise in the field of mobile television. It offers a single-chip, low-power mobile TV solution integrating both a multi-band RF tuner and a demodulator.

In 2007, Abilis launched a new generation of this product with further enhanced performance, especially as regards reception quality and length of viewing time. This new mobile TV receiver is the most highly integrated mobile digital TV device on the market, enabling the rapid design of low-cost mobile TV services for personal computers, personal navigation devices, personal multimedia players and set-top boxes.

The technology used by Abilis complies with the various standards established or under development concerning broadcasts to mobile devices.

In 2007, Abilis established a structure in Taiwan in order to ensure the development of its activities in Asia and set up a sales network covering the Asia/Pacific region.

Removable security modules: SmarDTV

Through its company SmarDTV, the Kudelski Group addresses the needs of the rapidly expanding market of removable security modules for integrated digital television sets increasingly sold worldwide.

These devices feature a Common Interface (CI) into which a conditional access module (CAM) can be inserted, making the use of a separate decoder superfluous. SmarDTV is world leader in the development and production of these modules. In 2007, the company sold more than 1.3 million modules throughout the world, representing a growth of 50% over the previous year.

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PCTV

Watching TV on a computer is becoming more prevalent. Millions of DVB tuners, enabling the reception on PCs of terrestrial, cable and satellite broadcast programs have been sold, and demand is growing.

The new generation of computers contains an integrated TV reception capability. These systems are suitable for the reception of free-to-air TV content. However access to pay TV content requires the use of SmarDTV's security technology. SmarDTV's newest product line consists of a compact dongle, the size of a USB drive, integrating the USB interface, the conditional access technology and a DVB tuner for digital terrestrial reception.

Active participation in standardization committees

The role played by the Group in standardization committees testifies to the innovative spirit of the company. The Group is in fact actively contributing to the genesis and development of digital TV standards specifications, with the benefit of being able to anticipate the development and deployment of standards in emerging markets.

The Kudelski Group has been elected by the DVB (Digital Video Broadcasting) General Assembly to be one of the ten companies representing digital television manufacturers to sit on the DVB Steering Board along with regulators, broadcasters and network operators. This Board is responsible for setting the overall DVB policy and approving specifications towards standardization.

In the Mobile TV sector, as a member of the FLO Forum, NagraVision contributed to the definition of the Media-FLO standard with Qualcomm. This is a new open broadcasting standard used initially in North America.

In the area of removable security solutions, the Group is also actively involved in standardization committees through its company SmarDTV. For several years, SmarDTV has been contributing to the development of technical specifications for open digital receivers and decoders worldwide, and in particular to the development of the DVB-CI and follow-on standards.

Kudelski Group's main Digital TV customers

Americas	Europe/Middle East	Asia/Pacific, Africa
Broadband/broadcast EchoStar/DISH Network (US) Iowa Network System (US) Bell ExpressVu (Canada) Telefónica Latinoamérica (Argentina, Brazil, Chile, Columbia, Mexico, Peru, Venezuela) NET Serviços (Brazil) TVA (Brazil) Globo (Brazil)	Canal Satellite (France) Canal+ TNT (France) Neuf Cegetel (France) Numéricâble (France, Belgium, Luxemburg) Virgin Media (UK) TopUp TV (UK) Mediaset (Italy) Digital+ (Spain) Kabel Deutschland (Germany) Premiere (Germany) UnityMedia (Germany) APS (Germany) Canal Digitaal/TV-Vlaanderen (Belgium, The Netherlands) Cablecom (Switzerland) UPC/UGC (Ireland, The Netherlands) Cyfrowy Polsat (Poland) Cyfra+ (Poland) TV Cabo (Portugal) Portugal Telecom (Portugal) Telenet (Belgium) BeTV (Belgium) Indi (Belgium) RCS/RDS (Serbia, Romania, Bulgaria) Digiturk (Turkey)	StarHub (Singapore) Reliance (India) IMCL (India) BGCTV (China) OCN (China) Dalian Tiantu Cable Network (China) Suzhou Digital Television (China) C&M (Korea) Orix (Korea) Hong Kong Cable (Hong Kong) Kbro (Taiwan) Canal+ Horizons (Africa)
Mobile AT&T/Hiwire (US) Telefónica (Peru) CNN/Turner (US)	3 Italia (Italy) Telecom Italia Mobile (Italy) Vodafone (Italy) Bouygues Telecom (France) Dominanta (Russia) T-Mobile (Czech Republic) abertis telecom (Spain) Telefónica (Spain)	Maxis (Malaysia) PMSI (The Philippines)
Middleware/advertising EchoStar/DISH Network (US) Time Warner Cable (US) Comcast (US) Cablevision (US) Charter Communications (US) Cox Communications (US) Bell Express Vu (Canada) NET Serviços (Brazil)	BSkyB (UK) Numéricâble (France) Sky Italia (Italy) UPC/UGC (Ireland, The Netherlands) Canal Digitaal/TV-Vlaanderen (Belgium, The Netherlands) Casema (The Netherlands) NTV Plus (Russia) TV Cabo (Portugal) Portugal Telecom (Portugal) Cablecom (Switzerland) Digiturk (Turkey) Hot (Israel)	FOXTEL (Australia) AUSTAR (Australia) DishTV (India) Sun Direct TV (India) Reliance (India) J:COM (Japan) ActVila (Japan) Panasonic/MEI (Japan) TrueVisions UBC (Thailand) StarHub (Singapore) Sky New Zealand (NZ) MultiChoice (South Africa)

